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Furniture for children

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FURNITURE FOR CHILDREN

By

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I had very special experiences while working at Rochester Institute of Technology in the School for American Craftsmen studios. The environment enabled me to observe countless options, directions and solutions to solving design problems. It also afforded unusual apportunities to incorporate different technologies within my work.

CONTENTS

PREFACE

The purpose of this thesis is to design furniture specifically for children. My work will incorporate color, form, and ornamentation that addresses both children's aesthetics and their human scale.

By working on my thesis, I realize that most furniture which is available for children is insensitive to their aesthetic judgment, poorly constructed, and even sometimes physically dangerous. It is quite obvious that the majority of manufacturers for child furnishings market exclusively to the parents as consumers. The child is regarded only in the consideration of furniture proportioned to their age and size requirements.

I intend to design juvenile furniture which will overcome and eliminate these problems. It is also my intention to create exciting environments by designing furniture that is both aesthetically and physically pleasurable, toy-like objects with utilitarian purpose.

The thesis itself is divided into three parts. Part one describes the characteristics of children and perceptions of their world. Part two discusses space and furniture for children; the room needs that exist, and important considerations for furnishing a child's environment. Part three provides an explanation of my thesis projects. Two

aspects of furniture design are explored in depth. Some of my work focuses upon aesthetic solutions to furniture design, while others explore mass production possibilities. A brief summary concludes my written thesis.

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INTRODUCTION

Through environment interaction, we gain a lot of experiences which become the basis of growth. The environment stimulates our thoughts and emotions, therefore expanding our individuality. We recognize that our environment is critically important. As we try to fabricate positive surroundings, we cannot help but be concerned about good design.

Design is necessary because it serves human needs. That is its only excuse for being. As human needs have become more complicated, and human beings more numerous, the design necessity has become more intense. Design is not all a matter of problem solving, neither is it all a matter of art. It is both. Design solves human problems by identifying them, examining problem resolving options and then, choosing and executing the best solution.

My approach to design is to make children's furniture which pleases them. Sturdy and attractively designed furniture and/or equipment is a satisfaction at any age. Even a very young child recognizes something that is aesthetically pleasing. Objects that are tastefully designed will not only please a child but will also be a factor in shaping their own aesthetics.

All children love a place that is theirs alone - a special realm where everything is scaled to their own proportions, where dreams and playthings reflect the spirit, as well as the dimensions of their world.

I intend to provide detailed suggestions and plans for creating a comfortable, usable and pleasant environment where a child may live and play.

PART ONE

1. THE CHILD

- Children show their interest in something new.
Children have short attention spans and often tire of an object quickly. They satisfy their new needs through a five perception system; looking, listening, smelling, tasting, and touching.
- Children are very sensitive to surroundings. They are very much affected by their environment. Influence from peers, family, and circumstance are important.
- Children like things which make them happy. They repeat pleasant experiences and avoid repeating unpleasant ones.[1)]
- Children are curious about everything they see. Child inquisitiveness and attempts to find answers provide constant activity in their young world.
- Children enjoy watching and imitating an adult for their entertainment. In their imitative activities, children pass through sequences of development and are socialized.
- Children grow and development quickly. Both physically and mentally, their rate of growth and intellectual development is high. It is necessary to watch them carefully, and to provide children with appropriate circumstances or experiences.

NOTE1) pp.3. John Kitamura. Juvenile Furniture. Thesis: RIT, 1970.

- Children learn the way things work through trial and error. As they grow older, their learning becomes more complex.
- Children like to repeat physical patterns continuously. One of the characteristics of play is repetition.[2] This repetition of activities is regarded as learning experience.

NOTE 2) pp.6. Mario Dal Fabbro. How to Make Children's Furniture and Play Equipment. 2nd ed. New York: McGraw-hill Book Company, 1975.

2. THE SCALE OF A CHILD'S WORLD

Children live in a world of adult sized furnishings, furniture that does not fit them either physically or psychologically. Even very young children need furnishings scaled to their growing bodies and minds. It is really necessary to design furniture that realizes the needs of children.

Imagine a child living in a giant's world. Every time the child wants to sit, the giant has to lift him/her onto a chair, and the child's legs always dangle. Imagine a world in which this small person has to stand on tiptoes to see what is being served for dinner. This is the world where a young child lives all the time.

Obviously it is impossible to scale down the world, to fit a child's present size. We can, however, provide some living areas for children, such as a small table, small chairs, and low shelves. It is important to provide spaces where children and their friends can sit, with feet resting comfortably on the floor, where they can see toys attractively arranged, and reach them easily.

A child's world is vastly different from adults, dimensionally. The projects for this thesis are designed with this important fact in mind. There is a great deal of research

that has been done on the topic of human dimensions. But, to date, very little ergonomic data has been available for the designer regarding functional body measurements of infants and children. The human factor is essential in creating the proper design of juvenile playthings, furniture, and interior environments. This factor provides elements of safety as well as comfort. Improperly designed furniture causes accidents and injury to children.

The following tables provide some ergonomic data and show how working heights change as the child grows into adulthood.

TABLE 1.

Medium Working Heights for Children and Teenagers

ITEM	MEDIUM WORKING HEIGHT, INCHES, BY AGE			
	4 to 7	7 to 11	11 to 14	14 to 18
CABINET, DISPLAY (TOP)	50	57	68	76
CHAIR AND BENCH	10	12	15	18
CHALKBOARD (BOTTOM)	22	25	31	36
DESK AND TABLE	18	21	26	29
DESK, TYPING			26	26
DOORKNOB	25	28	32	36
HOOK, COAT	35	45	56	66
LAVABO AND SINK	24	27	32	36
LIGHT SWITCH	27	35	50	65
MIRROR (BOTTOM)	35	39	46	52
PENCIL SHARPENER	27	32	40	48
SHELF, BOOKS	38	44	56	66
STOOL, DRAWING		21	24	26
TABLE, DRAWING		28	32	36
TABLE, WORK (STANDING)	26	28	32	36
TACKBOARD (BOTTOM)	22	25	31	36
TOWEL, SUPPORT	27	33	42	54
WINDOW EDGE	29	33	36	40

Source:

pp. 20. Mario Dal Fabbro. How to Make Children's Furniture and Play Equipment. 2nd ed. New York: McGraw-Hill Book Company, 1975.

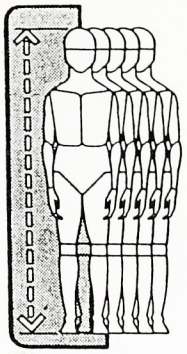
TABLE 2A-2J.

Weight and Structural Body Dimensions

(Children age 6 to 11)

Source:

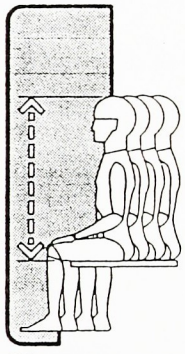
Robert M. Malina, Peter V.V. Hamill, and Stanley Lemeshow, National Health Examination Survey: Selected Body Measurements of children age 6-11, 1963-1965 (Washington, D.C.: U.S. Government Printing Office, Vital and Health Statistics Series 11, no.123, DHEW publication no. (HSM) 73-1605.



