Motion in Graphics

A Thesis Report Submitted to The Faculty of

The College of Imaging Arts and Sciences

In Candidacy for the Degree of

Master of Fine Arts

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Date: _5 / 16 1995._

Dedication

I would like to dedicate this thesis to my parents, for their support of my endeavors and for their belief in my capabilities. Inspiration comes in many forms.

Acknowledgements

I would like to thank the members of my

thesis committee for their flexibility and

patience throughout the thesis.

I would especially like to thank my

roommate, Pel-tzu Hung and my friend

Pofen Chen for all of their repeated support

during the completion of the thesis project.

Contents

Who I Am, What I Want, Where I Go

I used to be a designer in an advertising company in Taiwan. While I worked at that big company, I had the chance to see different design styles which were printed in magazines or books from Paris, Japan or America. At that time, I really enjoyed reading these books and magazines, but the more I read, the more I felt my work always looked the same. In order to broaden my abilities, to increase the design quality of my work and to get some experimental opportunities, I came here. I now stand at a special point which connects my past and my future.

In most design stages, I depended on my intuition to create art works. In Taiwan, traditional education trained me to be a good designer but not to be a creative artist. Once the intuition died, the designer died too. I enjoy seeing very complex composition designs. Each design element has its own reason to exist on paper, and all of them contribute to a rich visual language to express the meaning of the poster. Such thoughtful works are what I want to learn and create.

Preface

I think successful design work should have a sense of the human soul. In the future, I am going to follow my sensations to design, so that the works can touch people. And, meanwhile, I will use the methodology of the design process such as problem identification, research, synthesis, ideation to evaluation I learned in school to organize my thoughts.

First Talk with Professor Roger Remington

During last summer, I took a whole course load, but I continued to think about and find topics for my thesis. Of course, the topic can be anything, but I asked myself what is the most interesting thing, or what will be the biggest challenge to my design abilities. I used to deal with very simple composition in my works, but I thought it might be a good change for me to break up my design style. To increase the excitement and complicity of my style, I chose "motion" to be a part of my objective.

Motion can be the topic itself, and it also can be related to something else. Sports can be one topic which relates to motion, and transportation can be another. I picked trains for my objects because of their heavy loaded feeling and glorious appearance. Last summer, I explained the very rough thoughts to my professor, Roger Remington.

Introduction

Other Possible Topics

In the summer, I also tried to find some new directions. Recently Taiwan built a new Rapid Transit System. I thought this may be an opportunity to challenge myself and also to help the Rapid Transit Bureau design a whole set of applications. I asked my family to collect news about the Rapid Transit and meanwhile I contacted the bureau on September 3. I sent a letter with my proposal to the Bureau and allowed five or six weeks to wait for their response.

Narrowing down the Topic

Three weeks later, I got some feedback from my friends and family. From the bureau, I received the logo design, the map, brochures and some newsletters, but in general, these applications were not enough for me to describe or to introduce the new system to my audience. To consider the policy of the government , either it seemed hard to give their detailed plan of the Rapid Transit to the public or I needed to go back to Taiwan to contact them; however, time was limited. I decided it was a learning experience for me, and I continued to find other directions (see Appendix k :Taipei Rapid Transit).

Topic Selection

Thought Diagram

Besides contacting the Taiwan government, I tried to look back on my first year of graduate study. I remembered that the "Organization Methods Assignment: Theory and Application" was a very interesting topic. The teacher, Deborah Beardslee, utilized art historian Michael Baxandall's philosophies regarding "The Period Eye" as a springboard for visual communication. She asked each student to choose a significant point in time to use as a focus for the quarter's assignment (see Appendix b: Glossary of Terms).

This assignment represented the history of past events and also transferred them to visual communication.The way of representing history gave me an idea about the motion of time. I began to think about the history of the railroad and its relationship with humans. Later I created a diagram to illustrate my thoughts (see Appendix h: The Period Eye).

On September 13, after Professor Remington saw the diagram I created, he suggested I collect the bibliographies and related glossary terms and see German designer Hans J. Barschel's railroad poster collection in the Archives.

Talk with Dr. Zakia and Professor Heinz Klinkon

For the first time I talked with my advisor Dr. Zakia, one of my committee members. When I explained my thoughts, he gave me a lot of different directions. "The Period Eye" diagram showed the horizontal line of the history of the railroad and what the theme would focus on. The theme could be the history of the train or events which happened and influenced or related to the railroad such as wars, the speed of trains, or tourism. When he thought about the word "motion," he also suggested I look at the motion picture and the futurism movements to broaden the design view. Collecting information and keeping a diary of ideas were the important suggestions from our first individual meeting.

Professor Heinz Klinkon is another committee advisor. He mentioned some points, such as to see how far or how fast people still can catch the information of a poster; in other words, deal with the speed test by using color or text.

Since I began the research, the first step was to write down the source location list, such as libraries and private bookstores. When I first typed the key word "motion" in the computer, it was kind of exciting because a lot of books were listed on the screen. Some of the key words like "train" have some relative words, such as subway, railroad, and transportation. I tried to make a similar list of terms which was useful to research more information than before (see Appendix h: Similar Term List).

After the book list was done, for the convenience of finding and looking at what the detail of those books were, I cut all of the book's list, piece by piece, and then separated those pieces according to different floors to make a floor book list. Each floor list has five items: train, motion, graphics, photo, and environmental design. I searched each floor to find the books which I really wanted and typed them up for the bibliography reference (see Appendix b: Bibliography).

Besides the RIT library, I also borrowed books from the Downtown Public Library. I bought some books from the bookstores and New York Museum of Transportation and also looked at some CD's from Computer City.

Research / Analysis

In the New York Museum of Transportation, James Dierks, who works at the Archives of that place,not only responded to my questions about some terms of the railroad, he also helped me identify some logos which were created by different railroad companies. Finally, I joined their museum and became a member (see Appendix h: Interview Notes & Appendix j: New York Museum of Transportation).

Although the museum mostly deals with old and local trains, I still enjoyed talking with the people in there. Because most of the people working there were volunteers, their attitudes and emotions were true and were touching me very much. I was glad I picked the topic I chose, and I really enjoyed it too.

Thesis Outline

I spent almost ten weeks researching. After all the research, I looked back at all the information I had and tried to select the major points for the content of my thesis. During the research stage, I read many books which I organized and separated into three major parts: motion, railroad and graphics. I was interested in finding the interaction between the three parts. From the definition of motion, no matter which field-- physics, music, or design-- all of their definitions certainly relate to the change of position, direction, and time (see Appendix h: Thesis Outline).

The history of railroad is actually represented by the history of human civilization -- from the steam trains to the diesel trains to the electric trains to the magnetic system. All trains show the four proofs of their powers. The trains carried people or freight from here to there and traveled long distances, but they also showed the quality of human life over time. People were moving and changing too. From the past, the present, and into the future, when people look at travel posters, they can tell how different the poster styles are, with their different life styles from each time period. Also the railroad posters show the motion of life.

Synthesis

The change of position, the force and the time all represent the interactive relationship in motion, railroad and graphics. Newton's theories-- the law of inertia, law of acceleration, and law of reaction-- have their interactive relationship, and I thought they are similar with my three points-- motion, railroad, and graphics. So I utilized his theory on the "law of motion" to transfer my concept which connected each section of my thesis. On January 10, 1995, I narrowed down the first thesis outline (see Appendix d: Notes;Thesis Outline/Concept).

The Refinement of the Thesis Content

Since I had the rough thesis outline, I felt more comfortable continuing on to the next step. But before doing on, the important thing was the refinement of the thesis outline. So after I had an individual meeting with Professor Remington, I rethought the priority of my thesis. What points shall I focus on? How much should I put into the different sections? Who is the audience of my thesis? What is the most appropriate form to present the thesis' contents? So I redesigned the thesis outline. I modified the content of the rail record part which was about special train records. Even though it was an interesting topic, I thought it was not really related to the "motion in graphics," and I decided to reduce it. I also changed psychology to philosophy in the definition section because philosophy has a typical relationship with physics. Some of the points of view of philosophy and physics are opposite, and some of them are connected to each other. For example, we are familiar with the mathematical ideas that an infinite series can have a finite sum, which appears to dispose of the philosopher Zeno of Elea's arguments against motion, which precipitated a crisis in Greek thought (see Appendix i: Philosophy). But philosophers and physicists all studied the relativity theory of Einstein. I also chose design instead of dance under the visual perception, because I thought design was more related to the thesis topic (see Appendix h: Thesis Outline).

During the outline refinement stage, Professor Remington mentioned to me to begin thinking about the application format. On January 19, I decided the final product would be five series posters, but meanwhile I still had to analyze information and type my notes and quotations following the outline content. Around the middle of February, I gradually finished the research and synthesis stages.

In this stage, because I decided to design a set of posters for the final application, Professor Remington suggested putting all the posters together, so they could be viewed at one time, making it easier to deal with the image form or to use an organizational layout, such as grid systems, and also to think about pragmatics.

I looked back to see the thesis outline and continued to think of its main contents and relationship from beginning to end. Professor Remington suggested that I use text design on the first poster and use only visual design on the last poster, which could be one way to make a system for the five pieces of the posters. I created the content outline to a methodology structure and identified each poster topic from the same structure to design a matrix of posters (see Appendix h: Methodology Structure & Development Matrix).

Both the Methodology Structure and the Development Matrix had been **Ideation** refined several times. They were created for the poster set, so they could be modified when the design of the poster needed to be changed. In the original Development Matrix, the unit grid was used instead of the compositional, construct and cross-design models; thus, it became more a design system.

On the Development Matrix the titles of each poster also had been modified many times. Its original middle hairline of the diagram suggests the degree of each category, but in the final sketch I created another line drawing instead because I thought it would be clearer than the hairline (see Appendix h: Development Matrix).

When I met with Dr. Zakia about the Methodology Structure, he suggested to turn the placement of the past, present and the future the opposite way because the visual direction would suggest more of the history of railroads going up and to the future. The outside contour was changed to a thicker line to have a more three-dimensional look. The refinement was still in progress; however, my implementation was simultaneously occurring.

Sketches

The ideation stage generated conceptual solutions and prepared alternative preliminary designs, but the implementation stage is focused on production of the final form.

In order to decide the poster size, I first called the printing stores to ask about paper size; color out-put, and cost for each poster. The out-put quality and the design quality are more important than the poster size.

The images I used were scanned from the books when I enlarged them, but the final product lost the image's quality. Thus, I decided to use the 11" by 17" format for the poster size. Meanwhile I also measured the total size of the posters compared with the walls of the gallery. The dimension seemed to fit perfectly into two removable walls. I also discussed my consideration with Professor Klinkon to make sure the size of the posters would be acceptable.

Application

After the individual meeting, the size format had been decided, and I began to create the unit grid for the basic composition of the posters. The total poster is five pieces, and each poster has its own title and major focus. According to the key point, I stored the appropriate images to five folders on the computer and also selected the poster text from my notes (see Appendix e: Unit Grid).

I had practiced two kind of layouts and then concentrated on the first poster design with only types. I was thinking of colors which relate to traffic signs, so the green, yellow, and red would go through the whole poster set.

The other main consideration was the poster composition. Somehow it needed to represent the topic " Motion in Graphics" so the posters could express the speed of the train. Using diagonal or strong horizontal shapes and lines can suggest the feeling of the motion.

For the typeface, the heading I created used Avant garde typeface, and the text part used Helvetica because the text only deals with messages, so it was not necessary to use fancy fonts.

I spent the whole spring break sketching the five posters. Following the poster matrix, in the early spring quarter I already had the rough poster sketches waiting for the next stage.

Refinement

In the first week of the spring quarter, I started to refine my poster sketches. I had a regular meeting once a week on Thursday. with my chief advisor Remington. I also had two individual meetings with Dr. Zakia on March 4 and 25. Both of dates were on Saturday at one o'clock in the RIT library. I also had two meetings with Professor Klinkon on Friday March 10 and 24 (see Appendix g. Timeline).

During this quarter, I had a chance to meet a special speaker, Ken Garland, who is a graphic designer and a typographer. He came from London and was invited to come to the U.S.A. to give several lectures on art and design at schools such as Washington University and RIT. He had two lectures during his stay at RIT. The second lecture was about the London underground diagram, a topic that is part of my thesis content.

Professor Remington set up an appointment for me to meet with Ken before the lecture on Friday, March 17. Bruce , one of the graphic design faculty, introduced me to Ken and then the three of us began our conversations.

Ken is a very thoughtful person. In the beginning I introduced myself to him and then explained what my project is. I hoped he could give me some advice for the thesis applications. In this one hour meeting, I learned his design concept in which he suggested he might put the "Motion in Graphics" the other way, focusing on the society side. And also I learned how a designer expresses his points with confidence. He explained all the problems of my posters. For instance, the title "definition"of the first poster was in a vertical direction, pointing to the "music." He felt the definition only started on the right hand side and did not include the physics on the right of the poster. Certainly, this argument was acceptable.

I also considered the last poster which has a long title, so I decided to change the title position from vertical to horizontal. The horizontal direction will suggest the feeling of motion more than the vertical will. I put each title on the right-hand side. The whole refinement stage ended by March 30, which is the last day I did the last final color output.

Computer Output

Before I started to design the poster, I called several output bureaus and also went to their places to ask about the biggest output size they had. The first place I went to was Sentry Color Labs, where they do large computer outputs (see Appendix h: Output Center/Price).

The large output is called Egret™ print, a system which cannot "sense" the page size. To avoid sizing their fields incorrectly, customers should follow a few special procedures before printing.

The Egret™ print can be either sunning or regular paper, and the price for each 40" x 40" print will cost almost sixty dollars. I was glad to find this place, but they told me that if the image came from printed sources, the results would come out with the printed dots, lowering the quality of resolution.

Pragmatics

Although somehow the bigger size has the better visual effect, I felt that design quality was more important than size. After I measured the wall size in the gallery and compared it with the application size, I decided on the 11"x 17" format for each poster. The posters were then printed on the regular size papers, and I went to the Educational Technology Center Imagery Service (ETC) in school to do the first color output.

The turnaround time is three days, but when I picked up my works, the color had come out very weird; some blocks that should have been black turned out to be a dark green color. The people in the Center all tried their best to help, but the results were still awful.

During the refinement stage, I got permission to do a color output in the Printing Lab. I chose Dye-Sublimation (3M Rainbow) instead of the Canon CLC500 which I had already tried in the ETC. The quality of Dye-Sublimation came out nicer than the Canon copy did. So I completed my output in the Printing Lab at the end of March.

Framing

The final stage is framing. In order to keep the visual effect, the strong horizontal direction presenting the speed of motion, I put only glass to protect my works and left them unframed. I had gone to downtown to find a framing service. The store called Light Impressions was the place I chose. On March 27, I ordered six pieces of glass and bought six sets of Swiss Corner clips.

In the pragmatics stage, I cut all the glass again because some of the edges were not cut well. And the color output also had some problems such as the black color turning into different colors. The problems might have come from the software because the problem had happened before, but finally, I got better qualities of output.

I spent totally three hundred and fifty dollars for the final stage. Overall the process was difficult, and I really appreciate a lot of people helping me. I owe special thanks to my three advisors who tried to help me with their passion and their professional knowledge.

To evaluate my thesis application, I analyzed and designed two tables which show the refinements of the posters and the results of my individual meetings (see Appendix h: Feedback/Posters & Suggestions/Teachers).

In reviewing the details of my individual meetings, I really appreciated the members of my thesis committee and special speaker Ken Garland for their help and encouragement. From the typographical problems to the visual compositions, I got many suggestions from them so that I could get a chance to design good quality works. After the whole project was completed, I felt my thinking in design process had become more organized, and some diagrams I created were more thoughtful than my first-year graduate studies. The content, the text, the color, and the composition of the application structured a rich visual presentation. In the beginning, I had been planning to design very complex posters; however, the topic I chose was more educational, so I kept the posters simple, such as treating the size, weight, and direction of typography toward a more verbal presentation.

Evaluation

I thought the content and the layout blended well in my project, and the feedback from the audience was positive too (see appendix j: Thesis Evaluation Notes / Audiences).

Appendix

a. Thesis Proposal

This is a very general statement which describes what my thesis will be. After I wrote the rough statement, I went to the English Center to get the grammar and spelling corrected. I contacted the teachers in the center and told them I would gradually come and meet with them to get some help before I sent my writing to my advisors. This would make it easier for my advisors to read my writing. This might leave more time to critique the thesis work itself.

The purpose of this thesis is to explore the history of the railways through visual devices. I will choose significant points in time to use as a focus for visual communication. The completed thesis will be a series of posters, brochures, or folded books, and I will use the computer as my main imaging tool.

b. Thesis Planning

Thesis planning started in fall quarter, which helps students prepare the means of finding out what their thesis objectives are and then getting more feedback on how to manage the design process that will lead to successful visual design. The thesis planning items include project title, designer and address, situation analysis, problem statement, mission statement, goals, objectives, process and strategies, time plan, glossary of terms and bibliography.

When I gradually wrote down each section, I found my thinking to be clearer than before and found more possibilities and directions which could be challenged and used during my research, for example, interviewing people from the transportation museum to collect more sources. My imagination and creative ideas were helping the project to become more interesting than I thought it would be.

About the process of this planning, I have been checking several thesis reports, which were done by previous students. Having these references, I followed the teacher's handout "the design process", and began to write. From the problem identification, implementation items, the thesis goals, objective, process and strategies, I found this to a thoughtful and challenging stage.

In order to find the glossary and bibliography part I began to do some research while making the thesis planning. On October 14, I had an appointment with librarian Barbara Polowy. From her, I learned how to find information by using the library computer. One useful tip she gave me was to check on the computer the name called "Wilson" which was better in finding specific magazine articles as opposed to using "Einstein". Art Index and Bibliography also are useful ways to get sources from the magazines.

With regard to the time plan, the main part is the thesis project dates. Besides the thesis schedule, I also put the general calender and school calender in my thesis planning report . They were put in the whole time plan for better understanding of my project dates. Of course, the time plan can be adjusted, if needed, in the future (see the following: Time/Implementation Plan).

The last part of the thesis plan book was the title page. According to the title "Motion in Graphics", I certainly felt that I needed to do either text layout design or image design to express the feel of motion for this book. I experimented with the train images and repeated the text "motion in graphics" to try to get the sense of motion (see the following: Title page and Cover).

From the title page, I repeated the text composition to design the cover, and I also added the sentence, "I am a foreigner to you in my own language . . . I long to translate myself by doing this". on the front of the cover. Since I am a designer, I really feel everyone is a foreigner to the other person. No matter how complex the relationships are, everyone needs to translate himself or herself by doing something to communicate with people. That's why, although the thesis should be a formal way of showing people their feelings, I still want it to be on the more personal side. As I have been saying in the preface, I will follow my intuition to catch the feeling of people while I am doing my design.

I am a foreigner to you in my own
language....

Motion
in Graphics

I long to translate myself
by doing this.
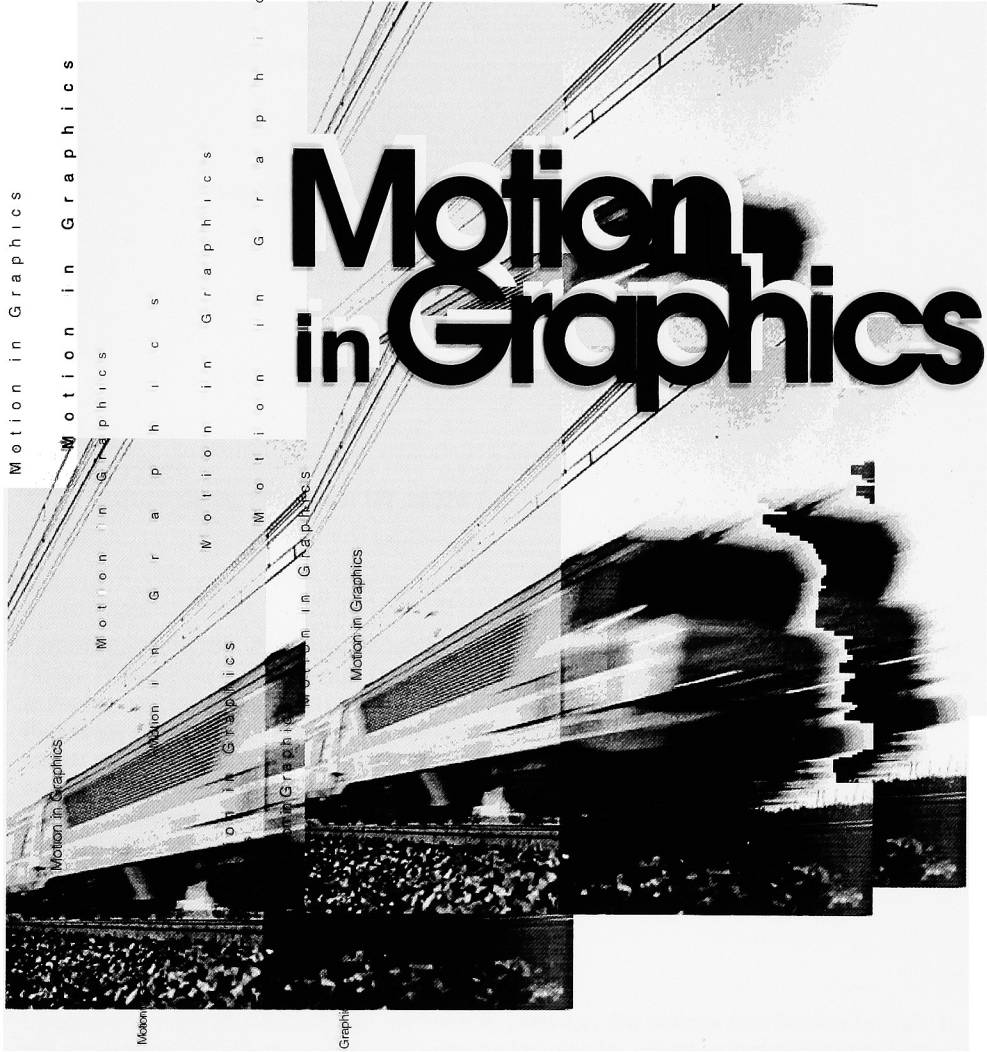
Rochester Institute of Technology

M o t i o n i n G r a p h i c s

Thesis Planning Report

November, 1994

Designer & Address

Jung-mei, Tsen
487 Fairwood Circle, Rochester NY 14623

Situation Analysis

I intend to re-explore all of the concepts I learned from my graduate course with Professor Roger Remington and Professor Deborah Beardslee. These concepts range from structure to theory and from translation to information design. The thesis will be based upon Professor Beardslee's Organization Methods Assignment, "The Period Eye," which is based on art historian Michael Baxandall's philosophies. After additional research, I will choose significant points as the focus for this thesis. The ability to understand and simplify complex relationships is highly important. Additional considerations are the appropriate context and vehicles for this message and where this message would have the most impact. I will start from the history of the railway and represent my points of view.

Problem Statement

I propose to explore the historical relationship between the railway and human beings. I will choose significant points in time to use as focuses for visual communications. I intend to research and identify the visual elements (type style, line quality...) of railway applications that could clearly represent the specific time period. The completed thesis will be a series of historically informative packages.

Mission Statement

Motion in Graphics" is an analytical, interpretive, and theoretical project that will explore past, present, and future trends in graphic design for the railroad. It is hoped that the project will make others aware of this important historical tradition.

