Volume III, No. 1

As decided at the Cincinnati workshop, lists of exercises, materials and sources for different areas of the curriculum will be given in each issue. We solicit and welcome additions, corrections and additional sources to this information and they will be published in subsequent issues. This may be used as a checklist for self-evaluation for the contents of one's classroom.

If you have additions or changes please duplicate the sheet or sheets which show what they are and send them back to the *Newsletter* coordinator. If you know of other sources for any of the materials, please inform us and include the address of the source.

	SOURCES			
	Neinhuis	Baroni & Marangon	MDF	Make by Hand
I. Introduction to numeration Presentation of zero to 10				
A. Red and blue rods	0.027.00	60		
B. Sandpaper numerals	0.028.10 0.028.11 0.028.A0	63 64		
C. Association of rods and numerals	0.033.00 0.033.01 0.033.A0			
D. Spindle boxes Intuition of zero Games for zero	0.032.00 0.032.01	61		
E. Cards and counters Concept of odd and even	0.036.00 0.036.01	62	(300 (cards only	
F. Memory game - tags			300	
1. Objects all the same				
2. Objects all different				
3. Same type of objects make up a set				
4. Objects from room				
5. Objects from outdoor environment				
II. Overview of the base 10 system				
A. Introduction to 1, 10, 100, 1000	0.252.00			
B. Complete layout	0.083.00			
9 of each quantity		65 66 67 68		
Numeral cards	0.071.B0 0.072.B0	69		
C. Formation of numbers				
D. Exchanging				

	Neinhuis	Baroni & Marangon	MDF	Make by Hand
III. Linear counting				
A. Snake game for the research of 10	0.076.00 0.090.00 0.091.A0	86 87 88		
B. Teen boards	0.030.00 0.030.01	80		
Golden ten bars	0.030.A0	66		
Short bead stair bars	0.030.A0	81		
C. Ten boards	0.031.00 0.031.01	82		
1. By 10's to 90	0.076.00	71		
2. By 1's to 99	0.031.A0	83 84		
D. 100 board	0.180.00			
E. Chains of the squares of numbers from 0 to 10	0.080.00 0.080.A0	144		
Numeral tags	0.080.B0		310-a	
1. Counting by 1's 2. Skip counting				
F. Chains of the cubes of numbers from 1 to 10	0.086.00 0.086.A0	144		
Numeral tags	0.086.B0		310-b	
1. Counting by 1's 2. Skip counting 3. Powers of numbers				
G. Wooden hierarchy mat'l. to 1,000,000	0.132.A0	131		
Numeral tags				X
IV. The concept of the 4 operations: addition, subtraction, multiplication, division				
A. First experience with red & blue rods	0.027.00 0.253.00	60		
B. Introduction of the concept with golden beads	0.083.00	70 71 72 73 74 75 76		

	Neinhuis	Baroni & Marangon	MDE	Make by Hand
V. Memorization of the facts	0.162.00			
Paper for memorization work	0.163.00		350-W	
	0.145.00		M1A	
	0.145.A0		M1B	
	0.145.B0		M34A	
	0.166.00,1,2,3		M34B	
	0.166.B0,1,2,3		M34C	
			M12A	
			M12B	
			M12C	
A. Addition				
1. Strip board	0.092.00	100		
		101		
a. Introduction				
b. Prepared booklets	0.144.01	102		
c. Problem tickets	0.142.F1		350	
d. Doubles of the numbers from 1 to 9				
e. Ways to make a number				
1) Without 0's				
2) With 0's				
3) Matching commutative partners				
f. Chart problems			351-a	
g. Circle problems			351-b	
2. Finger charts	0.142.A0	101		
a. First chart w/problm tickets	0.142.F1		350	
b. Second chrt w/prblm tickets	0.142.F1		350	
c. Third chrt w/problem tckts	0.142.F1		350	
d. All charts w/chart problems			351-a	
e. All charts w/circle prblms			351-b	
f. First and second charts with place holder problems				
g. Blank board				
1) With problem tickets			350	
2) Pick up tiles				
3) Arrange tiles and place				
4) Games				
5) Blank paper chart—fill in matrix			M34B M12B	
3. Addition with bead bars	0.190.00	173		
a. Answers less than 10				X
b. Answers more than 10				X
4. Commutative addtn w/bead bars	0.190.00	173		
Commutative problems			35	

	Neinhuis	Baroni & Marangon	MDF	Make by Hand
5. Snake game for memorization of addition - Same material as before				
6. Greater than, equal, less than problems			354	
Paper			354-W	
7. Addition w/parentheses				X
a. 1 set of parentheses				
1) Answer less than 10				
2) 1st answer less than 10 2nd answer over 10				
3) 1st answer more than 10				
b. More than 1 set of parenthes				
c. Child makes parentheses prblms out of regular problems				
d. Greater than, equal, less than problems				
8. In your head problems with flash cards				X
a. Regular problems				
b. Place holder problems				
c. Addtn of 10's, 100's, 1000's				
d. Addtn w/carrying (regrouping)				
1) Teens to 20's				
2) 20's to 30's				
3) Mixed				
9. Addtn of 3 vertical numbers				
10. Addtn of many numbers with short bead stair				
B. Subtraction				
1. Strip board	0.092.A0	103 104		
a. Introduction				
b. Prepared booklets	0.143.01	105		
c. Problem tickets	0.142.F1		350	
d. Same minuend problems				
e. Chart problems			351-a	
f. Circle problems			351-b	
2. Finger charts	0.142.B0	104		
a. With problem tickets	0.142.F1		350	
b. Chart problems			351-a	
c. Circle problems			351-b	
d. Place holder problems				X
3. Blank board	0.142.B0	104		
a. With problem tickets	0.142.F1		350	

	Neinhuis	Baroni & Marangon	MDF	Make by Hand
b. Pick up tiles				
c. Arrange tiles and place				
d. Games				
e. Blank paper chart				X
Fill in matrix				
4. Snake game for the memorization of subtraction	0.076.00 0.090.00 0.091.A0 0.029.00	89 90 91 92 93 94		
5. Greater than, equal, less than problems				X
6. Subtraction with parantheses				X
7. In your head problems with flash cards				X
a. Regular				
b. Place holder problems				
c. Subtraction of 10's, 100's, 1000's				
d. Subtraction with borrowing (regrouping)				
1) 20's				
2) 30's				
3) Mixed				
8. Answers below 0 (negative numbers)				
C. Addition and subtraction				
1. Missing sign of the operation problems			353 353-W	
2. Renaming exercises				X
3. Greater than, equal, less than problems				X
4. 12 ways to write 3 numbers				X
D. Multiplication				
1. Multiplication board	0.087.00	106		
a. Introduction				
b. Prepared booklet	0.155.01			
c. Problem tickets			350	
d. Chart problems			351-a	
e. Circle problems			351-b	
f. Place holder problems				X
2. Short bead stair	0.190.00	173		
Multiplication table				

	Neinhuis	Baroni & Marangon	MDF	Make by Hand
a. Layout of each section of the multiplication tables			350	
b. Handful multiplication				
c. Commutative problems			352	
3. Changing 1st control chart to 2nd				
4. Finger charts	0.142.C1	107		
a. 1st chrt w/problm tickets	0.142.F1		350	
b. Change 1st chart to 2nd				
c. 2nd chrt and problm tickets			350	
d. Both charts w/chrt prblms			351-a	
e. Both chrts w/circle prblms			351-b	
f. Both charts with place holder problems				X
5. Blank chart	0.142.C1			
a. With problem tickets	0.142.F1		350	
b. Pick up tiles				
c. Arrange tiles and place				
d. Games				
e. Blank paper chart			M34B M12C	
Fill in matrix				
6. Snake game for the memorization of multiplication	0.076.00 0.090.00 0.091.A0	86 87 88		
7. Introduction to multiplication by 10, 100, 1000	0.083.00	70 71 72 73		
8. How many ways to get a certain result, i.e., 12	0.135.00 0.136.00	174 144		
9. Formation of squares from 1 to 10	0.190.00 0.086.00	173		
10. Multiplication with parentheses				X
a. Binomial times 1 digit (3 + 2) X 5 =				
b. Trinomial times 1 digit (3 + 7 + 4) X 6 =				
11. In your head problems with flash cards				X
12. Greater than, equal, less than problems				X

		Neinhuis	Baroni & Marangon	MDF	Make by Hand
13.	Decanomial	0.190.00	173		
	a. Vertical				
	b. Horizontal				
14.	Squares of binomials & trinomials	0.086.00	144		
15.	Passing from 1 square to a successive square	0.086.00	144		
16.	Passing from 1 square to 1 not successive	0.086.00	144		
17.	Decanomial—commutative	0.190.00	173		
18.	Numerical decanomial				X
19.	Decanomial	0.190.00	173		
	a. Substitution of bars				
	b. Substitution of squares				
	c. Substitution of cubes				
20.	Algebraic decanomial	0.186.00			X
E.	Division				
1.	Division board	0.096.A0	109		
	a. Long research				X
	b. White working papers	0.158.01			
	c. Prepared booklets	0.158.01	111		
2.	Finger charts	0.142.:1	110		
	a. Problem tickets w/reminders				X
	b. Prblm tickets w/out reminders	0.142.F1		350	
	c. Place holder problems				X
3.	Blank board	0.142.:1	110		
	a. With problem tickets	0.142.F1		350	
	b. Pick up tiles				
	c. Arrange tiles and place				
	d. Games				
	e. Blank paper chart.				X
4.	In your head problems with flash cards				X
	a. Regular				
	b. Place holder problems				
	c. Multiplication of 10's, 100's, 1000's				
5.	Greater than, equal, less than problems				X

	Neinhuis	Baroni & Marangon	MDF	Make by Hand
F. Multiplication and division				
1. Missing sign of the operation problems			353 353-W	
2. Greater than, equal, less than problems				X
3. 12 ways to write 3 numbers				X
G. Addition, subtraction, multiplication and division				
1. Missing sign of the operation problems			353 353-W	
2. Greater than, equal, less than problems				X
3. 12 ways to write 3 numbers (2, 2. 4)				X
VI. Toward abstraction with addition				
A. Static addition problems (no regrouping)			301	
1. Golden beads	0.083.00	71 72 73 74 75 76		
2. Stamp game	0.082.00	95 96		
3. Bead frame	0.093.00	125		
Bead frame paper	0.153.01	126 127		
B. Dynamic addition problems (with regrouping)		301		
1. Horizontal method of working (regrouping last)				
a. Golden beads	0.083.00	71 72 73 74 75 76		
b. Stamp game	0.082.00	95 96		
c. Bead frame	0.093.00	125		
Bead frame paper	0.153.01	127		

	Neinhuis	Baroni & Marangon	MDF	Make by Hand
d. Dot game	0.050.01			
Dot game paper	0.050.A0	97		
2. Vertical method of working (regrouping first)				
a. Bead frame	0.093.00 0.094.00	125		
Bead frame paper	0.153.01	127		
b. Dot game	0.050.01			
Dot game paper	0.050.A0	97		
VII. Toward abstraction with subtraction				
A. Static problems (no regrouping)			301	
1. Golden beads	0.083.00	71 72 73 74 75 76		
2. Stamp game	0.082.00	95 96		
3. Bead frame	0.093.00	125		
Bead frame paper	0.153.01	127		
B. Dynamic problems (with regrouping)			301	
1. Golden beads	0.083.00	71 72 73 74 75 76		
2. Stamp game	0.082.00	95 96		
3. Bead frame	0.093.00 0.094.00	125		
Bead frame paper	0.153.01	127		
C. With 0's				
Bead frame	0.093.00 0.094.00	125		
Bead frame paper	0.153.01	127		
VIII. Toward abstraction with multiplication				
A. Multiplication with a 1 digit multiplier				
1. Static (no regrouping)			301	

		Neinhuis	Baroni & Marangon	MDF	Make by Hand
a.	Golden beads	0.083.00	71 72 73 74 75 76		
b.	Stamp game	0.082.00	95 96		
c.	Bead frame	0.093.00 0.094.00	125 128		
	Bead frame paper	0.153.01 0.154.01	127 129 130		
2.	Dynamic (with regrouping			301	
a.	Golden beads	0.083.00	71 72 73 73 74 75 76		
b.	Stamp game	0.082.00	95 96		
c.	Bead frame	0.093.00 0.094.00	125 128		
	Bead frame paper	0.153.01 0.154.01	127 130		
B.	2 digit multiplier				X
1.	Bead frame	0.094.00 0.099.00	128 123		
2.	Checkerboard	0.137.01 0.138.00	121 122		
3.	Large bank game	0.073.00	124		
C.	3 and 4 digit multiplier				X
1.	Bead frame	0.094.00 0.099.00	128 123		
2.	Checkerboard	0.137.01 0.138.00	121 122		

	Neinhuis	Baroni & Marangon	MDF	Make by Hand
3. Large bank game	0.073.00	124		
D. Cross multiplication with the checkerboard - age 10	0.137.01 0.138.00	121 122		
1. Ways to get units, 10's, 100's, etc.				
2. With letters abstractly				
3. On board—products not over 9				X
a. Just with board				
b. Write on paper				
c. Add partial products in your head				
d. Do carrying in your head				
e. Abstraction				
4. Products over 9				X
a. Write on paper				
b. Add partial products in your head				
c. Do carrying in your head				
d. Abstraction				
IX. Toward abstraction with division				
A. Problems with a 1 digit divisor			301	
1. Distributive or partitive division				
a. Static (no regrouping)				
1) Golden beads	0.083.00	70 71 72 73 74 75 76		
2) Stamp game	0.082.00	95 96		
3) Long division material	0.095.00	132 133 134 135		
b. Dynamic (with regrouping)				
1) Golden beads	0.083.00	70 71 72 73 74 75 76		
2) Stamp game	0.082.00	95 96		
3) Long division material	0.095.00	132 133 134 135		

	Neinhuis	Baroni & Marangon	MDF	Make by Hand
2. Group division				
a. Stamp game	0.082.00	95 96		
b. Long division material	0.095.00	132 133 134 135		
B. 2 digit divisor				X
1. Distributive or partitive division				
a. Golden beads	0.083.00	70 71 72 73 74 75 76		
b. Stamp game	0.082.00	95 96		
c. Long division material	0.095.00	132 133 136		
2. Group division				
a. Stamp game	0.082.00	95 96		
b. Long division material	0.095.00	132 133 136		
C. 3 digit divisor				X
1. Distributive or partitive division				
a. Golden beads	0.083.00	70 71 72 73 74 75 76		
b. Stamp game	0.082.00	95 96		
c. Long division material	0.095.00	132 133		
2. Group division				
a. Stamp game	0.082.00	95 96		
b. Long division material	0.095.00	132 133		

	Neinhuis	Baroni & Marangon	MDF	Make by Hand
3. 0's in the divisor (stamp game and long division material)	0.082.00 0.095.00	95 96 132 133		
a. In place of 10's				X
b. In place of the 1's				X
c. In place of 10's and 1's				X
D. 4 digit divisor				X
Long division material	0.095.00	132 133		

That's all for this issue. In the next *Newsletter* will be:

Divisibility
Multiples
Fractions
Measurement
Decimal numbers
Distance - rate - time
Money
Interest
Square root
Cube root
Algebra

[illegible]

There are few victories more exciting than a scientific discovery.

Scientists can spend an entire career never knowing that triumph. But not John Nash Ott.

Ott lost count a long time ago of the breakthroughs in knowledge he has caused. But there is a streak of honesty, perhaps humility, in his character:

"Everything I've discovered has been simply an accident," he says.

John Ott couldn't grow a pumpkin, and years later a man was cured of cancer. Ott couldn't make a green apple ripen, and years later 10 of 11 hyperactive and emotionally disturbed children were returned to normalcy in six months. John Ott broke his glasses, and years later a blind man regained his sight.

Cause and effect?

The final scientific returns aren't in yet, but even the experts agree Ott is making remarkable contributions.

John Nash Ott is director of the Environmental Health and Light Research Institute (EHLRI) in Sarasota.

At the age of 63, Ott is twice a pioneer: once in time-lapse photography, and again in the entirely new science of photobiology.

Photobiology is a science dealing with the chemical and biological effects of light on plant, animal and human life.

In 20th century America, we live in "malillumination" — polluted light, a lighting environment markedly different from the natural outdoor spectrum under which all life on earth evolved. As endocrinologist Dr. Richard Wurtman of the Massachusetts Institute of Technology wrote in an editorial in the *New England Journal of Medicine:*

"Most Americans spend much of their time indoors, exposed to artificial light sources whose spectra differ appreciably from sunlight. For example, 'daylight' fluorescent bulbs provide very little long wave ultraviolet light and emit yellow and red radiations in a ratio quite different from that present in sunlight. It does not seem wildly imaginative to speculate that prolonged exposure to this unplanned phototherapy might have psychologic consequences."

Ott's research indicates that lighting can have a definite effect on both physical and mental well-being. While trying desperately to stay away from any taint of the quack or the faith-healer, he nonetheless has recorded what appear near-miraculous cures in cancer, mental illness, arthritis, blindness, leukemia, exophthalmic goiter and even receding hairlines.

The connection to all these disparate maladies and countless others is the pigment epithelial cells of the eye. The existence of the cells has been known for some time, but their function remained a mystery. They played no part in vision, and hence were never studied extensively. Anatomists discovered the presence of neurochemical channels leading from the eye to the brain, but again no purpose or function was found.

It remained for John Ott to discover the connection. The pigment epithelial cells of the eye, Ott postulates, pick up light and transmit it through the neurochemical channels to the two master glands of the body, the pituitary and the pineal. The presence of certain rays from the light spectrum activates production of hormones by the glands, with resultant mental and physical manifestations.

And more importantly, Ott discovered that the *absence* of certain portions of the spectrum also creates production of hormones. But these result in abnormalities, just as malnutrition results in an abnormality of the body. We suffer these absences every day: Window glass in our homes and cars completely screens out ultraviolet rays, as do almost all eyeglasses now worn. Sunglasses are worse, especially if tinted any color other than neutral gray. Besides cutting off ultraviolet rays, which can't penetrate ordinary glass, sunglasses block off certain portions of the visible spectrum of light. Artificial light also has color-starving properties.

The unlikely series of events [illegible] brought Ott, a man without [illegible] high school diploma, to the [illegible] front of a highly technical field [illegible] search began in California at the end of World War I. There, one day, young John invested 10 cents in a dime-store camera.

His fascination with photography mushroomed. In school he saw a slow-motion film of a running horse, and became intrigued with the possibility of doing the reverse: shooting a speeded-up film of something that happens very slowly, something like a growing plant.

His parents sacrificed the innards of a kitchen clock for John's first timer, one he still uses today.

It was a perfect hobby for a less-than-healthy young man. During his early high school years John's eyes developed a strange weakness, causing them to lose and regain focus irregularly. His parents sent him to a ranch in New Mexico for recuperation. After a protracted stay in the sunshine his eyes just as mysteriously cleared up — a fact John accepted thankfully and forgot for the moment.

He went into banking. By the late 1940s, however, his avocation was taking more time than his vocation.

By 1950, his photography work had come to the attention of Walt Disney, who wanted a time-lapse sequence for his movie *Nature's Half-Acre.* Disney loved Ott's work, and wrote a film called *Secrets of Life* with scenes calling for specific time-lapse sequences.

"Now I had to shoot something specific — something the script called for," Ott said, sitting in EHLRI's cramped three-room offices in Sarasota.

Disney wanted footage of a pumpkin growing and an apple ripening — nothing else. Both were miserable failures, and both led indirectly to the founding of the science of photobiology.

Ott grew the pumpkin — or tried to — under artificial light in his basement. During the first year, the staminate (male characteristic) blossoms developed, but the pistillate (female characteristic) blossoms dried and fell off. Ott told Disney of his failure, and Disney told him to try again.

The following year the pistillate blossoms flowered, almost abnormally so, but the staminate blossoms withered away.

Ott was mystified until he finally realized that the only change in his basement studio from the first year to the second was the lighting. When Disney had told him to try again, Ott had replaced the fluorescent bulbs, which were flickering with age. He had stacked the old bulbs in a corner, and now brought them out for inspection.