2A
STATURE

Stature of Children in Inches and Centimeters by Age, Sex, and Selected Percentiles

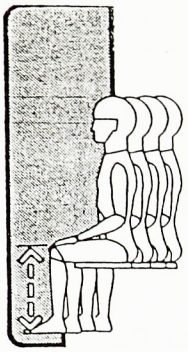
		6 Years		7 Years		8 Years		9 Years		10 Years		11 Years	
		in	cm	in	cm	in	cm	in	cm	in	cm	in	cm
95	BOYS	50.4	128.0	52.9	134.4	54.8	139.3	57.2	145.4	59.6	151.3	61.8	157.0
	GIRLS	49.9	126.7	52.2	132.7	54.8	139.3	58.0	147.4	60.4	153.4	62.9	159.7
90	BOYS	49.5	125.7	51.9	131.8	54.1	137.3	56.5	143.5	58.5	148.5	60.7	154.3
	GIRLS	49.2	125.0	51.5	130.7	54.0	137.2	57.0	144.8	59.1	150.2	62.2	158.0
75	BOYS	48.0	122.0	50.4	128.0	52.6	133.7	55.2	140.1	56.9	144.6	59.2	150.4
	GIRLS	47.9	121.6	50.2	127.4	52.5	133.4	55.2	140.1	57.4	145.7	60.2	152.8
50	BOYS	46.7	118.5	49.0	124.4	51.2	130.0	53.4	135.6	55.4	140.6	57.4	145.8
	GIRLS	46.3	117.7	48.7	123.6	51.0	129.6	53.3	135.4	55.5	141.0	58.0	147.4
25	BOYS	45.3	115.1	47.6	120.8	49.7	126.3	51.7	131.4	53.6	136.2	55.6	141.2
	GIRLS	45.0	114.4	47.1	119.7	49.4	125.5	51.5	130.8	53.5	135.9	56.3	143.0
10	BOYS	44.0	111.8	46.4	117.8	48.5	123.3	50.0	127.0	51.7	131.4	54.0	137.2
	GIRLS	43.5	110.6	45.8	116.3	47.8	121.4	50.0	127.1	52.0	132.0	54.7	138.9
5	BOYS	43.6	110.7	45.5	115.6	47.4	120.3	49.1	124.6	50.9	129.3	53.0	134.6
	GIRLS	42.6	108.3	44.8	113.7	46.9	119.1	49.0	124.4	51.0	129.5	53.3	135.4



2B
SITTING HEIGHT ERECT

Sitting Height Erect of Children in Inches and Centimeters by Age, Sex, and Selected Percentiles

		6 Years		7 Years		8 Years		9 Years		10 Years		11 Years	
		in	cm	in	cm	in	cm	in	cm	in	cm		cm
95	BOYS	27.4	69.5	28.2	71.7	29.2	74.1	30.2	76.6	30.9	78.5	31.7	80.6
	GIRLS	27.1	68.8	28.1	71.3	28.9	73.3	30.1	76.4	31.1	79.1	32.8	83.4
90	BOYS	26.9	68.3	27.8	70.6	28.8	73.2	29.7	75.5	30.4	77.2	31.3	79.5
	GIRLS	26.7	67.9	27.7	70.3	28.5	72.4	29.6	75.3	30.6	77.6	32.0	81.4
75	BOYS	26.2	66.5	27.0	68.7	28.1	71.3	29.0	73.6	29.6	75.2	30.5	77.5
	GIRLS	25.9	65.8	26.9	68.2	27.8	70.7	28.9	73.3	29.8	75.6	31.0	78.7
50	BOYS	25.5	64.7	26.4	67.1	27.3	69.3	28.1	71.4	28.8	73.1	29.7	75.4
	GIRLS	25.2	64.1	26.1	66.3	27.0	68.6	27.9	70.8	28.9	73.4	30.0	76.1
25	BOYS	24.7	62.8	25.6	65.1	26.5	67.3	27.2	69.2	28.0	71.0	28.9	73.3
	GIRLS	24.4	62.1	25.2	64.1	26.2	66.5	27.0	68.7	27.3	70.7	29.1	73.8
10	BOYS	24.1	61.1	25.0	63.5	25.8	65.5	26.3	66.8	27.2	69.0	28.1	71.3
	GIRLS	23.7	60.1	24.5	62.3	25.4	64.4	26.3	66.7	27.1	68.8	28.2	71.6
5	BOYS	23.7	60.2	24.6	62.4	25.4	64.5	25.9	65.9	26.5	67.4	27.6	70.1
	GIRLS	23.1	58.8	24.1	61.2	24.8	63.1	25.8	65.5	26.7	67.8	27.4	69.7

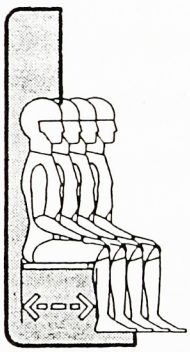


2C

KNEE HEIGHT

Knee Height of Children in Inches and Centimeters by Age, Sex, and Selected Percentiles

		6 Years		7 Years		8 Years		9 Years		10 Years		11 Years	
		in	cm	in	cm	in	cm	in	cm	in	cm	in	cm
95	BOYS	15.6	39.7	16.6	42.2	17.2	43.8	18.4	46.7	19.1	48.6	20.0	50.9
	GIRLS	15.6	39.7	16.4	41.6	17.4	44.3	18.6	47.3	19.4	49.3	20.2	51.2
90	BOYS	15.3	38.8	16.3	41.3	16.9	42.9	18.0	45.6	18.7	47.5	19.6	49.8
	GIRLS	15.2	38.7	16.0	40.7	17.0	43.3	18.1	46.1	18.8	47.8	19.8	50.3
75	BOYS	14.7	37.4	15.6	39.6	16.4	41.7	17.2	43.8	18.1	45.9	19.0	48.2
	GIRLS	14.7	37.3	15.6	39.5	16.5	41.8	17.5	44.4	18.3	46.4	19.0	48.3
50	BOYS	14.1	35.9	15.0	38.2	15.8	40.2	16.7	42.4	17.4	44.3	18.2	46.3
	GIRLS	14.1	35.9	14.9	37.8	15.8	40.1	16.7	42.3	17.5	44.4	18.3	46.6
25	BOYS	13.6	34.6	14.4	36.7	15.2	38.6	16.0	40.7	16.7	42.4	17.5	44.4
	GIRLS	13.6	34.5	14.4	36.5	15.2	38.5	15.9	40.5	16.7	42.4	17.6	44.8
10	BOYS	13.2	33.5	14.0	35.5	14.7	37.3	15.4	39.1	16.0	40.7	16.9	42.8
	GIRLS	13.0	33.1	13.9	35.2	14.6	37.2	15.4	39.1	16.0	40.7	16.9	43.0
5	BOYS	13.0	32.9	13.7	34.8	14.3	36.3	15.0	38.1	15.6	39.7	16.4	41.7
	GIRLS	12.8	32.4	13.5	34.3	14.3	36.3	15.0	38.2	15.6	39.6	16.6	42.1



2D

BUTTOCK-POPLITEAL LENGTH

Buttock-Popliteal Length of Children in Inches and Centimeters by Age, Sex, and Selected Percentiles