Motion in Graphics

Goals	Objectives	Process and Strategies
To learn about motion graphics by doing research and analysis on the topic	• The user will become aware of the developments of motion graphics from history and theory	1. Research the history of railway to understand the relationship between trains and human beings 2. Research the theories of motion pictures relating to graphic design 3. Research the art historian Michael Baxandall's philosophies, "The Period Eye" 4. Research transportation documents
	• The user will be able to construct the important relationship between the visual sources and the historical sources	1. Gather graphic works, train photos, motion pictures, speed images
	• The designer will create an interactive database for other designers	1. Make a list for the researched sources 2. Create a questionnaire for mail, for interview, or for phone call to get more information
To discover interrelation ships between motion and graphics by focusing and selecting the research information	• The designer will be able to define motion, graphics, and "The Period Eye" according to the researched sources and to construct the design concept and direction on the topic	1. Gather motion sources specifically on graphic design 2. Sort the key words pertaining to the motion, graphics, and "The Period Eye"
	• The user will be able to clearly identify the relationship between motion and graphics	1. Create an interrelationships matrix for motion and graphics 2. Make key words list, visual categories list, and vehicle's list

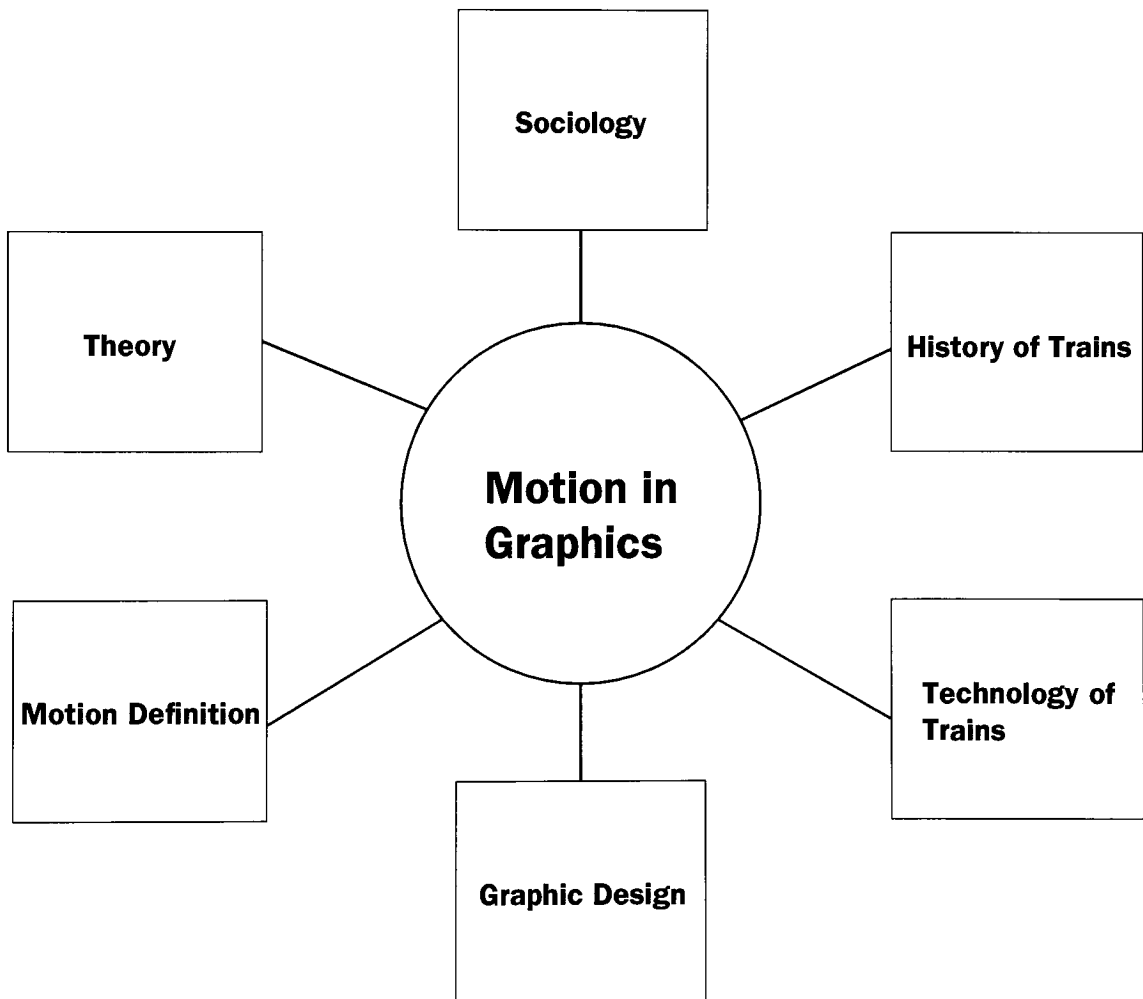|		
To apply the ideas and concepts of related sources of the topic to design a useful application that educates designers	• The user will be able to identify various aspects of the topic and apply them to solve design problems	1.Gather different aspects on the topic from historical views, ideological concepts, and visual examples
	• The designer will target the topic to specific groups in design, to analyze its relevance	1.Project how the theory will impact each designer 2.Project the designer's future relative to the theory
To evaluate previous discoveries on the Motion in Graphics	• The designer will be able to be aware of the insufficiency on the topic and continue to do more research	1.Loop back to the interactive process to find the confusions 2.Discuss with the committee to solve the design problems
	• The designer will construct the appropriateness of the application	1.Discuss feedback from designers who are relating to or interested in the topic
To develop the findings on the topic toward an effective design	• The designer will construct a theme on design process to create integrated applications for the user	1.Utilize the history of the railway as a horizontal timeline and select war, tourism, trains, speed, or how railway travel as represented in posters as a theme to develop the vertical points 2.Analyze and synthesize gathered information into a "utility" which will be further developed into problem-solving or research tools 3.Address design elements to syntax, semantics, pragmatics, and utilize organizational methods to build an integrated design

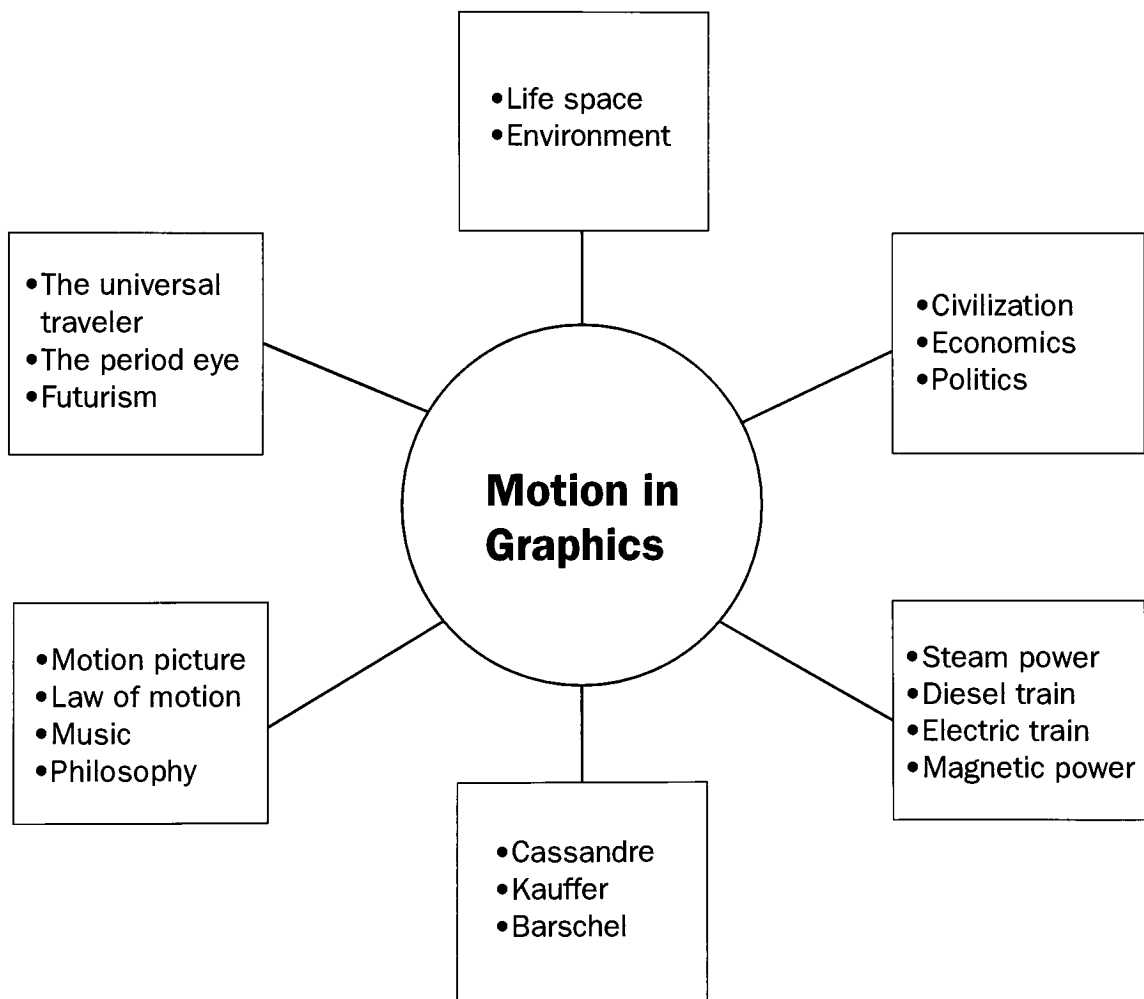|	• The user will be able to demonstrate the forms of design such as a folded book or poster in the future	1.Gather and apply the "utility" to design to build two-dimensional, three-dimensional, or multi-media electronic application 2.Experiment electronic technology to develop effective visual communication on the topic
To measure the project's success, functionality, and contribution to graphic design	• The designer will be able to be aware of the success of the design process	1.Create an evaluation form or a note book to provide with the application which the user will be able to evaluate the whole project 2.Interview audience, to get faster feedback on the topic
	• The user will be able to be aware of the surrounding environment or space also for design purposes	1.Evaluate the necessity and amount of spatial interval needed for a display situation 2.Compare the visual expression of the thesis work with the surrounding works

Methodology Diagram

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                    │  Sociology   │
                    │              │
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│              │          │          │                  │
│   Theory     │        ╱─┴─╲        │ History of Trains│
│              │      ╱       ╲      │                  │
└──────────────┘    │  Motion in │   └──────────────────┘
                    │  Graphics  │
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│              │          │          │  Trains          │
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                    │Graphic Design│
                    │              │
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Methodology Diagram (content)

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                    ┌──────────────────┐
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                    │ • Environment    │
                    └────────┬─────────┘
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│ • The universal  │        │         │ • Civilization   │
│   traveler       │      ╭─────╮      │ • Economics      │
│ • The period eye │──────│ Motion │───│ • Politics       │
│ • Futurism       │      │  in    │   └──────────────────┘
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                          ╰─────╯
┌──────────────────┐    /    │    \   ┌──────────────────┐
│ • Motion picture │───/     │     \──│ • Steam power    │
│ • Law of motion  │         │        │ • Diesel train   │
│ • Music          │         │        │ • Electric train │
│ • Philosophy     │         │        │ • Magnetic power │
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                    ┌──────────────────┐
                    │ • Cassandre      │
                    │ • Kauffer        │
                    │ • Barschel       │
                    └──────────────────┘
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Time/Implementation Plan

Calendar		R.I.T	Thesis	Project
8/31 9/5	Labor Day	Classes Begin No Classes		
10/12 10/16 10/31	Columbus Halloween			Research, analysis
11/11 11/17 11/24 11/30	Veterans Thanksgiving	Winter Break 11/29 Classes Begin		
12/6 12/20 12/21 12/25	Christmas	Holiday break 1/2	**Committee meeting** Individual meeting	**Research, Synthesis**
1/1 1/3 1/12 1/13 1/22	New Year M.L.King Jr.	Classes Begin	Individual meeting	**Ideation, sketches**
2/9 2/12 2/14 2/22 2/23 2/27	Lincoln Valentine Washington	Spring break 3/5	Individual meeting Individual meeting	Evaluate sketches **Implementation**
3/6 3/23 3/26		Classes Begin	Individual meeting	Refinement **Evaluation** Refinement Prepare exhibition -April 2
4/3 4/5		Thesis Show: 2nd	Begin writing thesis report	
5/16 5/21		Exam. week Commencement	**Thesis committee meeting:** **report** approved	

Glossary of Terms

Motion The act or process of changing place, position, and /or orientation. Visual motion can be illustrated by showing starting and stopping points, blurring of the image, and so on.

Graphic design Generic term for the activity of combining Typography, illustration, photography and printing for purposes of persuasion, information or instruction. William Addison Dwiggins first used the term 'graphic designer' in 1922, although it did not achieve widespread usage until after the Second World War.

Science As used primarily in this text, the study of the world in terms of causes and effects; the seeking, by a combination of experimentation and reasoning, of a rational understanding of phenomena.

Technology Applied science; the inventions, machines, materials, and processes through which science touches most people's lives are the products of technology. Technological advances rest on the discoveries of "science- for its own- sake," but basic research in science also benefits from the inventions of technology. Neither can bet along without the other.

Kinematic Having to do with the description of motion.

Kinetic Having to do with motion. Kinetic energy is the kind of energy a moving body possesses.

Concept The structuring of a relationship among forms and messages to achieve a specific expression within **a** given context.

Structure The basis of formal relationships. When defined structurally, a form can be described and analyzed. The fundamental terms of a structure are difference and identity. Identity (similarity) is the unifying principle; difference (contrast) is the means for conveying meaning.

Form The characteristics that distinguish one visual mark from another, including shape, size, color, and texture.

Content The underlying thought that provides the criterion and stimulus for a form. Content is the permission for the form of the message. As content changes through cultural evolution, formal renewal is the natural consequence. Because it requires an open, listening mind to engage any new content and present it in a new form, the tendency is to appropriate old content (and old forms) to avoid the challenge.

Context The environment- cultural or physical- in which a message or form is perceived and by which it is conditioned. Recognizing, and responding to, changing content and context is the best deterrent to merely decorative, nostalgic, stylistic, or aesthetic design.

Semantics The relationships and meaning among signs and symbols and the objects they represent.

Syntactics The study of the formal properties of signs and symbols and their relationships to other signs.

Pragmatics The branch of semiotics that deals with the relationships among signs, symbols, and their users.

The Period Eye The dominant expectations and conventions that govern the way people see and interpret images at a given time. The definition by Michael Baxandall.

Format A two- or three dimensional field or space in which art forms, visual messages, designs, and environments are created. Two-dimensional formats have length and width; three-dimensional formats have length, width, and depth.

Matrix A kind of structure which places information on coordinates, usually- though not necessarily horizontal an vertical. Connections among elements of information can be read across the whole field in any direction. A matrix is semi-or non-hierarchical. It is a pattern of connections.

Direction The visual sense of movement resulting from the orientation, position, and arrangement of shapes within a format.

Message The message is the intended statement, idea, or feeling communicated. The message code is the physical figure or form of the message used singularly or in combination; that is, verbal language or visual language composed of signs, symbols, terms and definitions, structure or syntax, and so on. The visual message can consist of symbols, trademarks, photographs, illustrations, creative images, objects, products, environments, and so on.

Orientation The position of a compositional element relative to the format or other elements in a composition or structure. Orientation is the placement of the figure or form within a given space described as "facing forward","upside down", etc.

Futurism Revolutionary art movement founded in 1909 by the Italian writer and poet Filippo Tommaso Martinetti. Conceived as a literary movement, it subsequently embraced all the arts including painting, sculpture, music and architecture. The first Futurist Manifesto, published in the French newspaper Le Figaro on 20 February 1909, advocated an uneasy mix of Italian nationalism, militarism, and the 'new religion of speed', as expressed through cars and aeroplanes. Other significant Futurists included Umberto Boccioni, Giacomo Balla and Gino Severini. Futurism encouraged the emergence of the typographer/poet, challenging the tradition of the printed page and the predictable sequence of typographic information. Type elements and collage were used in a dynamic manner to create picture-poems, early forerunners of concrete poetry. Futurism's influence as a force for change declined rapidly after about 1915.

AIGA American Institute of Graphic Arts founded in New York in 1914, the AIGA is the oldest and largest organization in the US devoted to the interests of creators and users of the graphic arts. It is non-profit making and through exhibitions, seminars, competitions and publications endeavors to 'do all things which would raise the standard and the extension and development towards perfection of the graphic arts in the US'. In 1974 the US Department of Transportation commissioned the AIGA to design a master set of user symbols for universal use. An advisory committee of five prominent graphic designers, chaired by Thomas Geismar of Chermayeff & Geismar Inc. and including Rudolph de Harak, Seymour Chwast, Massimo Vignelli and John Lees, researched and evaluated each symbol. The final set was designed by cook and Shanosky Associates.

Typeface Alphabet created for the purpose of reproduction. The individual characters of a typeface are designed to work in different combinations and to remain consistent when reproduced by printing. Available in a wide variety of designs and sizes, typefaces offer a predictable outcome when specified by typographers, designers, printers, etc.

Cassandre, A.M.(1901-68) Born in the Ukraine, he migrated to Paris during the First World War. Studied painting at the Ecole des Beaux Arts and the Academie Julian. Between 1923 and 1936 responsible for a series of classic and enormously influential advertising posters which assimilate different elements of the language of Modernism, particularly Cubism and Purism. Worked in the US during the late 1930s, producing exceptional posters for container corporation of America and N.W. Ayer. Commissioned by fellow Russian Alexey Brodovitch to design covers for Harper's Bazaar. Returned to France in 1939, concentrating for the next three decades on painting, theatre and ballet design. Cassandre's original output represents a major contribution to the development of 20th-c. graphic design.

Kauffer, Edward Mcknight (1890-1954) American graphic designer and poster artist. Born in Great Falls, Montana, he became a major figure in British advertising art between the wars. Moved to London at the outbreak of war and in 1915 received his first poster commission, from Frank Pick of London Underground. In 1930 he became art director of the publishing house Lund Humphries. In 1937 the Museum of Modern Art, New York, held a one-man show of his work. Returned to the US in 1940 where he produced several posters for Greek war relief and the US Treasury. Post-war he designed for American Airlines (1947-48), the New York Subway Advertising Co. Inc. (1949) and the publisher Alfred A. Knopf.

Barschel, Hans J. He was born in Germany and was employed by the German railway in the 1930s to do all art work. He lived in New York city and Rochester in 1937.

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c. The first Thesis Committee Meeting

At the end of fall quarter I already made an appointment with my three advisors. The time had been set on December 6, from 12- 2 o'clock. Before the meeting date in the winter quarter, I called my two associate advisors Dr. Zakia and Professor Klinkon to remind them about the meeting.

I was nervous since this was the first formal committee meeting. This meeting had two important missions. One was the question for the thesis planning book and the proposal review. The second mission was to report my research sources so far.

In order to organize my thoughts, I created a diagram to present the main research directions. In the center of the diagram is the thesis topic, and the branches were divided into six categories: theory, motion definition, sociology, history of trains, technology of trains and graphic design (see Appendix b: Methodology Diagram).

Before the end of fall quarter, I gave three copies of the thesis planning book to my chief advisor Remington, and two associate advisors Dr. Zakia and Professor Klinkon so that in this first meeting we might find some insufficient points or questions to improve my future plan.

In the rest of my meeting, I presented my researched information by using the diagram I had created. From the "theory," I utilized the period eye, the futurism concepts and *The universal travel* which deals with problem solving and the process of researching goals. These theories led me to different points of view (see Appendix b: Methodology Diagram; Content).

The "motion definition" looks at any possibilities which are about motions, such as photo, film, physics, and mathematics. Their contents include motion picture, Newton's law of motion, human movement matter and motion, music, and Einstein's four-dimension space time world. "Motion definition" might inspire some new ideas used in the expression of thesis application.

"Sociology" considers the life space which is about human's past, present and the future experiences. Sociology also includes environmental problems such as crime in the subway. All are talking about human reactions in our society.

"History of trains" will present the history timeline as a main point from the steam locomotives, diesel train, electric train, to magnetic power system. "Technology of trains" will focus on the function and structure of trains. "Graphic design" side will include signs, maps and poster designs of the railroad, so people will see the interactive relationship between the railroad and graphics.

After the meeting, I got some feedback. In "motion definition" the visual perception was added. "Graphic design" might consider not only the posters that were already done by artists but also how the information was translated in the modern train by using video or multimedia, related to graphic design. In "sociology," what might be focused on is the effects of the trains, such as freight trains working for people. The teachers also suggested I look at the introduction of sociology books too.

d. Thesis Presentation

This thesis presentation was a new annual requirement for each second year graduate student and was scheduled for March 14, 1995. I received a notice at the end of winter quarter. I looked at the content which said that each student would have to prepare and deliver a thirty minute his or her presentation that summarized thesis project and needed to include visual information.

I set my thesis show in the second section on April 3. In order to prepare this presentation I had to complete the research and synthesis stage and at least start to do some application sketches before the presentation, so I would be able to clarify, focus and communicate of my thesis to the presentation's audiences.

During the spring break, I finished my typing and completed the five rough poster sketches. Meanwhile I showed the poster set to three of my advisors. For the presentation, I reviewed all of the processes and information I did before. I thought the concept and procedure were the major points to the presentation, so I followed the process I did to present and also gradually talked about the concept of my thesis.

I prepared outline handout and overhead for the presentation, starting from the title, mission statement and focusing point "process." The overhead contains all of my thought process. I showed them by creating diagrams because I did all the stages step by step. I was familiar with the process. Although I cannot speak English well, I did try to do my best to report my project (see the following: Handout).

In the Graphic Design program, I got used to having a lot of work to do; actually, I am not afraid of those assignments, but I did get really nervous about the presentation. I remembered during the first year of the spring quarter I almost wanted to quit my studies at RIT At that time I felt the most terrible pressure from the presentation topic which was "macro view and micro view." In comparison of my presentation with my classmates, the quality was lower. Although that time was my first presentation since I came to the U.S.A. and I did prepare my chapter but I really hurt from that time. After that, I convinced myself to stay, and I learned to accept the pressure.

For this thesis presentation, my chief advisor Remington's feedback was positive. He is the person who always encouraged me even though I knew sometimes I was not doing well. And some comments from my classmates were positive too, such as Joe's comment "It is a thoughtful process". and many discussions about my diagrams with Sunah One special feedback was from Professor Deborah Beardslee who is the teacher assigned the presentation "Macro view and micro view." I received a notice from her in my mail folder, and she asked for my methodological structure and development matrix. I was glad to hear the feedback from her. Some day I want to be a teacher too, and I will treat each individual student the way I was treated so warmly by the professors. Generally speaking, the thesis presentation was positive (see Appendix j: The Feedback of the Thesis Presentation).

Motion in Graphics

A railroad is a motion....the feel of speed

Before the title:
Before I came to the united States, I was a designer in an advertising company in Taiwan. I used to design the simple compositions especially in newspaper advertisements for which I used very few design elements. I decided to give myself a chance to think about different way to present my thesis works.

About the title:
The term "motion" is very attractive to me, especially when I saw it happen in complex design works. The change of their sizes or shapes gave me an interesting visual experience. Happenings attract us more spontaneously than things do, and the prime characteristic of a happening is motion. So I chose motion as a part of my main points.

Since motion has many different meanings, I needed to give it a certain definition. Then I tried to think of some more obvious objects which also relate to motion. I chose trains for my object, because their heavy-loaded impression contrasts with streamlined shape, which represented the movement of the civilization of human beings. It is more sensational for me than other vehicle.

Mission Statement:
"Motion in Graphics" is an analytical, interpretive, theoretical project that will explore past, present, and future trends in graphic design for the railroad. Hopefully the project will make others aware of this important historical tradition.

Process:
concept: I intend to re-explore all of the concepts I learned in my graduate course with Professor Roger Remington and Professor Deborah Beardslee. These concepts range from structure to theory and from translation to information design. The thesis will be based upon Professor Beardslee's Organization Methods Assignment, "The Period Eye," which is based on art historian Michael Baxandall's philosophies. After additional research, I will choose significant points in time as the focus for this thesis. I will start from the history of the railway and represent my chosen time periods.

The period eye definition:
The dominant expectations and conventions that govern the way people see and interpret images at a given time.