The first year, he saw, he had used "cool-white" fluorescent lights, which are strong in the yellow-orange part of the spectrum, the tint of light that gives interior decorations and cosmetics a warmer tone. The second year, by chance, he had bought "daylight" bulbs -- strong in the blue area of the spectrum.

He mixed the lighting to present a full color spectrum, and grew pumpkins with no further trouble.

That was half Ott's basic discovery: The absence of certain parts of the visible color spectrum affects plant life. But what of the invisible portions of the spectrum, particularly ultraviolet?

That knowledge arrived with the apple. While struggling with the pumpkin, Ott also was having problems with Disney's request for a ripening apple. Ott had built a small box with a glass window in the top to admit sunlight, bent an apple branch into the box and stationed a camera and timer in front of it. The apple grew, but wouldn't ripen. It was green.

Ott remembered having read somewhere that ultraviolet rays cannot penetrate glass. As an experiment, he substituted an ultraviolet-transmitting plastic for the glass in his box. The apple flourished immediately. Ott had learned the second half of his lesson, and photobiology was born.

The third most important accident occurred while Ott was addressing a garden club years later in Sarasota. An ophthalmologist attending the lecture, Dr. Thomas Dickinson, introduced himself to Ott and gave him an intriguing proposition. Dickinson had been working with the pigment epithelial cells and had learned they showed abnormal growth patterns after excessive use of tranquilizers then new on the market. He asked Ott to use microscopic time-lapse photography to study the matter further.

"I worked with the Wills Eye Hospital in Philadelphia," Ott said. "They prepared tissue-culture slides of cells from rabbits' eyes in a growth medium, and I added tranquilizers and filmed what happened."

Ott immediately saw that the cells showed widely varying rates of abnormal growth depending on what color he used as a light source. He realized that the living cells suffered when deprived of certain portions of the spectrum.

Ott thinks he is living proof of this phenomenon. He was nearly crippled with arthritis; doctors told him his hip would have to be replaced with a plastic joint. But one day Ott broke his glasses -- and started to feel better. He walked a mile that day, without a cane for the first time in months, and realized that his eyes were receiving ultraviolet rays for the first time in years.

He went to Florida for a week in the sun, returned home and began a strict program of avoiding artificial light. His arthritic condition disappeared -- and his hairline stopped receding.

Ott is the first to admit that such miracle stories are best received with a grain of salt. But he carried his work further, compiling a mass of empirical data:

▷ He obtained the permission of Bellevue Medical Center in New York to work with several terminal cancer patients. After following his list of instructions concerning exposure to light, Ott reports, cancerous growth either slowed markedly or ceased completely in every patient but one -- a man who had misunderstood the instructions.

▷ A friend of Ott's sent the same list of rules to an elderly man living in Arizona, a man diagnosed as having terminal lung cancer. In a matter of months, Ott says, the man's tumor actually disappeared, and he lived eight years before dying of a heart condition.

▷ Ott conducted an experiment with mice specially bred to be cancer prone. He exposed them first to the narrow pink band near the end of the visible spectrum, and the rats contracted cancer which grew at an abnormally fast rate. Their average life span was seven and a half months. He exposed other mice to fuller and fuller portions of the light spectrum, and says each time the life span increased. He finally employed the full spectrum, and the cancer grew so as to be almost negligible and the life span was sixteen and one-tenth months.

▷ A man who had done some still photographs for Ott had gone totally blind, the result of a diabetic condition causing the bursting of blood vessels in his eyes. After following Ott's program, the remaining blood vessels grew healthier and the man's vision returned sufficiently to allow him to distinguish colors and follow the vague outline of a sidewalk as he walked to work, Ott reports.

▷ The Communicable Disease Center of the U.S. Public Health Service in Atlanta reported that a school in Niles, Ill., had the highest rate of leukemia of any school in the nation. Ott investigated and learned that all nine children stricken with the blood cancer had been located in two rooms, both lit by "warm-white" fluorescent lights, strong in the orange-pink part of the spectrum, and both with windows covered by translucent green curtains. The curtains were removed and the lights changed, and the incidences of leukemia stopped immediately, Ott reports.

Ott is involved now in a similar experiment in a Sarasota school, where he is installing the healthiest possible light and window materials. He contends both discipline and attendance will improve markedly.

▷ The Kansas City Royals' Baseball Academy near Sarasota, a super-scientific training ground of the future, asked Ott to tour its facility and suggest lighting arrangements. Ott noticed one boy wearing tinted sunglasses, and saw another's room, which contained psychedelic lamps to highlight gaudy posters. Ott asked how both boys were doing, and Academy Director Syd Thrift, surprised, answered that both had mysteriously fallen off in discipline and performance. Ott recommended changing the sunglasses and removing the lamps, and both boys snapped out of their slumps.

▷ The chinchilla industry asked Ott if light could play a part in determining the sex of the animals. Ott found that daylight incandescent lights produced a preponderance of females, and ordinary incandescent a higher ratio of males. Now the chinchilla industry can successfully regulate the sex of litters 85 per cent of the time, which has resulted in enormously higher profits.

▷ Ott's work led him to discover that X-rays from color television sets have harmful effects. At the Special Adjustive Education Center at Gulf Gate School in Sarasota, 11 children were diagnosed as hyperactive and emotionally disturbed. Ott's research found that all 11 either watched television an inordinate period of time each day, or their parents owned defective sets which spewed out radiation far in excess of safe measures. The families of 10 of the children cooperated with Ott's program of either repairing the sets or keeping the children away from them, and all 10 had returned to normal classes in half a year. The eleventh remained in special education.

Ott's work in television radiation led to passage of the 1968 Radiation Control Act, setting limits on the rays receivers may admit.

And there are other cases: Corporations such as Obrig Laboratories in Sarasota, for instance, have copied the methods Ott used in his own home concerning lighting and windows, and report dramatic increases in attendance, production and morale.

"But these are suggestions any person can follow, not just companies," Ott said. "First of all,, people should stop wearing tinted sunglasses or contact lenses, unless they're neutral gray. The only eyeglasses used should be made of Armorlite, which is an ultraviolet-transmitting plastic. That's the only lens I know of that's tested right now – it's the only one that bears the EHLRI seal of approval.

"And another thing – in rooms where people spend a lot of time, they should replace window glass with ultraviolet-transmitting plastic. It isn't that expensive, and it'll last about 10 or 12 years with proper care. And wherever possible, all lighting should be replaced wilth full-spectrum fluorescent bulbs, because they're the closest thing we have to natural light. The only one made now is Vita-Lite by the Dura-Test Corporation . . .

"But now, if people aren't able to use the Vita-Lite, they should at least replace all their bulbs with daylight incandescent. They have a slightly bluish tint that helps balance out the spectrum somewhat, but they're far from perfect. See, up until now the biological aspects of lighting have been completely ignored. The emphasis has been on efficiency – the number of lumens produced in relation to the watts used.

"And one other suggestion – be careful about paint on interior walls. A variation in colors is much healthier than one solid color such as all pink, or all blue. We've found definite reactions in animals from reflected light. Right now only Eastman Kodak has developed a paint that reflects the full spectrum, but it's prohibitively expensive. Only laboratories use it."

Ott's institute exists on private donations and occasional public grants. He's presently beginning a fund drive for $1.75-million, with which he plans to construct a new center for EHLRI. As he explains in his new book, *Exploring the Spectrum*, to be published in July, his research will attack behavioral problems such as crime as well as physical problems such as his No. 1 project, cancer.

It's a beginning, just as the entire science of photobiology is a beginning. A national society has been formed in the new medium, with Dr. Kendric C. Smith, a Stanford University biochemist, as president. The American Society for Photobiology will hold its first national meeting in Sarasota this June, with approximately 1,000 scientists expected to attend.

Smith, an associate professor of radiology at the Stanford School of Medicine, looks upon Ott's work as a beginning, the fascinating basis for an entire new discipline of science.

"John Ott has made some remarkable empirical observations, well worth following up with properly controlled scientific study," Smith said. "I think the new association will give more credibility to this field than it had before.

"The problem in that area comes from the fact that people have tended to ignore light. The common,

the sun coming up in the morning and going down at night . . .

"People are confused by the fact that their eyes can only see certain wavelengths of light. They think light can't penetrate their hand, for instance, just because they can't see it. But once people become aware of this aspect, the early observations such as those John Ott have made will be easier to explain to them. All we have to do is eliminate the prejudice from the mind that light doesn't penetrate man. Then we can find out what light *does* when it penetrates man.

"The important thing is that Dr. Ott is a remarkable observer, in the old philosopher tradition of centuries ago, where people simply observed interesting effects and then tried to explain them."

TV Radiation Seen Hurting Life Nearby

Radiation from television sets can affect behavior of children, plants and animals, according to John N. Ott.

Ott also believes: There is no safe television set radiation level. Black and white sets can be as dangerous as color sets. There is more than coincidence involved in that the first generation growing up on television is the same generation of unrest on college campuses.

Ott spoke last night at the Garden Center of Greater Cleveland and during the day on television and radio shows.

HE IS DIRECTOR of the Environmental Health and Light Research Institute, Sarasota, Fla., and president of John Ott Pictures Inc.

Ott is a former banker who made a second career out of time-lapse plant photography. Some of his work was in the Walt Disney films, "Secrets of Life" and "Nature's Half-Acre," and the movie, "On a Clear Day You Can See Forever."

In an interview he said his comments on the effect of X rays emitted from television sets and the effects of artificial light on plants, animals and humans stem from experiments made in time-lapse photography work.

Plants shielded from a television set by photographic paper grew wildly. Those shielded by lead grew normally. A bean plant set on top of a television set grew its roots upward instead of downward.

LABORATORY RATS 15 feet from a TV set with radiation levels within federal standards for safety became hyperactive, vicious and fought all the time instead of remaining normally docile.

Six months ago his institute began working with the Sarasota County School District to help disturbed children with learning problems.

In two dramatic instances, television set radiation was definitely shown to have affected the behavioral problems of children, he said. One child had been sleeping with her head against a wall that had a video set on the other side.

Removing the set made a startling difference in the child's behavior and learning process.

His experiments began with artificial light on plants. He found most light bulbs did not emit the full spectrum of light found in sunlight. One type of fluorescent tube resulted in only male flowers on a pumpkin plant, for example. Another type resulted only in female flowers.

BUT SEEING ON the electrons used, light also could be used to breed all-male or all-female fish. Chinchilla breeders became believers recently. Some breeders' litters were turning out mostly males. By changing the type of artificial light, sexes were controlled.

Ott also believes artificial light perceived through the eyes can affect human behavior and health if a full spectrum is lacking. Several colleges are researching the possibilities.

NOTE: ALL TV sets give off radiation up to six feet away from

Food Additives

Sitting down to a meal in 1973 often means an encounter not only with or and vegetables but with scores of artificial flavors and colors as well. These chemical additives have no nutritional value and serve only to enhance the appearance and taste of processed foods like hot dogs, ice cream, soft drinks and ready-to-eat cereals—precisely the stuff consumed in enormous quantities every day by American children. In the past, these synthetic ingredients have been classified as safe by the Food and Drug Administration. But last week a California allergist told the AMA meeting that these additives may in some cases trigger the symptoms of extreme hyperactivity and severe learning disorders in schoolchildren.

Because artificial flavors and colors have been shown to cause a wide variety of allergic reactions, Dr. Ben F. Feingold of the Kaiser-Permanente Medical Center decided to test the possibility that the substances might also be responsible for some cases of hyperkinesis. Hyperkinesis is a behavioral disorder characterized by excessive physical activity and the inability to concentrate and learn.

Control: The children were placed on a diet eliminating all foods containing artificial flavors and colors. Within a few weeks fifteen of them showed dramatic improvement. One 7-year-old boy, for example, had been extremely hyperactive for several years. "When he was at home," Feingold recalls, "he stomped around, slamming the doors and kicking the walls and even charging oncoming cars with his bicycle." At school, his hyperactivity prevented him from learning and disrupted the rest of the class. A round of pediatricians, neurologists and psychiatrists could do nothing for him—until he was placed on Feingold's diet.

After a few weeks of dietary control, reports the allergist, the boy settled down and was able to perform well in school and behave properly at home. Interestingly enough, notes Feingold, any infraction of the diet led almost immediately—within a matter of hours—to a return of the hyperkinetic behavior. "We can turn these kids on and off at will," he says, "just by regulating their diet."

Because he has not yet done a controlled study, Feingold cautions that his observations must be regarded as preliminary. But in the meantime, he thinks that many cases of hyperkinesis can be controlled by a diet free of artificial flavors and colors. Unfortunately, keeping a child on the restricted regimen can be an all-but-impossible task. "Artificial colors and flavors are contained in 90 per cent of processed foods," notes Feingold. "Is it any wonder that our children are jumping and failing to learn?"

A new way of looking at the world

By Joe Alex Morris Jr.

That map on the wall is not a racist hangover from the era of white colonial domination of a world full of subject peoples.

But look at it again. If it's a Mercator projection, as most maps are, it gives the following picture:

- Two-thirds of the land surface seems to lie north of the equator.
- Europe is in the very center of it.
- The Soviet Union appears to be at least twice the size of Africa, whereas in fact Africa is 50% larger.

Gerardus Mercator (latinized version of Gerhard Kremer), who produced the map about 400 years ago, really wasn't a racist colonialist. He merely wanted to produce a map which could be used by seamen to navigate around the world, and in this he succeeded admirably.

But the fact is that Kremer's projection has been in constant use ever since, contributing a major distortion to mankind's ideas of what the world really looks like.

For some years, this has annoyed Dr. Arno Peters, a 56-year-old German historian. In Bonn recently, he unveiled his answer to Mercator's distortions.

It's called the Peters Projection, or the orthogonal map of the world. And it will take a bit of getting used to.

To start with, Peters put the equator where it belongs—exactly in the middle of his map. His second major task was to represent every country on the earth in its exact size. And, as closely as possible, its real shape.

He set himself one major handicap in that he insisted upon using the conventional, rectangular-shaped map which people are used to. And he had the built-in obstacle of the mathematical impossibility of projecting a globe onto a two-dimensional surface.

The result is a compromise, but Peters insists it is the most honest projection of the world yet devised. Particularly in the case of Europe—which appears as a tiny blurb on his map—he has stuck to Mercator's shapes of countries, thus distorting actuality.

"Mercator presents a fully false picture, particularly regarding the non-white-peopled lands," Peters said. "It overvalues the white man and distorts the picture of the world to the advantage of the colonial masters of the time."

Other map-makers have tried to improve upon Mercator, with limited success. The elliptical map was closer to reality, but the public never accepted it because it looked like a collection of pieces of a peeled orange.

"We live in a four-cornered world," Peters says. "The television tube we sit in front of is perhaps the best symbol of it."

Peters claims his map is absolutely accurate on areas, and 50% more accurate on real shapes of lands than the Mercator projection.

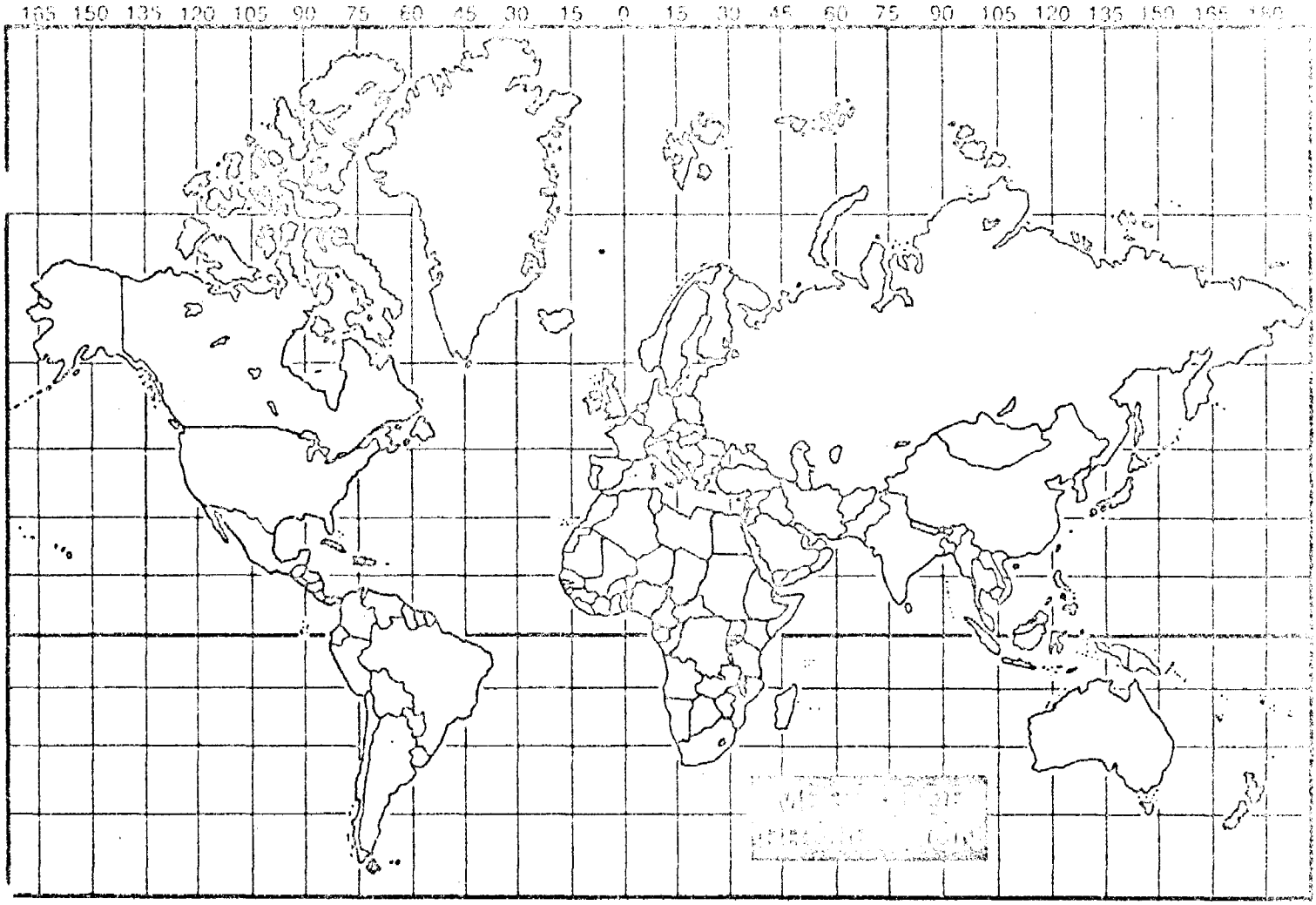
Peters's new orthogonal map exemplifies his political concern over what he calls "Euro-centrism" to the detriment of the rest of the world. He recognizes that, from the earliest map-makers on, all put their own countries at the center of the universe as it was then known.