		6 Years		7 Years		8 Years		9 Years		10 Years		11 Years	
		in	cm	in	cm	in	cm	in	cm	in	cm	in	cm
95	BOYS	14.7	37.4	15.3	38.9	16.6	42.2	17.7	45.0	18.3	46.5	19.0	48.3
	GIRLS	15.2	38.6	15.9	40.3	17.0	43.1	17.8	45.2	18.8	47.7	19.9	50.5
90	BOYS	14.1	35.7	15.0	38.0	15.8	40.1	16.8	42.7	17.4	44.3	18.3	46.4
	GIRLS	14.6	37.0	15.2	38.5	16.2	41.1	17.2	43.8	18.0	45.8	19.2	48.7
75	BOYS	13.3	33.7	14.1	35.7	14.9	37.8	15.7	39.9	16.5	41.9	17.2	43.7
	GIRLS	13.5	34.4	14.4	36.5	15.2	38.6	16.2	41.2	17.2	43.6	18.0	45.7
50	BOYS	12.6	31.9	13.3	33.8	14.1	35.8	15.0	38.2	15.6	39.7	16.4	41.7
	GIRLS	12.8	32.6	13.6	34.6	14.4	36.6	15.3	38.9	16.2	41.2	17.0	43.1
25	BOYS	12.0	30.4	12.8	32.4	13.5	34.3	14.3	36.3	14.9	37.8	15.6	39.7
	GIRLS	12.2	31.1	13.0	32.8	13.8	35.1	14.6	37.2	15.4	39.1	16.1	40.9
10	BOYS	11.5	29.3	12.3	31.2	13.0	33.1	13.7	34.7	14.3	36.2	15.0	38.2
	GIRLS	11.7	29.7	12.4	31.6	13.2	33.5	13.9	35.4	14.6	37.0	15.4	39.2
5	BOYS	11.3	28.6	12.0	30.4	12.7	32.3	13.4	34.1	13.9	35.3	14.5	36.9
	GIRLS	11.3	28.8	12.0	30.6	12.9	32.7	13.5	34.3	14.1	35.8	15.0	38.1

PART TWO

3. A CHILD'S ROOM

Children learn naturally through interaction with their environment. Experiences and impressions from the environment affect children's growth and development. Attitudes are usually reflections of their environments as well.

The child's room is a controlled environment. The room is a child's kingdom in which he/she dreams about the future, and imagines the creating of a new world. Thus, it is very important to consider a child's sex, age, and interests when designing their room. Parents often create a room based on adult aesthetics, ignoring those of their child. It is desirable to include a child in the purchasing of furniture and arrangement of the furnishings. The room becomes a three-dimensional art project where children can plan and construct. The furniture is seen as adornment. The relationship between the furniture, displays, other objects, as well as their harmonious placement within the room, constitute the total composition.

The room has to be functional as well as decorative. A child's room means much more to him/her than just a place to sleep. The function of child's space is largely divided into four areas; rest, storage, work, and play.

The rest space needs a bed for short naps and night sleeping. Throughout childhood, the influence of furniture is very important. Therefore, it is a good idea to choose a bed that is big enough to accommodate growth changes and maturing aesthetics.

Dressers and shelves are conventional bedroom storage spaces. A child's dresser and shelves do not need continual replacement as a child grows. Therefore, before first purchasing dressers and shelving units, some serious considerations should be made. Wood finishes, furniture construction and design all should be critically examined. Toy boxes or chests are extremely practical for a small child. Color and design should be major factors in selecting toy storage units. It is in this early childhood stage that a child gains an awareness of color and form.[3)]

The desk and chair learning/working space affects a child's mental and physical growth. These furnishings must be safe and sturdy. Adjustable and multi-purpose desks and chairs, those designed for study, work, and play, are convenient and economical.

Play space focuses upon developing a child's imagination and his/her observation skills. Play tables and rocking toys are two items which stimulate play activities. These

NOTE 3) pp.55-64. MIrian Lindstrom. Children's Art. Berkeley and Los Angeles, California: University of California Press, 1964.

facilitators encourage play but are not essential in creating a play atmosphere. Children usually sit on the floor to play; for this reason carpeting a child's room is a worthwhile consideration. Whatever surface is selected, it is important to keep the floors clean.

Light is the most important factor in a child's room. Wall lighting is adequate for an infant's room. Task lighting for desk areas, to accompany wall lighting, is necessary for a school aged child. Light switches must be located within a child's reach for both lamps and wall fixtures.

4. A CHILD'S FURNITURE

Safety and Health Hazards

Furniture is one of the most significant causes of household accidents. Due to our constant contact with furniture at school, work, and home, even minor safety risks can become significant.[4)]

Because children are not aware of potential furniture hazards, their furnishings must be as safe as possible. Bunk beds, stacked one atop the other, with or without a ladder, cause a surprising number of major injuries in bedrooms. Narrow spaces between rails and bars are also a risk to children. Concern for safety is especially critical in the design of cribs and youth beds.

Sharp edges and corners on furniture are dangerous for small children. While it is evident that all furniture designs do not round corners, there is no doubt that beveling, curving, or otherwise softening edges will minimize accidents.

Finishes for furniture surfaces are an important health factor. It is essential to select a paint that is non-toxic. The chief offender is common, exterior house paint which may contain significant amounts of lead. This paint is extremely dangerous to preschool children; they often chew and suck furniture. It is amazing how many children will place a toy

NOTE 4) pp.183. John F. Pile. Modern Furniture. New York: A Wiley-Interscience Publication, 1979.

in their mouth even well beyond the infant stage.

Stability and Durability

Throughout the preschool and the primary school years, children like to actively run, climb, and jump. They will create games and play activities that incorporate inventive body movements such as sliding, bouncing, swinging and leaping. Juvenile furniture must be strong and stable to survive the demands made within these play environments.

Furniture should be able to fulfill its function, and maintain its attractiveness, without significant deterioration, for many years. Usually, the cost of furniture correlates with the quality of furniture construction and its durability.

Color

Children of all ages are more interested in color than the size or shape of furniture. "Most young children prefer light and bright colors, which have a great attention value." [5] Traditionally, intense primary colors have been the favorites of the young. But, too much color stimulation will overwhelm the child. It is not necessary to use riotous colors, extensively. Sophisticated earth tones and tepid pastels are generally favored by adults. However, children who are color

NOTE 5) pp. 407. Elizabeth B. Hurlock. Child Development. McGraw-Hill Series in Psychology. 5th ed. New York: McGraw-Hill Book Company, 1972.

sensitive respond strongly to these colors as well. Such colors generally evoke cozy, and friendly feeling for people of all ages.

As children grow older, they show a preference for darker, less highly saturated hues of their favorite colors. When selecting the colors for juvenile furniture, a child's age and personality should be considered. Appropriate color values that are not outgrown quickly are advisable.

Children's Growth

Parents want to invest wisely in furniture for their children. Ideally the furnishings will adapt to the growth demands placed upon them. Often, adjustable furniture best solves this problem. Expandable legs, adjustable shelving, folding or extending features address this need for flexibility in furniture design. Even toy boxes could convert to storage chests for older children.

Marketing Attraction

Marketing difficulties occur when the furniture has no appeal to the parent or purchaser. Then price alone will rarely entice a buyer to purchase the furniture. If the buyer purchases the furniture without involving the child in the selection process, another problem arises. The child may dislike the furniture immensely and might be forced to live

within a distasteful or even hostile environment. Additionally, because the consumer-purchaser and consumer-user are different family constituents, often a child's furniture requires complex marketing strategies. Advertising and display of children's furniture may need to be targeted at two age levels - to attract both the parent/buyer and the young child.

PART THREE

5. ICONOGRAPHICAL FURNITURE

My work breaks away from traditional, adult conceptions of children's furniture. These iconographical forms are intended to be a happy collection of figures to capture a child's spirit. This furniture may transform an ordinary room into a magical place that sparks a child's imagination.