Feedback from teachers:
Photography: Moving image, moving graphic, and motion pictures
Futurist Movement: Tendency to capture motion ,such as Marchel Duchamp "nude Descending a staircase
Graphic design: Posters of A.M. Cassandre, Mcknight Kauffer, Jean Barschel, Jean carlu
AIGA symbol and signs

Research: main matrix
I separated main items into trains, motion, graphics, photo, and environmental display and each item spread out into three categories: history, theory, and visual images
Sources come from different media: books, magazines, interviews, and videotapes (music) (see Appendix h: Organizational Matrix).

similar items list:
railway, railroad, transit, transportation, subway, underground, rapid transit, travel, speed
movement, visual perception, traffic sign, map, railway posters, timetables (see Appendix
h: Similar Term List)
source list:
Library: RIT, U of R, Public library
Museum: New York Museum of Transportation, George Eastman House, Science
Museum
Bookstore: RIT, Borders, Gutenberg Books
Other sources: Taiwan-Taipei Rapid Transit Bureau, Video stores
Miscellaneous source:
Timetables, map , poster, calender, stamp, brochure, books, newsletter, marks, postcard,
ticket, token, advertisements, magazines

Synthesis:
Rough Methodology sketch (see Appendix b: Methodology Diagram)
After I collected all the information, I categorized the motion definition, thinking theory,
sociology, the history of trains, the technology of trains, and the history of design into six
different categories.
The contents of the Methodology (see Appendix b: Methodology Diagram; Content)
1. Thinking theory is the period eye, Futurist, and *The universal traveler* which lead me to
see different viewpoints
2. Motion definition includes motion picture, law of motion, philosophy, and music
3. Sociology is looking for human movement and considers life space: man's past,
present, and future experience. and involved environments, such as the crime and fear in
the subway. Some problems occur after building the transportation, like air pollution and
accidents and the crowed commuter hours problems.
4. The history of trains shows how they relate to human life, such as economics, politics
5. The technology of trains is looking at the different powers of the steam locomotives,
diesel trains, electric trains, and magnetic power trains.
6. The history of design is about some designers with their railway posters.
Thesis Outline/Concept: from the methodology I reorganized the information.
1. The first section is the "motion definition:" I identified the general sense about motion
into three parts
science: physics
philosophy: Aristotle, Galileo, Zeno and Einstein
Art perception: photo, painting, design, music   -----get some ideas about motions

2. The second one starts to present my own concept and the thesis content
I used Newton's law of motion to be my philosophy through into the whole thesis.
The first law is Motion is inertia: An object which is at rest or in motion will remain at rest
or in motion at the same speed. From macro view, if people compare an individual and
the universe, people could not tell the motion of the planet, even the earth motion,
because the universe is too big. So for the individual, the universe which is at rest will
remain at rest. But in the micro view, people see their points of view and are involved in
a certain time. Motion exists in that time. I also use the theory of Futurism as part of my
philosophy "Futurists" emphasize that people themselves determine what the future will
be like. If people are to mold a better future, they must be inventive and come up with
creative new ways to meet problems. It searches for better quality which relates to how

the technical powers and the speed of trains can be improved.

In the concept part: I introduced the "types of motion", "laws of motion" and talked about how I used three laws of motion to be the main concept of each section in my thesis.

3. The third item is "motion is action." I put the history of railroad and the technology of trains in this section. Since the steam locomotive was created, people tried out many different ideas to make their trains work better and go faster. There are several factors which modify motion, such as air resistance, gravity, and friction. "motion is action" is about how people improve the power of trains and making the action go faster. It also includes the wheel codes which are graphic images make it easy for people recognize the different types of trains. I also includes the gauges, the signalling, and the tunnels and bridges. And finally I show rail records: the most powerful diesel and the longest railway in the world. All of those show the action of trains themselves.

4. "Motion is reaction" is about railroad graphics, which are people's reactions to trains, such as signs, maps and, some railroad posters which show the connection between the railroad and people. The contents are showing some corporate images and a case study about London Underground in which I identified the different style posters from different years, such as from the beginning of the London underground during the war period and subsequent years.

5. The graphic people in the railway introduced the three main graphic designers, A.M. Cassandre, Edward Mcknight Kauffer, and Hans j. Barschel, who had designed very famous railroad posters. I studied the art-historical background of each designer and analyzed the posters style of each of them. In addition to their powerful "motion" posters, I also quoted their personal statements, such as " posters are telegram," to be a part of my strong point on Motion in Graphics.

Ideation:

    Methodology Structure

    Poster Development Matrix

Evaluation:

    Key word list

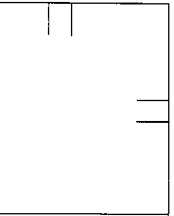**Implementation:**

    Unit grid

    Practices works

Retrospective Evaluation

M o t i o n   i n   G r a p h i c s

A r a i l r o a d i s a m o t i o n . . . . t h e f e e l o f s p e e d

**Thesis Presentation
March, 14 1995
Jung-mei, Tsen**

Before the title

About the title
the motion
the train

Mission Statement
"Motion in Graphics" is an analytical, interpretive, theoretical project that will explore past, present, and future trends in graphic design for the railroad. Hopefully the project will make others aware of this important historical tradition.

Process:
concept:
"The Period Eye" (definition): The dominant expectations and conventions that govern the way people see and interpret images at a given time.

Feedback:

Research:
main matrix (see Appendix h: Organizational Matrix)
item, category, media
similar term list (see Appendix h: Similar Term List)
Miscellaneous sources
Timetables, map , poster, calender, stamp, brochure, books, newsletter, marks, postcard, ticket, token, advertisements, magazines, sticker

Synthesis:
Methodology (see Appendix b: Methodology Diagram)
Theory, Motion definition, Sociology, The history of trains, The technology of trains, and The history of design
contents: (see Appendix b: Methodology Diagram; Content)
1.Theory: *The universal traveler*, The period eye, Futurism
2.Motion definition: Motion picture, Law of motion, Philosophy, Music
3.Sociology: Life space (man's past, present, and future)
Environment: air pollution and accidents and the crowed commuter hours problems

Pages Missing

f. Thesis Exhibition

At the end of winter quarter on November 3, the gallery planned the first graduate thesis meeting during which students signed up for the thesis show schedule. Since that time I decided my show should be on April 3, which is the second schedule for the thesis show.

On March 14, the gallery had a meeting for the second show students, and its purpose was to decide the gallery space for each person. So before the date, I had been thinking about adding a bigger poster as an introduction to my project and a proposal book to help explain the process.

Finally, I decided I needed three removable walls. I wanted the direction of the poster set go from left to right. I would put the big poster on the first wall and then put the proposal book with a comment book on a pedestal.

Below the figure shows where the final space is and how the place layout will be. Before designing the introduction poster, I considered the contents between it and the proposal book, because the proposal book already included my purpose of the project, and it presented the verbal form more than the visual form. So I chose My Methodology Structure and Development Matrix for the contents of the introduction poster. The two diagrams represent the development of final posters. And I also utilized the train images which came from the title page of the proposal book to express my project title "Motion in Graphics". The size of this large poster is twice that of each final poster (see Appendix h: Methodology Structure & Development Matrix).

On March 28, I showed the big poster to Professor Remington. He suggested that I add some sentences to explain what the diagrams are. We met twice to discuss the sentences. By the date March 30, I produced it with my five posters at the same time. Finally, I hung on all of the posters on April 2 in the gallery (see Appendix e: Final Application: Introduction Poster).

(Layout for Thesis Show Space)

Desk
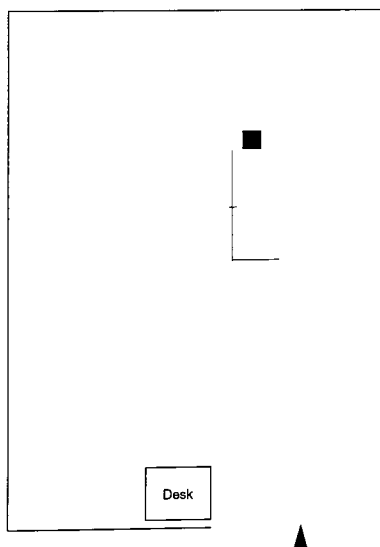
4.The history of trains: The influence relating to human life such as economics, politics

5.The technology of trains: Steam locomotives, Diesel trains, Electric trains and Magnetic power

6.The history of design: Railway posters, Designers

Thesis Outline

1. Motion definitions

       Science: physics

       Philosophy: Aristotle, Galileo, Zeno, Einstein

       Art perception: photo, painting, design, music

2. Motion is inertia

       Macro view

       Micro view

       Futurism

       the concept

3. Motion is action

       The history of the railroad

       The technology of trains

4. Motion is reaction

       Signs, Maps and Railroad posters

       London Underground

       The graphic people in the railway

Ideation

       Methodology Structure

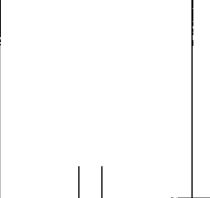   Poster Development Matrix
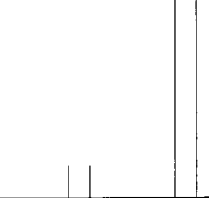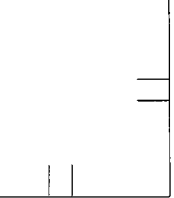
Evaluation

       Key word list
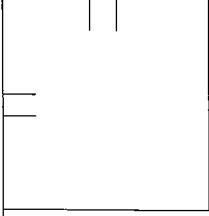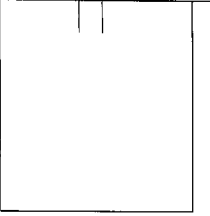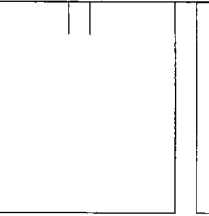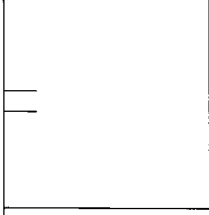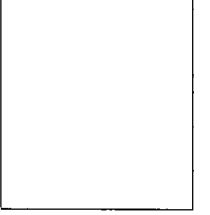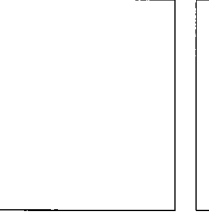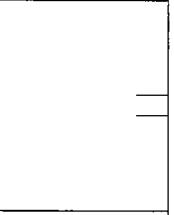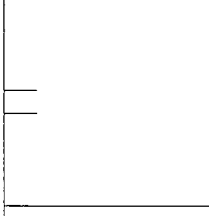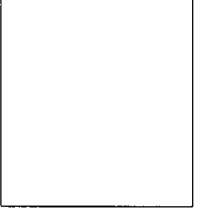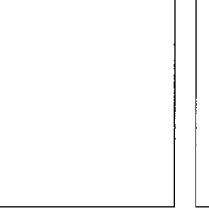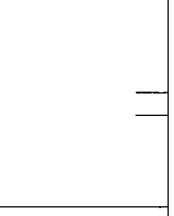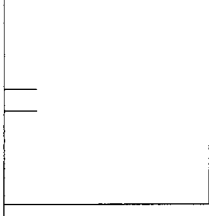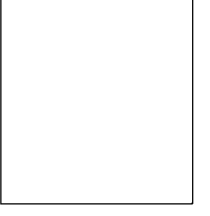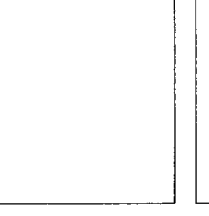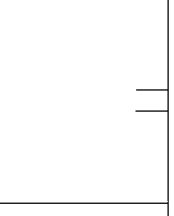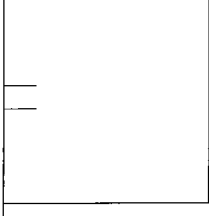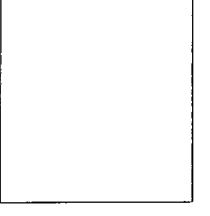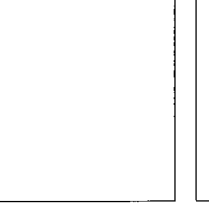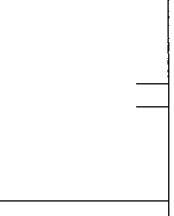
Implementation

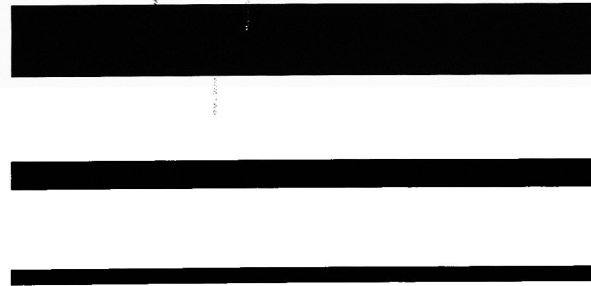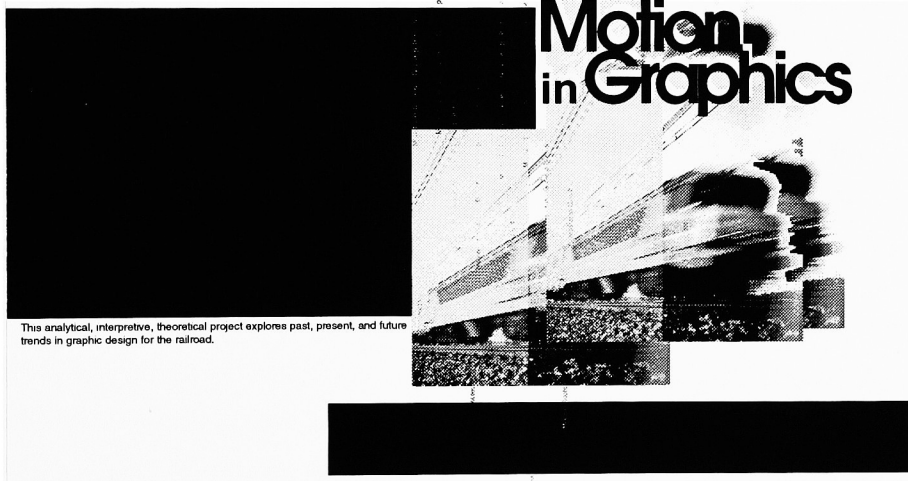   form: 11" x 17", 5- piece poster

       Unit grid

To apply the ideas and concepts of related sources of "Motion in Graphics" to design a useful application that educates designers
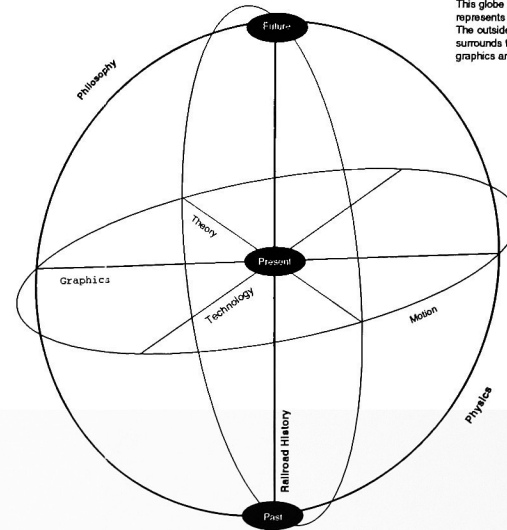
e. Thesis Application

Unit Grid

Methodology Structure

This globe structure reflects the content of the thesis. The center line represents the railroad timeline from the past, to the present, to the future. The outside contour represents Physics, Philosophy and motion, which surrounds the globe. Inside the structure, one horizontal line represents graphics and two diagonal lines represents theory and technology.

Future
Philosophy
Theory
Present
Graphics
Technology
Motion
Railroad History
Physics
Past

Motion, in Graphics

This analytical, interpretive, theoretical project explores past, present, and future trends in graphic design for the railroad.
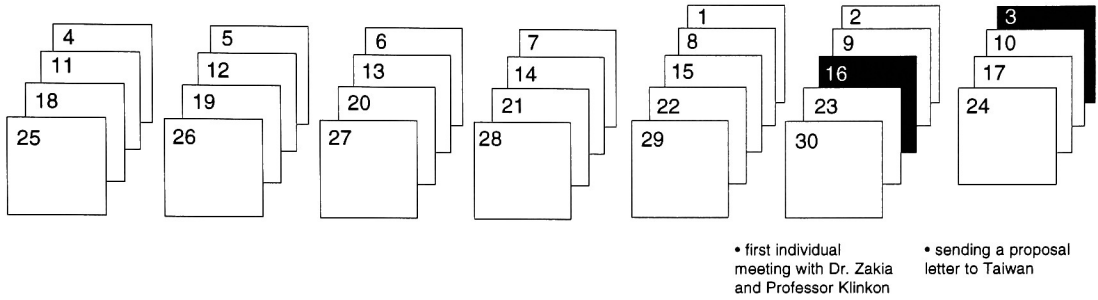
Poster Development Matrix

According to the diagram above, the Methodology Structure suggests five major themes for the final application. On the Development Matrix, each small globe is given a bold line to identify the different aspects of the structure. On the left column are the various design elements of the whole poster set.
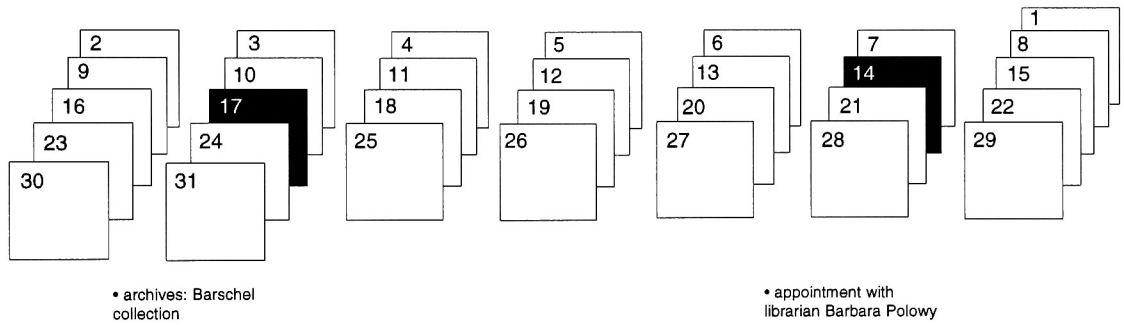
Content	Definitions	The History of the Railroad	The Power of the Railroad	The Image of the Railroad	Three Designers and Their Railroad Posters
Texture	Verbal				Visual
Message Quality	Information				Expressive
Scale	Subordinate				Dominate
Dimensionality	Flat		Spatial		Flat
Grouping of Elements	Regular				Irregular
Orgnizational Methods	Unit Grid				Unit Grid

g. Timeline

September

4	5	6	7	1	2	3
11	12	13	14	8	9	10
18	19	20	21	15	16	17
25	26	27	28	22	23	24
				29	30	

• first individual meeting with Dr. Zakia and Professor Klinkon

• sending a proposal letter to Taiwan

October

2	3	4	5	6	7	1
9	10	11	12	13	14	8
16	17	18	19	20	21	15
23	24	25	26	27	28	22
30	31					29

• archives: Barschel collection

• appointment with librarian Barbara Polowy

November

6	7	1	2	3	4	5
13	14	8	9	10	11	12
20	21	15	16	17	18	19
27	28	22	23	24	25	26
		29	30			

• appointment at New York Museum of Transportation

December

				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

• first committee meeting   • • • regular meeting with Professor Remington

January

1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

• • interview at New York Museum of Transportation:

• individual meeting with professor Remington
• interview with Professor C, Warren (Music)

• • regular meeting with Professor Remington
• interview with Professor John T. Sanders (Philosophy)

February

			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28				

• • • regular meeting with Professor Remington
• individual meeting with Professor Klinkon

March

• presentation	• regular meeting with Professor Remington	• individual meeting with Professor Klinkon
• individual meeting with Professor Remington	• phone call to Dr. Zakia	• interview with Ken Garland
	• computer output	• individual meeting with Professor Klinkon
	• regular meeting with Professor Remington	• computer output

• • individual meeting with Dr. Zakia

April

• gallery installation

• last day of the thesis show

• thesis show reception

May

• thesis committee meeting: report approved

• commencement

h. Diagram/Table Lists

Motion in Graphics
The Period Eye

Past

(The history of railway)

present

future

Time, Events

Time, Events

Time, Events

Time, Events

Context:
Technology
History

Tonality:
Dark
Light

Graphic Elements:
Dot, Line
Shape

Interval:
Irregular
Regular
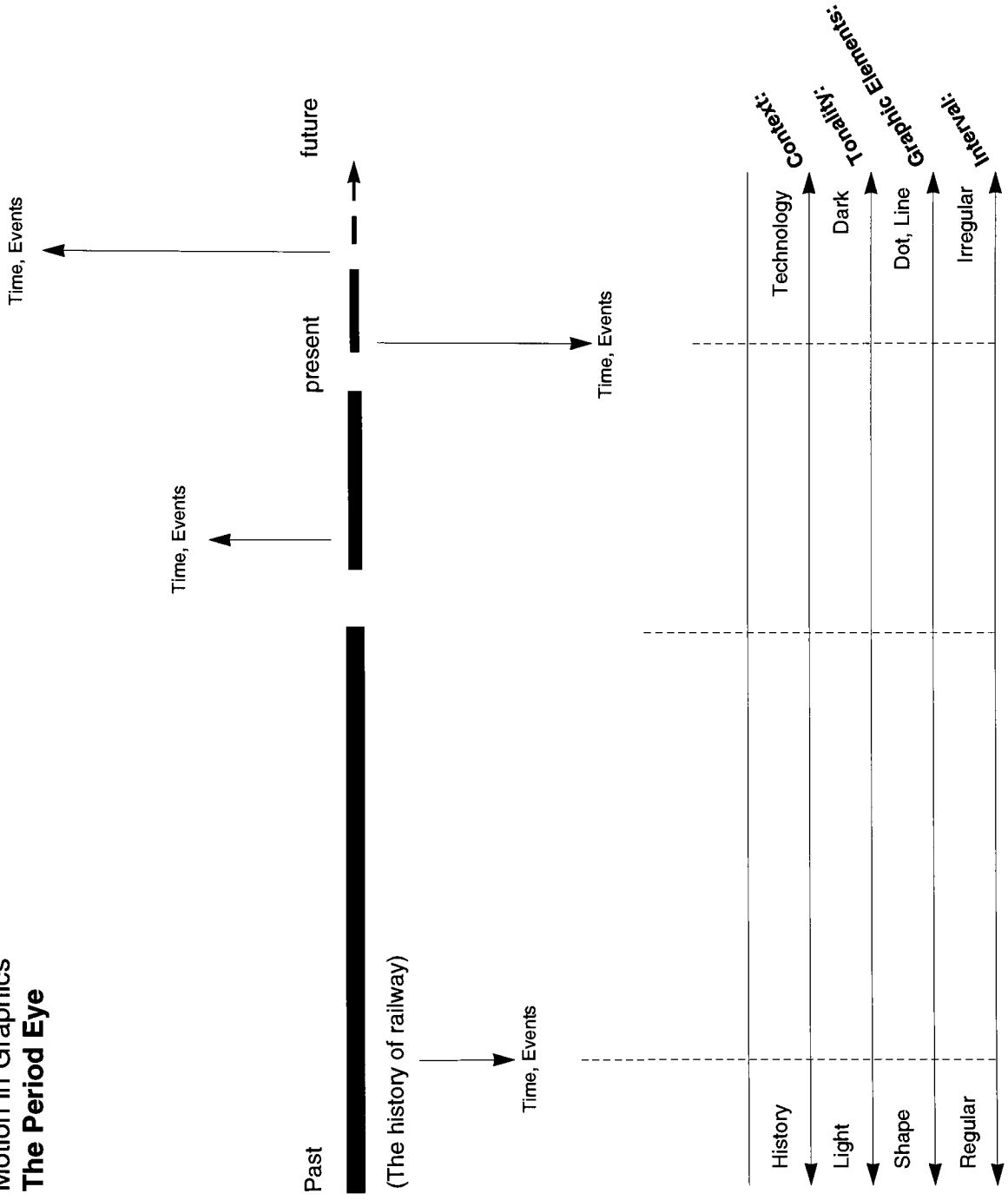
The Period Eye ---Time Setting?