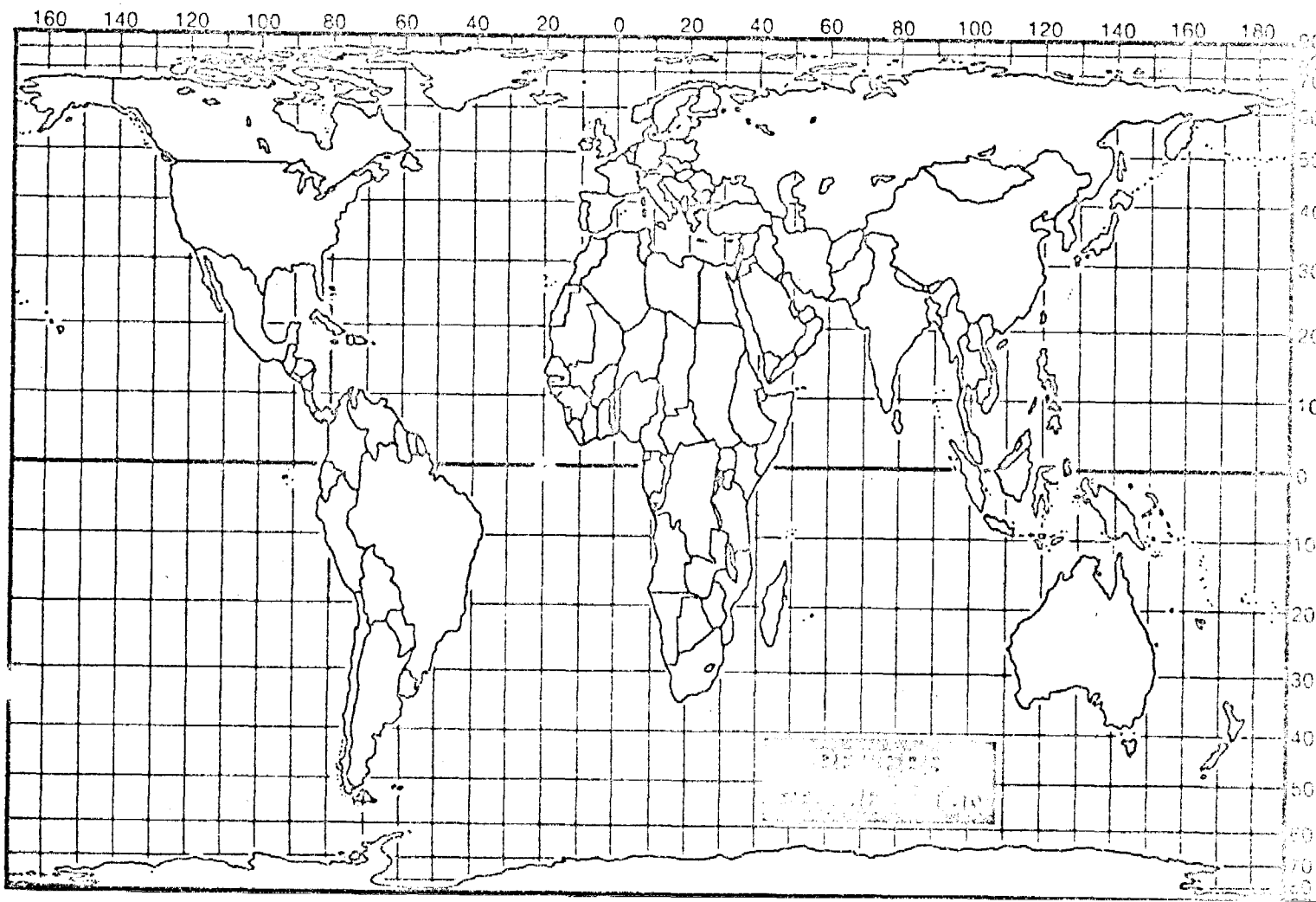
In the late 20th century, he suggests, it's time to change this. He doesn't want to abolish Mercator altogether—Kremer's projection is still the best for sailors.

Peters' new projection is not likely to find favor everywhere, least of all in the Soviet Union, which appears most squashed together of all countries, except perhaps Canada, on his map. But as he points out, his map gives a much better picture of the relative size and juxtaposition of the Soviet Union and its arch-rival, China.

"It makes it easy to see why the Russians are so nervous about the Chinese," he says.

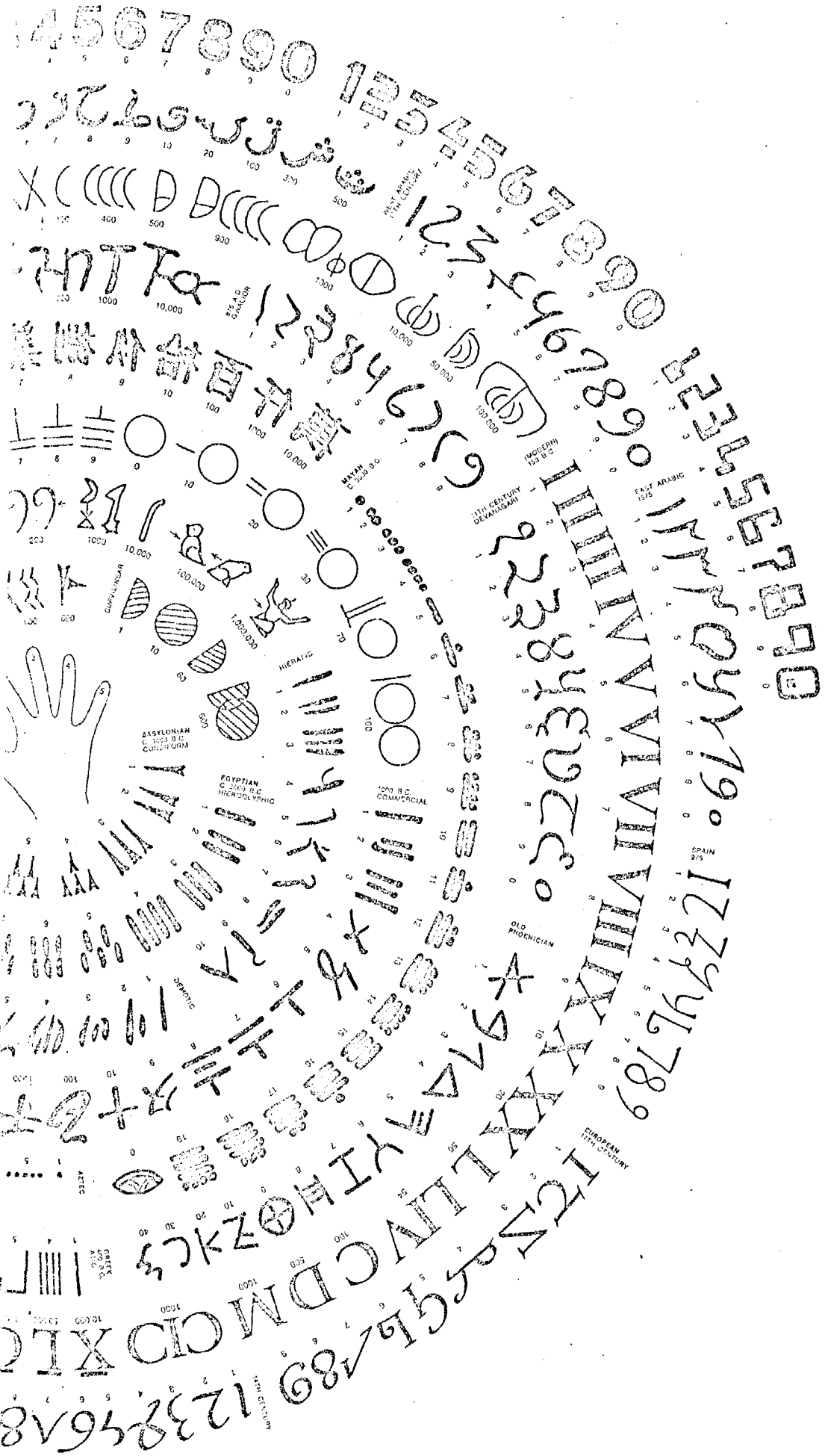
(c) The Los Angeles Times


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160 140 120 100 80 60 40 20 0 20 40 60 80 100 120 140 160 180
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Tom Ockerse's visual history of numbers demonstrates the way various world civilizations have indicated amount throughout the ages. In most cases, it shows more than one form from each culture. For example, the Babylonian numbers are shown in both their cuneiform and curvilinear styles. The Egyptian numbers are shown in hieroglyphic, the most ancient style; hieratic, the highest form, favored by the upper classes; and demotic, the style of common people. Chinese is represented in the ancient stick form, a higher developed commercial form, as well as the increasingly more pictorial basic and official styles. The Arabic characters 0, 1, 2, 3, 4, 5, 6, 7, 8, 9 have been in common European use since the 12th century.





Not shown in the chart are the various uses of numbers. Banking, for example, was clearly a function developed by the Sumerians, the Babylonians and the Egyptians. The first bookkeeper or accountant appears to have been Babylonian. The first known reference to double entry bookkeeping appears in books belonging to the commune of Genoa and date from 1340. Fray Luca Paciolo's *Tractactus de Computis et Scripturis*, considered the foundation of modern accounting, appeared in 1494, first appeared in English translation in 1543.

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Occasions arise when high school and college students seek advice about how they can prepare for Montessori elementary training. Many colleges are allowing students to "self-style" their curricula on a contract basis coordinating independent study with a faculty advisor. This curriculum resume is intended to serve as an aid to the formulation of a liberal arts prep program for the Montessori Elementary Training.

HIGHER EDUCATION GUIDELINES FOR THE PROSPECTIVE MONTESSORI ELEMENTARY TEACHER

By David J. Kahn

The Montessori discipline is derived from a philosophy of nature and man. The prospective teacher must realize that his higher education should be directed to humanistic themes which relate to the philosophical and practical dilemma "what is man and what is his significance on earth?" Within the Montessori cultural curriculum this question of man's cosmic task and position is approached first through a study of the earth (that origins of plants and animals within a geological framework;) and secondly the curriculum concerns itself with the history of man from the hypothetical origins of man to the present. The study of details is related to the study of first principles which underlie the experimental natural, physical and social sciences. The over all education of the prospective teacher should be philosophical in so much as he should strive to unify his approach to physical and human culture, by studying not only independent disciplines (to be listed) but the relationships between these disciplines.

THE GEOLOGICAL/BIOLOGICAL APPROACH

The Montessori approach entails a study of life which integrates the geological and biological sciences. The welfare of the planet and aspects of its functioning are intimately related to the evolution of life. Animal and plant life is to be studied in direct correlation with the geological developments. The following sciences are recommended as a preparation for the life-centered earth discipline Montessori has designed for children:

Paleontology
Geology
Botany
Zoology
Organic Chemistry
Astronomy
Embryology

These sciences whould be approached as a means for understanding the earth as a whole dynamic. The prospective teacher should be aware of the basic schemes for classification in these sciences so that the organization of these same sciences may be simplified for the understanding of children. And finally each science should be studied as an aspect of man's analysis of himself. (e.g. Paleontology may be understood as the study of life before man imparting a sense of his biological and geological significance). Primary readings of some thinkers who influenced Montessori in this area:

Jean Henri Fabre <u>The Life of Insects</u>
Charles Darwin <u>Origin of the Species, Autobiography</u>
Henri Bergson <u>Elan Vitale</u>
Lyell <u>Earth and Life</u>
Coghill <u>Anatomy and Problems of Behavior</u>
Hugo de Vries on mutations, sensitivity periods
Wolf and Baer on embryology

In the study of these sciences attention must be given to the origin of modern science. Structured readings in the history and philosophy of science would be beneficial.

PART II THE SIGNIFICANCE OF MAN

The Montessori curricular approach leads the child to discover that man is an integrated part of the universe with unique conscious power to make a "supernature" or culture through civilization. Montessori has developed a scheme of universal needs for man which can be applied transhistorically and transculturally (through time and space).

Needs of Man

Spiritual	Material
Vanity	Transportation
Religion	Clothing
Art	Defense
	Food
	Habitation

The prospective teacher may utilize the following sciences and philosophies to relate the needs of man to history and geography. (e.g. How did man solve his need for clothing in 16th Century Japan?)

- Anthropology
- Sociology
- Psychology
- Moral Philosophy
- Aesthetics and Art History
- Comparative Religion
- Comparative Civilization

Man and the resolution of his needs should begin with the first man on earth.

References which influenced Maria Montessori:

- Eduard Sequin
- Alfred Adler
- Carl Jung
- Jean Itard
- Carrel, (Man Unknown)
- Ross, (Groundwork of Educational Psychology)
- Ruth Benedict (Patterns of Culture)
- Coghill (Anatomy and Problems of Behavior)
- Ovide DeCroly (Theory of Education)

LANGUAGE

The evolution of language in the child begins with the infants capacity for absorbing language. The Montessori elementary language program includes a strict presentation of English grammar based on the child's acquisition of grammar. The child's acquisition of grammar repeats the same pattern of acquisition as that of the history of man. Language may be studied from the humanistic point of view that it is an adaptive medium whereby the human relates to his group. Every human throughout the world acquires language in the same way.

Subjects of Study:

- Comparative Linguistics
- History of Language (first man to present)
- Basic Grammar
- Foreign Language

MATHEMATICS AND GEOMETRY

In Mathematics the child proceeds from an understanding of basic operations of the decimal system to calcaultions with whole and decimal numbers, concepts of divisibility, fractions, ratios, proportions, square and cube roots. Increasingly abstract work leads to algebra.

Geometry includes Euclidian nomenclature, as well as concepts of congruency, similarity and equivalence which are learned in relation to the calculation of the surface area of plane figures. From the concept of surface area we proceed to explore volume.

A survey of the above concepts should be conducted by the prospective teacher keeping in mind the creative function of mathematics, in relation to the development of the child's mind (Bruner, Piaget, Montessori). The human function of mathematics can be best understood by experiencing the origin of mathematics and its evolution through the history of man. The role of Geometry in the history of human culture as well as in the development of the child can be derived from the understanding of the original use of Geometry "to measure the earth". The perception of geometrical forms in both nature and man-made objects leads to the understanding of geometry as a natural mechanism of the mind. (e.g. the golden section in Greek Architecture). Primary readings of some thinkers who influenced Montessori in this area are:

Pascal
Poincare
Descartes

PEDAGOGY

Montessori's theory of education should be studied only after the aforementioned disciplines have been experienced. The propective teacher will then be able to see the relationship between the Montessori approach and a biological, geological point of view. The evolution of human existence and of the child is linked to the material processes of the universe. The potential of the child is defined by his physical and psychological role on the earth. Intelligence is not a fixed phenomenon, but an overchanging force which shapes the child's view of himself in relation to his environment. Studies recommended are:

A history of epistemology (limits and methods of human knowledge) with readings in Aristotle, Plato, British Empiricists, Kant, Piaget, Bruner, Dewey, Skinner, etc.

Some thinkers who influenced Montessori in pedagogical theory:

Froebal, Dewey, William James, Herbart, Itard, Seguin.

* Sources influencing Montessori's thought have been derived from her footnotes. The references are by no means definitive.

MATHEMATICS

DECURION AND CENTURION DIVISION

from

D. Alan Temple

Decurion division is two digit division—that is, with a two digit divisor. The story goes that in the old Roman army a "decurion" was a leader of ten men, thus the blue skittle (or the child with the blue ribbon with the golden beads) is a decurion. He represents ten men. Centurion division is division with a three digit divisor, the word coming from a leader of one hundred men.

I have adapted these terms and concepts to multiplication as well. It seemed to me that the explanation of a decurion or ten's man at the time of division was confusing to the child. The explanation itself implied multiplication, "I give him ten times as much." I, therefore, introduce the concept and the ribbons with multiplication with the golden beads. Generally I say that we want to multiply a number by the number of children in the class. Because of the limits of beads, trays, etc. I suggest we appoint one child to represent ten, then I tell the story of the decurion. I bring out the ribbons (which I have made large enough to wear as a necklace). Each child then gets his number, but the decurion must get enough for all ten. They are summed and the answer is found. When I get to division, the children already understand the concept and they proceed almost on their own.

I follow the same procedure with the stamp game. I introduce the skittles with multiplication. For example, if I have a number taken 42 times, the child places out four blue skittles and two green skittles. With each of the green skittles the child forms the multiplicand. With each of the blue skittles the child forms ten times the multiplicand. The result is pushed together and counted up just as a dynamic subtraction problem.

I have seen a great interest by the children in all the operations of the stamp game, more so than predicted at Bergamo. I have made a series of color coded booklets for each operation (and for static and dynamic within each operation) which I have duplicated and stapled. (This could be a hardy job for parents.) The children begin with the first in the series and work until the end, or until they have done enough (if I feel they understand). The result has been a great deal of work with the stamp game, even in multiplication and division.

STORY PROBLEM SOURCES

from

D. Alan Temple

The Sullivan Math Program has a series of workbooks designed for the differen operations for each grade level. They also have separate workbooks for written problems and story problems. I believe they call them word problems. This seems to be a good source of problems isolated for just what you want—also a good resourc for typing them over for yourself.

Random House publishes a workbook called *You + Math = Fun*. It is a book entirely composed of story problems written and illustrated by elementary children.

MATH CONCEPTS FOR GRADE ONE IN A TRADITIONAL SCHOOL

Numbers and Numerals 0 - 9
Counting and Order 0 - 9
Numberline — Order
Concept of addition
Combinations through 5 — Horizontal
Combinations through 5 — Vertical
Finding missing addends
Concept of subtraction
Subtraction through 9 — Horizontal
Subtraction through 9 — Vertical
Finding missing subtrahend
Finding missing minuend
Inequalities
Place Value
Counting through 99
Reasoning and Deduction
Coins — dimes, nickels and pennies
Time — hour and half hour
Commutative principle of addition
Associative principle of addition
Measurement
Skip Counting
Fractions — 1/2, 1/3, 1/4
Sums and Differences through 19

Any need to comment on the above?

* * * * * * * *

Due to overprogramming, I have not been able to complete the list of exercises, materials and sources for Math. I plan to have it ready it ready for the next issue.

Jean K. Miller

PROPOSED PLATFORM FOR CHILDREN'S LIBERATION
(To be studied, discussed—but most importantly--practiced by the overgrown children of our world, the adults.)

WHEREAS, I, THE CHILD, desire to be a model for what true liberation can mean; now, therefore be it

RESOLVED BY THE CITIZENS OF EARTH, That when word of my coming has spread, let there be joy in the hearts of my mother and father; and be it

RESOLVED, That during my development in my mother's womb, let it be known that since the external world affects me even then, let my physicoembryonic (prenatal) life be respected by my mother and father through their physical, mental and spiritual preparation for my birth; and be it

RESOLVED, That during my birth all possible aid be given to support Nature in its release of a new creation; and be it

RESOLVED, That I need warmth, fondling and love as soon as my entry is accomplished, as well as acceptance of me as an individual, regardless of my sex and other attributes; and be it

RESOLVED, That intelligent, loving observation and care in a transitional environment be given to me during the first precious hours of my life; and be it

RESOLVED, That during the next months flowing into the first two years, my psychoembryonic (unconsciousness) life be respected because now that I am entirely dependent upon my parents and the environment for my experiences (favorable or unfavorable) at this time—a time when adults can provide the greatest help or become the greatest obstacles to my progress. Let there be much sun, grass, sand, water and other things of Nature, as well as the freedom to explore, within my experience; and be it

RESOLVED, That during the next three years (ages 3-6), an environment be prepared which will allow me to sort out reality through positive conscious experience so that I can construct my total personality including control of my body, sensory discernment, imagination, intelligence and my attitudes toward the world around me. Know that to do this I need purposeful activity; and be it

RESOLVED, That when I am between ages 6-12, I need an environment where my imagination will be ignited by activities which will help me integrate myself and develop a perspective as expansive and as organized as the universe. Let me discover self esteem and my place in the universe; and be it

RESOLVED, That when I am between ages 12-18, my environment needs to provide me with experiences which build up my social personality, preferably close to Nature and with opportunity to develop economic responsibility, as well as to help me to reintegrate myself through continued work with my hands in preparation for the tasks of the future; and be it

RESOLVED, That if there are unavoidable difficulties during any period of my development that you realize it is increasingly hard for me to compensate because of the passing of the depths of intensity that I experienced during earlier periods which were meant to help me to form myself to my fullest potential; and be it

RESOLVED, That if you do attempt to cooperate with Nature in my development, my gift to you will be your own liberation and the basis for a cohesive society.

* * * * * * *

I deeply implore that you pass this resolution—I, THE CHILD, cannot!

-Beth Haggerty, Education Director, Gateway Montessori Schools, San Francisco, 3/73

THE ORGANIC, DYNAMIC BASIS OF THE MONTESSORI PREPARED ENVIRONMENT

The Montessori prepared environment is usually difficult for the adult to understand. Dr. Montessori did not set out to teach or to develop a teaching method. From the outer behavior of children she sought to understand what guided their psychic structuring and what could be done to help the process. After careful observation of children, Dr. Montessori discovered periods of "intense interest" in the child and offered appropriate "keys" within the environment to be an aid to growth.