Chest of Drawers

The primary objective of the robot figurature piece is to create a chest of drawers that delights "children" of all ages. Sophisticated design and a mature color pallet helps to bridge age differences and produces a favorable response from both adults and children.

The robot is designed for children four to eleven years old. The stature for this age group generally averages 40" to 58". I designed the chest of drawers fifty inches by twenty five inches by eighteen inches (50"x25"x18"). A small child can use the lower drawer, and can reach the top doors by stretching arms. A child can store gloves, underwear or special treasures in the top triangular compartment.

All parts, (top, body, legs), were bolted together with steel threaded inserts or T-nuts. Construction for the top of the chest of drawers, the robot's triangular head, consisted of 5/8" plywood. Maple was used for turning the balls and

cylinders. I incorporated silkscreening on wood for the triangle head. Mac-draw software on the Macintosh computer generated all pattern designs. Balls and cylinders were hand painted with a brush for special textured effects. By using acrylic paints, I avoided health hazards from turpentine or lacquer based paints. Two sets of L-knife hinges and touch latches were installed as part of the top doors design. Pressure applied at the corner of the doors release the lock and allow the doors to open or close.

It was necessary to stabilize the robot's torso by constructing with three quarter inch particle board. Costs were minimal. White formica, used for the body, was both durable and clean looking. Three drawers, made from cherry, were designed for the robot. I attached steel drawer sliding guides on the side of each drawer. The guides were easy to install, allowed for full openings, and their drawer stopper design prevented the risk of the drawers pulling completely out of the chest. Bright pink, aqua green, and gray handles composed a part of the robot body, and these colors against the white body, caused a fresh, airy spirit.

Three quarter inch particle board was also used to create the two legs for the robot. I again created a textured surface, like the top cylinders, and selected a palette of pink, green, gray, and white acrylic paint for the legs.

Chest of Drawers

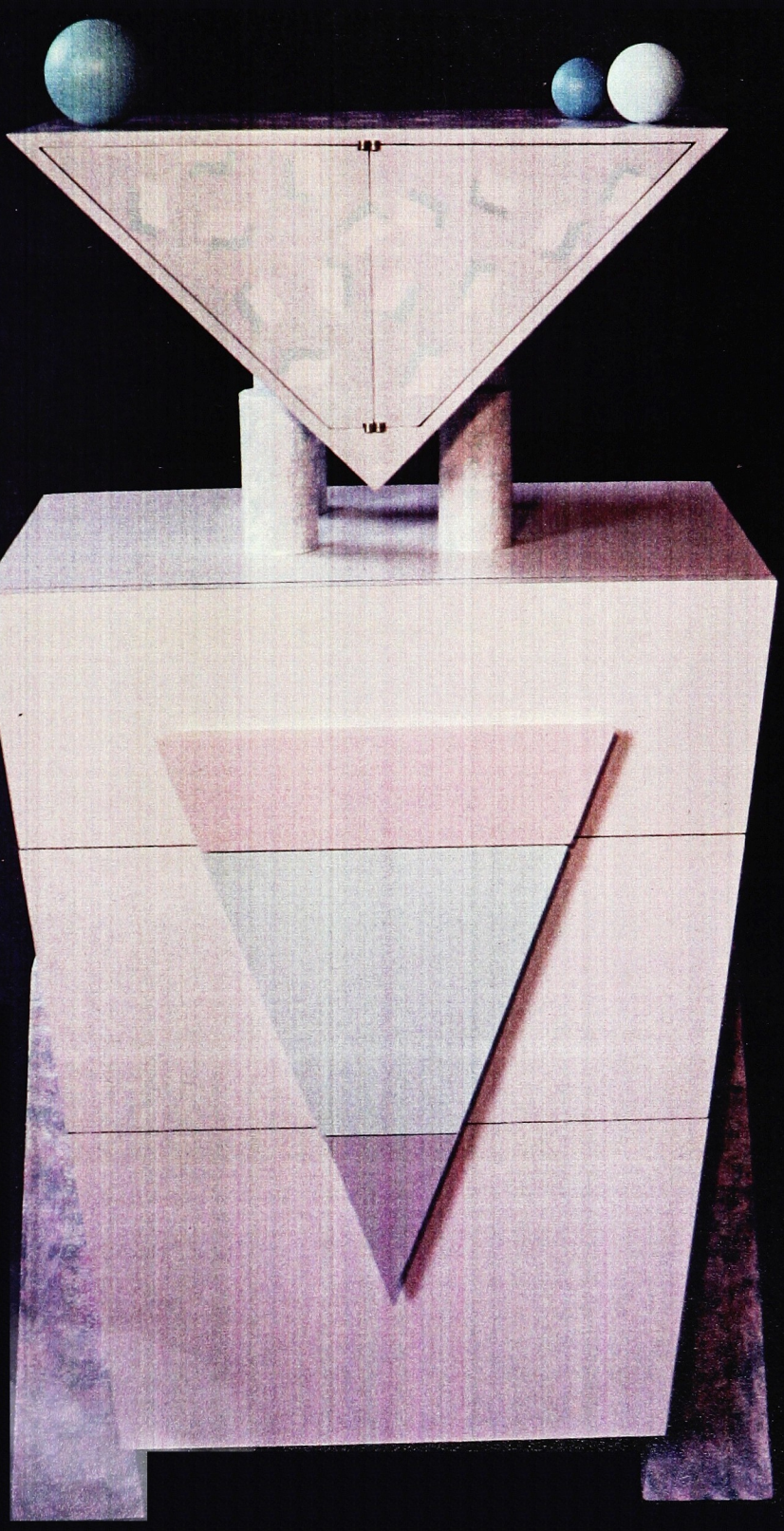
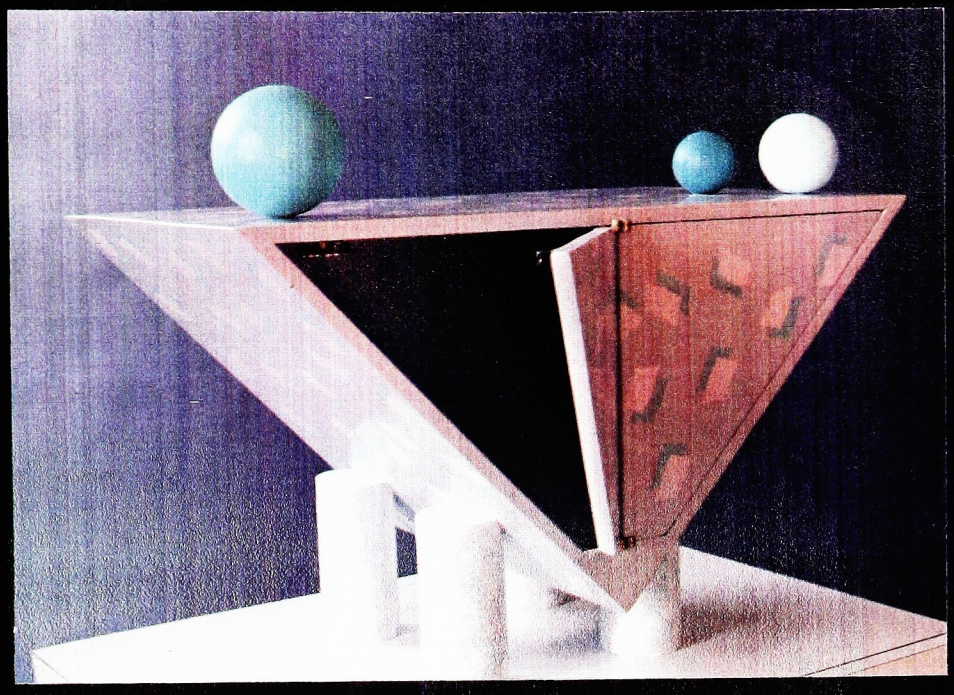