The History of the railroad

Countries: America (New York)
          France
          German
          Japan

Cities: New York--- Past (60's, Events) **compare with** present (90's, Events)
       Boston
       San Francisco

The point of view
(The view of designers)

1. where: location
2. when: Time (10 years or 20 years)
3. what: Events, Issues (war, AIDS)

(The view of passengers)

1. Stand---past (historical view, war, reflection
2. Walk---present (every day's life, current events, drug, abortion, newspaper
3. Subway---future (technique, speed, imagination

	issue / Positive	Issue / negative
History		
Society		
Technology		

Category	Item	Book	Magazine	Video / Tape	Interview
Historical	Train				
	Motion				
	Photo				
	Graphic				
	Environment				
Theoretic	Train				
	Motion				
	Photo				
	Graphic				
	Environment				
Visual	Train				
	Motion				
	Photo				
	Graphic				
	Environment				

Motion in Graphics
Similar Term List

Motion

Movement

Speed

Visual perception

Railway

Railroad

Subway

Rapid Transit

Train

Underground

Transportation
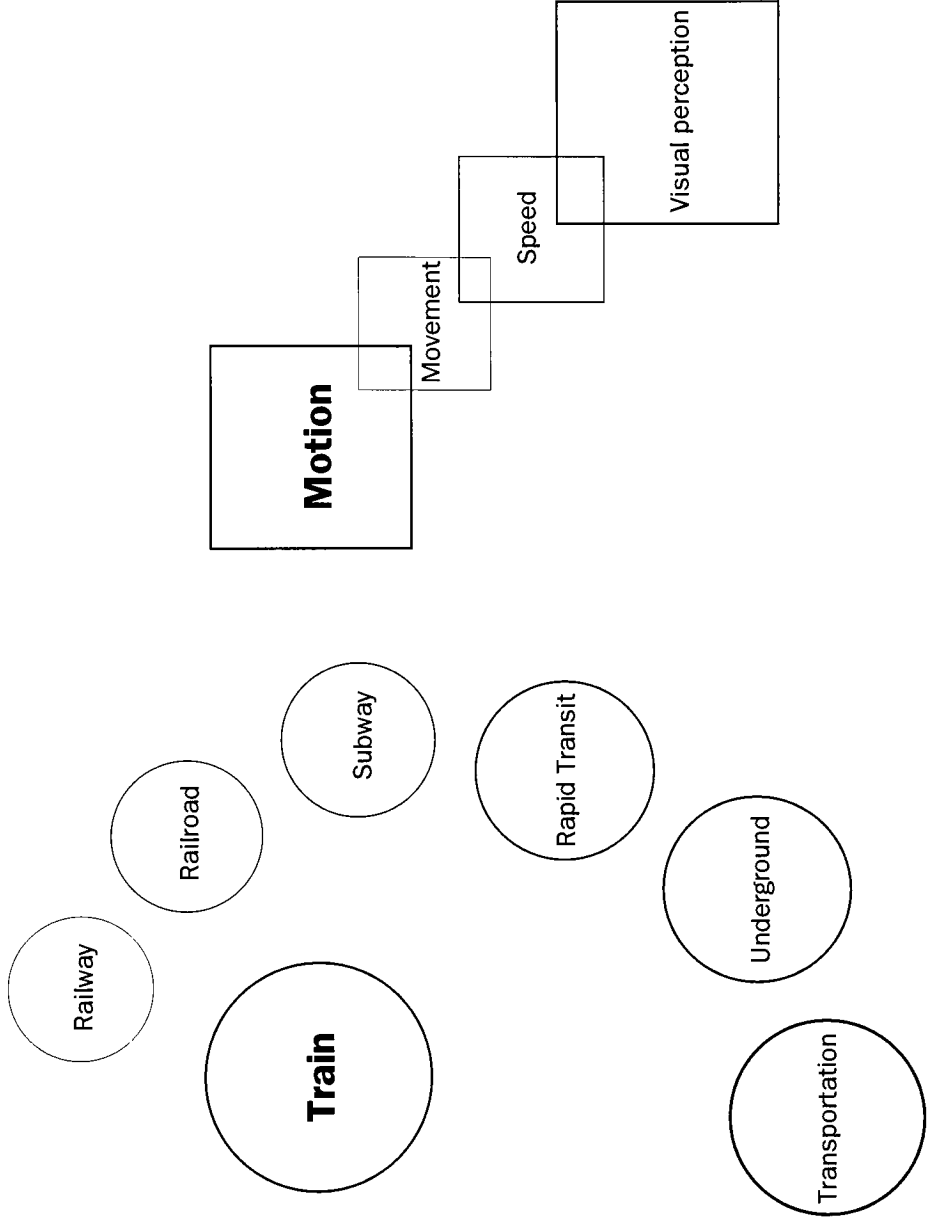
Interview Notes

	The name of people	Notes
Philosophy	John T. Sanders (RIT faculty)	Two AudioCassettes: Einstein's Revolution
Music	C. Warren (RIT faculty)	Melody is the motion of the music.
Physics	Pel-tzu Hung (RIT Graduate Student)	The low of motion; The air of resistance
Graphic	Barbara Polowy (RIT librarian)	Willson: computer item; Art Index: Bibliography
Trains	James Dierks (New York Museum of Transportation)	Railroad and railway; Company logos

A r a i l r o a d   i s   a   m o t i o n . . . . t h e   f e e l   o f   s p e e d

Poster 1 Introduction motion 20 %	**Definition: Motion**
	Motion is ....
	Motion is ....
	Motion is ?
	/ Graphic diagram

Science	Art Perception	Philosophy
Physics	Music	Aristotle
	Photo	Galileo Zeno
	Painting	Einstein
	Design	

Motion is inertia

An object which is at rest or in motion will remain at rest or in motion at same speed.

Theories
Macro view: Universal traveler
Micro view: The period eye
Futurist
Concept
Types of Motion
Laws of Motion
Newton VS Motion in Graphics

Motion is action

When a body is acted upon by a force, its resulting acceleration (change in speed) is proportional to the force and inversely proportional to the mass.

Poster 2 / 3
Train history
Train technical
40 %

General history / People on the Move
The timeline of the railroad
Key word list
How they work
The powers
    Steam
    Diesel
    Electric
    Magnetic
The wheel codes
The gauges
The signalling
The tunnels and bridges

(Thesis Outline)
(see Appendix i:
Thesis Outline Quotes/Notes)

Poster 4
Graphic Motion
20 %

Poster 5
Graphic Motion
20 %

Motion is reaction

To every action force, there is an equal and opposite reaction force.

Case study
London Underground
    The posters
    The sign
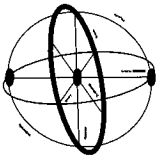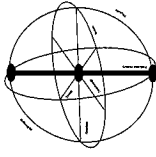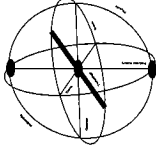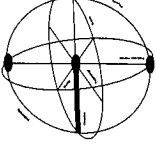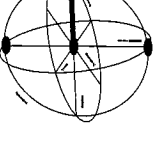   The map

Graphic people in the railway
Cassandre, A.M.
Kauffer, Edward Mcknight
Barschel, Hans J.
    / The Art-Historical Background of the designers
    / Quotes
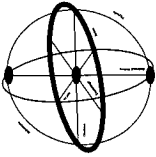   / Posters

Motion in Graphics
Methodology Structure

Future

Present

Past

Physics

Motion

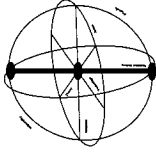Railroad History
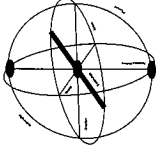
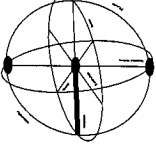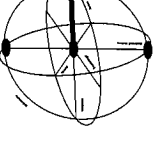Theory

Technology

Philosophy
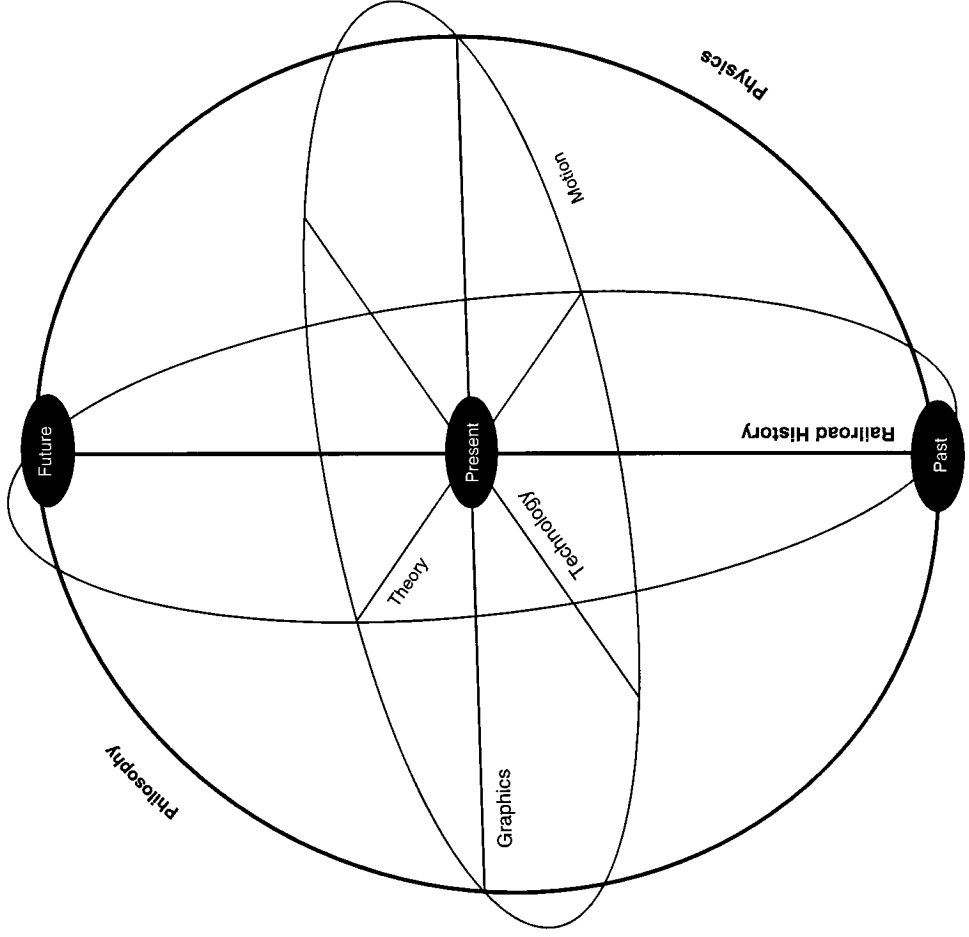
Graphics

Motion in Graphics
Development Matrix

	Definitions	The History of the Railroad	The Power of the Railroad	The Image of the Railroad	Three Designers and Their Railroad Posters
Content					
Texture	Verbal				Visual
Message Quality	Information				Expressive
Scale	Subordinate				Dominate
Dimensionality	Flat		Spatial		Flat
Grouping of Elements	Regular				Irregular
Orgnizational Methods	Unit Grid				Unit Grid
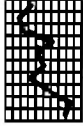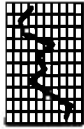
Output Center/Price

	The name of Proofing Method	Price List
Educational Technology Center (ETC)	Canon CIC 500	$6.oo (11" x 17")
Sentry	EGRET print 5775 Fiery Color	$60.oo (40" x 40") $2.90 (11' x17"), Copies from negatives are an additional $2.50 for the first copy
The Electronic Prepress & Publishing Lab (EPPL)	Dye-Sublimation (3M Rainbow)	$2.00 (11" x17")

Feedback /Posters

Content	Definitions	The History of the Railroad	The Power of the Railroad	The Image of the Railroad	Three Designers and Their Railroad Posters
Project heading	◄				
Poster title	◄	◄	◄	◄	◄
Composition	◄				◄
Image	◄	◄	◄	◄	◄
Text	◄		◄	◄	◄
Color	◄	◄		◄	

Suggestions / Teachers

	Roger Remington	Dr. Zakia	Heinz Klinkon	Ken Garland
Project heading	✓			
Poster title	✓	✓		✓
Composition	✓		✓	✓
Image	✓	✓	✓	
Text	✓	✓	✓	
Color	✓	✓	✓	✓

i. Thesis Outline Quotes/Notes

M o t i o n i n G r a p h i c s

•Motion definition:

Science	Art Perception	Philosophy
Physics	Music	Aristotle
	Photo	Galileo
		Zeno
	Painting	Einstein
	Design	

Physics: Since everything in the universe is moving-Atoms and Molecules, Stars and Planets, the Earth and its surface- motion must be considered relative to whatever point or object we choose. A jet aircraft may be flying through the sky at a speed of 450 miles per hour with reference to the ground, but the surface of Earth is moving at about 1000 miles per hour around the center of Earth. A passenger on the jet walking up the aisle of the aircraft will be moving at one speed relative to the airplane, another with respect to the ground below, and still another with respect to the Earth's center. ----Richard P. Brenna, Dictionary of scientific literacy (John Wiley & Sons, Inc. NY 1992)

If an object is observed at two different instants, and it is seen to be in two different positions at those two instants, then the object is in motion or has been in motion during the interval between the two observations, e.g. a the motion of the planets round the sun; b the motion of a stone falling under the force of gravity; c the motion of a motor car going along a road. ----Longman Dictionary of Scientific Usage (A Godman EMF Poyne)

The universe is full of motion. In fact, motion rather than rest seems to be its natural state.

Motion in a circular path is always accelerated motion, because although the magnitude of the velocity remains constant, its direction continually changes, so anything that is moving in a circular (or elliptical) path is subject to an unbalanced force.-circular motion

Central force pulling falling objects faster and faster to the earth and the force holding the moon in its orbit around the earth are the same. The apple falls around the earth if its horizontal velocity is sufficiently high to prevent its path from intersecting the earth.-Falling motion and orbital motion

Motion that repeats itself in a definite interval or period of time is called periodic motion. It is characterized by a constantly changing acceleration due to a constantly changing force acting on the body performing the periodic motion. ----Charlotte R. Ward, This Blue Planet Introduction to Physical Science (Little, Brown and Company Boston 1972)

A change in the position of a body or system with respect to time, as measured by a particular observer in a particular frame of reference. Only relative motion can be measured; absolute motion is meaningless. ----Concise Science Dictionary (Oxford University press, 1984)

Music: The pattern of changing pitch levels (high-low) in the melody, as distinguished from rhythm, which is the pattern of different durations (long-short). Any melody can be separated into a motion-pattern and into a rhythm-pattern, as shown under Melody. Motion may be ascending or descending, in the narrow steps of the scale (conjunct) or in the wider steps of a chord (disjunct). The study of these features is of prime importance in melodic analysis.

The term "motion" is also used to describe the relative changes of pitch in two or more simultaneous voice-parts. Two such parts are said to be in "parallel " motion if they remain in the distance of the same interval; in "similar" motion if they move in the same direction but change their distance ; in "contrary" motion if they move in opposite directions; in " oblique" motion if one part remains stationary on the same pitch. ----Harvard Dictionary of Music, Willi Apel 1969

Motion means change of position of a given body with respect to some reference body. If the moving body is very small with respect to the reference body, or with respect to the dimensions of the spatial domain covered in its motion, so that its shape is practically irrelevant, the problem is reduced to the description of the motion of a point in space. This is a " one-dimensional " case of motion.

There is a certain class of motions in which the material point follows a pattern that is repeated time and again. This is called periodic motion, or vibration. It is the type of motion of greatest importance to physics of music. In order to have a truly periodic motion, a body not only has to come back to same position repeatedly, it has to do so at exactly equal intervals of time and repeat exactly the same type of motion in between. The interval of time is repeated is called the period. The elementary pattern of motion that occurs during one period and that is repeated over and over again is called a cycle.

The " simplest" kind of periodic motion, there are many examples in nature: the back and forth oscillation of a pendulum, the up and down motion of a spring, the oscillations of molecules, etc. Their motions have something important in common: they all can be represented as the projection of a uniform circular motion onto one diameter of the circle. What is called a simple harmonic motion also called a sinusoidal motion. --Juan G. Roederer, Introduction to the physics and psychophysics of music (Springer-Verlag, New Your 1975)

Musical form: musical forms have a close and inseparable relation to musical styles. Aesthetic ideas are the soil from which the various forms of our art grow and expand themselves, until they have exhausted their vitality and superseded by other new aesthetic ideas.

All music is dominated by the idea of " up" and "down," high and low, or rising and falling, though strictly speaking, there is actually no up and down at all in the world of sound. What we call higher or lower sounds are in reality only different frequencies of vibrations, air waves not discernible in space at all, but only in time. Yet the attributes of space are universally applied to an art existing in time only, for practical reasons, symbolically, and for the sake of an easily explainable theory of music.

An idea of vital importance for music is the conception of motion. With motion the idea of rhythm is inseparably linked. ....motion is perceptible both in space and in time, yet motion in music generally occurs only in time. Motion in space cannot be perceived by the ear, but only by the eye. Only when music is linked with drama, in an opera scene or ballet, is motion in time and in space combined.

Motion is indeed an important attribute of style, different styles being dominated and characterized by certain well defined types of motion and rhythm. The most up-to-date variant of that idea has been the introduction of the machine-like " motoric" motion, with speed and force combined.

Repetition in music, very much like repetition in architecture, is a means of obtaining the effects of continuity, coherence, order, and symmetry. It is a primary factor of importance for artistic work. Of all constructive ideas, repetition is the simplest and most elementary one, because the easiest thing for the

mind to do with any idea just uttered is to repeat it. Thus any characteristic pattern of motion, a motif in the musical terminology, may be repeated exactly, once, twice, or many times.

A discovery of immense artistic value and incalculable consequences was made during the Gothic era in France and later during the sixteenth century in Italy when the dimensions of space were for the first time utilized in music.

These three dimensions in musical terms would be:
1. Linear extension or melodic line = length or height.
2. Harmonic or contrapuntal filling out, accompaniment = breadth.
3. Dynamic and color effect = depth.

In an aesthetic sense, the problem of " expression" has become a central problem. To express something one first has to be impressed, and in order to impress somebody else one has to express something. Impression is made possible by the senses of seeing, hearing, and feeling. ...The problem of art is to translate these sensual impressions into expressions fit to impress others. ----Hugo Leich Tentritt, Musical Form (Harvard University press, Cambridge 1965)

Visual perception: Perception is the ability to interpret, meaningfully, sensory information coming into the brain via the sensory organs. ----Jika. m. Zgola / Doing things (The Johns Hopkins University Press, Baltimore and London 1987)

Motion is the strongest visual appeal to attention....Motion implies a change in the conditions of the environment, and change may require reaction.

Happenings, then, attract us more spontaneously than things do, and the prime characteristic of a happening is motion. We call the railway station a thing; the arrival of train, a happening....The distinction depends not only upon movement, but also upon other kinds of change- the lobster and its getting red, the potato and its getting tender.

To the physicist all matter is in motion, ...matter being nothing but an agglomeration of energy. In this simplified concept of nature, thingness and activity are but properties of patterns of forces.

Certainly the performance of a dance, a piece of music creates a very different experience and conveys a different concept of life than a picture. We are accustomed to say that the dance occurs in time whereas the picture is outside of time. Time is the dimension of change. It helps describe change, and does not exist without it. In a universe in which all action had ceased, there would be no more time. Similarly immobile objects give us the impression of being outside of time.

Is it really the experience of its being in time that distinguishes the dance performance from the picture?.... And exactly what part of his performance dose belong to the present? ....If the whole leap belongs in the present, at what point of the performance before the leap does the past start?

Our question turns out to be absurd. The time category does not seem to apply. The dance is given to us as an essentially timeless whole, just as any particular leap or motion....A car on the highway is experienced as moving in space, not through time. In a spirited conversation the argument moves along a path, one thought leading to the next in a coherent sequence. It is the logic of this process or development that characterizes the event, not the succession of elements in time....Under such conditions you are comparing two points of time: the present and the goal point of fulfillment.....Rather you are concerned with time instead of with what is happening....time cannot create order. It is order that creates time.

....the trace of a picture seen recently may be changed by that of another picture seen years ago.... Everything that came before is constantly modified by what comes later.

This availability of the past for change, and the fact that the whole sequence of a past event is given to us like the motion of an object we are looking at now, is explained by the spatial character of memory.

Whatever is remembered is located in the space of memory traces, has its place somewhere in the brain as it exists now, has an address rather than a date.

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....The forces represented in a painting are defined primarily by space. The direction, shape, size, and location of the shapes that carry them determine where these forces apply, where they go, how strong they are. The expanse of space and its structural features-such as, for example, its center-serve as frame of reference for the characterization of forces.

Under what conditions do we perceive movement?....The experience of visual motion presupposes that two systems are seen as being displaced in relation to each other....The psychological rile for what happens in any particular event has been formulated by Duncker. He points out that in the visual field objects are seen in a hierarchic relationship of dependence....The dancer is a part of the setting, not the stage setting the outer rim of the dancer....The room serves as framework for the table, the table for the fruit bowl, the fruit bowl for the apples.

....some of the factors that produce dependence. Enclosedness is one of them. The "figure" tends to move, the "ground" to stand still. Variability is another. If one object changes its shape and size and the other remains constant- for example, a line "growing out of "a square- the variable object assumes the motion....Size ....Intensity also plays a role.

It must not be forgotten that the observer himself acts as a frame of reference....the object fixated assumes the character of the "figure" whereas the nonfixated part of the field tends to become ground.....the resulting perception of motion will be determined by the relative strength of the factors involved.

As long as the dominant framework is without motion, any immobile object will be perceived visually as being "outside of time," just as the framework itself. But when the framework is in motion, the stillness of any dependent object will be interpreted dynamically as its being deprived or incapable of motion or actively resisting displacement.

Motion, as well as other kinds of change, is perceivable only within a limited range of speed. The sun and the moon travel so slowly that they seem to stand still; and that spark of the lightning is so fast that its entire course appears simultaneously as a line.

The motion picture has broadened not only knowledge, but also our experience of life, by making it possible for us to see motion that is otherwise too fast or the slow for our perception.

The high speed of an object may be perceived as being caused by the great motor power in the object and or the small resistance of the medium. Slowness is seen as being the result of weakness or lack of effort on the part of the object and or great resistance of the medium.

Visual speed also depends upon the size of the objects involved. Large objects seem to move more slowly than small ones. A smaller surrounding field makes for faster motion.

Movement without motion:
When we say that a person sees movement, we generally mean that he sees something changing its place....The term "movement" is also used in quite a different sense. T.S. Eliot says of a Chinese jar that it "moves perpetually in its stillness." There is movement in the marble folds of a Greek statue or in the spiral scrolls of a baroque facade. Artists attribute great importance to this quality.

In a painting or a statue visual shapes are striving in certain directions. They convey a happening rather than a being. They contain, as Kandinsky has put it, "directed tensions."....any visual image that presents objects by means of such perceptual qualities as wedge shape, oblique direction, shaded or blurred surface will give the impression of movement;....the strong dynamic effect often produced by patterns not directly related to objects of daily life experience, for example, in architecture or " abstract" art.