Each Montessori directress has great faith in the natural learning ability of each child, is well trained to observe the needs of the child and to offer the appropriate "keys" so that gradually each child experiences the dawning phenomenon of concentration that is as delicate as a bud just about to open. In Montessori's own words:

> "The child who concentrates is happy within himself, unconscious of his neighbors and of his surrounding. For an instant his spirit is like the spirit of the hermit in the desert, and there is born in him a new consciousness, the consciousness of his own individuality. When the concentration passes, he seems to become aware, as if for the first time, of the world which surrounds him, with unlimited scope for further discoveries; aware also of his companions in whom he shows loving interest."

Such is the remarkable phenomenon Dr. Montessori describes as "normalization."

The Montessori directress is deeply concerned with witnessing this experience in each child, whether it occurs through the young child sorting various grains or with the older child where it may be based on his "clicking into" the awareness of himself and his responsibilities as he relates to his place in the universe. Then the Montessori directress can feel content that the child, whatever his developmental level, has begun the path of dynamic growth toward an integrated personality able to cope both with himself and the global community, the universe.

This, of course, occurs differently with each child. As adults, we need not be fearful of whether our child is going "to succeed," if we begin to understand this process.

We hope this introductory explanation reveals why the Montessori directress is not anxious about offering the greatest number of experiences in the shortest amount of time to a child, but is selective in choosing those "key" experiences which can be the turning point within those periods of "intense interest" toward the child's discovery of learning as a joyful experience.

Beth Haggerty, Education Director/Gateway Montessori Schools/San Francisco

ADDITIONAL ANIMAL GROUPS

from

Pauline Harter

NOTE: Pauline, a native of New Zealand, is currently taking the AMI Children's House course from Mr. Joosten in India.

a bale of turtles
a chain of finches
a clattering of coughs
a convocation of eagles
a crash of rhinoceri
a deceit of lapwings
a hover of trout
a knot of toads
a mustering of stalks
a spulk of foxes
a trip of wildfowl
an unkindness of ravens
a walk of snipes
a watch of nightingales
a wedge of swans

NOTE: An extensive list of animal groups were published in the *NEWSLETTERS* last year. All three 1972-73 *NEWSLETTERS* are still available, at $5.00 for the set of three.

SUMMARY CHART IN ANIMAL CLASSIFICATION

Animal	Length of lifetime	Length of dependency	What parents do for survival of young during dependency	Number that survive to reproduce	Number of offspring in female lifetime

A DEFINITION OF ART

by

Anthony Burgess

From the *NEW YORK TIMES* Magazine Section, July 1, 1973

It is the purpose of all art to shock—that is, to impel the viewer, reader or auditor to see with new eyes what he has previously taken for granted, to recognize certain patterns or relationships in life that were formerly hidden or insufficiently apparent. Art that merely soothes is not art at all; it may even be thought of as anti-art. The Muzak that twangs and buzzes in public buildings and restaurants and on aircraft uses the materials of art for what is literally an anesthetic purpose: More, it is an intrusion on the privacy of the sense and mind, and I would have no hesitation about outlawing it. Anti-art dulls awareness; art enhances it.

SPECIAL NOTE ON ERDKINDER

Bob Detmer writes:

> "Our Erdkinder study group is once again active. I would like to invite any or all elementary Montessorians to read *ERDKINDER* and respond to us regarding how they envision an *ideal* Erdkinder functioning in the United States. After we get some feedback, we will be most pleased to keep the *ELEMENTARY NEWSLETTER* informed regarding its development. We would like the fresh feedback first, so the initial viewpoints and comments will not be influenced by what we have already accomplished. Many of the program and political hurdles have already been crossed and we are now seeking a site. Funding of the initial program is our biggest problem, and we hope that this will soon be solved also. Obviously, we welcome the participation of as many Montessorians as possible."

Send your comments to:

Robert W. Detmer, Director
The Montessori Educational Research Center
Box 203
Redmond, Washington 98052

If you do not have a copy of *ERDKINDER*, it has been reprinted as part of the new Shocken book, from *CHILDHOOD TO ADOLESCENCE*, by Maria Montessori.

CONTRIBUTIONS WANTED

Information on the following has been requested by *Newsletter* subscribers:

1. List of basic rules of behavior in various classrooms.
2. Helpful class management ideas (especially nitty-gritty).
3. A list of those people who were trained by Maria Montessori or worked directly with her.
4. Source for clear plastic boxes—sizes for language cards.
5. The role of the teacher in regard to his/her movement in the elementary classroom—as opposed to remaining at one's desk and speaking loudly.
6. Information on pictures and definitions for geography nomenclature.
7. Sources for basic cultural materials, especially pictures for the classification chart and history cards.

Vol. III, No. 3

THE PREPARATORY ENVIRONMENT

Herewith we present an exposition of the theory of the Preparatory Environment written by Ravi Romano for this issue. We believe that this "transitional" room is a crucial aspect of our goals for a truly superlative school, and we want all our parents to have a better grasp of what the purpose of that room is.

The Montessori Community School of Scituate provides a uniques service to children newly entering a Montessori environment between the ages of two and a half and three years. This special place is a small room called the Preparatory Environment.

The regular classroom is called the Children's House Living Room. There twenty to thirty children may be working individually and independently with scientifically determinded, colorful, interesting materials. The difficulty arises when a new child arrives. Is he expected to move into the Living Room and its plethora of displayed materials with control, to know their use and the way to respect them (and thereby respect himself),to respect the other children he will find in concentrated activity, to recognize the social order which at once supports and stimulates the spontaneous discipline all around him? To expect this from a $2\frac{1}{2}$-year-old child is unjust. Typically, he will be lost and the teacher may easily become a negative figure, a deterrent -- having to say "don't touch" rather than the active, positive, and loving catalyst between the child and the materials and elements of the environment.

Then how do we help the new child?
We do it with the Preparatory Environment. Here the child is offered the place and the time he needs to develop inner discipline--to learn to be actively independent in the midst of many other children.

The Preparatory Environment is a secure small and intimate room gaily decorated with plants and objects of art.

At first, there are simple, familiar activities which need no presentation from the teacher: bead stringing, puzzles with knobs, the sorting of different objects into separate vessels, etc. The teacher tells stories, sings songs, and engages the children in group activities such as walking on a line, tiptoeing between mats laid on the floor, and other such activities that stimulate and challenge the young child to begin to master and then refine his movements.

Over a period of from one to four months, depending on the individual, the child is exposed to increasingly challenging activities of the kind he will later find in the Living Room. Activities are offered which by their very nature attract the child: mastering elementary movements -- picking up, putting down, rolling, unrolling, carrying, holding, walking, sitting, getting up, etc.; caring for the environment -- dusting, sweeping, polishing, washing, laundering, etc.; caring for self -- combing, washing, dressing, etc.; social behavior -- greeting, departing, sneezing, coughing, excusing self, asking for help, offering, receiving, etc. These activities of practical life answer an inner need of the child to do the tasks he has observed around his home during his first years of life. They provide the motor and mental movements which serve his needs for development. Children express this need daily as they ask to help their parents in the kitchen, workshop, and garden.

The Preparatory Environment is separated from the Living Room by only a door. When the child has achieved a certain level of self-control and self-direction, he is offered the opportunity to pass through whenever he pleases. In the living room he finds the same materials he has become familiar with in the Preparatory Environment and much more. Here he can choose work and securely carry it out without having to depend on the adult or the other children. Thus he enters from a position of strength rather than weakness. Now he has spontaneously become a part of the social order rather than being compelled to adjust.

The introduction has been unhurried enough for the child to begin a process which will bring him ever closer to his own developing needs. It is upon these needs that the House of Children is established and continues to develop.

1780 1796 1800

PRESIDENTIAL TERMS

GEORGE WASHINGTON 1789-97 JOHN ADAMS 1797-1801 THOMAS

PRESIDENTIAL ELECTIONS

YEAR—WINNER	1789—George Washington	1792—George Washington	1796—John Adams	1800—Thomas Jefferson
PARTY		Federalist	Federalist	Democrat-Republican
VICE-PRESIDENT	John Adams	John Adams	Thomas Jefferson	Aaron Burr
DEFEATED CANDIDATE			Thomas Jefferson	Aaron Burr
POPULAR VOTE (Winner / Loser)	Records incomplete	Records incomplete	Records incomplete	Records incomplete
ELECTORAL VOTE (Winner / Loser)	69	132	71 68	73 73
NOTES	Washington chosen unanimously; no political parties until 1792	Both parties supported Washington; split on choice of vice-president. Dem-Reps. supported George Clinton	Until 1804 electors voted for 2 candidates; the one receiving majority of votes was elected president; next highest, vice-president	Tie threw election into House of Representatives; Jefferson won on 36th ballot

BOOMS AND DEPRESSIONS

Foreign tr

WARS AND THE UNITED STATES

American Revolution, 1775-1783

French and English War, 1778-1783

Spanish and English War, 1779-1783

1789-1815

French Revolution;

French Wars against England, Holland, Austria, Prussia; Napoleonic Wars

Tripolitan War, 1801-1805

AFFAIRS OF STATE

1786 Shays' Rebellion

1787 Constitutional Convention

1787 Northwest Ordinance

Bill of Rights 1791

1791 First Bank of U. S. established

1792 Alexander Hamilton, Sec. of Treasury

1794 Whisky Rebellion

1794 Jay Treaty

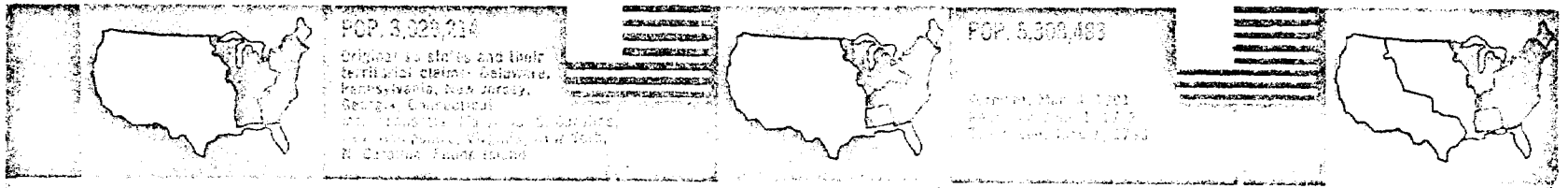
1795 Washington's Farewell Address

1798 Alien and Sedition Acts

1798 11th Amendment (limitation of judicial power)

1801 John Marshall, Chief Justice (est

THE FLAG AND THE GROWTH OF THE UNITED STATES AND ITS PEOPLE



IMPORTANT EVENTS INVENTIONS TRANSPORTATION COMMUNICATIONS

First circus came to U. S.

First complete English Bible printed in U. S.

Anthracite coal discovered in Pa.

U. S. Military Academy established at West

Samuel Slater built first spinning machinery in U. S.

Eli Whitney's cotton gin

Lancaster Turnpike—first paved U. S. road

First balloon flight in U. S.

Robert Fulton's steamboat, Clermont, made N. Y.-Albany

First successful daily newspaper (Pa.)

First U. S. Post Office (N. Y. C.)

1810 1820 1830

1804—Thomas Jefferson	1808—James Madison	1812—James Madison	1816—James Monroe	1820—James Monroe	1824—John Q. Adams	1828—Andrew Jackson
Democrat-Republican	Democrat-Republican	Democrat-Republican	Democrat-Republican	Democrat-Republican	(no distinct party affiliation)	Democratic
George Clinton	George Clinton	Elbridge Gerry	Daniel D. Tompkins	Daniel D. Tompkins	John C. Calhoun	John C. Calhoun
Charles C. Pinckney	Charles C. Pinckney	DeWitt Clinton	Rufus King	John Q. Adams	Andrew Jackson	John Q. Adams
Records incomplete	Records incomplete	Records incomplete	Records incomplete	Records incomplete	108,740 ! 153,544 :	647,286 ! 508,064 :
162 14	122 47	128 89	183 34	231 1	84 99	178 83
Electors now voted separately for president and vice-president	Following Washington's precedent, Jefferson refused to run for third term. Madison continued "Virginia dynasty" in White House	Although Madison was reelected, the Federalists doubled their strength in Congress	Federalists packed Rufus King for president, had no candidate for vice-president	Monroe almost unopposed. One vote cast for John Q. Adams to prevent Monroe from winning unanimously, as Washington had	No presidential candidate of the 4 who ran for office won majority of electoral votes; House of Representatives chose Adams	This election marked actual start of "Democratic Party"

ade expansion War of 1812 and post-war boom Period of adjustment

1823 Start of "Era of Good Feeling"

War of 1812

ablished right of Court to pass on constitutionality of laws)

Embargo Act on American shipping

12th Amendment (separate election of president and vice-president)

Lewis and Clark expedition

Missouri Compromise

Rush-Bagot Agreement (basis for unarmed U. S.-Canadian border)

Monroe Doctrine

Point Pike's Peak discovered

Francis Scott Key wrote "The Star-Spangled Banner"

run in 32 hours

First Mississippi River steamer constructed

Santa Fe Trail

Erie Canal connected Albany and Buffalo

First U. S. machine-made paper produced

SS Savannah - first successful steam crossing of Atlantic

1840 — 1850

WILLIAM H. HARRISON 1841 | ZACHARY TAYLOR 1849-50 | 1850-53

JACKSON 1829-37 | MARTIN VAN BUREN 1837-41 | JOHN TYLER 1841-45 | JAMES K. POLK 1845-49 | MILLARD FILLMORE | FRANKLIN PIERCE 1853-57

1832—Andrew Jackson	1836—Martin Van Buren	1840—William H. Harrison	1844—James K. Polk	1848—Zachary Taylor	1852—Franklin Pierce
Democratic	Democratic	Whig	Democratic	Whig	Democratic
Martin Van Buren	Richard M. Johnson	John Tyler	George M. Dallas	Millard Fillmore	William R. King
Henry Clay	William H. Harrison	Martin Van Buren	Henry Clay	Lewis Cass	Winfield Scott
687,502 530,189	762,678 549,000	1,275,016 1,129,102	1,337,243 1,299,062	1,360,099 1,220,544	1,601,274 1,386,580
219 49	170 73	234 60	170 105	163 127	254 42
All presidential candidates now nominated by national conventions	No vice-presidential candidate received majority of electoral votes. Johnson chosen by Senate	Tyler lost support of Cabinet and Congress, became a man without a party	Native American Party, opposing immigration, naturalization, Roman Catholicism, convened 1845. Later called Know-Nothing Party	Dissident Democrats and the newly organized Free Soil Party nominated former President Van Buren, who polled 291,263 votes	Franklin Pierce won the Democratic nomination on the 49th ballot

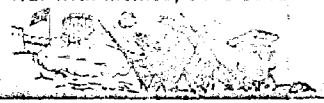
Westward expansion

Land speculation and inflation 1834-36 — Bank failures, Panic of 1837, and depression — 1849-56 Gold Rush and inflation

War for Texan Independence, 1835-1836



War with Mexico, 1846-1848

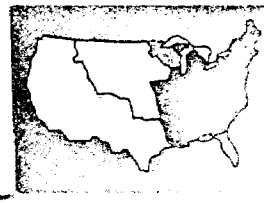


Crimean War, 1853-1856

1832 President Jackson vetoed bill to recharter Second Bank of U. S.

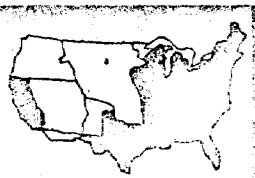
1832 Henry Clay's Compromise Tariff Bill

1842 Webster-Ashburton Treaty fixed Northeast boundary between U. S. and Canada



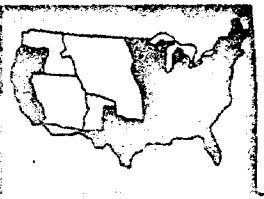
POP. 17,069,453

Arkansas, June 15, 1836
Michigan, Jan. 26, 1837



POP. 23,191,876

Florida, Mar. 3, 1845
Texas (territory), 1845
Texas, Dec. 29, 1845
Oregon territory, 1848
Utah, Sept. 28, 1850, Mexican Cession, 1848
Wisconsin, May 29, 1848
California, Sept. 9, 1850



Start of Underground Railroad for escaped slaves — Brigham Young and Mormons settled Salt Lake City — Gold discovered in California — John Brown's Raid at Harpers Ferry

Webster-Hayne Debate — Battle of the Alamo — U. S. Naval Academy opened at Annapolis — Woman's Rights Convention — "Uncle Tom's Cabin" by Harriet Beecher Stowe

McCormick reaper patented — Goodyear's vulcanization process (basis of rubber industry) — Sewing machine patented by Howe — Safety pin (Hunt) — Otis elevator

Baltimore and Ohio Railroad started — National Road completed — Converter for making steel

First steam locomotive, the "Tom Thumb" — Samuel Morse sent first telegraph message — Atlantic cable (Cyrus

Richard M. Hoe invented rotary press, forerunner of modern newspaper press — Wells, Fargo & Company organized

1860 1870 1880

JAMES BUCHANAN 1857-61 | ABRAHAM LINCOLN 1861-65 | ANDREW JOHNSON 1865-69 | ULYSSES S. GRANT 1869-77 | RUTHERFORD B. HAYES 1877-81 | JAMES A. GARFIELD 1881 | CHESTER A.

1856—James Buchanan	1860—Abraham Lincoln	1864—Abraham Lincoln	1868—Ulysses S. Grant	1872—Ulysses S. Grant	1876—Rutherford B. Hayes	1880—James A. Garfield
Democratic	Republican	Republican	Republican	Republican	Republican	Republican
John C. Breckinridge	Hannibal Hamlin	Andrew Johnson	Schuyler Colfax	Henry Wilson	William A. Wheeler	Chester A. Arthur
John C. Frémont	John C. Breckinridge Stephen Douglas	George B. McClellan	Horatio Seymour	Horace Greeley	Samuel J. Tilden	Winfield S. Hancock
1,838,169 1,341,264	1,866,452 2,223,110 (combined)	2,213,665 1,805,237	3,012,833 2,703,249	3,597,132 2,834,125	4,036,298 4,300,590	4,454,416 4,444,952
174 114	180 84 (combined)	212 21	214 80	286	185 184	214 155
The Republican Party, organized in 1854 to oppose extension of slavery, ran its first candidate. Whig Party disintegrated	Bolt in Democratic ranks resulted in 2 candidates. Breckinridge and Douglas ran separately; their combined vote greater than Lincoln's	Lincoln died at 7:22 A.M. on April 15, 1865. Johnson, a Democrat, had difficulties with the Republican Congress	Republicans unanimously nominated Grant on first ballot	Greeley died before Electoral College met. Democratic electors scattered their votes	Tilden won popular election, lost in Electoral College by one vote	Over 9,000,000 votes cast; less than 10,000 difference between Garfield and Hancock

Civil War and Reconstruction Period—inflation and depression

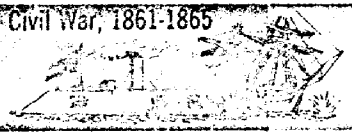
Government corruption and business speculation—industrial depression

1857 Panic, bank failures, and depression

"Black Friday" (gold market collapsed) 1869

"Greenbacks" redeemable in gold under Resumption Act 1880-83

Civil War, 1861-1865



Franco-Austrian-Sardinian War, 1859-1860

Franco-Prussian War, 1870-1871

Russo-Turkish War, 1877-1878

1854 Commodore Perry signed treaty with Japan

1854 Kansas-Nebraska Act (repealed Missouri Compromise)

1857 Dred Scott Decision

Morrill Act passed to establish "land-grant" universities 1862

1862 Homestead Act encouraged settlement of West

1863 Emancipation Proclamation

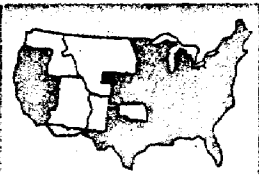
13th Amendment 1865 (prohibition of slavery)

14th Amendment (civil rights) 1868

1870 15th Amendment (Negro suffrage)

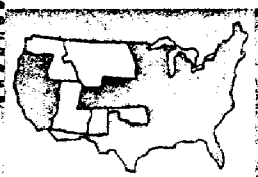
POP. 31,443,321

Gadsden Purchase, 1853
Minnesota, May 11,1858
Oregon, Feb. 14, 1859



POP. 39,818,449

Kansas, Jan. 29, 1861
W. Virginia (withdrew from Virginia), June 20, 1863
Nevada, Oct. 31, 1864
Alaska Purchase, 1867
Nebraska, Mar. 1, 1867



POP. 50,155,783

Colorado, Aug. 1, 1876

Susan B. Anthony organized National Woman Suffrage Association

Oil struck in Titusville, Pa.