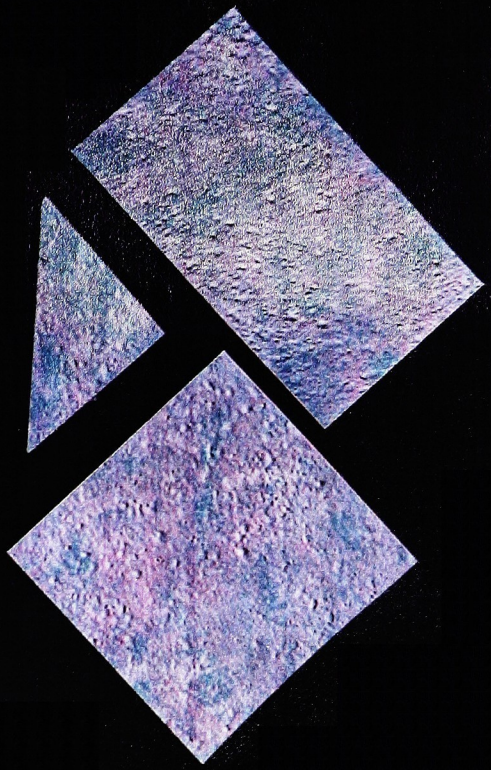
Plate 1

50 x 25 x 18 (inch)

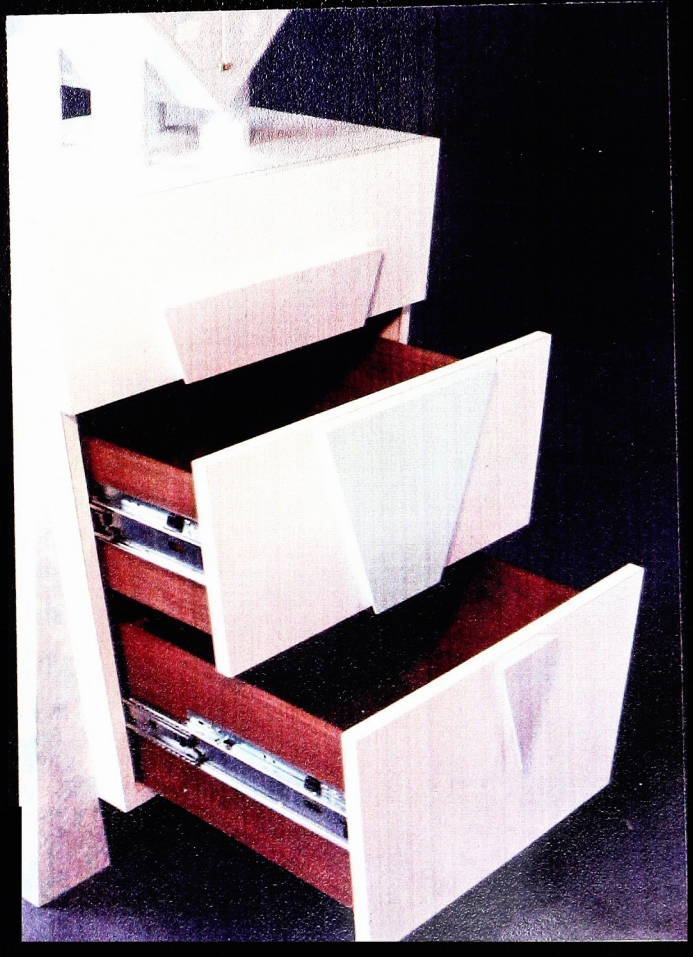
Details



Detail of Top Doors



Painting Texture



Detail of Drawers

Plate 2

Coat Rack

My intention for designing "Alien", the spaceman shaped coat rack, was to creat a furniture toy. I recognized the fact that children like to personify things. Little Alien was built with one face, eight arms, and six legs, and was designed to be a whimsical friend for children. This captivating coat rack will hopefully interest adults as well.

Poplar wood and aluminum were the major materials used for constructing Alien's body (58"x 17"x 13"). These two materials were comparatively cheaper than other woods and metals, and had unique qualities that complemented my design. Due to its inherent softness, poplar was easy to turn and carve. Aluminum was an excellent metal to select, primarily because it was easy to surface color.

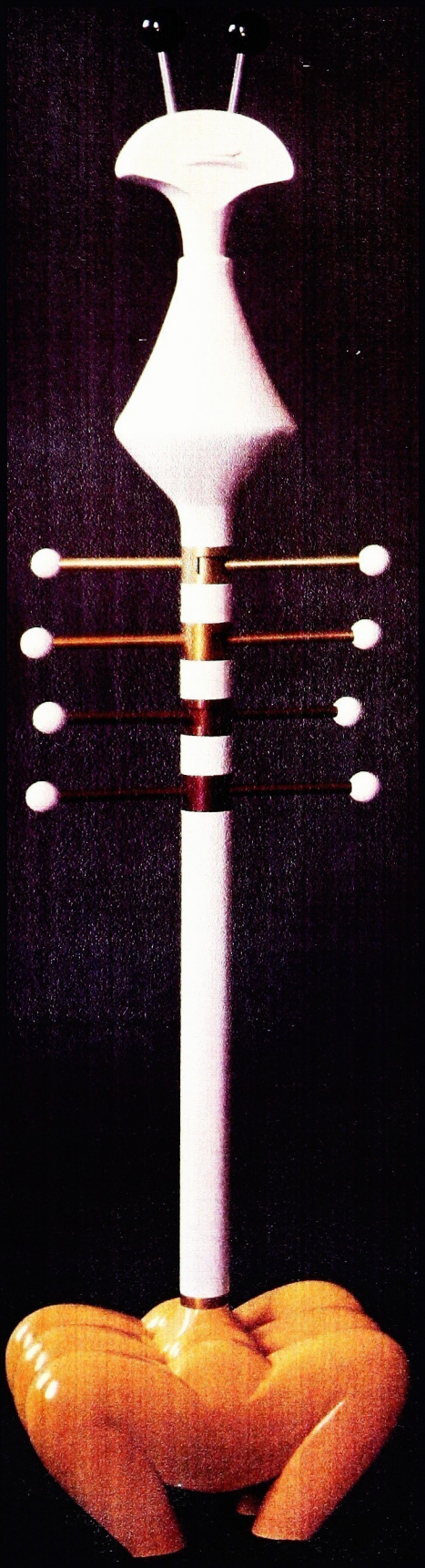
The face, chest and long cylinder parts were laminated and turned. After turning, the face was shaped, lips were carved and holes were drilled for the eyes. Springs connected the eyes onto the face and created a funny facial element that would encourage play by children.