Michelangelo's Creation of Adam: The bridge of the arm visually connects two separate worlds: the self-contained, complete roundness of the mantle that encloses God and is given forward motion by the diagonal of his body; and the incomplete, flat slice of the earth, whose passivity is expressed by the backward slant of its contour....the structural skeleton of the pictorial composition reveals the dynamic pattern of the story.....The forces that characterize the meaning of the story become active in the observer....--Rudolf Arnheim, Art and visual perception a psychology of the creative eye (University of California press, Berkeley and Los Angeles 1954)

Photo: Motion study: Aspect of work study which deals with movement economy. Photographic applications: 1. Included analysis of movements too rapid or too minute to see (micromotion study) usually carried out using 16 mm cine film which records a chronometer face on each frame. 2. Recording the paths of movements involved in a particular operation by fastening a small lamp to the moving member and recording the light trace it produces when a long exposure is made using a still camera (chronocyclograph). ----D A Spencer, The Focal Dictionary of Photographic Technologies (Focal press/ Amphoto/ Prentige-Hall Inc, NY 1973)

Motion picture: A sequence of photographs taken with a short (usually fixed) time interval between successive exposures. When the sequence is projected (or otherwise viewed in rapid succession) the result to an observer is the impression of movement. The rate at which the exposures are made varies, but is typically 24 frames per second for ordinary photography. A similar effect is produced in animated films by a series of drawings progressively changing the pose or position of the character, etc. Motion picture is preferred to: moving picture; movie; film; flick. ----Leslie Stroebel & Hollis N. Todd, Dictionary of Contemporary Photography (Morgan & Morgan Inc, NY 1974)

Elements of design: Participation in the visually interesting world requires that we move our eyes about so that we obtain the essence of three-dimensional experience....to explaining three-dimensional experience in two dimension? We cannot recreate such experiences but we can suggest some of their dynamic quality. In as doing we will be combining static dynamic imagery.

....there were many gadgets which exploited the motion potential in static images....the thaumatrope, a device which demonstrated the persistence of perceived static images....A bird cage is drawn on one side and bird on the other. When the disk is spun the bird is seen inside the cage. Sequence of static images as used in a Zoetrope, a spinning cylinder with slits enabling a viewer to receive the illusion of motion.... Another device based on the same principle was the phenokistoscope....

motion in two dimensions:
In order to communicate any sense of motion in two-dimensional work we must use graphic devices embodying the idea of continuity. And ...a little knowledge of physical forces, a little knowledge of the gross properties of the environment,....through knowledge and imagination, the idea of continuity.

Wind action is seen in the shape of branches, billowing of cloth, and the cant of an umbrella. We supply the knowledge which enables this kind of image to communicate motion.

1....in images of leaping, jumping, and walking the plastic content may be quite uneventful, yet we feel a movement. ...we should call this motion through mental participation.
2.When we supply part of the idea in the illusion of motion we get clues from the way objects point....the action goes from left to right....our culture read from left to right....the idea of a sequence in time, earlier on the left and later on the right.
3.Projects with pointing devices can be executed with the aid of arrows, hands, and other found material.
4. Continuity line also suggests motion....The same idea is used in the light writing and the oscilloscope study....
5. Motion can also be implied by drawing the path of a volume traveling from deep space toward the picture plane....This idea can be seen in dramatic instance in Picasso's "Guernica" . Here the head and arm enter the scene from a window removed in space. The sam technique is often used in photography, with a first close to the lens enormously enlarged and other parts of the body reduce in size.
Example: Particles in deep space come toward the observer with the path traced by line. In this representation of a meteor shower, motion is implied through a version of linear perspective.
6. Combining different points of view in the same work also suggests a kind of action....combine the front view of the eye and the side view of the head they are crossing end views in a sequence....a spiral motion is implied.
7. the multiple image:
An action pictured in a sequence of static images suggests motion on a two-dimensional surface, because of our knowledge of what the cation ought to be....an animal with a double set of legs, we read the graphic information as an implication of motion.
8. .... scientific investigation....Velocity and time entered into considerations of appearance....The group of artists most keenly interested in the graphic implications of speed and time were the Italian futurists. They were not interested in the devices of motion for their own sake but as an expression of a rather complex philosophy, part of which involved the rejection of Italy's past. The futurist manifesto written in 1909 declared: "we want to free our country from the fetid gangrene of professors, archaeologists, guides, and antique shops."
..."Dog on Leash"....An essentially static profile is given the appearance of life....Marcel Duchamp's "Nude Descending a Staircase". This work, executed in 1912, burst on the American art scene like a bomb....in the Duchamp work there is a spatial continuum from to back, with apparent size difference playing a part. It is essentially a cubist painting with a space-time countenance.
The futurists demonstrated a rather inordinate fondness for themes of force, strength, noise, action, violence, and revolution. They skillfully developed the means to identify these qualities, and.... their work should be studied very carefully to see how various kinds of action are communicated....Umberto Boccioni, became interested in portraying states of mind.
9. the foggy outline:
When an object passes by the field of vision at high speed it registers as a kind of blur....The graphic parallel to this visual phenomenon is an indistinct outline. Often this blur of contour is used on the back end of a moving form,....

New techniques in motion imagery:
A stroboscope is an instrument designed to permit the observation of successive phases of an object in motion through periodic interruptions in the light source. The instrument ....allows a great number of photographic images to be recorded in a very short time.

....multiflash technique....Sometimes the light tracks the form in a continuous shape, while at other times the form is recorded in staccato images.
A cathode-ray oscilloscope may be used to obtain and record continuous patterns in an illusion of motion. Electric information fed into this instrument is translated into a continuous wave form.

Long-exposure photographs permit the recording of light in movement. Light writing then becomes a creative technique....It will be noticed that the line varies in intensity, fading away when the light source is in the distance, accentuating the feeling of motion in depth. ----Donald M. Anderson, Elements of Design (Holt, Rinehart and Winston, New York 1961)

Graphic side(motion reaction): Movement events.... can be rendered in movement notion with more exactitude than when they are described in words.... A notion based on the combination of motion characters....---- Irmagard Bartenieff & Dori Lewis, Body Movement: Coping with the Environment (Gordon and Breach Science, New York 1990)

Art perception: Artists related their own bodies to the qualities they perceive in models or images, they can transmit those qualities through their art medium. Irmagard Bartenieff & Dori Lewis, Body Movement: Coping with the Environment (Gordon and Breach Science, New York 1990)

Perception is the ability to interpret, meaningfully, sensory information coming into the brain via the sensory organs. .... Meaningful activities and accepting relationships can help reestablish a positive self-image and strengthen the person's sense of identity. .... Meaningful communication and meaningful relationships go hand in hand, since relationships are bonded by communication. ---- Jika. m. Zgola / Doing things (The Johns Hopkins University Press, Baltimore and London 1987)

Philosophy: Philosophy is human thought become self-conscious.....Philosophies, like movements of thought in general, demand lengthy statement and resist swift definition. ----Simon Blackburn, The Oxford Dictionary of Philosophy (Oxford University, Oxford, NY 1994)

Motion, or movement, in its modern meaning, is change-or more precisely, change of the relative positions of bodies. The concept of motion thus involves the ideas of space and time.

Kinematics, in the nineteenth century usually called "kinetics" or " phoronomics, " is the science that deals exclusively with the geometrical and chronometrical aspects of motion, in contrast to dynamics, which considers force and mass in relation to motion.

In medieval terminology, following Aristotelian tradition, "motion" had a much wider significance, denoting any continuous change in quality, quantity, or place.

Aristotle:
In Aristotle's natural philosophy the concept of motion played a decisive role, since for him nature was the principle of movement or change....every motion originates in another motion; only animate organisms possess an inherent power to move....(" All things that move are moved by something else"), To avoid infinite regression and to find a satisfactory explanation of the existence of motion, Aristotle reduced the ultimate origin of all movements to an eternal mover who is himself unmoved. Motion....may produce a substantial form, may change qualities and quantities, or, finally, may be a change of place.

Galileo:
the speed of free fall is proportional to the weight of the falling body and inversely proportional to the density of the medium; that the motion of projectiles depends on some action of the medium; and that motion is impossible in the void.
Galileo's experiments pointed to the conclusion that force is not required to maintain motion, only to change it. ---Paul Edwards, The Encyclopedia of Philosophy (The Macmillan Company & The Free Press, NY 1967)

Galileo and Newton: "The motions of bodies included in a given space are the same among themselves, whether that space is at rest or moves uniformly forward in a straight line." ---Charlotte R. Ward, This Blue Planet Introduction to Physical Science (Little, Brown and Company Boston 1972)

Zeno's paradoxes:

Zeno of Elea's arguments against motion precipitated a crisis in Greek thought. They are presented as four arguments in the form of paradoxes:

1. Suppose a runner needs to travel from a start S to a finish F. To do this he must first travel to the midpoint, M, and thence to F: but if N is the midpoint of SM, he must first travel to N, and so on ad infinitum (Zeno: "what has been said once can always be repeated"). But it is impossible to accomplish an infinite number of tasks in a finite time. Therefore the runner cannot complete (or start) his journey.

2. Achilles runs a race with a tortoise, who has a start of n metres. Suppose the tortoise runs one-tenth as fast as Achilles. Then by the time Achilles has reached the tortoise's starting point, the tortoise is n/10 metres ahead. By the time Achilles has reached that point, the tortoise is n/100 metres ahead, and so on ad infinitum. So Achilles cannot catch the tortoise.

3. An arrow cannot move at a place at which it is not. But neither can it move at a place at which it is. But a flying arrow is always at the place at which it is. That is, at any instant it is at rest. But if at no instant is it moving, then it is always at rest.

4. Suppose three equal blocks, A,B,C. of width l, with A and C moving past B at the same speed in opposite directions. Then A takes one time, t, to traverse the width of B, but half the time, t/2, to traverse the width of C. But these are the same length, l. So A takes both t and t/2 to traverse the distance l. ---- Simon Blackburn, The Oxford Dictionary of Philosophy (Oxford University, Oxford, NY 1994)

Einstein's Revolution:

In 1905, Albert Einstein published his Special Theory of Relativity, followed by the General Theory of Relativity in 1916. He firmly established (1) the idea that all judgement about motion is a matter of perspective; (2) that energy and mass are interrelated ($E=mc^2$); (3) that nothing can move faster than the speed of light (which does not vary). Einstein's theory of the space-time continuum was dramatically confirmed in a 1919 experiment during a solar eclipse. ----John T. Sanders, Science & Discovery The Audio Classics Series / Einstein's Revolution (Knowledge Products, TN 1993)

•Motion is inertia

Concept is split from percept, and thought moves among abstractions. ----Rudolf Arnheim, Art and visual perception a psychology of the creative eye (University. of California press, Berkeley and Los Angeles 1954)

Universal traveler: A major difference between novices and experienced travelers is that old-timers expect the unexpected and ready themselves to meet it; whereas, newcomers are rarely prepared as they rush impulsively ahead into unfamiliar territory.

The life process as a creative journey: The "process of life" is generally measured in stages or events. As we become more aware of being in change of that step-by step process, we begin to improve our movement between its stages. As self-navigators, we set our courses and overcome barriers as we strive to reach them.

Learning to live life....The difficult part comes with knowing when to behave that way, developing the freedom to actually do it, and gaining expertise (knowledge, attitude, and skill).

In dealing with life, everyone is forced to be a problem-solver. To professional problem-solvers, the act of design implies creativity. It describes the activity or process of creative problem-solving. Another word for process is sequence; a series of interrelated actions or events. Professionals are conscious of process and behavior. Design process; a sequence of unique actions leading to the realization of some aim or intention. Creativity is probably best described as constructive extraordinary behavior....Learning to behave creatively requires awareness and effort to control behavior instead of being a mere bystander in the life process.

Anyone can learn to be more creative. It's all in knowing a few basic behaviors and developing a constructive, active point of view....Getting to any intended destination is just a hop, skip, and jump from where you are right now. The path has been clearly marked by many previous travelers who have returned from their adventures into once uncharted regions of creative problem solving to share vivid description of what you might expect along the way. (note: learning from history)

....preparing for travel by getting both physically and mentally "fit" makes sense.
....be sensitive to life's patterns and details in order to learn and develop,..becoming aware of another person...

Thinking and behaving are natural functions. Everyone thinks and acts. However, " clear think" and " creative behavior" are not normal, but special....learning from experience isn't very efficient. Most people relearn the same things over and over again without ever putting their learning to work for them.

Clear thinkers differ from normal thinkers in that they see both macro- as well as micro- scopically. Their holistic approach helps them go beyond the surfaces of things which stop normal thinkers and to comprehend "big pictures" while others see only fragments. This difference in vision leads them to other forms of uniqueness and ultimately to inventiveness.

....your mentality can control both your thoughts and resoning as well as your actions and sensitivity.

Micro- macro represent two different vistas: a micro-view and a macro-view. As children, we develop our insights by getting as close to things as possible. We touch, taste, listen to, and smell everything. As we age, we get more and more distant from things and learn to stand from them in order to better see the external relationships between things instead of more information about the things themselves. Big pictures and overall patterns are easier to spot from the outside.

In the overall context of nature, all things are interrelated. Ideally, a complete folio of analytic findings for any specific subject contains the combined information from both close-up scrutiny and wide- angle overview.

This wide-angle technique is a "tag-on" to a method for increasing creative awareness introduced by the British author / lecturer, Edward DeBono. It follows the principle that discovery is more likely to result from a macro-or broad view approach of seeking relationships between different subjects than via a micro approach of only digging deeper within the bounds of the subject.

Points of view: Obviously, there are many, many "other " ways than yours to look at life. ...It's as if every viewpoint comes with its own set of filters that allow only certain things to pass and exclude all others. --- Don Koberg & Jim Bagnall, The universal traveler (Crisp Publications, Inc. California 1991)

The period eye: ....the dominant expectations and conventions that govern the way people see and interpret images at a given time. ----The New Yorker, October 1993

....tough with reality. ----The New Yorker, October 1993

....the style of pictures is a proper material of social history. Social facts lead to the development of distinctive visual skills and habits: and these visual skills and habits become identifiable elements in the painter's style....pointing out that social history and art history are continuous, each offering necessary insights into the other.

Cognitive style: ....so here are three variable and indeed culturally relative kinds of thing the mind brings to interpreting the pattern of lightplate 13 casts on the retina: a stock of patterns, categories and methods of inference; training in a range of representational conventions; and experience, drawn from the environment, in what are plausible ways of visualizing what we have incomplete information about.

....culturally relative pressures on perception...

But there is a distinction to be made between the general run of visual skills and a preferred class of skills specially relevant to the perception of works of art. The skills we are most aware of are not the ones we have absorbed like everyone else in infancy, but those we have learned formally, with conscious effort: those which we have been taught. And here in turn there is a correlation with skills that can be talked about. Taught skills commonly have rules and categories, a terminology and stated standards, which are the medium through which they are teachable. These two things---- the confidence in a relatively advanced and valued skill, and the availability of verbal resources associated with them----make such particularly susceptible to transfer in situations such as that of a man in front of a picture.

....the forms and styles of painting respond to social circumstances...to suggest that the forms and styles of painting may sharped our perception of the society.....They arise from the face that the main materials of social history are very restricted in their medium: they consist in a mass of words and a few ----in the case of the Renaissance...

A society develops its distinctive skills and habits, which have a visual aspect, since the visual sense is the main organ of experience, and these visual skills and habits become part of the medium of the painter: correspondingly, a pictorial style gives access to the visual skills and habits and , through these, to the distinctive social experience.....One has to learn to read it, just as one has to learn to read a text from a different culture, even when one knows, in a limited sense, the language: both language and pictorial representation are conventional activities.

The history of design can be read in the objects that surround us. The process of design, which often begins in the imagination of the designer, ultimately includes the society in which the designs were owned and used. Design can express the personality of an individual designer, but it may also reveal the character of a period or even a nation, reminding us that we, too, are leaving cultural documents through the designs we make, use, and preserve.

Futurism: No one can know for certain what may happen in the years ahead, but some people are now thinking very seriously about the future and can give us at least an think of what we may witness in the years to come. Even more important, they can help us decide what we should do today to make the world a better place to live in tomorrow. We must not forget that we jointly create the future by what we do---or fail to do---- in our daily lives.

We cannot know what the future holds, due to the inherent uncertainty of events, but we can identify some of the possibilities, so that we can decide more wisely what we should do today to create a better future world.

We have inherited a great deal from our ancestors whose contributions through the centuries created the civilization that we enjoy today. But we ourselves must carry forward the human enterprise in the face of many new challenges.

Whether we are on the threshold of a Golden Age or on the brink of a global cataclysm that will extinguish our civilization is not only unknown and unknowable, but also undecided. The decision will emerge through what we do in the years ahead, for each of us will create a little piece of the common future of all mankind.

The Society does not take stands on what the world will be like or should be like in the years ahead, but serves instead as a neutral clearinghouse or forum for a wide variety of viewpoints.

The future as history, to use the past to build a better future. Futuriestics has even been called" applied history."

The future as challenge. " describes some of the problems that humanity now faces, but also suggests means of solving those problems or at least softening their impact.

The future as invention. " futurists emphasize that we ourselves determine what the future will be like. If we are to mold a better future, we must jbe inventive and come up with creative new ways to meet problems.

The modern futurist movement, which began developing rapidly during the 1960s, appears to be gradually forming a coherent philosophy or world view.
Among the emerging futurist principles are :1. the unity or interconnectedness of reality, 2. the crucial importance of time, and 3. the importance of ideas, especially ideas about the future.

The unity of the universe: the perception that the universe is all one piece, rather than an aggregation of independent, unconnected units.....This thinking contrasts with the traditional view that man exists in the universe but is not really a part of it.....man is as much a part of nature as anything else in the universe: individual human beings owe their existence to the operations of the universe and cannot possibly be separated from it.

The unity of the universe is a unity of time as well as space, that is, the world of the future is being created out of the world of the present, and for this reason we can know much about the future world by looking carefully at what has been happening during the recent past. The future is built largely with the materials of the present.

The crucial importance of time: the problems of today did not appear suddenly out of thin air; they have been building up, often for many years, and might have been dealt with fairly easily if they had been tackled earlier. The crisis that we face today is generally the minor problem that we neglected yesterday. ....a small change that is wisely introduced today can result in major improvements in the years ahead. Such a change may be likened to a seed that is planted in good soil and grows, almost by itself, into a great tree. Thus, time is a curcial element that can make things easy to accomplish ----or impossible.

Earl Josehp, Editor of Future Trends, published by the Minnesota Futurists, had identified five basic periods of the future: 1. Now: the immediate future (up to one year from), 2. the near-term future (one to five years from now), 3. the middle-range future (five to 20 years from now), 4. the long-range future (20 to 50 years from now), 5. the far future (50 or more years hence). (See Joseph's article in The Futurist, August 1974.)

Joseph makes two points that are important in futurist thinking: 1. The world that we will experience in five to 20 years is being shaped by decisions made now.....This curious fact results from the time lag between the making of a decision and its final impact. 2. Aimost anything can be done in 20 years!

These two points underlie the futurists insistence on making the more distant future an integral part of current decision-making. The whole point of studying future possibilities, futurists emphasize, is to improve the quality of decisions that are being made right now. Today's decisions are shaping tomorrow's world,

yet only too often we make decisions with little concern about their impact on the longer-term future.

The importance of ideas: Since the future does not exist, it must be invented; that is to say, ideas about what may happen in the future must be generated and studied. Such ideas or futuribles are critically important because our thinking is shaped both by our concepts of what happened in the past and our images of what may see in the future. Ideas are the tools of thought. Without them, no thought is possible. Ideas may be divided into two classes: concepts and theories. A concept is a kind of mental map or picture of something; a theory (in this sense) is an interlinkage of two or more concepts to indicate how they relate to each other......A theory may be compressed into a concept by striking out the space.

Concepts and theories are our mental models of how the world operates. They enable us to recall what happened in the past and to imagine what happen in the future.....In thinking, we play with our concepts, moving them about in various ways..... A theory that promises to "work" rewards us, because we enjoy the feeling of power that it gives us.

Ideas have made civilization possible and keep it advancing. For example, the division of labor is one simple idea that has proved extraordinarily powerful through history. Each person can become proficient in his part of the work and everybody benefits. Without the division of labor, civilization would be almost inconceivable.

" If we really give serious attention to the future, rather than continue to lurch from crisis to crisis, we can hope for enormous benefits in the years ahead." (From The Study of the Future)....If our ideas are powerful, we can dramatically change the world to make it a happier place. But if our ideas are weak, then we are extremely limited in what we can do. The power of ideas os itself a poerdul idea.....the major constraints on human achievement ar enot physcial but conceptual, that is, the limitations ar ein our ideas rather than in the material resources at our disposal. ...To get the right idea, we can invest in the research required to develop them.

...futurists are extremely interested in the systematic development of ideas. Better ideas will make it possible to improve the human condition.....To develop such a consensus, futurists believe, ideas about the future world should be systematically generated and studied, and that implies the development of the study of the future as a major human activity. ----1999 The world of tomorrow

Time, said St. Augustine, is a three-fold oresent: the present as we experience it, the past as a present memory, and the future as a present expectation.... in the way we design our environment and thus sketch the lines of constraints, the future is committede..... The future is not an overarching leap into the distance; it begines in the present.----The Futurists

The laws of motion: Motion implies a change of place or position. It involves direction and speed. Motion of a body or object, or part thereof, is brought about when a force of sufficient magnitude to overcome the object's intertia is applied to it. Newton formulated three Laws of Motion. ----Efficiency of Human movement

1. Law of intertia: a body at rest will remain at rest, or a body in motion will remain in uniform linear motion, unless an unbalanced force acts upon it.
A book lying on a table is undoubtedly acted upon by the earth and pulled downward, but it doesn't move downward because the table exerts an upward force on it of equal magnitude....A airplane may fly at a constant speed in a straight line although four separate forces actupon it if their sum, or resultant, is zero. A body that is subject to no unblanced force is said to be in equilibrium. The equilibrium may be static as in the case of the book on the table, or it may be dynamic.

2. Law of Acceleration: The acceleration of a body is directly proportional to the unbalanced force acting upon it and inversely proportional to its mass. A force is simply what, when unbalanced, produces an acceleration....the magnitude of an acceleration depends on mass as well as force.

3. Law of reaction: If a body A exerts a force on a second body B, then B exerts an equal force on A but in the opposite direction. Its popular statement is " for every action there is an equal and opposite reaction,"....One of the best illustrations of the third law is the functioning of gravitation. ----Charlotte R. Ward, This Blue Planet Introduction to Physical Science (Little, Brown and Company Boston 1972)

Types of motion: the basic characteristics of all these movements are studied, it is found that there are actually two types of motion -linear and rotatory.

Linear (also called translatory) motion is characterized by the progression of the body as a whole with all parts moving the same distance, in the same direction, at a uniform rate of speed.... The human body may be carried forward as a whole on a train, in a car. Many objects have a form of motion which is not strictly linear but rather curvilinear.... The motion is linear at the start but gravity, air resistance, or friction act upon the object to make the motion curilinear.

The second type of motion is angular or rotatory. This is characterized by movement around an axis with all parts of the object moving in an arc....scissors, the legs, in fact all levers, carry out this type of motion. One part of the object remains at fixed points....The movement of the legs that carries the body as a whole linearly is actually a series of two angular motions.

A great of movement is not strictly linear or rotatory, but rather a combination of the two....the act of walking takes place because of the rotatory motion of the legs but the body as a whole is moved linearly. A car, a train, a bicycle, a wheelbarrow, in fact anything on wheels moves linearly as a result of angular motion of its wheels. ----Efficiency of Human movement

Newton vs Motion in Graphics:
concepts related to the Law 1: Movement is the life space. ..., for there is neither space without movement nor movement without space.

Human unity is the fulfillment of diversity. It is the harmony of opposites.

(universal): ....Movement not only speaks through an object; a living organism owes its final form to it; movement leads to growth and structure...

The future as history: the past can illuminate the future.----1999 The world of tomorrow

related concepts to the Law 2: All movement is an eternal change between binding and loosening..... Stability and mobility alternate endlessly.

The future a schallenge: if we face emerging problems squarely, we may be able to solve them or at least soften their impact. ----1999 The world of tomorrow

related concepts to the Law 3: The future as invention: "inventing the future" has become a popular phrase among futurists. They do not see the future as something that just happens to people; instead, people create the future by deciding what they want and then working to achieve it. ----1999 The world of tomorrow

Life space (definition): Life space is conceptualized to be the sum total of man's past, present and future experience ....Life space is a dynamic, personal, cumulative and constantly changing world.

Transportation is in effect a channel penetrating all zones of the life space.