Sherman's "March to the Sea"

Start of Ku Klux Klan

Patent on condensed milk

Lowe's ice-making machine

First transcontinental railway (Union Pacific and Central Pacific joined at Promontory, Utah)

Field)

Invention of air brake for passenger trains (George Westinghouse)

First Pony Express

Stanley reached Livingstone in Africa

Custer's Last Stand

Clara Barton

Chicago fire

End of Tweed Ring in N. Y. C.

John D. Rockefeller organized

W.C.T.U. founded

Barbed wire introduced

Edison's incandescent bulb

Nevada silver rush

Edison's phonograph

Brooklyn Bridge completed

Commercial typewriter put on market

Halftone process of photoengraving

Alexander Graham Bell's telephone

Emile Berliner invented microphone

1890 1900

1881-85 ARTHUR | GROVER CLEVELAND 1885-89 | BENJAMIN HARRISON 1889-93 | GROVER CLEVELAND 1893-97 | WILLIAM McKINLEY 1897-1901 | THEODORE ROOSEVELT 1901-09

1884—Grover Cleveland	1888—Benjamin Harrison	1892—Grover Cleveland	1896—William McKinley	1900—William McKinley	1904—Theodore Roosevelt
Democratic	Republican	Democratic	Republican	Republican	Republican
Thomas A. Hendricks	Levi P. Morton	Adlai E. Stevenson	Garret A. Hobart	Theodore Roosevelt	Charles W. Fairbanks
James G. Blaine	Grover Cleveland	Benjamin Harrison	William J. Bryan	William J. Bryan	Alton B. Parker
4,874,986 4,851,981	5,439,853 5,540,309	5,556,918 5,176,108	7,104,779 6,502,925	7,207,923 6,358,133	7,623,486 5,077,911
219 182	233 168	277 145	271 176	292 155	336 140
One of dirtiest campaigns in history, Republicans cried, "Rum, Romanism, and Rebellion." Democrats stressed corruption	Cleveland won popular election, lost electoral vote	Vice-president Stevenson was grandfather of 1952 Democratic presidential candidate	Campaign issue: gold vs. silver. Bryan, "The Boy Orator of the Platte" made more than 600 speeches	McKinley assassinated September 6, 1901	Roosevelt nominated unanimously on first Republican ballot

Railroad expansion — Corporation growth and industrial expansion

1884 Depression — Fall in price of silver and financial panic 1893 — 1896 "Free coinage of silver" issue — 1907 Inflation and panic

Spanish-American War, 1898 — Philippine insurrection, 1899-1902

Sino-Japanese War, 1894-1895



Boer War, 1899-1902

Russo-Japanese War, 1904-1905

1883 Civil Service Commission formed

1887 Interstate Commerce Act

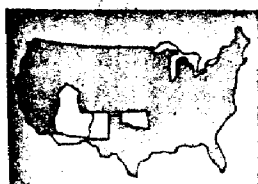
1890 Sherman Anti-Trust Act

1890 McKinley Tariff

1899 Start of "Open Door" policy toward China

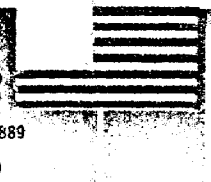
1900 Gold Standard Act

1906 Pure Food and Drug Act



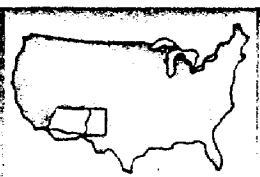
POP. 62,947,714

N. Dakota, Nov. 2, 1889
S. Dakota, Nov. 2, 1889
Montana, Nov. 8, 1889
Washington, Nov. 11, 1889
Idaho, July 3, 1890
Wyoming, July 10, 1890



POP. 75,994,575

Utah, Jan. 4, 1896
Hawaii, 1898
Puerto Rico, 1899
(Commonwealth, 1952)
Guam, 1899
Philippine Islands, 1899 (Independence, 1946)
American Samoa, 1900



POP. 91,972,266

Panama Canal Zone, 1904
Oklahoma, Nov. 16, 1907

founded American Red Cross — Start of A. F. of L. — Johnstown, Pa., Flood — Walter Reed showed cause of yellow fever — San Francisco earthquake

Standard Oil Trust — Statue of Liberty — Blizzard of '88 — Klondike gold rush — Galveston hurricane and tidal wave — Industrial Workers of the World

Electric welding machine — Burroughs' adding machine — First authorized voting machine — Motor-driven vacuum cleaner — "Bakelite," basis of plastic industry, Baekeland

First practical aluminum process — Eastman Kodak — Gasoline automobile (Duryea Brothers) — Subway (Boston) — Wright brothers first flight at Kitty Hawk, N. C. — Model T Ford

Mergenthaler linotype machine — First comic strips—Buster Brown, The Yellow Kid — "The Great Train Robbery", first motion picture with a plot — Lee De Forest's audion

Waterman's fountain pen — Invention of teletypewriter — Pacific cable

1910 — 1920 — 1930

WILLIAM H. TAFT 1909-13 | WOODROW WILSON 1913-21 | WARREN G. HARDING 1921-23 | CALVIN COOLIDGE 1923-29 | HERBERT HOOVER 1929-33

1908—William H. Taft	1912—Woodrow Wilson	1916—Woodrow Wilson	1920—Warren G. Harding	1924—Calvin Coolidge	1928—Herbert Hoover	1932—Franklin D. Roosevelt
Republican	Democratic	Democratic	Republican	Republican	Republican	Democratic
James S. Sherman	Thomas R. Marshall	Thomas R. Marshall	Calvin Coolidge	Charles G. Dawes	Charles Curtis	John N. Garner
William J. Bryan	Theodore Roosevelt	Charles E. Hughes	James M. Cox	John W. Davis	Alfred E. Smith	Herbert Hoover
7,678,908 6,409,104	6,293,454 4,119,538	9,129,606 8,538,221	16,152,200 9,147,353	15,725,016 8,386,503	21,391,381 15,016,443	22,821,857 15,761,841
321 162	435 88	277 254	404 127	382 136	444 87	472 59
Bryan's third and final campaign	Roosevelt, on Progressive ticket, polled more than the Republican candidate. Taft received 3,484,980 popular votes, only 8 electoral votes	Presidency conceded to Hughes on election night; California returns next day put Wilson in office	Socialist Eugene Debs polled over 900,000 votes although in jail throughout the campaign for violating the Espionage Act	Davis nominated by Democrats after 103 ballots. Robert La Follette, running on Progressive ticket, polled 4,822,856 votes	Five southern states crossed party lines and voted for Republican Hoover	Roosevelt flew to Chicago to accept nomination, breaking tradition that nominee await formal notification of election

World War I prosperity

Period of "Normalcy" and stock market boom, ending October 24, 1929

1924 Aftermath of the war

Occupation of Vera Cruz, 1914

General Pershing's punitive expedition into Mexico, 1916-1917

Italo-Turkish War, 1911-1912 — First World War, 1914-1918

Balkan Wars, 1912-1913 — Russian Revolution, 1917

First World War, 1917-1918



Japanese Occupation of Manchuria, 1931

1913 16th (income tax) and 17th (popular election of senators) Amendments

1913 Federal Reserve Banking Act

1914 Federal Trade Commission Act

National Park Service established 1916

1920 18th Amendment (prohibition)

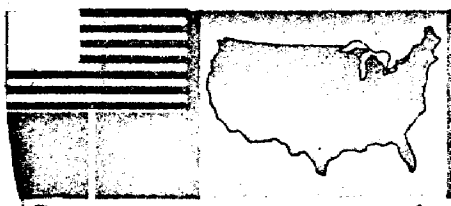
1920 19th Amendment (women granted the vote)

Kellogg-Briand Pact to 1928 outlaw war — National Recovery Act 1933

Hoover moratorium on war debts 1931

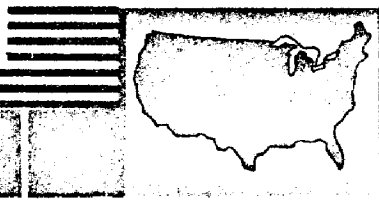
Reconstruction Finance Corporation 1932

20th Amendment ("lame-duck") 1933

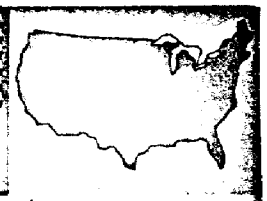


POP. 105,710,620

New Mexico, Jan. 6, 1912
Arizona, Feb. 14, 1912
Virgin Islands, 1917



POP. 122,775,046



Robert E. Peary reached North Pole — Panama Canal completed — Teapot Dome oil scandal — Lindbergh's nonstop flight to Paris — War Veterans' March on

(I.W.W.) organized — Titanic disaster — Lusitania sunk — Sacco-Vanzetti case — Scopes Trial — Byrd flew over South Pole — Boulder Dam

Gyrocompass (Sperry) — Petroleum cracking process - start of modern gasoline production

First transcontinental flight

First regular commercial flights

Amplifier (basis of modern radio) — First commercial radio station, KDKA — First transatlantic radio communication (N. Y. and London) — Federal Communications

D. W. Griffith's "The Birth of a Nation" — first movie "extravaganza" — "The Jazz Singer" ended age of silent movies — First all-talking movie, "Lights of New York"

DWIGHT D. EISENHOWER 1953-1961

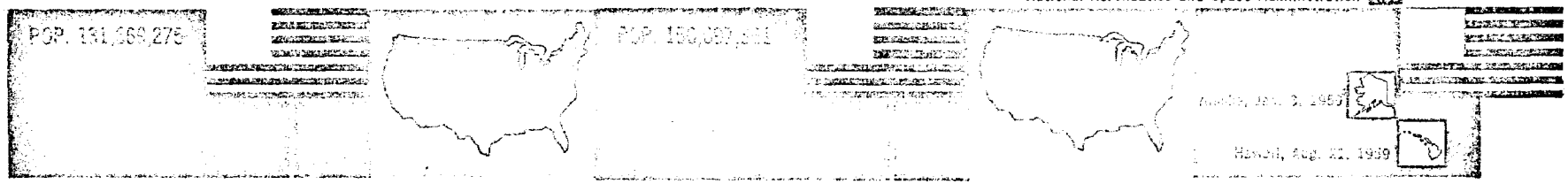
1936—Franklin D. Roosevelt	1940—Franklin D. Roosevelt	1944—Franklin D. Roosevelt	1948—Harry S. Truman	1952—Dwight D. Eisenhower	1956—Dwight D. Eisenhower
Democratic	Democratic	Democratic	Democratic	Republican	Republican
John N. Garner	Henry A. Wallace	Harry S. Truman	Alben W. Barkley	Richard M. Nixon	Richard M. Nixon
Alfred M. Landon	Wendell L. Willkie	Thomas E. Dewey	Thomas E. Dewey	Adlai E. Stevenson	Adlai E. Stevenson
27,751,597 16,679,583	27,244,160 22,305,198	25,602,504 22,006,285	24,105,695 21,969,170	33,824,351 27,314,987	35,590,472 26,029,752
523 8	449 82	432 99	303 189	442 89	457 74
The Democrats scored the greatest electoral majority of any party since 1820, carrying all states except Maine and Vermont	The Republicans nominated Willkie, a nonpolitical "dark horse," stressed no-third-term tradition	F. D. R. died April 12, 1945	J. Strom Thurmond, States' Rights Democrat, polled 1,169,021 votes in the South; Henry Wallace, Progressive Party, received 1,156,103	Several southern states had 2 delegations at G.O.P. convention one for Taft, one for Eisenhower. Eisenhower delegates were seated	Eisenhower polled more popular votes than any candidate in U. S. history. First time since 1848, winner's party lost Congress.

Decade of The Great Depression

World War II and postwar prosperity

Spanish Civil War, 1936-1939
Italo-Ethiopian War, 1935-1936
Outbreak of "The China Incident", 1937
Second World War, 1939-1945
Chinese Civil War, 1946-1950
UN in Korea, 1950-1953 Armistice
Suez Crisis, 1956
UN Emergency Force created

1935 National Labor Relations Act
1933 Repeal of 18th Amendment (prohibition)
1934 Securities and Exchange Commission
1935 Social Security Act
1941 Atlantic Charter
San Francisco Conference (U.N.) 1945
1945 Yalta Conference
1946 Atomic Energy Commission
1947 Taft-Hartley Act
1948 Marshall Plan
1949 Unification of U. S. Armed Forces
1949 NATO
1951 22nd Amendment (to limit presidential term)
1953 U. S. Department of Health, Education, and Welfare
1954 Desegregation decision of Supreme Court
National Aeronautics and Space Administration 1958



Washington
Start of C.I.O.
Pearl Harbor
U.N. Building (N. Y. C.)
U. S. Air Force Academy established, Colorado Springs
Du Pont nylon
First atomic explosion, Alamogordo, N. M.
Salk polio vaccine
U.S.S. Nautilus, 1st nuclear submarine
between Europe and U. S.
Alaska Highway
Air Force Superfortress made first nonstop round-the-world flight
Sputnik, 1st man-made satellite
Commission
FM radio
TV broadcasts to public started
International Geophysical Year
Atomic Power Station for peaceful, commercial uses, at Shippingport, Pa.
First intercity TV broadcast
First transcontinental TV broadcast by coaxial cable
St. Lawrence Seaway

CLASSIFIED CHARTS FOR THE ANIMAL KINGDOM: From Siv and Don Jenney

CHART I: SUB-KINGDOM OF INVERTEBRATES

No.	Name	Definition	Picture
1. (K)	Animals	Any living being that: nourishes on substances already transformed by plants, can move itself and re-act in different ways according to circumstances, (definiton card should be placed so that half is on both charts.)	Composite picture of invertebrates on Chart I continued on Chart II with composite of vertebrates
(SK)	INVERTEBRATES	Any animal without a vertebral column.	
2. (P)	PROTOZOA	The first animals to be on earth. Formed by only one cell. Some are like both plants and animals.	Amoeba 284
3. (P)	PORIFERA	The most primitive animals with more than one cell. Like sacks but with sides full of holes, pores.	Sponge 283
4. (P)	COELENTERATA	Very simple animals but the first group to have a digestive tract. Have tentacles which can sting badly.	Jelly-fish 284
5. (P)	ANNELIDA	Have long bodies that seem to be made up of rings. Some have little bristle feet for movement.	Earth Worm 283
6. (P)	ARTHROPODA	Body divided into three parts. Many pairs of jointed limbs. Have hard shell which is shed.	Ant 15
7. (P)	MOLLUSCA	Have a soft body protected by a mantle. Usually have a shell. Can be without a head.	Snail 285

(P) = Phylum (K) = Kingdom (SK) = Sub-kingdom

No.	Name	Definition	Picture
8. (P)	ECHINODERMATA	Have external skeleton with spines. Usually have five arms. Spaces between arms may be filled in.	Star-fish 283
9. (C)	MYRIAPONDA	Have head and long segmented body with many legs.	Millipedes
10. (C)	ARACHNIDA	Have eight legs. Often have poison gland. Feed by biting or sucking.	Spider 35
11. (C)	CRUSTACEA	Have hard, thin shell. Antennae and many legs. Some have large strong pincers.	Cray-Fish 8
12. (C)	INSECTA	Body divided into three parts. Have six legs. A pair of antennae. Most have two or four wings.	Grass-Hopper 15
13. (O)	HEMIPTERA	True "Bugs". Have a beak for sucking plant juice or animal blood. Four wings.	Bed-Bugs 36
14. (O)	ORTHOPTERA	Four wings or none at all. Have mouths for chewing. Some can "sing".	Cock-roach 36
15. (O)	ODONATA	Large insects with four thin wings with nerves. Have large eyes.	Dragon fly 35
16. (O)	DIPTERA	Have only two wings. Can sting and suck. Some spread diseases. True "flies".	Fly 15
17. (O)	LEPIDOPTERA	Have wings covered with scales. These can be very beautiful and full of colors.	Butter fly 38
18. (O)	HYMENOPTERA	Have four wings or none. Often live in large communities. Some can sting.	Bee 15

No.	Name	Definition	Picture
19. (O)	COLEOPTERA	True "beetles". Two hard front wings which cover the thin back wings like a case.	May-bug 15

PART II: SUBKINGDOM OF VERTEBRATES

1a. (P)	VERTEBRATES	Animals having a vertebral column or backbone.	Horse 39
2a. (C)	PISCES	Breathe all their lives with gills. Body usually covered with scales. Their limbs are fins.	Fish 11
3a. (C)	AMPHIBIA	Hatch in water. Develop legs and lungs. Have gills when young. Adults live on land.	Toad 166
4a. (C)	REPTILIA	Live mostly on land. Have four legs or none at all. Skin covered with scales or bony plates.	Boa constrictor 289
5a. (C)	AVES	Body covered with feathers. Warm-blooded. Front limbs are wings.	Parrot 207
6a. (C)	MAMMALIA	Have hairy bodies. Babies are fed milk from their mothers. We are in this group.	Elephant 43
7a. (O)	Anura	Amphibians with no tails as adults. Swimming and hopping animals.	Frog 166
8a. (O)	CAUDATA	Amphibians having tails. Gills in some adults. The skin is smooth and moist.	Salamander 287
9a. (O)	SERPENTES	Reptiles whose body is covered by scales. Have no limbs. Move by crawling.	Coral snake 289
10a. (O)	SAURIA	Reptiles having four limbs, each having five toes. Their eyes have eyelids.	Lizard 287

11a.	(0)	CHELONIA	Reptiles with bony or leathery shell or case. Have no teeth.	Turtle 290
12a.	(0)	CROCODILIA	Reptiles with bony shells inserted in their skin. Have four limbs. Back feet webbed.	Crocodile 288
13a.	(0)	STRUTHIONIFORMES	Birds with very strong legs adapted to running. Cannot fly.	Ostrich 211
14a.	(0)	ANSERIFORMES	Swimming birds with broad, ridged bill. Three webbed toes. Short tail.	Duck 208
15a.	(0)	CICONIIFORMES	Birds with very long legs, neck and beak. Live where there is much water.	Stork 212
16a.	(0)	GALLIFORMES	Heavy birds with short, strong beak and powerful feet. Feed on grain.	Chicken 204
17a.	(0)	COLUMBIFORMES	Moderate-sized birds with short bill and weak legs. Knob at base of beak.	Pigeon 203
18a.	(0)	PASSERIFORMES	Perching and singing birds. Generally small. Bill short. Four toes, with one reversed.	Sparrow 216
19a.	(0)	PICIFORMES	Birds with very strong beak. Feet adapted for climbing.	Wood pecker 207
20a.	(0)	FALCONIFORMES	Birds of prey with hooked bill and sharp claws. Fly well.	Eagle 202
21a.	(0)	MONOTRAMATA	Primitive mammals that lay eggs. Have beak or bill. May have webbed toes.	Platypus 41

22a.	(0)	MARSUPIALIA	Primitive mammals that nurse undeveloped young in a pouch on their bellies.	Kangaroo 41
23a.	(0)	EDENTATA	Mammals with incomplete or missing teeth. Toes have claws.	Ant-eater 5
24a.	(0)	RODENTIA	Mammals with front teeth long and sharp, which grow continuously.	Mouse 51
25a.	(0)	UNGULATA	Mammals having toes protected by hooves	Zebra 43
26a.	(0)	INSECTIVORA	Mammals with long snout. Teeth adapted for chewing insects. Clawed toes.	Mole 52
27a.	(0)	CETACEA	Large fish shaped mammals. Front limbs transformed into fins. No hind limbs.	Whale 42
28a.	(0)	PINNIPEDIA	Mammals with a fusiform body adapted to swimming. Limbs transformed into fins.	Seal 53
29a.	(0)	CARNIVORA	Mammals eating meat. The canine teeth are pointed and the molars are sharp.	Lion 54
30a.	(0)	CHIROPTERA	Mammals whose front limbs have large membranes which permit them to fly.	Bat 53
31a.	(0)	SIRENIA	Mammals with large body. Fore-legs paddle shaped, hind limbs absent. No ears.	Dugong 42
32a.	(0)	PRIMATES	Mammals with hands and feet adapted to grasping. Some walk erect.	Chimpanpanzee 165

To get all the pictures you will need for the two charts (mute and control) plus a set of pictures for animal stories, order three each of the following Tableau numbers from Series 39:

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A PYRAMID THAT SHARPENS RAZOR BLADES?