High gross latex finish, water-base and non-toxic paint, provided smooth, shiny surfaces. Sun yellow legs were used as a bright, bridging accent between the white body and the black shoes. The arms were painted four different colors (lemon, yellow, scarlet, and red) which evoke a warm feeling in contrast to the white body. To achieve these colors, I anodized

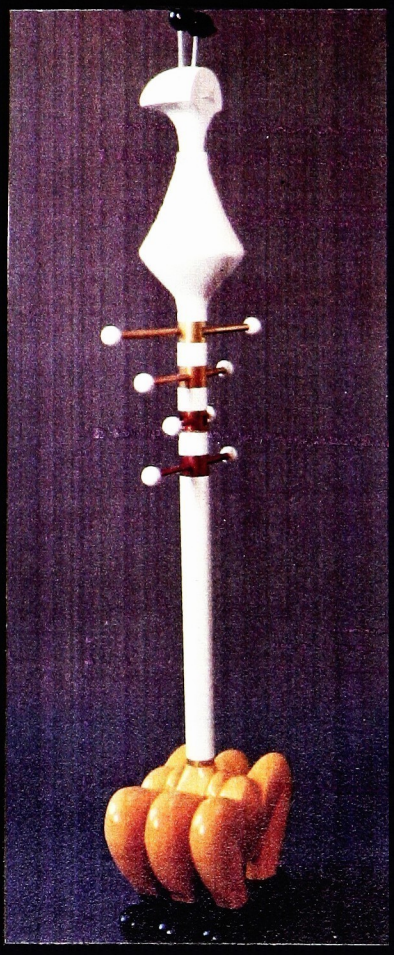
the aluminum. By subjecting the aluminum to electrolytic action, a protective, decorative surface was created.

The highest arms were placed 42" from the floor. Three inch intervals were allotted between each set of arms. Therefore, children of all ages could hang their coats by themselves, without any problem of reaching the coat rods. For constructing the arms, half inch aluminum rods were welded onto two inch or one and three quarter inch cylinders. By inserting the smaller welded cylinder inside the larger cylinder, a set of arms were completed (see Plate 4). The arms were designed to rotate so that children could arrange clothes easily. This movable arm feature would also encourage play activities with the spaceman.

Carving the six legs was time-consuming and a tedious part of the total construction. After roughly cutting the shape with a bandsaw, I then used hand carving tools to complete the leg forms. To save time and effort, I combined the use of a disc-grinder and tools appropriate for hand trimming. The fronts and backs of the legs differed in shape (see Plate 4), and were more animal-like than the other parts of the coat rack. The three set of legs were connected by vertebrate shaped parts.

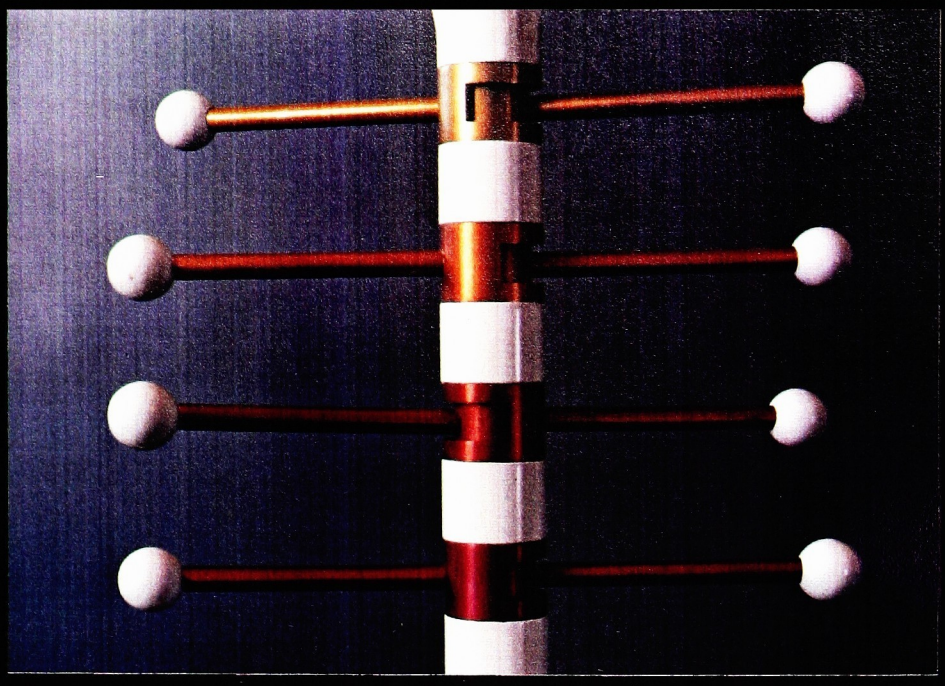


Coat Rack



58×17×13(inch)

Plate 3



Details

Plate 4

Mirrors

I designed two decorative mirrors that would suggest abstract human forms around a mirrored interior. The smaller mirror represented a child, and the large one represented a mother image. Because it distorted images, I felt that the small mirror was more a play toy than a functional mirror. The large form was a regular mirror that could be used in a conventional way.

The mirrors utilized sophisticate pastel hues; light pink, aqua green, and white. I selected a non-toxic, water based, latex finish.

The mother and child mirrors have carved frames, which suggest distorted body shapes. The mirror head parts are hand carved from poplar. Aluminum anodizing was also utilized in the neck area. The curved frame is made from 1" MDF (Medium Density Fiberboard). The MDF made both the task of creating curves and using a router easy. I did not have to concern myself with wood splintering or creating joints in the pieces I designed. I used 1/8" and 1/4" plexiglass mirror for several reasons. Glass mirror would have been extremely difficult to cut into curved shapes. Also glass mirror would be a particular hazard because of the possibity of breakage with resulting sharp, cutting edges. By incorporating the plexiglass, I could reduce material costs and avoid the danger of glass breakage.

For causing a distortion in the small mirror, I put cardboard padding between the mirror and the back panel. This laminated cardboard was sandwiched in the center of the mirror, thus creating an obvious center bulge. It was this bowed surface that created the distortion I sought. I realized that the 1/8" plexiglass, being thin and extremely flexible, created distortion even without added cardboard padding. I selected 1/4" plexiglass for the large mirror. No laminated cardboard was used. I wanted to keep the mother mirror distortion to a minimum.

Plate 5

23 x 9

45 x 16 (inch)

6. MASS PRODUCTION FURNITURE

It is hard to find manufactured childrens furniture that is sensitive to all concerns which I have previously mentioned. For mass producting children's furniture, the factors to consider, beyond those of child safety and furniture scale are as follows: the role or function of the piece, reasonable cost for production, and simplified processes for creating work. I attempted to meet these criteria in creating the child's table and stool.

Table and Stool

This table and stool set was designed for both study and play. The rainbow hue, traditional favorites of the children, was applied on the spacebar of the table, the stool's upholstery and the strechers of the stool. The bright rainbow colors contrasted with the white body and helped to maintain a simple design. The table and stool were basically designed by using the same elements. The sufficient depth of table(24" x19" x 24 1/2"), allowed for two children to play and study together. Three quarter inch particle board, 'Colorcore', and acrylic paint were the only materials used. Colorcore, a type of formica, was selected because a solid color can be cut out of colorcore. Traditional Formica leaves a black cutting line. However, Colorcore might not be a favored material for mass

production due to its high price. For mass producing, latex paint would be an acceptable coloring substitute. Heavyweight particle board created a stable stool and table. Strong, durable construction was essential, since children often jump and climb on furniture. The small cubby holes on sides of both the table and stool served to break up the expansive white surface and related to the front square spaces as well. To simplify the construction of the cubby holes, the jig, made out of solid maple, was used. First I drew the square on the sides of the table and stools, roughly cutting the squares with a sabre saw. I clamped the jig down to the rough cut spaces, and trimed it flush with a router. To make a sharp corner, I used a corner chisel; this enabled me to cleanly trim each corner. The rainbow spacebar provided storage spaces underneath the table top.