Psychological world is the inner as well as the outer world. Its boundaries are expanded by all the media of communication and are limited only by the capacity for imagination.

Social interaction performs several vital functions in the life of most elderly.....transportation systems influenced by their viewpoints.

The role of transportation: Transportation is the mediator between the person and much of his environment. It determines whether the community is a useless facade or a dynamic social system. Lack of appropriate transportation constricts the life-space of any person, limits his capacity for self- maintenance, restricts his activities and his contacts with other people, and may contribute to his disengagement or alienation from society, and his experience of anomie. Adequate transportation is not only humane to the older person, it is of economic value to society in that it supports the individual's for independent living and thus assists in postponing or obviating institutional care. ----Transportation and aging

•Motion is action

General History: People on the

move The complete and dramatic record of how man learned to conquer space- - - on land, on the sea and in the air. (cover)

"From the beginning of recorded time, transportation has helped to mold the social, economic, military, and political history of the world. Those whose accomplishments broadened the horizons of transportation through the ages have helped shape the course of civilization, and this will continue to be true." (p.12)

"How the human race always has wanted to go farther, higher, faster; how we always have had men of vision to devise the means of going, and brave men willing to push the frontiers of distance and space out a little further than they were before. The essence of the story, of course, is that those who dreamed and those who dared have together made this a better, richer, and happier world." (p.12)

There is a haze over the beginning of man's travels, but this much seems sure. Manlike creatures were traveling through the trackless jungles, deserts, primeval forests, and plains in Africa, western parts of Asia. and Europe 500,000 years ago. They lived in caves, a family to a cave. Little communities of them were scattered about the countryside. Transient communities, because these manlike creatures were constantly on the move. During the ice ages, they had to go still farther in order to escape the cold that swept down from the north. And to return northward as the cold relented. ....Just one means of land transportation existed--- man's own feet.

This was true even after homo sapiens with his bigger brain evolved 50,000 years ago. Man continued to move by foot only. Then men began to imitate nature. A swift stream was crossed by chopping down a tree so that it formed a bridge.

By 8000 B.C., seashells were being bartered hundreds of miles inland. Trade was just the impetus man needed to improve his tools and his transport. He started to make better implements out of stone, bone, wood, and with them he was able to construct conveyances to help him carry things.

The first great development was a sledge with runners in northern Europe. In the north, sledges ran smoothly on the ice and snow. People in the south used them on dry land. They poured water on the ground in front of the runners. Or, later, milk. The butterfat content in the milk proved to be a most effective lubricant.

Civilization was germinating faster now. Men began to domesticate animals and reap wild grain. Between 7000 and 5000 B.C. metalworking was introduced.

Copper and other metals could be softened under high heat and shaped. The whole way of life was changed. Meanwhile, another industry was spreading. Pottery was beginning to be traded beyond the boundaries of the towns in which it was made.

The need for better land transport was growing.

The use of animals was the next big advance. Men learned to pack goods on the backs of asses.Before long, men learned to ride their donkeys. Then came a bigger advance. Some time in the fourth millennium, farmers learned to yoke oxen to their plows and sledges. In the second half of the fourth millennium, somebody had an idea for one of the greatest inventions in the entire history of mankind. He thought of applying rotary motion to a vehicle and created the wheel.

There are conflicting theories about the origin of this brilliant device. It evolved from the roller. Men had conceived the notion of cutting a tree into small logs and placing the logs under a heavily loaded sledge. The men then pushed the sledge forward until it rolled off the logs. After a while, the theory goes, other men cut grooves in the rolls and fitted them into projections on the bottom of the sledge to keep them in place.

Another widely held theory is that potters first developed the wheel for use in their trade and it was later adapted to vehicles.....The best thinking seems to be that the vehicular wheel was a separate invention.

The first hints of the wheeled vehicles are those we get from the records which the Sumerians so carefully kept. On clay tablets dated about 3000B.C. appear symbols for two-wheel carts and four- wheel wagons.

The use of the wheel spread out of Sumer in all directions. In most places, spoked wheels soon coexisted with the solid wheels.

By 2700 B.C. the wheel was adapted for warfare. Sumerians had come up with a new weapon---the chariot.

When Pharaoh Cheops of Egypt decided to build a gigantic sepulcher in the twenty- eighth century B.C. Slaves did have one enormous advantage--- a paved road. It was the first big road construction job thought one was built on the island of Cyprus perhaps as early as 5500 B.C.

There were more innovations that helped to expedite transportation, such as tunnels. As the means of transportation improved, travel increased. By the start of the second millennium, the movement of people and goods over long distances was well-established.

Travel by caravan was laboriously slow. Despite the wheel and the pack animal, the average caravan went only as fast as a man could walk.

Something new and revolutionary was about to develop in land transport. It was the horse. By 2000 B.C., the Sumerians were riding horseback. In 1000 B.C., the horse was in use up and down Europe, Asia, and North Africa.

Men could go twenty miles per hour on a horse. Governments could exert control over much larger territories. And military operations could encompass vast distances, so war took on a whole new dimension.

Since they were too small to bear men in armor, horses were primarily employed to draw chariots.

The variety of chariots. The Greeks had chariots equipped with seats. Many Roman vehicles could be rented. A sort of a drive-it-yourself chariot. King of China during the Chou Dynasty, between 1027 and 221 B.C., had five different kinds of chariots.

Vehicle-pulling was rough on the horse. The ancients harnessed them in the same manner they did oxen, with wooden yokes over their necks. The true saddle didn't come until the fourth century A.D.

For all its effectiveness, the chariot went out of fashion in war, replaced by the armored rider on a new, larger type of horse. Chariots were restricted to comparatively smooth terrain. By the end of the fourth century B.C., the chariot had practically vanished from the battlefield.

Mule, camel, elephant were also making their bow on the transportation scene.- - - Mesopotamia:There was the first map drawn on a clay tablet around 1800 B.C., in Mesopotamia.- - - Another Mesopotamian innovation should be noted---the paved city street.- - - Mesopotamia had to its credit the first NO Parking sign. And gets credit for history's first great bridge as well.

Chinese inventions: The construction of the first pipeline deserves attention, and here the Chinese get the praise. Kite and the wheelbarrow might be mentioned.

Countrywide road system happened about 1000 B.C. and again China led the way. Still the Chou Dynasty created history's first national road network.

Furthermore, the Chinese under the Chous enacted the first traffic laws. These regulated a variety of travel matters, from the dimensions of vehicles and the speed they could move to traffic control at intersections.

Persians: They built an impressive network of roads to facilitate the governing of this territory.

To handle official mail, the Persian government instituted an courier system.

Greeks: The one interesting thing they did was to build roads with grooves for wagon wheels to roll in, somewhat like a railroad. And it had begun to construct a magnificent road system. This was Rome the resplendent.

The Roman government operated the official mail service. The private traveler rode in his own vehicle. Travel got to be more rapid.

Step by awkward step now, we have witnessed the origins of the art of transportation. We have watched the beginnings of various means of land transport, from the footsore hiker to the ripsnorting horseback rider, from the clumsy sledge to the dashing chariot, and we have observed their impact upon the life of early man. Government has grown more powerful, trade has spread, and cultures have been cross-fertilized through the help of transportation. Empire has become plausible and big-scale war has gotten to be technically feasible.

Manlike creature first learned to cross a stream by straddling a log and paddling with his hands. To increase his speed, he shaped wooden paddles bigger than his hands and he cut poles for pushing. The progression from floats to boats followed naturally, and in many places.

A dugout might come first. Men were using real boats by 6000 B.C.

By the middle of the fourth millennium B.C., men had discovered that boats were valuable means for trade and travel, fishing and fighting.

After all those ages of pushing and paddling, man had learned to harness the winds. It was a discovery that immeasurably changed travel habits on water. By 3000 B.C., men had begun to construct their boats of wooden planks instead of digging them out of logs. They replaced their paddles with oars, and they made big sails of linen or papyrus which hung down from a pole fastened crosswise to the mast.

In the northeastern corner of the Mediterranean, a style of boat building emerged that was to be the foundation of marine architecture in the West to the present day.

The shipwrights of the northeastern Mediterranean discovered this vital principle. When they began to build planked ships around 3000 B.C., they designed ships with long, strong frames sitting deep in the water.

With sailing ships men could search the other side of the seas for the things they needed. Year by year, sea trade increased.

There were historic battles as nations fought for control of the seas and of the lands that went with them.

A lodestone spoon spinning on a bronze plate was in experimental use in China in the first century B.C. The magnetic compass did not appear anywhere before the twelfth century A.D., though.

Many seaports built elaborate breakwaters, docks to provide havens for shipping. With all these improvements in shipping, sea trade boomed. By sea and by land, man had come far.

The isolation was in Europe in the Middle Ages. China embarked on a herculean canal-building program in the seventh century. This Grand Canal was 120 feet wide and 1200 miles long, and it was just one of thousands of canals that were dug. It;s the reason that Communist China has 200,000 miles of good canals today.

In Europe itself, the Vikings began to think more of peaceful pursuits then of piracy. With their encouragement, trade and travel slowly started to revive.

Another stimulant was the enterprise and avarice of the merchants in cities like Venice. They built themselves a rich commerce with Constantinople.

Religion also helped to restore commerce in another, more pacific way. (During the tenth and eleventh centuries, the Church at Rome promoted two reforms for Europe: the Peace of God, and the Truce of God. The Peace restricted feudal nobles to attacking military personnel and objectives exclusively.) Both reforms made life more secure for the merchant, pilgrim, and friar trudging along the rutted roads.

The greater traveler and travel writer: Marco Polo introduced the West to the mysterious wonders of the Far East. He was the only source of information the West had on some far-off parts of the Orient until the nineteenth century.

Before the end of the seventeenth century, the basis was being laid in Europe for one of the world's biggest revolutions in transport: widespread canal building. A Chinese engineer, Chiao Wei-yo built the first know canal lock in 984 but the concept was brought to fruition in Europe. Leonardo da Vinci lived in Italy from 1452 to 1519. The modern gate for canal locks was his invention.

There was pioneering with bridges. Antonio Da Ponte, the supreme Italian bridge designer, erected the celebrated Rialto Bridge with its graceful single arch in Venice in 1588.

In 1610 the Spanish put up an exceptional stone bridge in Lima, Peru.

In England a new idea appeared--- the turnpike in 1663.

The best news was the development of a splendid new conveyance--- the coach. It was invented around 1450.

By the end of the eighteenth century, stagecoaches were in operation in England transporting passengers between cities.

The evil condition of roads continued unabated into the eighteenth century.

Many of coach were so small that they were in constant danger of being upset. In the early spring, floating ice added extra hazard.

About the middle of the eighteenth century, wind, water, and steam were being harnessed to supply power. New techniques and steam were being invented.

Torrents of money poured into canal building in England , France, and in America the last decades of the eighteenth century saw a growing interest in canals. Slowly the roads began to improve, too.

France created in 1716 the first modern state-maintained organization of civil engineers, in 1747, the world's first engineering school. In 1770's, a Franc engineer developed a style of road building.

Railroads weren't so far off now. In sixteenth -century German mines, wooden rails had served as roads for hand-pushed ore carts.

By the start of the seventeenth century, wooded rails led downhill from certain English coal mines.

By the end of eighteenth century, all the important collieries in England had horse-drawn railways. Some of these used cast-iron rails. Everything was in place awaiting the arrival of the engine. The world was building up toward steam.

At sea: Travel by water could be miserably uncomfortable--- on longer trips the diet was a terrible hazard. Men became weak, caught scurvy, or a fever, and died. Diseases could sweep at sea. Fatal illness didn't decimate the crew--- there were always pirates.

During some half a million years, man had learned to travel over land only as fast as far as he could go on foot, or as his animals could carry or pull him; over water he went only as fast as far as the currents, oars, and the unreliable wind could move his boat.....He had made no important change in his means of trans-port for more than 4000 years.

By the eighteenth century one such change was on the way: steam power.....In 1690, a Frenchman named Denis Papin made public a design for a steam engine. James watt made a number of significant contributions that cleared the way for the development of an engine efficient and light enough to help men get around.

The age of steam was here.....Some magnificent things happened to transportation on land in the nineteenth century. Travel by road was still a miserable ordeal when the century started. There was more rut than road.

Some advances in road building appeared. One of them is concrete. It was reintroduced in England during the late 1820's.

Over the highways the best of the stagecoaches raced at speeds of ten miles an hour and up. By 1852 it was obvious that there was a better way to cross the country than in a racing breakneck stagecoach. Clear the track! Here comes the railroad.

Centuries before Christ, the Hittites constructed their roads with grooves for wagon wheels to roll in. Sixteenth- century German miners utilized wooden rails for the ore carts they laboriously pushed. Some English mines of the period had wooden rails, so that coal wagons could coast down to river landings. Horse-drawn railways came into use in English mines in the eighteenth century, and some had cast-iron rails.

Probably the grand-paternity of the railroad should be ascribed to an Frenchman by the name of Nicholas Joseph Cugnot. In 1769 M. Cugnot built a bizarre three-wheeled steam carriage to haul cannon. Cugnot's contraption was very different to steer and it could only travel fifteen minutes before it ran out of steam.

The direct paternity of the railroad must be credited to a Englishman by the name of Richard Trevithick. He invented a pump and a high-pressure steam engine and built a steam-propelled coach with 10-foot wheels that could go eight miles an hour. The only trouble was that the heavy locomotive damaged the rails.

An English miner, George Stephenson built a locomotive engine in 1814 that drew eight ore-laden wagons at a speed of four miles an hour. In 1825 he built the first steam railroad in England, from Stockton to Darlington. Initially, it hauled only freight. Until 1835 the passengers on the line rode behind horses.

He designed a husky new locomotive, the Rocket, which could draw three times its own weight at twelve and a half miles an hour.

In 1830 the first railroad in the world to haul both passengers and freight exclusively by steam power from Liverpool and Manchester.

The tide of the Industrial Revolution was rising fast, though, washing away the traditions of centuries. Machines, especially those gib, smoking monsters, the steam engines, were everywhere bringing change.

Grow they did. In 1841 England had 1600 miles of railway.
In 1835 the first railroad line in Germany.
In 1851, a railroad was abuilding in Africa, and Russia.
In America, the first railroad, the Baltimore and Ohio, was opened to traffic in the spring of 1830.

In 1836, the Charleston and Hamburg was the longest railroad under one management in the world. It originated rail roading's first headlight.

The first whistle was installed on the locomotive Hicksville which went into service at Jamaica, Long Island, in 1836.

With the years trains and their tracks lost some of the pioneering look. The locomotives began to take on a standard shaps-- a barrel body with smokestack at the front and a place for the engineer at the back and all iron T rails.

n 1837 the world's first sleeping car in Pennsylvania. George Mortimer Pullman designed a plush sleeping car with cherrywood seats, disappearing beds, curtains to ensure privacy, and two washrooms in 1858. A year after, a "hotel car " with both eating and sleeping facilities.

The discovery of gold in California lent new impetus to the deice for a crosscountry rail line. But there were obstacles to overcome, such as sectional jealousies. The South did not want any railroad if it passed through the free states. And what gauge was it to be ? Some railroads would have to spend a lot of money on gauge changing. For five years the work went on, faster and faster. May 10, 1869 the rails were to meet at Promontory Point, Utah.

There was other railroad news. Coal replaced wood and coke as fuel. Iron rails gave way to steel. In 1869 George Westinghouse patented his revolutionary compressed- air brake that made high-speed rail travel safe, and in 1893 the American Locomotive 999 set a world's record of 100 miles an hour. Luxuries were installed in passenger trains.

This was the era that germinated colossal railroad empires, and emperors. By 1900, the United States had far and away the most, 193,346 miles. the United Kingdom had laid down almost 22000 miles of line before 1900, and France almost 24000 miles.

German had constructed a magnificent network of strategically placed railroads to ensure fast mobilization for war.

Czarist Russia began its renowned Trans-Siberian Railway in 1891. In China, Japan, Australia, railroads were booming. In South America and Africa, too. Everywhere, the railroads brought people, trade, and higher living standards.

Bridge, tunnels, city tram railways were built.

The first cable cars appeared in San Francisco in 1873.

Trolley cars that drew their current from overhead wires were introduced in New York City in 1889.

London built the first metropolitan railroad underground during the 1860's.

Budapest built the first successful electric subway line, in a steelbeamed tunnel in 1893.

In America, Boston was the first city to have an electric underground railway. It opened a streetcar line in 1897.

"We surely live in a very fast age".

The Timeline of the Railroad
(source from *Railways & Trains*, Caroline Young)

2000 years ago, ancient Romans drove carts in ruts

1700s
Mining wagons ran on iron rails

1804
Richard Trevithick's steam locomotive pulled a heavy load at a mine in Wales

1810-15
Engineers found wheels with rims called flanges stayed on rail best

1825
First passenger railway in the world opened between Stockton and Darlington in England

1829
Rainhill Trials held to find the best sort of locomotive. The Stephenson' Rocket wins
Coloured flags used as signals on railways to stop trains crashing into each other

1830s
Railway-building starts all over Europe, North America and Russia

1831
The four-wheel bogie invented in North America

1839
First railway timetable, called Bradshaw's, published

1840s
Wooden semaphore railway signals used for the first time. Signalboxes appear on busy railways

1841
Thomas Cook runs the first railway excursion

1859
George Pullman built his first luxury passenger carriage in America

1863
First underground railway opened in London. Steam locomotives ran on it

1869
Two railroads met at Promontory point to carry trains across North America

1871 The first tunnels through the Alps Mountains finished. Three more were built in the next 30 years

1879 Siemens showed his electric locomotive at the Berlin exhibition

1883 First Orient Express ran from Paris to Istanbul in Turkey

1890 First electric underground train ran in London. Nicknamed the "Padded Cell" as it had small windows

1892 Sir Rudolf Diesel invented the diesel engine

1900 Early 1900's Marshalling yards opened to sort freight wagons into freight trains

1938 "Mallard" set world speed record for a steam locomotive reaching 203 kph (126 mph)

1939 Diesel train "Flying Hamburger" recorded 214 kph (133.5 mph)

1950s Electric railways built in Europe after the second World War (1939-1945)

1964 Electric "Bullet" trains started running in Japan

1981 TGV train began running on French railways. It reached 250 kph (160 mph)

1984 Small Maglev train started work at Birmingham Airport, England

1987 Work began on railway link between Britain and France, the channel Tunnel

1990 TGV Atlantic reaches 515 kph (320 mph). It is the fastest passenger train yet

1994 the channel Tunnel started running between Britain and France

Key word List

Inventors' name	Railway line	Bureau
Alfred de Gllehn	Baltimore and Ohio	Centralized Traffic Control (CTC)
Blenkunsop	Best Friend of Charleston	International Union of Railways
Dr Wilhelm Schmidt	Catch-me-who-can- locomotive	(UIL)
George Stephenson	Flying Hamburger	Ireland operation the United
John Blenkinsop	High Speed Train sets (HST)	Kingdom
John Birkinshaw	Liverpool Manchester Railway	the Central Pacific Railway
James Watt separate	Locomotion No1	the Union Pacific Railroad
Peter Cooper	Ludwigsbahn	the Canadian Pacific Canada
Richard Trevithick	Orussian State Railways	the Great Northern Railway
Tom Thumb Locomotive	Rocket	the Central Railway of Peru
Thomas Russell Crampton	Puffing Billy	the British Railways
Queen Marie-Amelie	Stockton and Darling	the National Railroad Passenger
William Jossop	Baltimore and Ohio	Corporation (Amtrak)
William Hedley	Switzerland Bern-Lotschberg-	the Delaware and Hudson Canal
William Losh	Simplon line	Company
	the Royal George locomotive	the Great Western Railway
	the Sans Pareil	the Metropolitan Railway
	the Novelty	the Midland Railway
	the Planet	the Indian Railway Conference
	the Best Friend of Charleston	Association (IRCA)
	the LNER A4 Pacific Mallard	the New York Central
	the diesel-powered Zephyr trains	the nationalization of the British
	Zephyr services	Railways
	999 of the Empire State Express	the Japanese National Railways

The power

steam:
The first trains used the power of steam to make them move. They burned coal or woods as fuel and made steam, smoke and sparks as they went.

An English blacksmith built the first engine powered by steam in 1712. His invention spread all over Europe. Almost 100 years later, a man called Richard Trevithic built a steam engine that could move and pull loads.

1. The firebox
A fire of wood or coal is lit in the firebox. The heat from the fire is used to boil water, generating steam.

2. The boiler
The boiler is readlly a large metal barrel of water, within which are lots of hollow tubes. The tubes are heated by hot air from the firebox. When the water boils, the steam is collected in the dome.

3. The dome
Steam from the boiler collects in the dome. When the steam pressure is high enough, the driver opens the regulator valve to let steam rush into the cylinders.

4. The cylinder
Inside each cylinder is a piston. When the regulator valve is open, steam enters the cylinder. The steam expands and pushes the piston along the cylinder. This motion, linked through a connecting road and crank, turns the driving wheels.

Diesel:
Diesel teains burn diesel oil. This sends power to an electric generator which makes the wheels turn. They can be smoky and noisy.

Diesel trains get power from an engine invented by Dr Rudolf Diesel in Germany 1892. At that time, they were less expensive to run than steam engines. By 1960, there were only a few steam trains left. Most diesel locomotives are called diesel electrics.

They have three main parts. These are a diesel engine, an electric generator and one or more motors. All three parts work together to make the locomotive move.

This is the diesel engine. Inside it, air is pushed into cylinders. The air gets so hot that when a little diesel oil is squirted in, it explodes.

The power of the explosion is carried to this generator. The generator turns it into electricity.

The electricity from the generator makes this motor work. It is called a traction motor. It makes the wheels turn.

Electric:
Electric trains use electricity. They do not need to carry their fuel. They can go faster than other trains and make little smoke or noise.

A German inventor called Siemens built the first electric train in 1879. Electric trains cannot run on ordinary railway tracks. They get power from a third rail carrying electricity or from a cable hung above the track.

Electric cables hang from masts, or pylons, above the track. This is the pantograph. It rubs against the cable and picks up electricity as the train moves.

Electricity is carried to this box, called the transformer. It sends electricity to motors above the wheels.

Motors make the wheels turn. They are called traction motors.

Magnetic Suspension Systems: this system might be compared to the repulsion experienced when you try to being together two bar magnets with north poles facing. ...The same magnetic force that lifts the vehicle can also be used to keep it centered; if a train tended to drift to one side, the repelling magnetic force on that side of the guideway would increase and tend to keep the vehicle centered. The vehicle is supported by rubber tired at low speeds or when stopped. ----Hal Hellman, Transportation in the world of the future (M. Evans and Company, New York 1974)

The Wheel Codes

A steam locomotive's wheel code, known as the Whyte notation, shows how many wheels is has and what job they do. 4-4-0, the first figure gives the number of leading wheels, the second the driving wheels, and the third the trailing wheels. Many wheel codes have names. A 4-4-0 is known as an American. This system of wheel codes was invented in 1900 by Frederick Whyte, an official of the New York Central Railroad, USA.

Diesel and electric engines do not use the same wheel codes as steam locomotives. Instead, letters show the number of driving axles on each bogie. "A' is one, "B" two, "C" three and "D" means four. An "0" after the letter means the asles are not coupled. (Numbers are given for carrying axles, letters are used for driving axles, Axles which are individually driven are suffixed "o".) This system is also used on the continent of Europe for steam locomotives (see Appendix j: the Wheel Codes).

The Gauges

The distance between the rails of a railway track is called its gauge. The standard gauge is 1.435 m and is use throughout the world. It was developed by George Stephenson, who based his gauge on the rails used by colliery wagonways. The width of the track was convenient for a horse to walk within while pulling a wagon loaded with coal. Different gauges are used in some parts of the world, ranging from the ting 381 mm gauge train to the 1.676 m gauge used in countries like India, Spain, Portugal, Argentina and Chile.

When the two gauges met, all the passengers and goods had to change trains. British engineers argued for over 50 years before choosing standard gauge in 1892.