By: Alexander Ross

Eric McLuhan firmly believes that the pyramid has astonishing powers...it can dehydrate meat, arrest bacterial growth and, yes, sharpen razor blades...

Sitting on a table in Eric McLuhan's living room in London, Ontario, is a pyramid made of clear plexiglass, about 18 inches high. Inside, on a little stand in the middle, he's placed a small hunk of hamburger, about the size of a sugar cube, and a small pellet of cheddar cheese. Down in one corner of the pyramid's interior, two similar hunks of cheese and hamburger are sitting on the pyramid's base. They've been sitting there for three months now, and you can see a pronounced difference between the food on the stand and the food on the base.

"The meat on the stand - at the focal point of the pyramid's interior - is quite dry," says McLuhan, "and it looks a little frosty, as though it were glazed a tiny bit. You can easily distinguish between the lean and fat bits.

"But the hamburger in the corner? It's equally frosty looking, but it's got sort of a purplish tinge. The cheese on the stand looks fresh. The food down in the corner is obviously not fit to eat."

McLuhan, the 31-year-old son of the famous University of Toronto media philosopher, firmly believes that the pyramid in his living room has astonishing powers. By virtue of its shape alone, the angles of the plexiglass model are indentical to those of the Great Pyramid in Egypt - he believes it can dehydrate meat, arrest bacterial growth and, yes sharpen razor blades.

"You simply take a dull blue-steel razor blade," says McLuhan; "for some reason, stainless steel doesn't seem to work too well. You put it on a platform inside the pyramid, one-third of the way from the bottom, with the edges of the blade lined up on a north-south axis. After about two weeks, it should be sharp enough to shave with again. If it is, take it out and shave with it, then drop it back in again. In two days at the most, it'll be ready to use again. From there on, just keep shaving with it, and leave it in the pyramid overnight. Some people get hundreds of shaves that way."

Eric McLuhan is very definitely a chip off the old block. Some sons react against famous fathers by being as unlike them as possible. Eric McLuhan is uncannily <u>like</u> his father, the author of that famous, and typically ambiguous slogan, The Medium is the Message. Father and son are both brillant, maddening eclectics. Both devour books as though they were popcorn. Both display an intellectual self-assurance that you find either awesome or irritating. Both have the sensibilities of poets and the jargon of scientists. Both display a tendency to confuse exciting possibilities with present realities. Both father and son can excite you with a concept one moment, and the next make you suspect you're the victim of a massive put-on. <u>A pyramid that sharpens razor blades?</u> What <u>is</u> this anyway?

Implausible as it may seem, there is a lot of empirical evidence which indicates that a pyramid of the proper dimensions, perhaps because it amplifies or refracts certain forms of energy in ways we don't understand, will indeed perform the way Eric McLuhan says it does. Lots of people have tried it, and it seems to work.

John Rode, a Toronto disc jockey who runs an occult bookshop as a sideline, has been experimenting with pyramids for months, and is convinced they work. "We've been working with large ones, two-and-a-half feet tall," he says. "We're not sure what forces the pyramid amplifies, but whatever they are, they do the job. They do indeed sharpen blue-steel razor blades, althought we haven't had much luck with stainless steel. Also, I've used the pyramid to sharpen a steel knife, and we've dehydrated hundreds of eggs, and about 10 pounds of porterhouse steak. It takes about 23 days to halt the decaying process in meat. You leave it under the pyramid and it doesn't go bad. Instead, it turns a little brown and eventually dries up. We've fried the steaks and eaten them, and they're delicious.

According to Lynn Schroeder and Sheila Ostrander, two Toronto-based writers whose book, Psychic Disvoceries Behind the Iron Curtain, is a best-seller, the razor blade effect is common knowledge in Czechoslovakia, where people routinely preserve their blades in little cardboard pyramids that they keep in their bathrooms. One Czech pyramidologist, Karel Drbal, has even patented the shape of the Great Pyramid of Cheops, and cardboard models are now produced under license in the U.S. (You can buy one for $3 from Evering Associates, 43 Eglinton Avenue East, Toronto, or make one yourself; for a six-inch-high pyramid, the base must be nine and three-eights inches on all four sides, and each sloping face must be eight and seven-eights inches long, or multiples of these. See diagram page 24.)

Unfortunately, there's no firm scientific evidence that the pyramid effect really exists. Researchers like McLuhan who are experimenting with them tend to be the kind of people who want them to work. And when McLuhan had an engineering consultant photograph a razor blade through a 100-power microscope before and after three weeks inside a pyramid, no changes could be detected visually. "The test wasn't conclusive one way or the other," says the consultant, who wants to keep his name out of the mushrooming pyramid controversy. "All I know is that on that one test, we weren't able to replicate the results McLuhan obtained."

McLuhan now teaches a course in creative electronics at Fanshawe College in London, Ontario, where several of the students and faculty, experts in acoustics, are working offhours on the problem. McLuhan believes that the pyramid's shape, in some way we don't understand, can manipulate the forces of magnestism and, yes, perhaps even gravity. McLuhan is suspicious of the prevailing notion that the pyramids were simply grandiose mausoleums, or what the ancient historian Pliny called an "idle and foolish exhibition of royal wealth."

"They're not just glorified tombstones," says McLuhan, "because many of them show no evidence of burial." Instead from a study of the pyramids' changing shapes through several centuries, he believes that "the Egyptians were going through a number of development prototypes. The pyramids were the stone-age equivalent of the transistor and the semiconductor."

McLuhan got this insight last year, while teaching at the University of Wisconsin. He chanced on a picture of the famous Bent Pyramid at Dahshur, and gasped: "Hey, that's a two-frequency octahedron" - a mathematically perfect shape studied by an old family friend named Buckminster Fuller. Floor plans of other pyramids astonished a friend of his, an acoustical engineer, who saw them. "It blew his mind," says McLuhan. "The plan looked exactly like a speaker system."

Were the pyramids some kind of stone prism used for channeling and redirecting some form of energy? Although the notion is, at the very least, pretty speculative, that's what McLuhan has been playing with for the past year. First, by building models in his garage in Wisconsin, he satified himself that they really do work. Then, he brain-stormed the problem with a number of colleagues in various disciplines physics, crystallography, acoustics, archeology, ancient history - swarming up on the problem from all sides at once.

Eric McLuhan, like his father, is a passionate generalist. "The reason pyramids have remained an enigma," he says, "is the separation between the disciplines. If an archeologist knows nothing about electronics, he's not likely to see that the pyramids were tools - sophisticated pieces of technology."

Well, if they are tools, how do they work, and what did they do for the Egyptians? McLuhan has a lot of speculative comment on that point, untested but fascinating. The razor blade and dehydration effects may happen, he suspects, as a consequence of a "coherent magnetic field" inside the pyramid. It's known, for instance, that oxygen atoms behave differently inside different magnetic fields; they can affect the way they combine with, or disassociate from, atoms of other elements. A similar resonant juggling of molecular structure, only this time with iron compounds, would perhaps account for the "sharpening" or reconstitution of razor blade edges.

Other investigators have speculated that the pyramid's shape is similar to that of the structure of various crystalline compounds, including the metal edge of a razor blade, and that the twin shapes somehow set up sympathetic vibrations with each other. But these are just guesses and, to my knowledge, they've never been subjected to rigorous scientific testing.

McLuhan asked a friend at Northern Electric's laboratories in Ottawa, for instance, to attempt to grow semiconductor crystals inside a pyramid. Semiconductors, one of the basic building-blocks of miniaturized electronics are sensitive to all kinds of radiation. McLuhan hoped that a semiconductor grown in magnetically pure environment might turn out to be wondrously efficient. Unfortunately, nothing's been done about the idea. The apparatus for growing semiconductors looks like a cross between a die stamping machine and an electron microscope, and Northern Electric's scientists haven't got the time, money or inclination to build a garage-size pyramid to check it out.

Still, there's a seductive amount of evidence to suggest that something weird happens at the focal point inside a pyramid. Schroeder and Ostrander, in their book, report that in 1968, scientists at Egypt's Ein Sham University used computers and X-ray machines to record and analyze the pattern of cosmic rays reaching the interior of the Chephren Pyramid near Cairo. They were looking for hidden chambers inside the pyramid, but the results baffled them. The cosmic ray patterns inside the pyramid varied sharply from day to day. "This is scientifically impossible," the project's director, Dr. Amr Gohed, told the Times of London. Whatever was happening inside the pyramid, he said, "defies all the known laws of science and electronics."

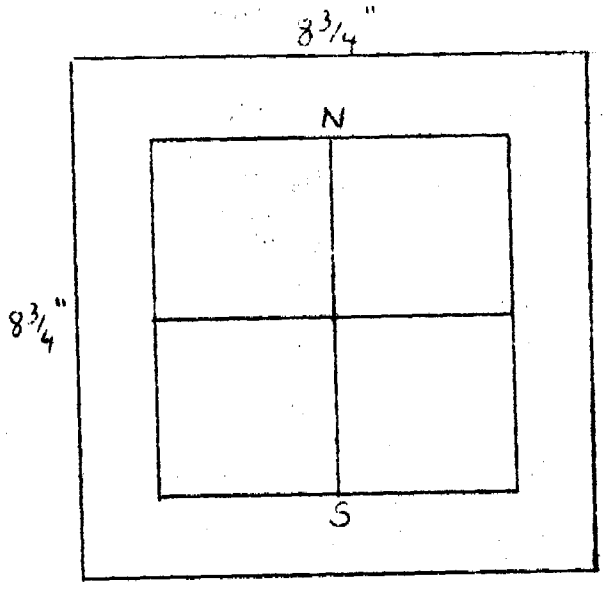
Magnetism one can begin to accept. But gravity? Yes, McLuhan suspects the two forces are related, and that the pyramids manipulated both. "How else did they get those huge stones across the desert?" he asks. "The conventional explanation is that they used rollers. But have you ever tried to pull a car out of the sand? It's almost impossible." He postulates some technology,

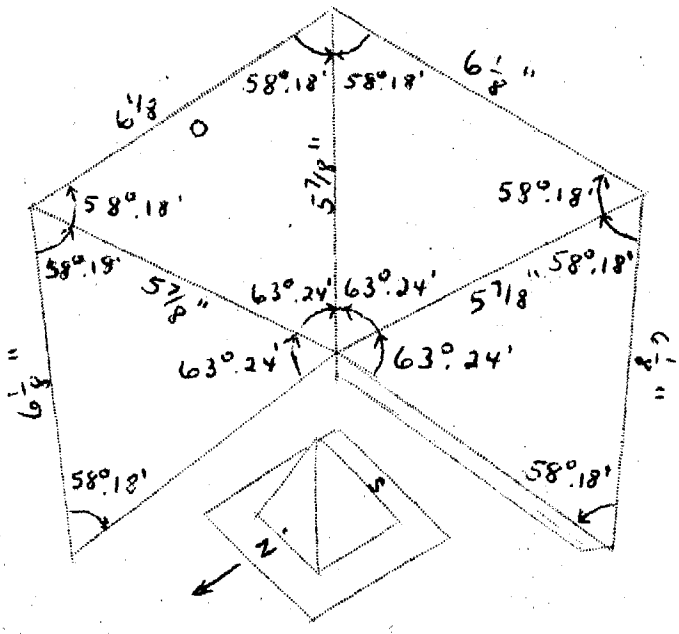
unknown to us, which could deprive an object of some of its gravitational pull, but not its mass. That way, blocks could simply be floated across the desert. Fanciful, but there are other considerations - such as the existence of one unfinished pyramid which still has ramps in place, and Egyptian paintings from a later period showing men hauling a huge stone in a sledge.

The mystery of the pyramids has fascinated scientists and philosophers for centuries. It has also intrigued a great many plain nuts. There are many cults, from the Rosicrucians to the Masonic order which deal heavily in fanciful pyramid lore. McLuhan may very well be the latest, and by far the most articulate, in a long and unscientific line of pyramid freaks.

But suppose he's on to something? Twenty years ago, his father's poetic insights about how the communications media affect our sensory balance, and thus the way a society perceives the world, were dismissed as fanciful and unscientific. Well, yes, they are; but there are very few educators or communicators today who don't acknowledge some debt to Marshall McLuhan.

Is it wholly inconceivable that the ancient Egyptians, a culture far older than ours, knew some things about technology that we don't know, but are beginning to rediscover?





THE CONSTANT CALENDAR

By Sterling Parks Jr.

We need a constant calendar instead of the present one, which changes from year to year and which causes more confusion than you may imagine. But before I tell you how my Constant Calendar works, I had better tell you why we need any calendar at all, and try to show where some of the calendar calculating trouble lies.

The earth orbits the sun in exactly 365.24219879 days. This is convertible to 365 days, 5 hours, 48 minutes, 46 seconds. These 5-plus hours are just 11 minutes, 14 seconds short of a quarter day (6 hours). They are also what louse up calendar designs.

This extraordinary exactness to the second is remarkable especially when it is considered that the earth, carrying with it a rotating and revolving moon, traverses its 585-million-mile orbit at a continually changing speed . This speed averages a little over 66,000 m.p.h. or 18½ miles a second. The earth travels fastest, about 18 3/4 m.p.s. on Jan. 2 when it is closest to the sun, 91,300,000 miles from it. This decreases to about 18¼ m.p.s. on July 2 when the earth is over 3 million miles farther away.

The earth's orbit is not a circular one. It is an ellipse. If, in defining a circle, we should refer to its center as a focus, then a circle with two focuses would be an eccentric one, out-of-round, an ellipse. The nearer these focuses are to each other, the smaller is the eccentricity of the ellipse. The earth's orbit is an ellipse of small eccentricity, with the sun at one focus, the other focus being vacant.

John Kepler (1571-1630), a German astronomer, discovered that the sun's planets have elliptical orbits. He also discovered that because of that fact, the planets' speeds in their orbits vary; and that when a planet is nearest the sun it travels faster, and conversely, it travels slower when farthest from the sun.

The varying speeds of the earth in its orbit affect the length of the seasons, as shown in this chart for the northern hemisphere, (minutes and seconds being omitted):

SPRING	begins March	21, an equinox	92 days	19 hours
SUMMER	begins June	22, a solstice	93 days	15 hours
AUTUMN	begins September	23, an equinox	89 days	20 hours
WINTER	begins December	22, a solstice	89 days	00 hours
		TOTAL	365 days	6 hours

The chart shows two equinoxes and two solstices. They pinpoint the earth's arrival times at the four certain equidistant points along the earth's orbit or path around the sun.

An equinox, "equal night," marks off the exact instant when the sun crosses the equator. These equinoctial crossings occur at the beginning of spring, March 21, and at the beginning of autumn, Sept. 23; at these equinoxes days and nights are of equal duration all over the world.

A solstice, "sun stands still," marks off the exact instant when the sun turns back toward the equator. These solstitial returns toward the equator occur at the beginning of summer, June 22, and at the beginning of winter, Dec. 22. On Dec. 22 the sun starts its 6-month trek northward. On June 22 it heads southward again. In our Northern Hemishpere the summer solstice marks the longest day of the year, while the winter solstice marks the shortest.

As we know, the sun only appears to cross the equator; or to stand still and then turn back toward the equator. These apparencies are accounted for instead by the earth's constant tilt of its axis 23½ degrees from the vertical. This tilt, of course, is inclined directly toward the sun on June 22 and directly away from the sun on Dec. 22. The amount of tilt is comparable to that of the minute hand of a clock when it's either 4 minutes before the hour or 4 minutes past. This steadfast tilt and its effect is easily visualized in the rotatable desk-size terrestrial globe commonly seen in schools, libraries and sometimes in homes.

* * *

Our Gregorian Calendar is substantially the Julian Calendar, named for Julius Caesar. In 45 B.C., after consultations with Sosigines, the Greek astronomer and mathematician, Caesar established our present calendar of 365¼ days, with its provision that four ¼ days would be absorbed by a leap year day every fourth year.

However, at that time, as now, the ¼ day or 6 hours, as explained above, was actually 11 minutes and 14 seconds less than 6 hours.

Over 1,600 years later, in the year 1582, these 11 plus minutes amounted to a total of about 10 days. This caused a gradual recession of the March 21 equinox to March 11. To remedy this, Pope Gregory XIII, after consulting with several of his men of science, eliminated those 10 days by ordering that Thursday, Oct. 4, 1582, be followed by Friday, Oct. 15. And to prevent a recurrence of the problem he ordered that three leap years in 400 years be eliminated. This was accomplished by ordering that century years should not be leap years unless they were divisible by 400. Consequently 1700, 1800, and 1900, although divisible by 4, were not leap years; but the year 2000 will be.

In passing, it may be of some interest to mention that England, which then included her American colonies, did not adopt the new style calendar until 1752, or 170 years later. George Washington was then 20 years of age, having been born on Feb. 11, 1732, of the old style, or Julian Calendar. But when he changed his birth date to Feb. 22, the 10 days of 1582 had by then become 11 days. Got it so far?

* * *

Construction of an unchanging calendar seems to depend solely on eliminating in some way the troublesome 365th day. It causes a year that same day of the week. This forces the next year to begin on a Monday, a day later, or on a Tuesday if the first year were a leap year.

Of course this 365th day could be eliminated and the year become a 364-day year (evenly divisible by 91 or 13 or 7 or 4) if the earth were to reduce the speed of its daily rotations on its axis (about 1,000 miles per hour at the equator) by about 30 hours a year (1¼ days); or if the earth would increase its speed in orbiting the sun so as to finish the course in about 30 hours less time.

The Constant Calendar, as here depicted, eliminates the 365th day, and the 366th as well, by sweeping them under the rug so to speak, in a way that helps us to activate the phrase,"out of sight, out of mind," or "if you don't see it, it isn't there."

The Constant Calendar, pictured above is based substantially on Mastrofini's calendar. In 1834, an Italian, Marco Mastrofini, in a scholarly work, proposed a 364-day calendar that would omit not only the

365th day, but the quadrennially recurring 366th as well. His year would begin on a Sunday and end on a Saturday.

His 365th day, similarly, would have neither a day-of-the-week name, nor any date of its own. Instead it would be simply lodged between the year end and Jan. 1, resulting, of course, in an eight-day week. His 366th day, similarly, would have neither a day-of-the-week name nor a date. And it would be lodged either at the end of February, or perhaps between his 365th day and January 1, thus producing a nine-day week.

Mastrofini's plan apparently did not include any rearrangement of the number of days allocable to particular months; nor did it include any arrangements for equalizing the quarter years.

In the Constant Calendar, quarter years are equalized by having January, July and October retain their 31 days. April acquires a day and becomes a fourth 31-day month.

So that the other eight months will all have just 30 days each, February acquires two days and becomes a 30-day month. March, May, August and December give up one day each and become 30 day months. June, September and November remain as they were, 30-day months.

As exemplified above, the Constant Calendar presents these features.

1. It obviates the need for reverting every year to another one of the present 14 calendar patterns (7 for common years, 7 more for leap years).
2. It can be condensed from the customary 12-block format to the more convenient 3-block one, since its calendar quarters are identical.
3. The Constant Calendar has other desirable features:
   - All fixed dates for instance, birthdays and the 4th of July, would fall on the same day of the week every year.
   - All fixed days, for instance, Tuesday, general election day, would fall on the same date, Nov. 7 every year.
   - The year would always begin on a Sunday and end on a Saturday, and have exactly 52 weeks or 364 days, 312 of them weekdays, 52 of them Sundays.
   - Each half-year would begin on a Sunday and end on a Saturday and have 26 weeks or 182 days, 156 of them weekdays, 26 of them Sundays.
   - Each quarter year would begin on a Sunday and end on a Saturday, and have 13 weeks or 91 days, 78 of them weekdays, 13 of them Sundays.
   - The first month of each quarter would begin on a Sunday and end on a Tuesday. It would have 26 weekdays, plus five Sundays, a total of 31 days.
   - The second month of each quarter would begin on a Wednesday and end on a Thursday. It also would have 26 weekdays, but only four Sundays, a total of 30 days.
   - The third month of each quarter would begin on a Friday and end on a Saturday. It also would have 26 weekdays, but only four Sundays, a total of 30 days.
   - The 365th day at the end of December would be suppressed by being deprived, not only of a day of the week of its own, but of a date of its own as well. Actually it would become an eighth day of the week. It would be identifiable for all purposes as Dec. 30D, the D standing for double, meaning a double Saturday that follows Saturday, Dec. 30.