By dividing the space into sections, the compartments established storage areas for stationery and small toys.

The dual position stool gives a child two options. Flipping it over from top to bottom, changes it from a stool to a rocker. It is very easy to remove and replace the cushion. This stool might well be a child's favorite plaything. I designed and wove the upholstery fabric with 100% wool fibers. The pattern of the fabric (a square checked pattern) reflects the stretcher colors and pattern of the rainbow hue.

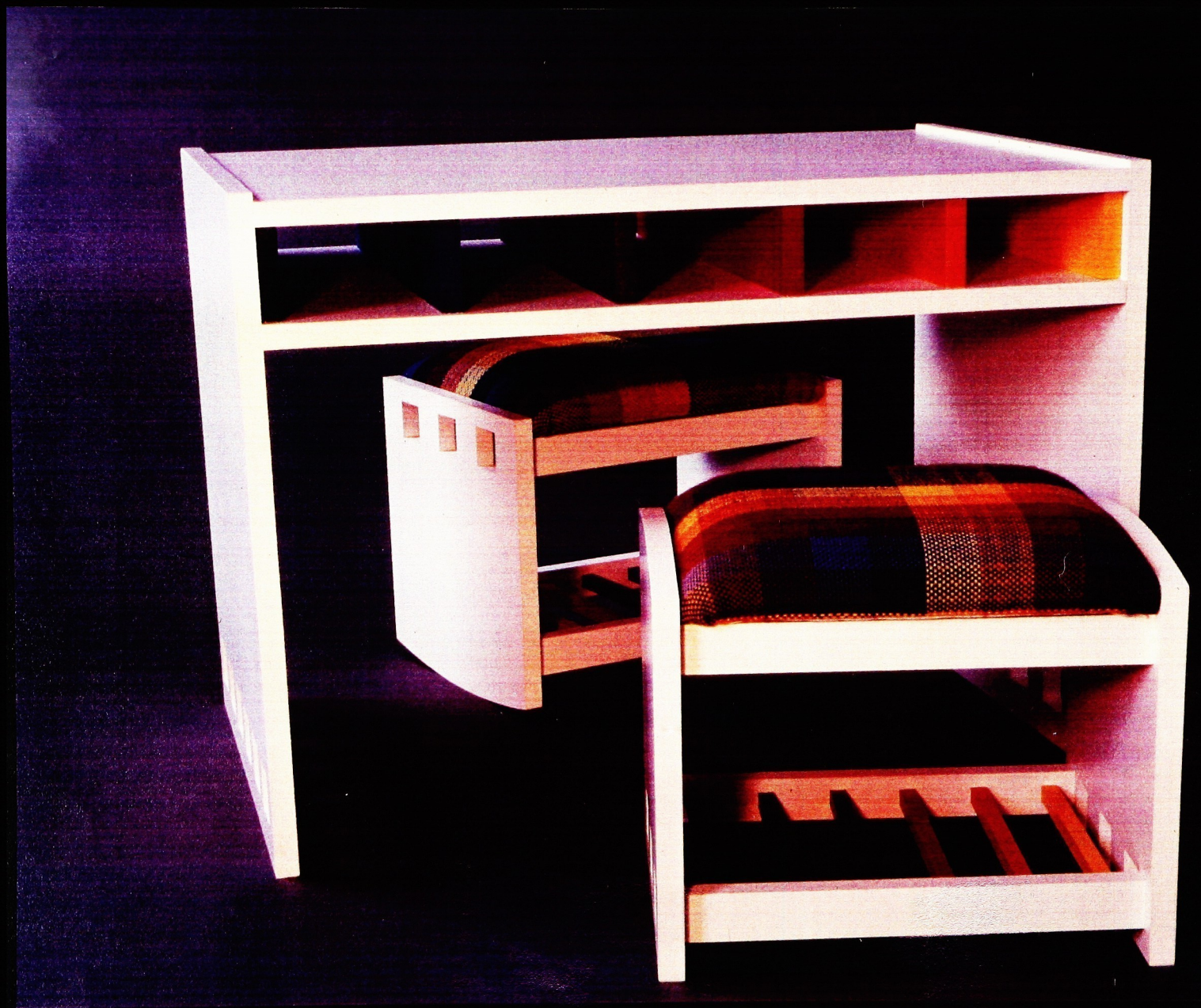
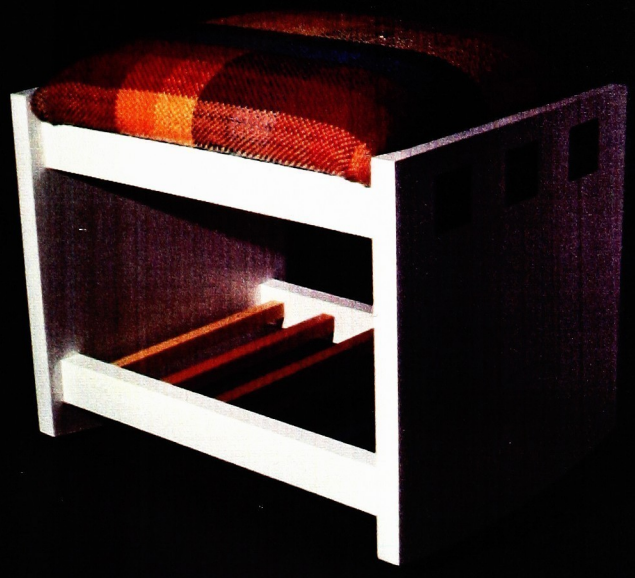
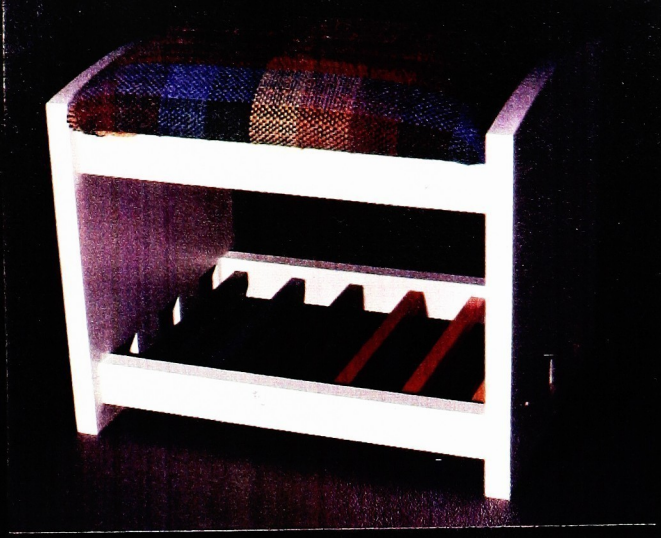