In 1871 there were 19 different gauges in the USA. They ranged from 914 mm to 1.83 m wide.

Australia has multi-gauge track to cope with the problems of different tracks. The diagram above shows how one section of track in South Australia can handle three different sized trains, each using separate pairs of rails of rails (see Appendix j: the Gauges).

The Signalling:

Signals help to make the railroad train the safest from of transportation. Some signals have messages for the eye. Some, like the locomotive whistle or bell, havemessages for the ear.

When railway lines began to cross each other, there was more danger of accidents. Train drivers needed signals beside the track to show when the line was clear. Here are some of the most common ones. At

first, special railway policemen help up flags as signals. Each flag position meant something different.

Soon, railway companies paid signalmen to control wooden signals on top of a post. They used levers to move them up and down.

Semaphore signals could be set in different positions. Each one had a different meaning.

By 1850, all the signals for a stretch of track were controlled from a hut called a signalbox beside the track.

By the 1860s, signalmen used electric telegraph machines to tell each other when a train was approaching their box.

Today, several signalmen often work in big signalboxes called power boxes. They control all the hundreds of signals and points along a large area of railway track. Inside each powerbox is a big diagram of all the track it controls. This in how signalmen use this diagram to set the signals and points for each train. 1. Lit -up numbers in these boxes tell the signalman a train is approaching and where it needs to go. 2. He sets the signals by pressing buttons on the diagram. The train's route lights up with whita lights. 3. As the train passes, the white lights turn red. This shows the signalman that that piece of track is busy. 4. Once the train has passed safely, the signalman presses a button to show him the line is clear for another train. (see Appendix j: the Signalling).

The tunnels and bridges

Tunnels carry railroads below the surface of the earth. The tunnel permits trains to run between cities by a more direct route; to pass through mountains, instead of around them; and to travel at a more level grade than would otherwise be possible. Tunnels also enable trains to pass under sities, rivers, and harbors.

Bridges make it possible for trains to cross rivers and valleys and to run from one city to another by more direct routes. The principal kinds of bridges are deck plate girder, deck truss, through truss, suspension, cantilever, viaduct, and trestle. (Where timber was plentiful, people built wooden railway bridges. They were called trestle bridges. ; Some valleys were too deep to fill with earth to keep the railway level. Bridges called viaducts were built over them. They had lots of brick or stone arches).

The "legs" of the bridge are called piers. The section between two piers is called a span. The "floor" of the bridge where the tracks are located is called the deck.

The major Structural Systems of the basic types of bridgesare: Beam, Truss, Rigid Frame, Arch and Suspension.

The Beam is the most common. A beam bridge is generally not used to span great distances.

A Truss is often used when the span length required exceeds the practical limit of a Beam bridge.

Rigid Frame and **Be**am bridges look very similar. Rigid Frames are frequently used when vertical clearance is critical.

The Slant-Legged Rigid Frame is a variation of the Rigid Frame concept.

The shape of an Arch is the source of its great strength.

The Suspenstion bridge is used when an extremely long clear span is required (see Appendix j: the Tunnels and Bridges).

•Motion is Reaction

London's Transport:
London in 1900 was the largest city in the world. Its population growth was closely associated with the development of public transport, which allowed people to live in suburbs some distance from their place of work....allowing longer distance commuting than the buses and trams. These railways included the first two underground lines, the Metropolitan and the District,....

Dramatic technological changes took place in all forms of urban transport in the early of the new century. Victorian transport was almost totally reliant on the horse and steam locomotive as sources of motive power. In the Edwardian era this situation changed very quickly. The first regular motor-bus service in London was introduced in 1899; only fifteen years later the last horse-bus was withdrawn. Electric trams appeared in 1901 and had replaced every horse-tram in the capital by 1915.

The opening of the City and South London Railway in 1890 offered a revolutionary alternative: it was the first electric underground railway in he world, running in deep-level tunnels with a circular profile -hence the name "tube".

Building electric tramways and underground railways was expensive, ... One large private company, the Underground Electric Railways of London Ltd, quickly came to dominate the urban transport scene. The UERL was set up in 1902....By 1914 the Underground Group, as the UERL and its subsidiaries became known, was major in London.

Design coordination:
London Transport was one of the very first corporations to coordinate its design. A corporation like a person, it develops a certain character, and builds up a certain reputation in the minds of others. A corporate image is the totality of pictures or ideas or reputations of a corporation in the minds of the people who come into contact with it. London Transport design has always been radical, insisting that form follow function, and closely integrated with general and operating management. The attitude is summed up in two aphorisms ascribed to Frank Pick; "Design is intelligence made visible" and "Good design is good business".

The posters:
The pictorial poster is a visual telegram, a concise means of conveying a message through a simple combination of words and images. At its best it is also an art form, albeit an applied art where the designer's skill and creativity is channelled towards a very practical purpose....A well-designed poster will attract attention and transmit an idea almost before the view has had time to think about it.

....Improvements in printing techniques and reproduction methods made the pictorial colour lithographic poster a suitably cheap and effective medium for advertising and publicity. It came into widespread in hte 1890s and 1900s, but it was not until the 1920s and 1930s that the massproduced poster reached a peak of stylistic quality.

Pick, born in 1878 in Spalding, Lincolnshire And early in 1908 was given responsibility for the Underground Group's publicity. The early publicity lacked the impact of a planned and coherent programme. Pick saw the opportunity to do this through posters, ...The Underground used very few posters to publicize its own activities, and when it did they were traditional " letterpress" productions with no pictorial content. Pick took the lithographic technique and adapted it to London. The earliest Underground posters were commissioned

from printing firms....He recognized the importance of presentation, and the need to recorganize the chaotic mass of advertising and information that covered the walls of so many railway stations at the turn of the century.

Display: Pick reserved special illuminated bords at the Underground station entrances for the company's own pictorial posters and maps. Commercial advertising displays were confined to the walls of the platforms and passenges inside the stations, and were restricted to carefully delineated grids, which could also include an allocation of space for the Underground's own use.

Typeface: The typigraphy of hte posters also required special attention....The eminent calligtapher Edward Johnston was commissioned to design the new lettering and produced his first version of it in 1916. Johnston's classic Underground typeface is based on plain, carefully proportioned block letters....It is ideal for use on poaters and signs where clarity and legibility at a distance are essential. The Underground has used it for nearly all its display signing since the 1920s and a modified version known as "New Johnston' is still the standard typeface applied to hte Underground's posters today.

Content: Pick rarely used posters for direct, ...Most of the posters were therefore gentle inducements to leisure travel, a large proportion featuring destinations in London's countryside....The benefits of London itself highlighted by the posters were also mainly those to be enjoyed at leisure - museums, theatres, cinemas, shops, parks, sporting events, or simply the sights of London.

Influences: Under Pick's influence good design became the hallmark of the Underground and of London Transport. Many of hte artists commissioned by the Underground were influneced by the avant-garde European art movements of the early twentieth century, and posters became a medium for popular commercial interpretation of these styles. Cubism, Futurism and Vorticism all reached the general public in Britain by way of the Underground poster.

The simplification of images into dramatic, geometrically based compositions -which was common to all these new art movements -was particularly appropriate to poster design, and stimulated an exciting new creative approach by commercial artists. Edward Mcknight Kauffer, the American designer first commissioned by Pick in 1915, was the most influential of the "new wave" of commercial artists. He claimed to be applying scientific principles in his use of modern artistic expression in advertising.

Into the present day: The number of pictorial posters issued by London Transport after the war never returned to pre-war levels. In hte 1920s the Underground was regularly producing over forty a year; by the 1950s this was down to seven or eight....London Transport was no longer actively trying to encourge new talent, but tended to play safer in its commissions.

....in the mid -1980s, a new marketing initiative brought art back to the Underground poster in a rather different form. London Underground's Marketing and Develpoment Director, Dr Henry Fitzhugh, took the decision in 1986 to revive the policy of direct commissions to artists...."Art on the Underground' is a scheme for displaying newly commissioned fine art in poster form, The subjects are loosely connected with the Underground as possible destinations, but generating travel is their least important purpose. Overall, Fitzhugh aims "to strike a balance, so that fine art which is popular with our customers continues to make a major impact on the visual appeal of the Underground.

Timeline:
1908-14: The standard of poster design was extremely high from the start, with a series of eye-catching designs and the first move towards a coherent graphic identity in the use of block lettering.

1914-18: During The First World War the Underground Group's posters took on a propaganda function in addition to their publicity role....the romantic appeal of London's countryside was used in posters sent out by hte Underground to the troops overseas as "reminders of home."

1918-33: The 1920s and early 1930s were the heyday of the Underground poster, both in quality and quantity. It was a period of rapid growth for the system,....corporate design identity....new graphic styles....Johnston typeface gave a strong visual coherence. The Underground Group became an important patron of the arts and the acknowledged leader in he field of poster publicity.

1933-39: In 1933 A New Organization, the London Passenger Transport Board, was created to run all bus, tram and underground railway services in the capital. With Pick as Chief Executive of London Transport, the high standard of the Underground Group's poster publicity was maintained and extended to cover all elements of the newly enlarged system.

1939-45: The Second World War had an immediate impact on civilian life in London. Unnecessary travel was discouraged and publicity posters ceased....The main role for pictorial posters was now to provide information....Due to shortage of paper, fewer posters were issued and most of them appeared in a reduced size.

1945-63: London Transport Carried more passengers in the late 1940s than ever before....In comparison with the pre-war years, the posters seem limited in range, reflecting an apparent shortage of talented young graphic artists. Poster art, unable to stem the decline in passenger numbers in he 1950s, was viewed as an outdated publicity medium.

1963-84: ....financial difficulties, staff shortages, unreliability and a decline in passenger numbers. Art poster publicity became widely regarded as an irrelevant luxury....Meanwhile publicity posters were contracted out to agencies, who tended to use photographic images rather than artworks....

1984-89: ....With a dramatic increase in passenger numbers since the early 1980s,....no longer needs the posters to encourage travel. The new campaign is essentially a programme of fine art sponsorship which has revived the London Underground's reputation as an arts patron and marks a return to the high artistic standards of the pre-war years.

The sign:

The design coordination of the Underground Group of companies is traceable back to 1907, when the "Underground" logotype came into use. In 1913 the circle -and bar symbol was added, an in 1915 Johnston's alphabet was commissioned (see Appendix j: London Underground signs).

The circle -and bar symbol was given its present standard form by Hans Schleger. The original designer is unknown, but it has a resemblance to the symbol of the London General Omnibus Company, which was merged into LPTB in 1933.

The map:

When the first Underground maps appeared in 1908, the system was sufficiently compact to be represented easily with geographical accuracy. As extensions were added in the 1920s, it became increasing difficult to fit the whole Underground system on one map.

In 1931, Henry C. Beck (1903-74), a young draughtsman working for the Underground, came up with a radical solution to the problem. In his spare time Beck had redesigned the map as a diagram, completely abandoning geographical accuracy for the sake of clarity. His layout, apparently inspired by diagrams of electric circuits, showed the various lines as vertical, horizontals and 45 -degree diagonals. The central area, which contained the most complicated interchanges, was enlarged in relation to the outer areas, making the map much easier to read.

Beck's unsolicited idea was tested by the Underground in 1933, initially as a folding pocket map, and was an instant success with passengers. He continued to experiment with, and adapt, his design until the late 1950s, but these and all subsequent versions of the diagram remain true to his original concept. It has inspired numerous imitations: the diagrammatic map is now a standard means of representing transport systems all over the world.

Graphic People in the railway

Cassandre, A.M.(1901-68) Pseudonym adopted by the poster artist Adolphe Jean-Marie Mouron. Born in the Ukraine, he migrated to Paris during the First World War. Studied painting at the Ecole des Beaux Arts and the Academie Julian. Learnt the techniques of poster production whilst working for the lithographic printer, Hatchard et Compagnie. Between 1923 and 1936 responsible for a series of classic and enormously influential advertising posters which assimilate different elements of the language of Modernism, particularly Cubism and Purism. Amongst the most famous are Etoile du Nord (1927), Dubonnet (1932) and Normandie (1935). In 1927, along with Charles Loupot and Maurice Moyrand he co-founded L'Alliance Graphique, which was disbanded in 1935 after Moyrand's death. Typeface designer for the French typefoundry Deberny & Peignot including Bifur (1929), Acier Noir (1936) and the popular Peignot (1937). In 1936 honored by the Museum of Modern Art, New York, with an exhibition. Worked in the US during the late 1930s, producing exceptional posters for container corporation of America and N.W. Ayer. Commissioned by fellow Russian Alexey Brodovitch to design covers for Harper's Bazaar. Returned to France in 1939, concentrating for the next three decades on painting, theatre and ballet design. Cassandre's original output represents a major contribution to the development of 20th-c. graphic design.

Quotes: "Poster work demands of the painter complete renunciation. He cannot express himself that way; even if he could, he has no right to do so. Painting is a self-sufficient proposition: not so, the poster. A means, a short cut between trade and the prospective buyer - a kind of telegraph. The poster artist is an operator: he does not issue a message, he merely passes it on. No one asks for his opinion, he is only expected to establish a connection: clear, powerful, accurate."

Style: Characteristics of his work are bold geometric abstraction, broad planes of restricted colour, dynamic composition and masterful integration of letterforms and image.

By 1923, the year when A.M. Cassandre made the first poster he considered to be truly his own - AuBucheron - the development of poster art since World War 1 was no longer influenced by commercial artists, but also by modern architects and, even more so, by avant-garde painters. The painters, especially, began to use posters with increasing frequency to announce cultural events and in so doing, left examples in poster form of the various experimental art movements of the early century, such as German Expressionism, Russian Constructivism, Dada, and the Bauhaus, among others. These "cultural" posters were printed in small quantities and directed at elitist audiences without concession to commercialism and popular taste. It certainly can be said that this type of poster influenced the young Cassandre and that he filled much of the gap between the avant-garde cultural poster and the commercial poster.

Although this was one of Cassandre's great contributions to the history and development of poster art, he was even more inspired by the paintings of the avant-garde than its posters.

As steeped as Cassandre was in avant-garde painting, he was not the first commercial poster artist that was influenced by such painters as Leger, Delaunay, and the Italian Futurists, although, as we shall see,

he was much more forceful and dynamic than any other in showing their influences. Accuracy, power, clarity: these are the qualities Cassandre has been careful to foster in himself, uncompromisingly, so as to place them at the service of the advertising craft.

....the famous Cassandre poster showing a brilliant application of geometric stylization....

plate: Nord Express (1927). With Nord Express Cassandre begins to use vanishing perspective in quite interesting and daring ways. What is so unusual here is that the receding effect takes place in the extreme right corner of the image at a ninety -degree angle that is achieved by making the telegraph wires recede straight back and the locomotive move from left to right. Cassandres integrates the letters into the pictorial matter first by making the split -colored D and the final carry on the direction of the first telegraph wire and then by fashioning the train's destinations into railway track, part of which carries the rear wheels of the train....The scale of the locomotive has been rearranged to emphasize the wheels and, by shrinking the body, to give the dynamic streamlining that is central to the overall effect. The end result is one that produces a kinetic, futuristic version of a train without making the viewer think twice about what he is looking at (see Appendix j: Railroad Posters).

plate: Etoile du Nord (1927). Of all Cassandre's posters, it may be his most audacious. He has dispensed with the railway imagery that one had always encountered in every previous railway poster: coaches, locomotives, passengers, baggage, conductors, and so forth. Leaving only the rails, Cassandre solves the problem of having to advertise a daytime service that uses a nocturnal image as its name. He achieves his solution by using the somewhat surreal device of turning a night sky into the ground of the poster and having the star hover above it. In what could have been a static arrangement, the rail are laid out so that they imply forward movement. This is done by splitting one rail off from another and having it rejoin another to its left. Even though such an arrangement is mechanically false, it is precisely because of it that the poster attains a dynamic realism more compelling than :reality itself,: which is why Etoile du Nord is one of Cassandre's best images.

plate: LMS Bestway (1928). It is Cassandre's most powerful poster. By changing to the unusual nearly square format, he evokes a feeling of vertical and horizontal compression of energy about to be unleashed. As in Nord Express, Cassandre uses a variety of contrasts and geometric forms to express and evoke the turning of the train wheels and driving rods that are not much more than blurs of gray and white. The notion of speed is best realized by the manner in which he juxtaposes the splitting of the disks into disproportionate black-and white sections and the way that he makes one large wheel black and the other a gradation of white, gray, and black. By leaving the area above the wheels relatively flat and solid and creating an artful cacophony of light, shading, and geometric forms, he is able to emphasize the kinetic and dynamic aspects of a train in motion. In certain respects, LMS Bestway fits into a body of machine art.

Kauffer, Edward Mcknight (1890-1954) American graphic designer and poster artist. Born in
Great Falls, Montana, he became a major figure in British advertising art between the wars. Attended evening classes in painting at the Mark Hopkins Institute, San Francisco1911-13, and spent six months at the Chicago Art Institute (1913). While in Chicago he saw the controversial 'armory show' (1913), which introduced modern European art to a sceptical US public. Sponsored by Professor McKnight of Utah University to study painting in Paris; Kauffer took his name in gratitude. Moved to London at the outbreak of war and in 1915 received his first poster commission, from Frank Pick of London Underground. His early commitment to painting and his familiarity with modern art were profoundly to influence his design. Cubism, Futurism, Art Deco and Surrealism all found expression in his posters. His famous Flight of Birds, a striking image inspired by Vorticism, was used as a Daily Herald poster in 1919. Designed 141 posters for London

Underground and many others for such clients as Shell, British Petroleum and Eastman & Sons. His book jacket for Lytton Strachey's Eminent Victorians (1921) was the beginning of his series of designs and illustrations for Nonesuch Press, founded by Sir Francis Meynell, and Faber and Gwyer. Kauffer's own book, The Art of the Poster, was published in 1924. In 1930 he became art director of the publishing house Lund Humphries. He also designed textiles and carpets; in 1929 he exhibited rugs alongside others designed by Marion Dorn, his future wife. Kauffer reached the zenith of his success in the 1930s with his posters bringing the language of modern painting to a large public. In 1937 the Museum of Modern Art, New York, held a one-man show of his work. Returned to the US in 1940 where he produced several posters for Greek war relief and the US Treasury. Post-war he designed for American Airlines (1947-48), the New York Subway Advertising Co. Inc. (1949) and the publisher Alfred A. Knopf.

Quotes: " The poster has an interpretive vision, and is not imitative slavery.... an intense realism may be more real than a photography because of its power of suggestion." And " Posters are telegrams".

Styles:

Flight: "The design Flight was not invented in a studio. It came after much observation of birds in flight. The problem seemed to me at any rate a translation into design terms of three factors, namely, bird identification, movement, and formalization into pattern and line. Birds in flight and aeroplane formations are singularly alike. The arrowhead thrust is the dominant motif. But wings have a contrary movement so this too has to be considered...."(see Appendix j: Railroad Posters)

The design is also Kauffer's homage to Vorticism. Woodcuts were a primary vehicle several Vorticist artists....Comparison between the woodcut and the version in color shows how skillfully Kauffer refined his idea. The wings in the woodcut are serrated -these are straightened out in the second version, which enhances the impression of speed.

The legibility of the design was improved by dividing the light and dark areas less geometrically but more aptly, the number of birds was reduced from eight to seven, and they were - suitably- given a great deal of "air". The second version was improved again in a final version, dated 1918.

The version shown in color had the disadvantage of making the group of birds into a solid mass which tends to "drop" through the space below. In the 1918 version the pattern of birds is linked to the borders of the poster. This small alteration emphasize flat, surface quality and stresses the idea of onward transition. The subject matter was new to Vorticism but not to Futurism....A comparison of Balla's interpretation with Kauffer's shows the essential difference in aims between Futurism and Vorticism as clearly as it shows the underlying similarities.

Balla's work could be regarded as "impressionism of speed", rendered in large wave-like rhythms. His observations were reinforced by study of E.J. Marey's photographic analysis of bird flight.

Kauffer's observations were reinforced from a very different source. Once again he used a Japanese model. It seems likely that a flight of small birds, printed predominantly in green, yellow, and grey in an illustrated sketchbook of birds, flowers, insects and fishes published in Japan in 1820, was his model.

A Winter Sales: poster in 1919 which is the first on a theme which drew the best from Kauffer in a subsequent series for the Underground. Vorticism surfaced again in a poster - Kauffer's design successfully adapts the style to the patterns of plain stripes typical of the firm's productions.

The flat diagonal stripes which represent rain are taken direct from Japanese color print conventions but so too is a great deal of the composition. A remarkably similar group of figures caught in squall of rain, their umbrellas forming abstract patterns, was published by Utamaro in 1801. It seems likely that Kauffer once more fused Vorticism and a Japanese source.

The most impressive and dramatic was one showing colored silhouettes of women shoppers being blown around in a mottled, swirling disk of blue, white, and gray that not only draws again on the simultaneity of Delaunary but also on the movement and interaction with the environment, a major characteristic of Italian Futurism and the related English Vorticist movement,...Italian Futurist force lines to connote speed and movement in automobile and aviation posters.

the Great Fire: It continues Kauffer's streamlined Vorticist style. Kauffer creates a rather Expressionistic stage-set effect of flames and black and white smoke that dwarfs three silhouetted small buildings. The solid orange, yellow, and brown columns of smoke are juxtaposed one against the other in a manner suggesting Delaunay's simultanist paintings, while their tall, gracefully curved abstracted shapes are reminiscent of the forms of Natalia Gontcharova was concerned with in her painting at the time.

Barschel, Hans J. Born in the Charlottenburg area in 1912, Hans J. Barschel spent his childhood
and youth in Berlin. There he studied with the famous book designer Gerorge Salter at the Municipal Art School and went on to graduate study with Professors Ernst Bohm and O.H.W. Hadank at the Kunsthochschule, the Academy of Fine and Applied Arts.

After completing his education Barschel practiced design in Berlin, opening his own studio there in 1935. He also worked as head designer for the Deutsche Reichsbahn, the German government railroad, and in 1936 created a mural depicting German railroad activities for the Olympaid station in Berlin. The image was done by airbrush on three gigantic plywood panels. That year Barschel also designed a poster for a major automobile exhibit in Berlin.

With the rise of Hitler and the Nazis in the 1930s, he made plans to leave Germany. He arrived in New York on May 9, 1937. His commissions included designs for book jackets, advertisements, magazine covers and illustrations, and posters. His clients included United Airlines, New York Central Railroad, and many others. His five covers for Fortune magazine, done between 1937 and 1942, were perhaps his most prestigious assignments.

In 1940s he met another German immigrant, Marga Erika Werdermann, and they were married in 1948. In 1954 he began to teach advertising design at Rochester Institute of Technology. His teaching at RIT was characterized by a global view of art and design and a thorough sense of professionalism. Within the academic world, Barschel's innovative ideas were manifested in the establishment of practical real-life assignments for his students and the development of visionary publications such as Matrix. He brought his students into the community to face real problems, dealing with environmental issues and community design, was among the first to see the potential of multimedia techniques in communications. Barschel retired from RIT as Professor Emeritus in 1976. Articles about his work have appeared in many magazines and journals such as PM, Art & Industry, Idea, and Gebrauchsgraphik. He expresses his most basic belief in the following sentiment: " yet, no mortal will ever surpass the conceptual daring, the colors and shapes, the creative imagination of the infinite Mind (God)!"