- The 366th day at the end of June, but only in leap years, would also be suppressed by being deprived, not only a day of the week of its own, but of a date of its own as well. Actually it would become an eighth day of the week. It would be identifiable for all purposes as June 30D, the D standing for double, meaning a double Saturday that follows Saturday, June 30, but only in leap years.

Transition from the present calendar would be easiest and simplest if the effective year were to be 1978, or 1984, a leap-year, or 1989, or 1995, since these four are the only remaining years of this century whose Jan. 1 falls on a Sunday, as it does in the case of the Constant Calendar.

JANUARY						
S	M	T	W	T	F	S
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				

FEBRUARY						
S	M	T	W	T	F	S
			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		

MARCH						
S	M	T	W	T	F	S
					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 D

APRIL						
S	M	T	W	T	F	S

MAY						
S	M	T	W	T	F	S

JUNE						
S	M	T	W	T	F	S

JULY						
S	M	T	W	T	F	S

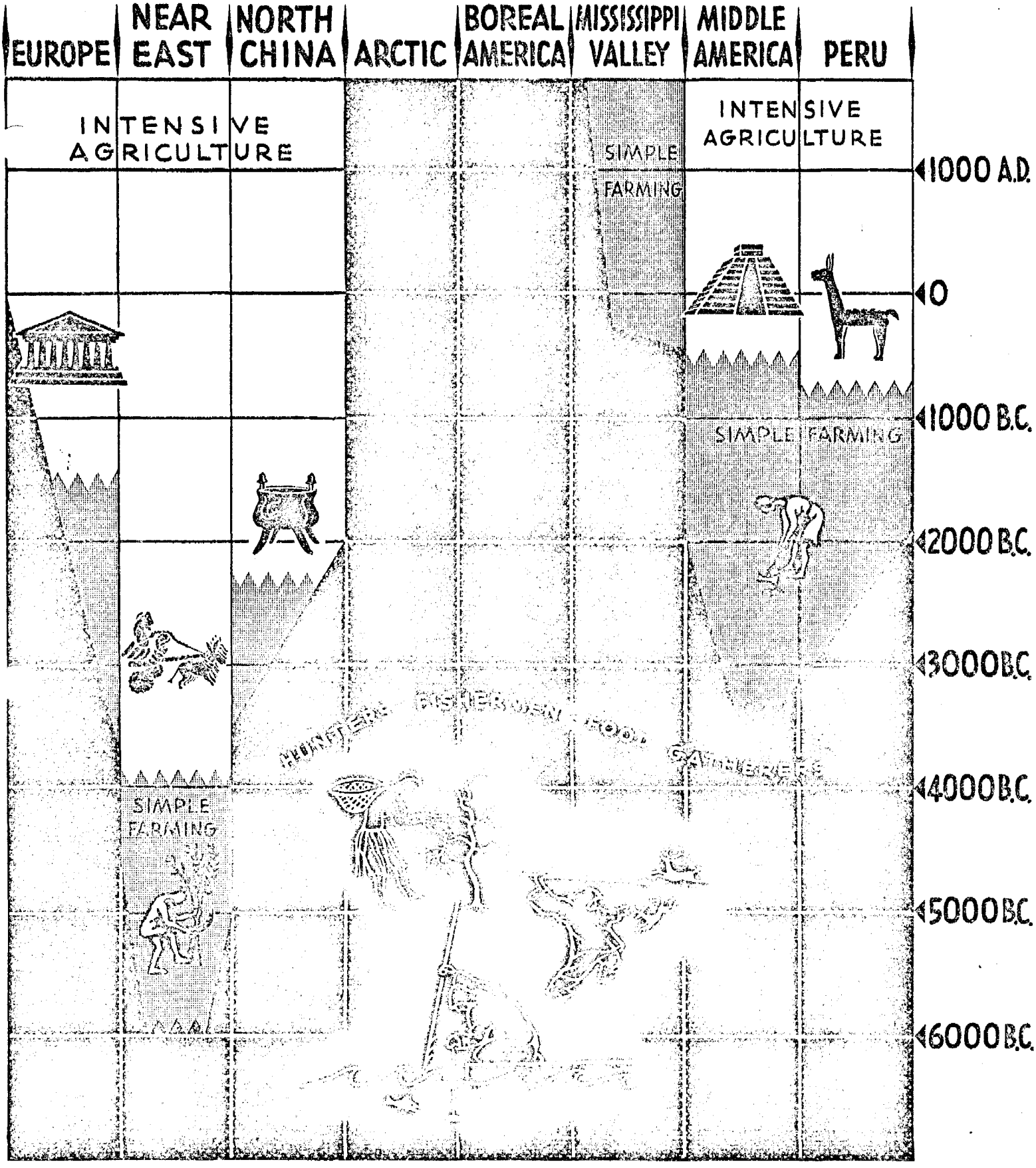
AUGUST						
S	M	T	W	T	F	S

SEPTEMBER						
S	M	T	W	T	F	S

OCTOBER						
S	M	T	W	T	F	S

NOVEMBER						
S	M	T	W	T	F	S

DECEMBER						
S	M	T	W	T	F	S



RISE OF CIVILIZATIONS

(Each of THESE PICTURES symbolizes the earliest civilization in the designated area)

RISE OF CIVILIZATIONS

Indian Leaflet No. 13

Published by
THE SCIENCE MUSEUM
ST. PAUL, MINNESOTA
1957

AMERICAN CIVILIZATIONS WERE INDIGENOUS

The usual assumption among scientists is that all prehistoric cultural movements to America were by way of the Asiatic - North American bridge. It will be immediately apparent from this chart that no cultures more complex than those of the simple northern hunters, fishermen and food gatherers could have passed this way. It is equally certain that if the usual assumption is true the civilizations of the Americas are indigenous and arose quite independently of those in Eurasia.

FOR THE RECORD

The dates of the rise of civilizations seem ancient in historical terms. Yet, when we consider the million year history of man on earth, civilizations are found to be relatively recent cultural developments. In the Americas, too, where we now know that man has hunted since the latter part of the Ice Age, the Indian civilizations of Central and South America are late indeed.

THE FORM OF THIS CHART

This chart should be considered as a series of separate vertical charts. By the device of placing these charts side by side, we have provided an interrupted cultural section for 8,000 years extending from Eurasia by way of the Asiatic-North American bridge to Central and South America. The vertical scale is wherever possible, based on radio-active carbon dates.

AGRICULTURE PRECEDED CIVILIZATION

Wherever civilizations have developed, they have been preceded by a long history of developing agriculture, for only by intensive agriculture could sufficient food be provided to support the specialized life we know as civilization. True agriculture was always preceded by the development of simple farming. The dates for the first deliberate growing of crops by man in each area, always difficult to assess by archeological evidence, have been estimated on this chart.

References

The primary data on which this chart is based may be found in Julian Steward's Theory of Culture Change, University of Illinois Press, 1955.

This chart has been adapted from an original three dimensional chart in The Science Museum planned by Louis H. Powell and Elden Johnson and executed by Heidi Schwabacher.

Vol. III, No. 4

ON BEGINNING A MONTESSORI ELEMENTARY CLASS

In an effort to help Montessori Centers that are contemplating beginning an elementary class, some experienced Montessorians drew up a set of statements and distributed them to many other trained Elementary Montessorians for their comments. The results are as follows.

Beginning a Montessori elementary class involves long range planning on the part of a Montessori Center. Selection of a proper site, purchase of materials and finding a suitable Elementary Montessorian generally takes several years.

When beginning a class, start with 6 year olds and grow the class an age a year (second year, 6 and 7 year olds; third year, 6, 7 and 8 year olds). There is so much material that must be handmade that it is difficult to keep up with the needs of 6 year olds the first year—and, impossible to meet the needs of 6, 7, 8 and 9 year olds all at once—unless you find an experienced Elementary Montessorian who has a complete set of materials of his own. Growing the class slowly also means that the new Montessorian has time to think through each section of the curriculum.

Avoid using workbooks! Workbooks kill the Montessori way of working and produce a totally different kind of mentality in children. This is true for both the Children's House and the elementary. The only way a workbook could be used (so that it doesn't violate the Montessori way of working) is to cut it up into isolated exercises that fit the Montessori sequence. The exercises are then recopied and completed by the children.

It is difficult for the trained Elementary Montessorian to take over a class that has been taught by a person who has not had the Montessori elementary training. It presents several problems:

1. A non-Montessori way of working has been firmly established in the class. (Montessori elementary is not the same as Montessori Children's House.)

2. There is the necessity of making a great deal of materials for the age range in the class—if one wishes to proceed in a Montessori manner.

3. There is also a great deal of remedial or "catch up" work that needs to be done in order that the children be able to function according to their sensitive periods.

It is difficult for a newly trained Elementary Montessorian to take a class with children who have had no previous Montessori experience. That situation presents a complex set of problems which no one should be expected to handle during the first year. Give the class and the Montessorian time (at least one year or more) to settle in before adding non-Montessori children. Many Centers take non-Montessori children either too soon or in too great a number and this prevents the class from arriving at a true Montessori way of functioning. Once the class has "arrived" then a few other children may be added. The class will be strong enough to preserve its Montessori flavor and will help the new children adopt the Montessori way of functioning.

It is also important that a new class not take children with special problems of a severe nature—emotional and/or physical—until after the class has firmly established a Montessori way of functioning. The inclusion of such children at

the beginning can spell disaster for the class. The message is the same as before: give the newly trained Montessorian and the new class time to arrive at a Montessori way of functioning before adding children with special problems. Classes will be better able to aid those special children in the long run and more Elementary Montessorians are likely to remain within the profession if they are not overwhelmed with difficulties at the beginning.

New children should be added to a class only with the consent of the Elementary Montessorian. He is the only one who knows how much he can handle on a day-to-day basis. An occasional exception is the teacher who overestimates his readiness to expand his class. In this case the Administrator must exercise his authority in order to protect the class.

Beginning a Montessori elementary class is a serious undertaking that requires even more time and effort than beginning a 3 to 6 class. It should not be attempted until your 3 to 6 classes have arrived at a truly Montessori level of functioning. This does not mean simply that the children have reached a normalized state through their work in practical life, sensorial, math and language—for that is only part of the 3 to 6 year old activity. They also must have successfully completed work in history, geography, biology, science, music, art, etc.—as it is spelled out in Montessori theory. Beginning a Montessori elementary class with a group of children who do not have a basis in *all* of the above means that arriving at a Montessori level of functioning with the class will be almost impossible.

* * * * * * * * * * * * *

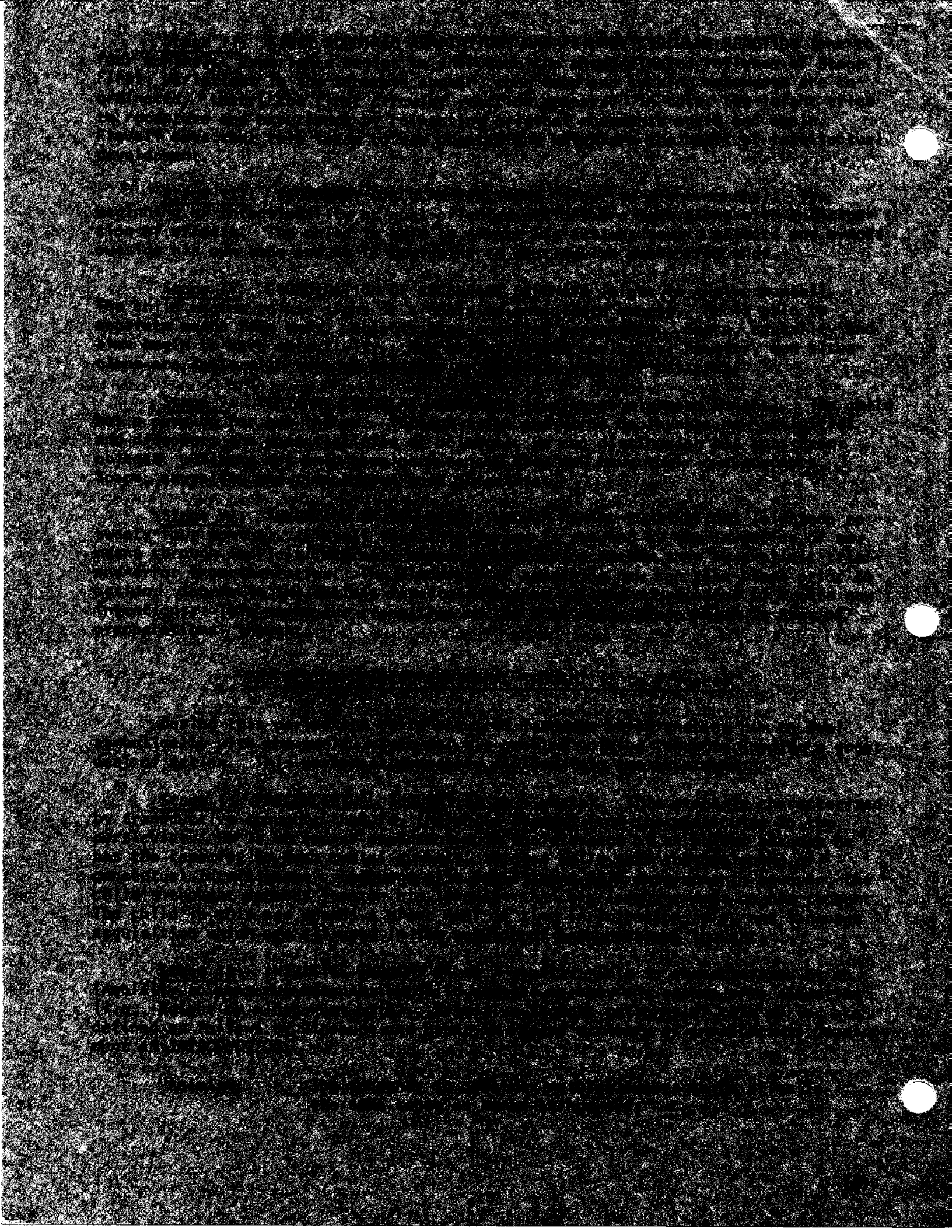
A questionnaire was sent to Bergamo graduates concerning the amount of money they spent for transportation, tuition and living expenses for their year of study. Over the past twelve years of the course the cost of living in Italy has steadily increased just as it has in North America. Tuition has also increased in order to provide more and better equipment and services for the students. The devaluation of the dollar has also worked to increase the overall cost for Americans. Reasonable living costs for a nine month school year based on the current situation in Bergamo are as follows:

Single person	$3,000
Married couple	4,000
Married couple with children	5,500 plus. This will vary according to the size of the family. If both parents are taking the course it may be necessary to employ a babysitter as the lectures are from 4:45 p.m. to 7:30 p.m. Monday through Friday.

The above figures do not include tuition or transportation to and from Europe.

If you are planning to sponsor a student for training in Bergamo, you and the student should be sure that the amount of money he will have available will be adequate. The training course is very, very intense. A strained living situation, because of excessive financial limitations, will not help the student's studies.

Vol. III, No. 5



Artificialism The tendency to believe that convergence stems of human, created natural events.

Participation The young idea that human actions and natural processes interact and are related.

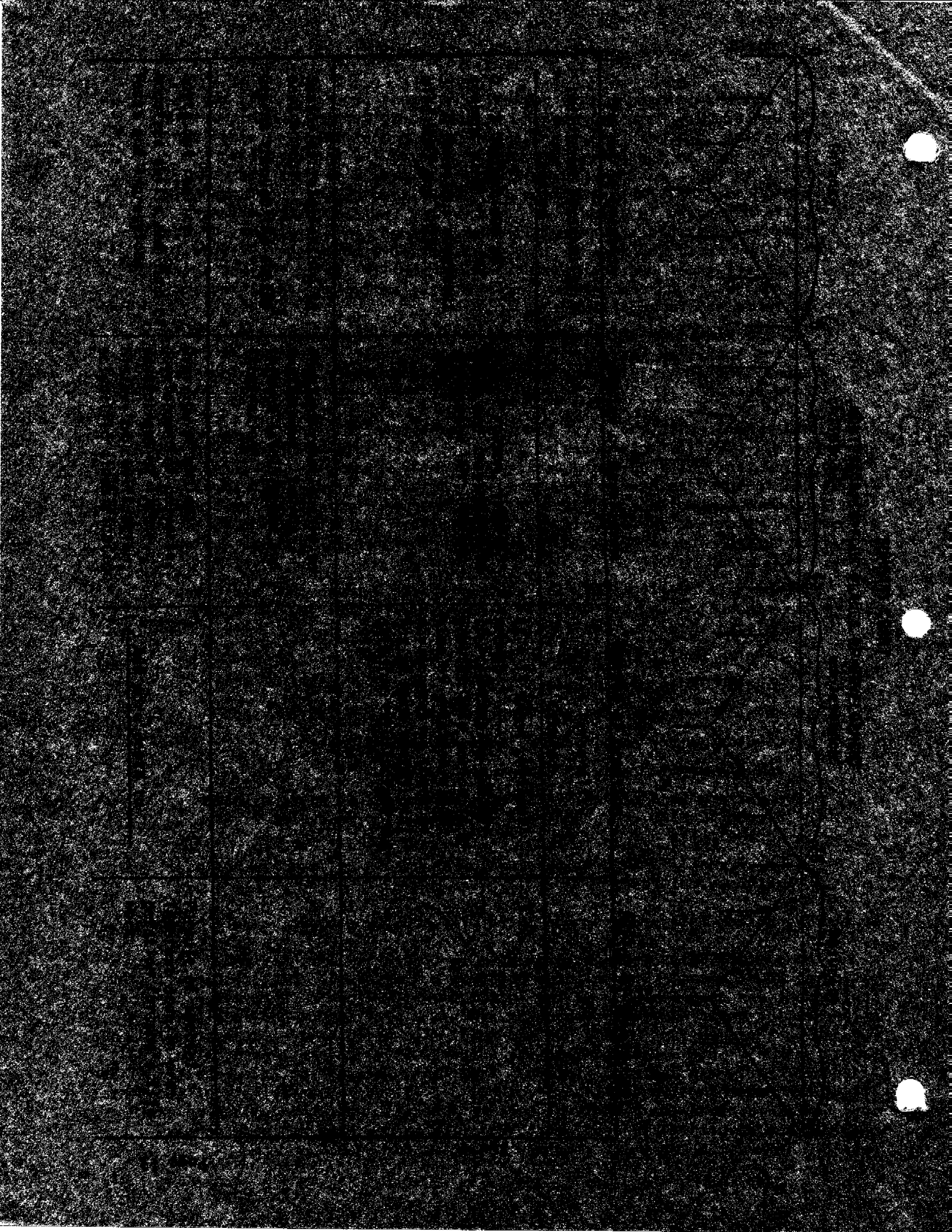
Syncretism The tendency to group together into a confused whole separate elements in order to find things or events.