Plate 6

Stools





17 x 13 x 14

Table

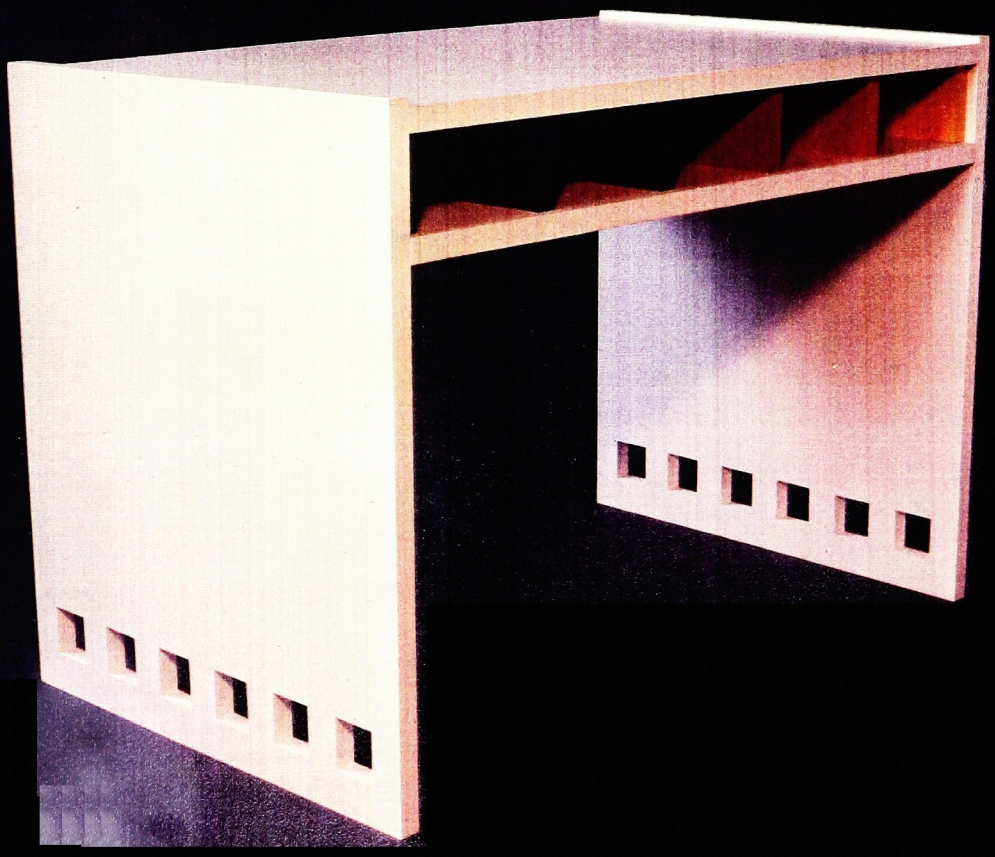


Plate 7

24 x 19 x 24 1/2 (inch)

Stools without Cushion

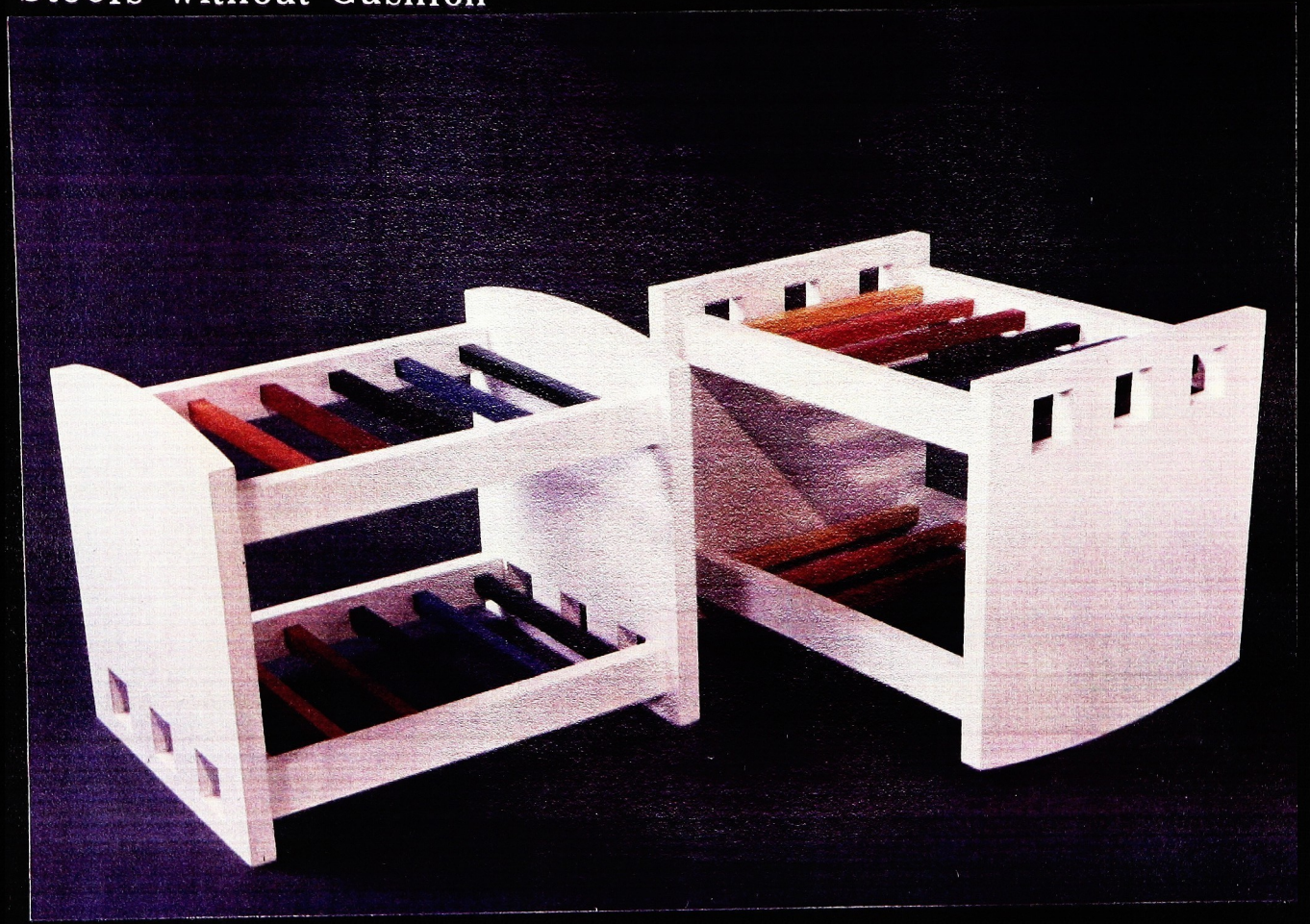


Plate 8

Summary

My thesis has given me the opportunity to investigate all concerns related to designing, constructing and marketing unique furniture work specifically designed for children.

Throughout my work, there were many design considerations that I needed to keep in mind. Basically I maintained three criteria for my children's furniture. First, I incorporated color, form and ornamentation that addressed both children's aesthetics and their human scale. I tried to create a comfortable, usable, pleasant environment where, children might live and play. Second, I was concerned with furniture hazards and tried to avoid safety risks. Since children were insensitive to potential furniture hazards, my concern for safety was critical in the design process. Third, I designed my furniture to be economical. It needed to meet a child's growth demands, and to be durable, so that it would function and remain attractive for years. The short attention span of children was one factor that impacted upon my designs. I wanted to create pieces that would attract children and sustain their interest, even as they matured.

With all the criteria I mentioned above, I was able to design and execute my thesis. I feel that the work was highly successful and time, hopefully, will verify their ultimate contribution to furniture design.

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