Quote: " In the thirties designers were interested in trains because those large steam engines were so glamorous. They had a great deal of character... as they huffed and puffed along. Of course, in those days, people in Europe used the railroads extensively for getting around."
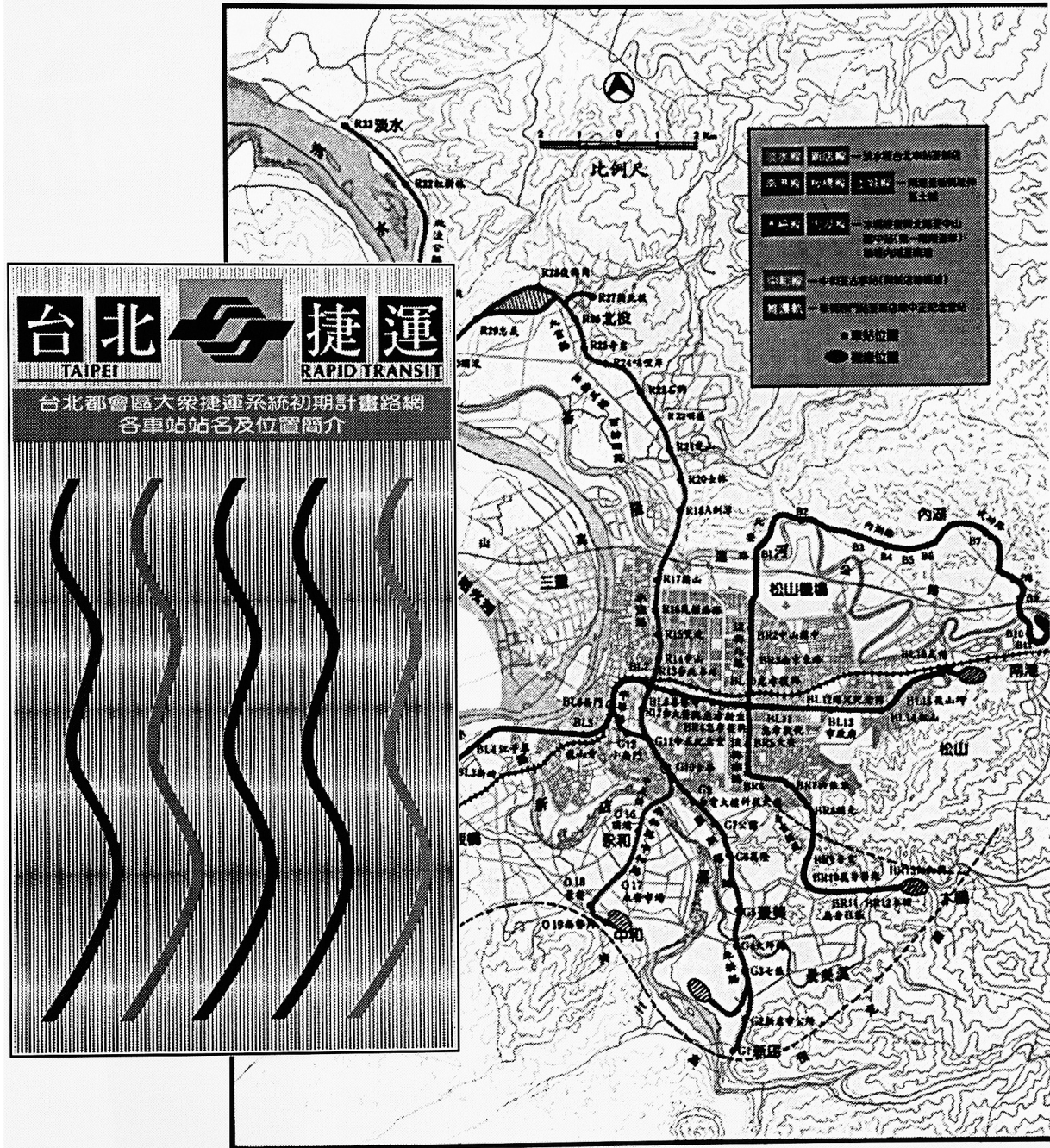
Style: Barschel's progressive style was very different from other American design pioneers such as Lester Beall, Bradbury Thompson and Paul Rand, who were also starting their careers in New York at this time. Their styles reflected roots in Constructivism and were much less pictorial in quality (see Appendix j: Railroad Posters).

Barschel was a master craftsman combining the airbrush and other techniques. His concepts were imaginative and his technique was flawless. His designs show a strong contrasting feeling of space between foreground and background reminiscent of Surrealist art. He used rich colors and successfully integrated the typographic elements with the pictorial and symbolic. Though realistic, his imagery often bordered in the abstract.
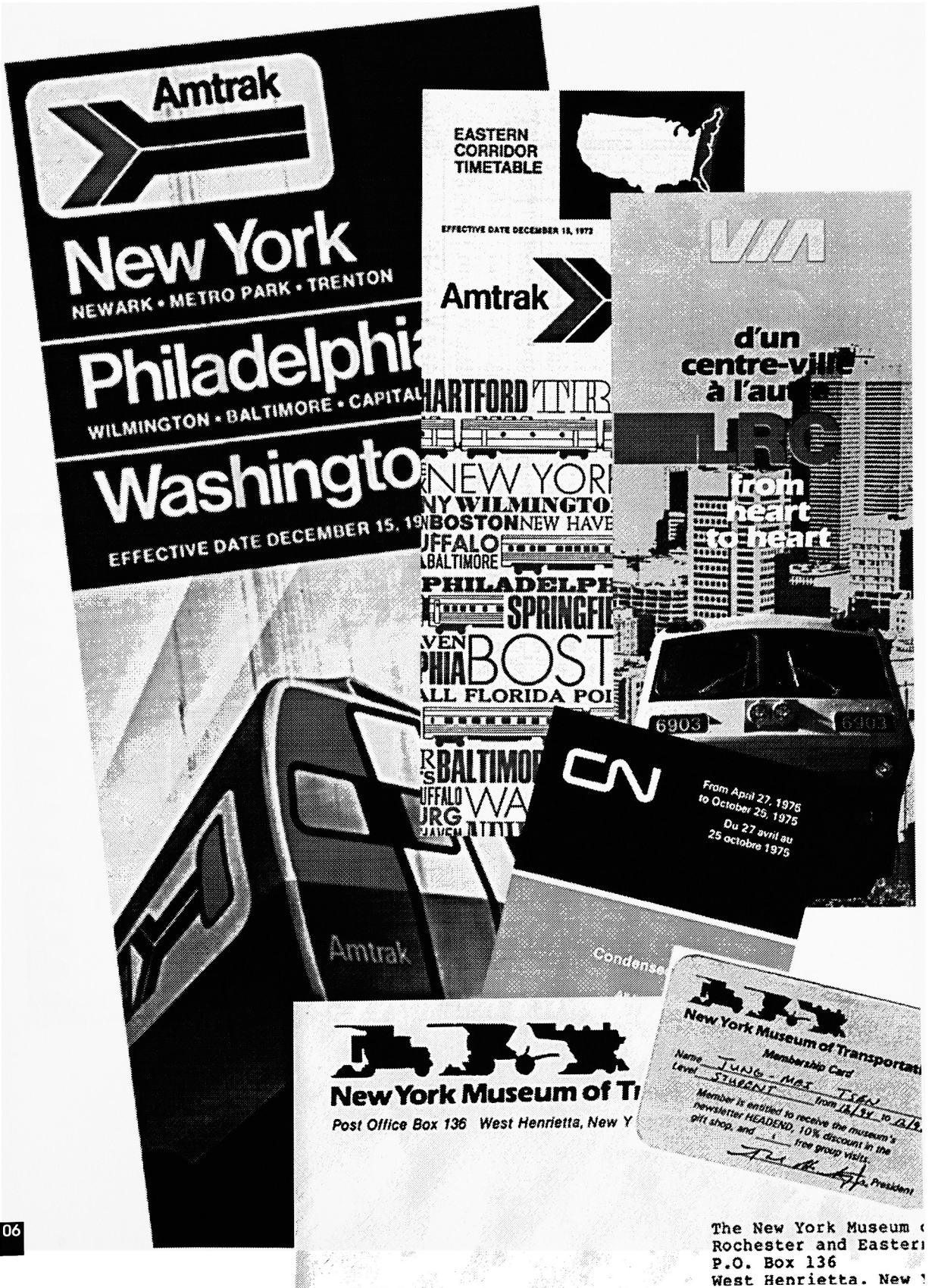
The direction that most interested him lay in combining the fine arts with the commercial....he designs according to subject matter and purpose, varying from the matter-of -fact realist conception of a subject, to the idealized abstraction, and even to the expression of surrealist composition....

j. Others

台北都會區大眾捷運系統初期計畫路網圖

Amtrak
New York
NEWARK • METRO PARK • TRENTON
Philadelphi
WILMINGTON • BALTIMORE • CAPITAL
Washington
EFFECTIVE DATE DECEMBER 15, 19

Amtrak

EASTERN
CORRIDOR
TIMETABLE

EFFECTIVE DATE DECEMBER 15, 1972

HARTFORD
NEW YORK
NY WILMINGTON
BOSTON NEW HAVE
UFFALO
BALTIMORE
PHILADELPH
SPRINGFI
VEN
PHIA BOST
ALL FLORIDA POI
R BALTIMOR
UFFALO
URG WA

VIA
d'un
centre-ville
à l'au
RC
from
heart
to heart

CN
6903   6903
From April 27, 1975
to October 25, 1975
Du 27 avril au
25 octobre 1975

Condense

Amtrak

New York Museum of Tr
Post Office Box 136   West Henrietta, New Y

New York Museum of Transporta
Membership Card
Name _IUNG - MAI TEN_
Level _STUDENT_ from _12/54_ to _12/_
Member is entitled to receive the museum's
newsletter HEADEND, 10% discount in the
gift shop, and ___ free group visits.
_____, President

The New York Museum
Rochester and Easter
P.O. Box 136
West Henrietta, New

Very Successful Design!

If I squint my eyes so that I can't see the individual characters, it still works because of the shapes, forms and colors.

The message is communicated visually and verbally (text).

Excellent

Jung-Mei,

Beautiful work. I'm impressed — but not surprised. Let's never lose contact with one another. Congratulations

Joe Picirillo

4-17-95

Jung-Mei

Interesting, informative and professional.

Congratulations

Dr. Z.

Jung-Mei :

畢業愉快!

You have done a wonderful work!

柏菊

April/7/95

R·I·T

Office Memo

To: Jung. mei

From: Deborah

Date: 14 March 1994

Subject:

Jung. mei —

Very nice presentation today! I would appreciate a copy of your "Development Matrix" for my files.

Thank you!

Deborah

Rochester Institute of Technology

One Lomb Memorial Drive
Post Office Box 9887
Rochester, New York 14623-0887

Steam trains

2-2-2
1-1-1

4-4-0
2-2-0

0-6-0
0-3-0

0-6-2
0-3-0

4-6-0
2-3-0

4-6-2
2-3-1

2-8-4
1-4-2

2-10-0
1-5-0

Diesel trains

C

1 Do 1

1C-C1

Bo-Bo

Co-Co

A1A-A1A

1Co-Co1

Standard gauge   Wide gauge

Narrow gauge

1.435 m

1.6 m

1.067 m
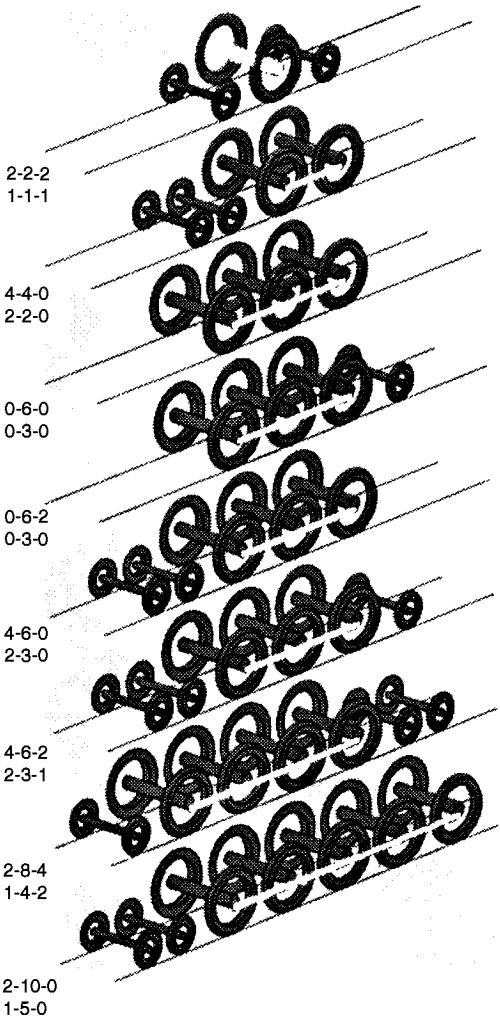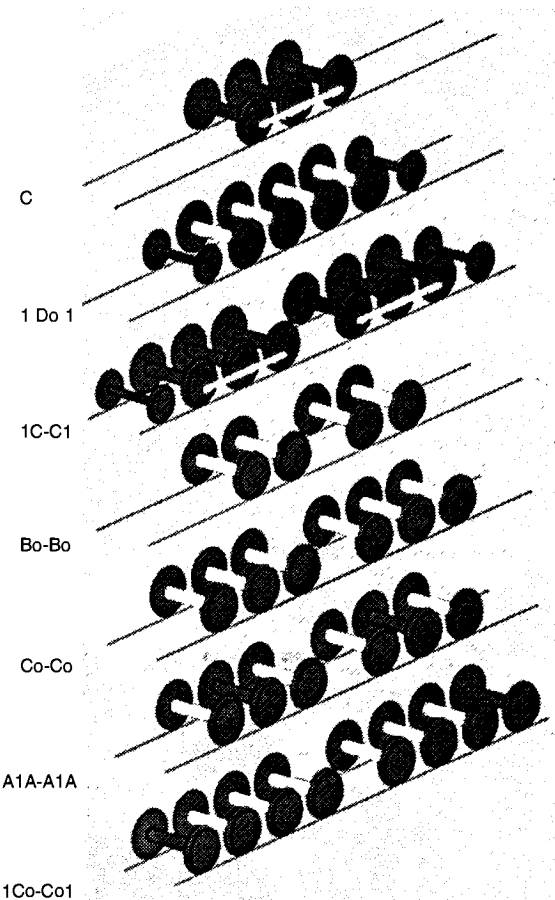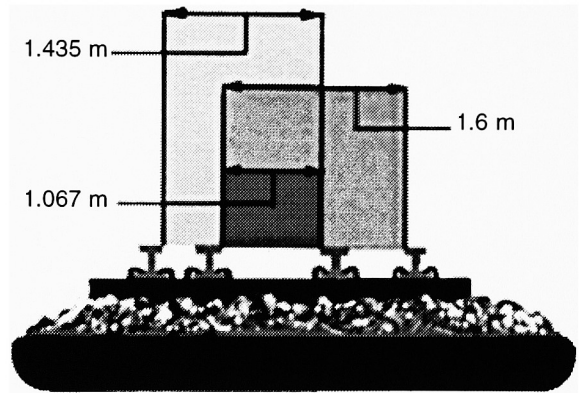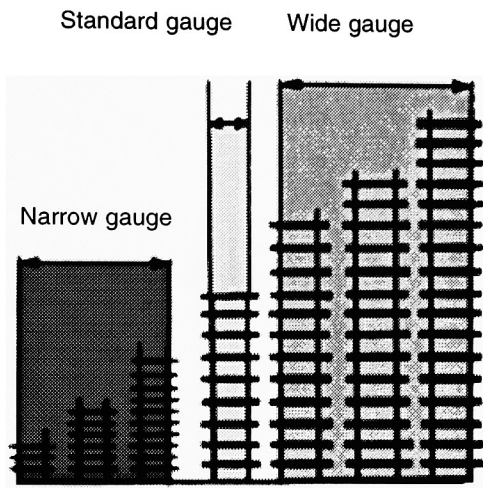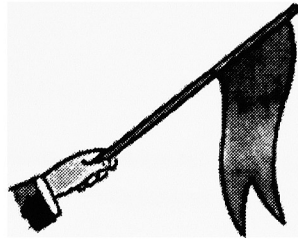
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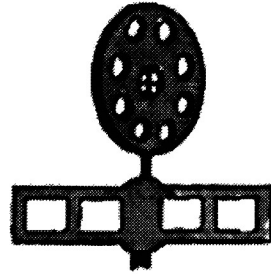
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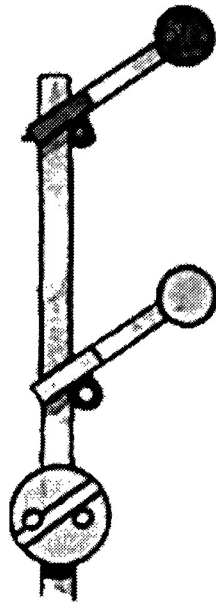
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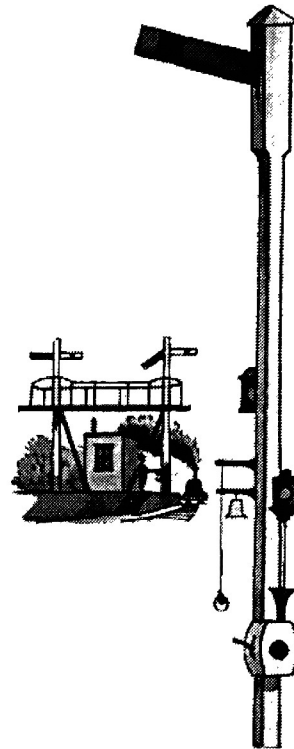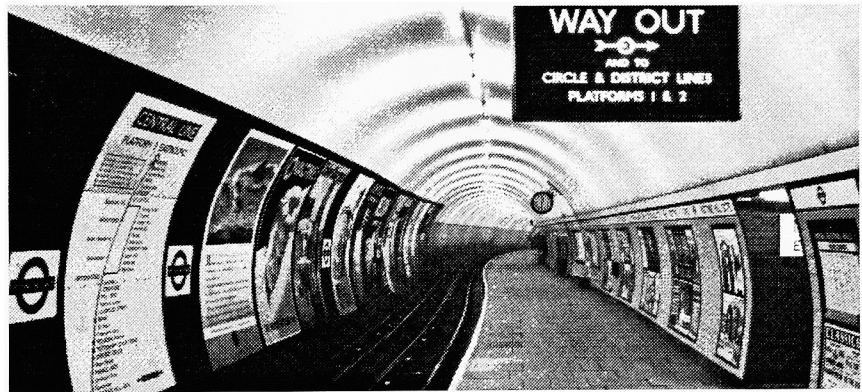
signalbox
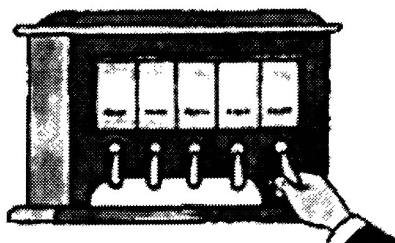
electric telegraph
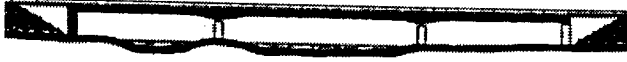
Beam
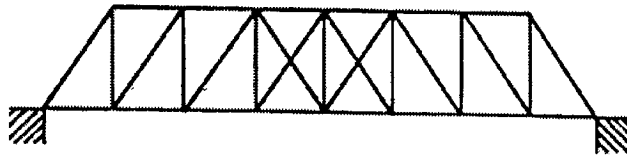
Truss
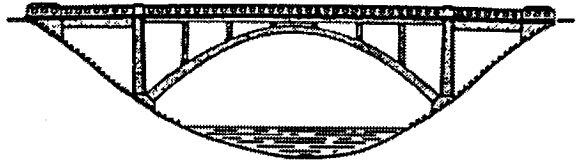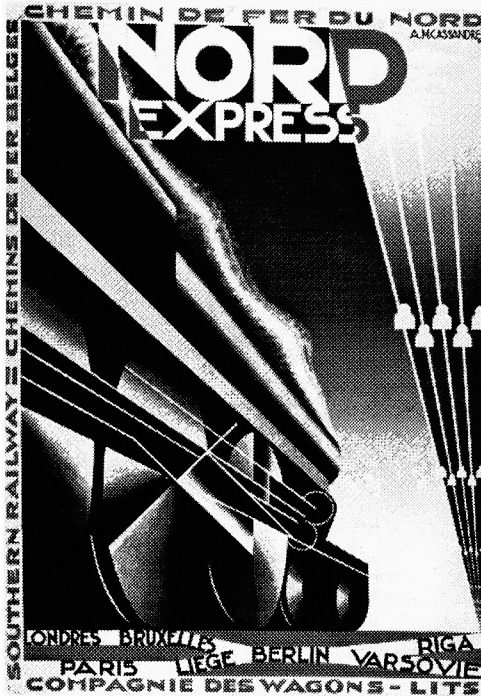
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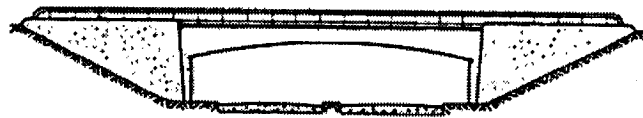
Rigid Frame
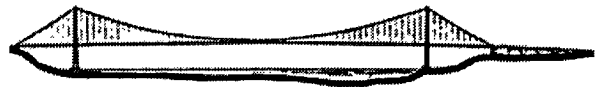
Suspension Bridge
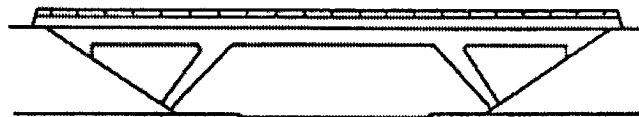
Slant-Legged Rigid Frame
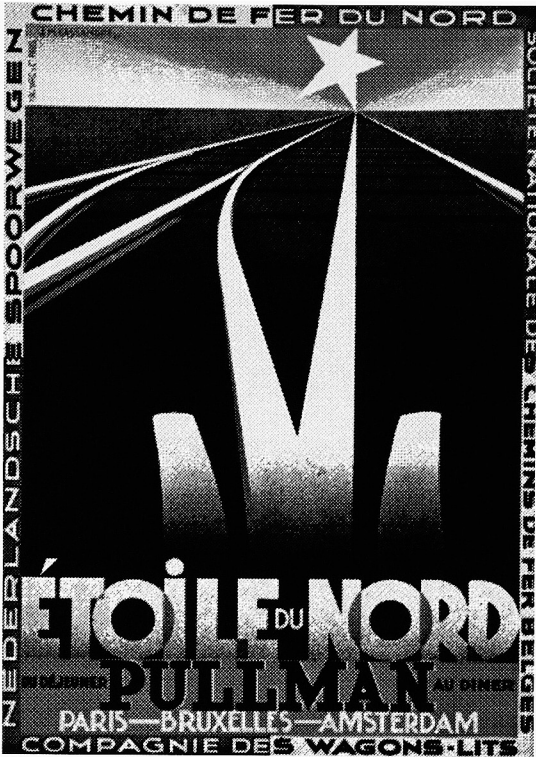
plate: Nord Express (1927)

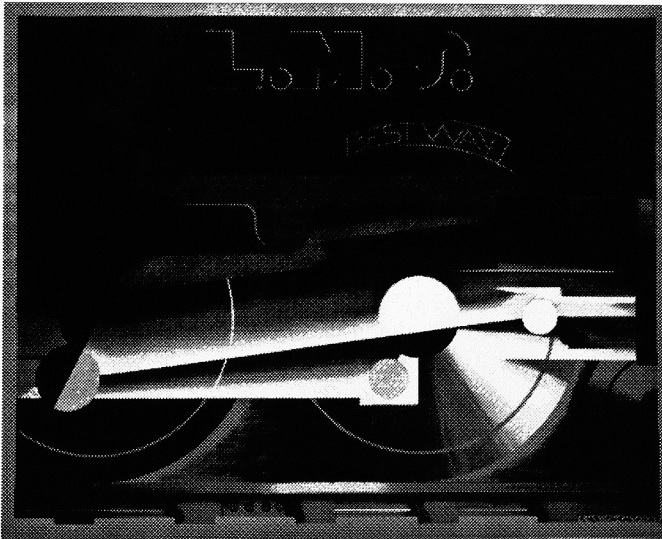plate: Etoile du Nord (1927)

plate: LMS Bestway (1928)

Flight

the Great Fire

WINTER SALES
are best reached by
UNDERGROUND

a Winter Sales