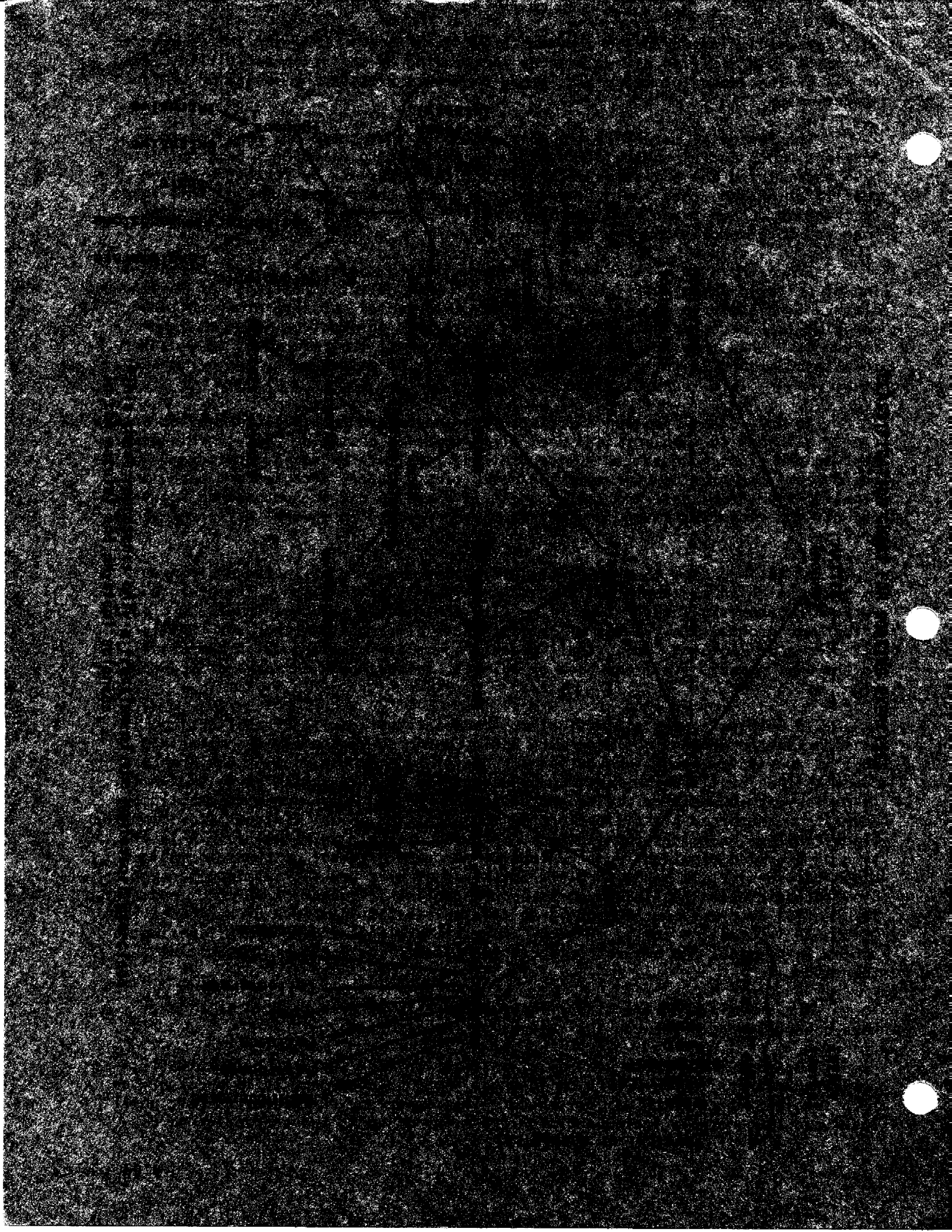
Juxtaposition The failure of the child to make connections among several things or events and the failure to understand either part-whole or whole-part relations.

Each [illegible] at this level is distinctly different from that of the following period. Children at this [illegible] are [illegible] and are perfectly normal—but they cannot [illegible] adequately. Their responses should depend upon the nature of [illegible] and the limitations of the operation preceding the answer.

THE PERIOD OF CONCRETE OPERATIONAL THOUGHT: (7 to 11 Years)

The child is now [illegible] operations. [illegible] and [illegible] operations as he can [illegible] [illegible] [illegible]





[redacted]

NOTE: You may find the following helpful when faced with the necessity of giving speeches or workshops on Montessori elementary.

MONTESSORI CULTURAL APPROACH

by David Kahn

Montessori elementary education does for the explosion of contemporary information what Webster did for the English language—it provides an order—not an order which is imposed on the child, but rather an order derived from the very mental and emotional sequence of the child's total developmental process. The presentation of the facts is rooted in a philosophical view—not some distant pedagogical theory—but a philosophical view which the child himself can understand and internalize. Montessori says in 1939 in a book entitled *From Childhood to Adolescence*, "I have proposed to lead the child to confront higher conceptions . . . and to follow as much as possible in their totality the needs of development and the needs of life . . . To bring detached notions to the child is to bring confusion: it is necessary to determine ties between the facts and . . .

determining the correlation between facts with the child is to obey that which is appropriate to the human spirit—we create for him a philosophy and why can't a child do philosophy."

In preparing the child for adult life, Montessori prescribes an essential principle of education. Disconnected details bring chaos: to establish a relationship between facts is to give consciousness. Basic to Montessori elementary education is what she calls the Cosmic View, what might be technically referred to as the Montessori Integrated Cultural Approach.

The six year old child wants to know the function of the world and its relationship to him. The family environment no longer satisfies his curiosity and with the power of imagination he can extend beyond physical limits of home, neighborhood, classroom and community. Imagination is what Montessori calls the "flaming ball" of human consciousness, the push whereby the child explores the dominion of his growth, which is nothing more or less than the universe. By giving the child the story of the universe we give him something a thousand times more infinite and mysterious to reconstruct with his imagination than fairy-tales or detective stories. We give the child concrete facts and laws about his planet from the beginning—and thusly, build the imagination with the specifics of natural science. Thus, the imaginative question which a child might ask a parent such as "Where do I come from," or, "Where does the earth come from," suggests the organization of the Montessori cultural approach. The success of the curriculum rests on its ability to answer not only the day to day queries which stem from the child's curiosity but rather the deep life questions which emerge from the child's innermost feelings. The elementary child is submerged in the dynamic of his own biological-psychological growth. He wants to know about plants, animals, rocks—all that makes up his environment. In the hurried passage of adult time and specialization we forget to answer the child's inquiries about life with precision and intensity. A spider is not a bug or an insect. It is an Arachnid. Every exact detail satisfying the child's curiosity about life makes for an enthusiastic adult personality.

So the Montessori integrated curriculum deals not with mere subjects of learning replete with academic cross references, but rather it selects for the child's environment a living model for study—the universe—with the hope that the child's interest will be won by his natural feeling to know about his significance both large and small in relation to his surroundings. This unity of curricular approach then is derived from the dynamic order which governs the universe and this order is relatively constant.

How then is this immense Cosmic View serviced in the Montessori classroom? To bring the world into the classroom is impossible and therefore, we must introduce the keys of the universe. In its entirety the world repeats the same elements more or less. No one has all

the facts of the universe before his eyes. To study all living things we must first establish a system of classification which provides the keys to study everything.

In giving the child a concept of the earth as a whole, we show that every aspect of the earth sets off a science of detail—paleontology, botany, mineralogy, geology, physics, chemistry. All purport to organize certain aspects of our planet's functioning. The classroom should be stocked with the ABC's of the sciences, what Montessori calls the classified nomenclature which impart to the child the basic organization of each science. Thus, we begin to examine the web of life through the medium of essential detail—not randomly selected facts but scientifically classified facts. For example, the child at age 7 begins to classify the animal kingdom the way a zoologist would according to divisions; phyla, classes, orders, etc. He learns the meaning of classification—to make order out of chaos. He compares animals to plants, to minerals and to himself.

However, the cosmic view doesn't merely incorporate the study of present earth conditions but rather exposes the child's imagination to life at the beginning of the world. For the child to make contact with the origin of the universe he needs a concept of time—and so the cosmic view incorporates a series of timelines that is historical representations of time. First, the child can graph his own life as marked by his birthday. Then, his lifetime is compared with that of his family. His family lifeline is grafted onto the history timeline of man which is marked by the Christian division B.C., A.D. The units of time are no longer birthdays but centuries. Finally, human time is projected onto geological time. Time progresses through geological eras: Paleozoic, Mesozoic, etc. History, then, is a preparation for the study of life. The child must understand the time scale of evolution in relation to his own lifetime.

We have added time to the study of the child's biology, we need still another dimension—geography. Animal evolution did not happen apart from the dynamics of the earth. Biological time is geological time. The fossil is the link between the living world of the present and the living world of the past. Geography which means "to write about the earth" is not then a secondary subject to be studied one half hour in the afternoon, but rather an essential science which unifies the physical and biological disciplines.

The student continues the study of life with a history of man recognizing his own kinship to humanity and to the earth. Human life thrives because of the good graces of nature. As the child studies the great civilizations with emphasis on their achievements (not wars), he witnesses that technical and scientific progress has brought about profound changes in the environment. No longer can national selfish needs be considered indiscriminately when we border on world ecological decisions. The child already understanding the world as a continuous geological force will easily grasp ideals of world cooperation and solidarity within the context of his own time.

Life is presented to the child as a creative power. It is an energy with special laws—physical, chemical and psychological. Children can know the power of life which exists within them. They can find the power to build something new for the mind—something new for society. Giving the child a beautiful and sentimental attitude about his earth graced with order and love may seem sentimental, but it establishes for him an intellectual emotion through which he celebrates being alive. As we scan the birth of the universe, the birth of life, the birth of man, the birth of civilization, the child learns to view his own life as a struggle endowed with the privilege to serve in the continuing development of his species. The child is a creature of individual evolution and can develop the firm conviction that to live is to progress.

* * * *

RESULTS OF QUESTIONNAIRE ON

SALARIES-INCREMENTS-FINANCIAL ASSISTANCE

Eighteen replies to this Questionnaire were received. Each reply was assigned a number. So that you may follow one particular individual's situation all the way through, look for the identifying number under each question.

WHAT IS YOUR PRESENT YEARLY SALARY?

1. $14,300
2. 14,000
3. 14,000
4. 11,500
5. 11,000
6. 11,100 for ten months or 10,000 for nine months
7. $10,800
8. 10,500
9. 10,000
10. 9,300
11. 9,000
12. 8,600
13. $ 8,500
14. 8,100
15. 8,000
16. $7,500 (next year, 10,000)
17. 6,250
18. Self employed

NUMBER OF YEARS YOU HAVE TAUGHT

Montessori Children's House indicated by the first figure in italics
Montessori Elementary indicated by the second figure in Gothic type style.

1. *0* - 5
2. *1* - 5
3. *0* - 2
4. *0* - 3
5. *6* - 1
6. *0* - 1
7. *6* - 2
8. *2* - 2
9. *4* - 1
10. *0* - 3
11. *0* - 1
12. *0* - 2
13. *2* - 6
14. *0* - 3
15. *2* - 2
16. *0* - 2
17. *3* - 4
18. *3* - 2

WHAT WAS YOUR STARTING SALARY?

1. $ 9,000
2. 7,000
3. 12,000
4. 10,000
5. 4,800 (Children's House)
6. 10,000
7. ?
8. 6,000 (Children's House)
9. $5,800 (Children's House) 10,000 (Elementary
10. 9,500 Plus tuition in a different city & school
11. 9,000
12. 7,400
13. 6,500
14. 7,363.62
15. $ 5,600 (Ch's. Hse.) 7,500 (Elementary)
16. 7,000 With sponsorship.
17. 6,000 (Ch's. Hse.)
18. ?

TYPE OF AREA IN WHICH YOU ARE WORKING

1. Large metropolitan, one million plus population.
2. Large metropolitan, one million plus population
3. Large metropolitan, one million plus population
4. Large metropolitan, one million plus population
5. Large metropolitan area
6. Large metropolitan area
7. Large metropolitan, three million population
8. City, approximately 800,000 population
9. City, metropolitan
10. City, approximately 200,000 population
11. City, approximately 100,000 population
12. Town (city suburb)
13. Large metropolitan, one million plus population
14. Large metropolitan, one million plus population
15. Large metropolitan, one million plus population

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2. *1* - 5
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4. *0* - 3
5. *6* - 1
6. *0* - 1
7. *6* - 2
8. *2* - 2
9. *4* - 1
10. *0* - 3
11. *0* - 1
12. *0* - 2
13. *2* - 6
14. *0* - 3
15. *2* - 2
16. *0* - 2
17. *3* - 4
18. *3* - 2

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6. Large metropolitan area
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9. City, metropolitan
10. City, approximately 200,000 population
11. City, approximately 100,000 population
12. Town (city suburb)
13. Large metropolitan, one million plus population
14. Large metropolitan, one million plus population
15. Large metropolitan, one million plus population

NUMBER OF CHILDREN IN YOUR CLASS

1. 52 (two teachers teaming)
2. 30
3. 29
4. 32
5. 20
6. 18
7. 27
8. 30
9. 19
10. 23
11. 15
12. 19
13. 40
14. 34
15. 41
16. 15
17. 15
18. 37

SCHOOL HOURS

1. 8:30 - 3:00
2. 9:00 - 3:00
3. 9:00 - 3:15
4. 8:45 - 3:00
5. 9:00 - 3:00 children
   8:30 - 3:30 adults
6. 9:00 - 2:30
7. 8:30 - 3:30
8. 8:45 - 3:00
9. 9:00 - 3:00
10. 8:30 - 2:30
11. 9:00 - 2:30
12. 9:00 - 3:00
13. 8:45 - 3:00
14. 9:00 - 3:00 children
    8:30 - 4:30 adults
15. 8:45 - 2:45
16. 9:00 - 3:00
17. 9:00 - 3:00
18. Seven hours

LENGTH OF SCHOOL YEAR

1. 180 days
2. 35 weeks (Sept-June)
3. 180 days
4. 9 months
5. 176 days (Sept-June)
6. 9 months
7. Sept-June
8. Day after Labor Day till June 15th
9. Sept-June
10. 180 days
11. 180 days
12. Sept 1 - June 14
13. 9 months
14. Mid Aug - May 30
15. 173 days
16. Sept 15 - June 10
17. 180 days
18. 10 months

IS ENVIRONMENT PUT AWAY ON WEEKENDS SO OTHERS MAY USE IT?

1. No
2. Yes, partially
3. No
4. No
5. No
6. No
7. No
8. No
9. No
10. No
11. Yes
12. No
13. No
14. No
15. No
16. No
17. No
18. No

IS THE BUILDING WHICH HOUSES THE SCHOOL, OWNED OR RENTED?

1. Rented
2. Rented (in church)
3. Both
4. ?
5. Rented
6. Rented
7. Rented
8. Rented
9. Rented
10. Owned
11. Rented
12. Rented
13. ?
14. Long term lease
15. Owned
16. Owned
17. Rented
18. Rented

DOES SCHOOL PAY EXPENSES FOR MONTESSORI CONFERENCES?

	Amount or Percentage Paid by School	Amount or Percentage Paid by You
1.	0	100%
2.	100%	0
3.	Yes, sometimes	
4.	Yes, varies	
5.	Sometimes	
6.	Yes, 50%	50%
7.	0	100%
8.	0	100%
9.	0	100%

	Amount or Percentage Paid by School	Amount or Percentage Paid by You
10.	Promised but not done so far	
11.	-	-
12.	50% room and board	Remainder
13.	Yes, varies	
14.	Yes, 100%	
15.	Fees—room	
16.	Yes	
17.	0	100%
18.	0	100%

DOES THE SCHOOL PAY EXPENSES FOR INSERVICE TRAINING?

	Amount or Percentage Paid by School	Amount or Percentage Paid by You
1.	0	100%
2.	No	
3.	Yes, sometimes	
4.	Yes, sometimes	
5.	Yes	
6.	Yes, 100%	
7.	No	
8.	No	
9.	No	
10.	No	
11.	Yes	$50 per year
12	-	-
13.	Yes, sometimes	
14.	No	
15.	No	
16.	Will give something towards helping if necessary, but generally NO!	
17.	0	
18.	-	-

DOES THE SCHOOL PAY FOR MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS?

	Amount or Percentage Paid by School	Amount or Percentage Paid by You
1.	0	100%
2.	0	
3.	0	
4.	0	
5.	0	
6.	Some—50%	50%
7.	Their's—not mine	
8.	0	
9.	0	100%
10.	0	
11.	Yes	All dues
12.	0	
13.	0	
14.	0	
15.	0	
16.	0	
17.	0	
18.	0	

DOES THE SCHOOL PAY MOVING EXPENSES?

	Amount or Percentage Paid by School	Amount or Percentage Paid by You
1.	0	
2.	0	
3.	0	
4.	0	
5.	0	
6.	0	
7.	0	
8.	0	
9.	0	
10.	Sometimes abour 2/3's	1/3
11.	0	
12.	0	
13.	0	
14.	Yes, 50%	50%
15.	0	
16.	0	
17.	0	
18.	-	

DOES YOUR SCHOOL SPONSOR YOUR TRAINING IN BERGAMO OR WASHINGTON?

	Amount or Percentage Paid by School	Amount or Percentage Paid by You
1.	0	
2.	0	
3.	0	
4.	Yes	Money, except personal
5.	0	
6.	0	
7.	By loan	
8.	0	
9.	0	
10.	0	
11.	Yes	
12.	0	
13.	Yes	None, except personal
14.	0	
15.	Yes	
16.	Yes	
17.	No	
18.	-	-

IS A MONETARY CONSIDERATION GIVEN FOR YOUR OWN CHILDREN WHO MAY ATTEND THE MONTESSORI CENTER IN WHICH YOU TEACH?

	Amount or Percentage Paid by School	Amount or Percentage Paid by You
1.	0	
2.	Yes, 100%	
3.	Yes	
4.	Yes,	!
5.	Yes	
6.	Yes, 100%	
7.	0	
8.	I don't know	

	Amount or Percentage Paid by School	Amount or Percentage Paid by You
9.	-	-
10.	No (promised)	
11.	No	
12.	?	?
13.	Yes, 1/2 tuition	1/2
14.	Yes, 100%	
15.	No (should be "we're working on it)	
16.	?	Have no children
17.	Yes—it would be	
18.	-	-

NOTE: (Should have asked whether or not the adult responding has children.)

IS THERE A PROVISION FOR HEALTH AND/OR LIFE INSURANCE?

		Amount or Percentage Paid by School	Amount or Percentage Paid by You
1.	Yes	50% health 100% life	50% health
2.	No		
3.	No		
4.	Yes	The plan is new-I think the school plans to pay 50%	
5.	Yes		
6.	Yes	100% of mine paid, I pay for my family	
7.	Yes		
8.	Not yet		
9.		No	
10.	No		
11.	No		
12.	Both	25%	75%
13.	Yes, the plan is new and I believe the school plans to pay 50%		
14.		?	
15.	Yes	100% health (12 months)	
16.	No		
17.	No		
18.			Yes

DOES THE SCHOOL HAVE PLANS FOR PROVIDING A SABBATICAL?

1.	None as ey, but rhaps in the future.			14.	No
2.	No		8. -	15.	No
3.	No		9. No	16.	No
4.	No		10. Beginning to think of it		
5.	No		11. No	17.	No
6.	No		12. ?	18.	-
7.	No		13. No		

	HOW MANY SICK DAYS ARE ALLOTED EACH YEAR OR MONTH?	MAY SICK DAYS BE ACCRUED?	HOW LONG?	MAY THEY BE CARRIED OVER FROM YEAR TO YEAR?
1.	10 per year	Yes		Yes, to maximum of 30
2.	10 per year	No		No
3.	10 per year			No
4.	10 per year	No		No
5.	7 sick, 3 personal	Yes	3 years	Yes
6.	Starting 2 days per year, 4 days 2nd year, 6 days thereafter	No		No
7.	10 per year	No		No
8.	10 per year	No		No
9.	As needed			
10.	10 per year	?	Board now considering	?
11.	11 per year (?)	Yes	1 year	No
12.	10 per year	?		?
13.	10 per year	No		No
14.	6 per year	Yes	1 year	No
15.	10 per year	No		No
16.	10 per year (only if absolutely necessary.)	No		No
17.	As needed (however, there is no back up staff to take over in the absence of the regular teacher.)			
18.	None			

IF THE SICK DAYS MAY NOT BE ACCRUED, HOW MUST THEY BE USED?

1. -
2. May be used for anything—personal, adm., workshop, etc.
3. -
4. -
5. -
6. Only covers days missed
7. -
8. Mainly personal days, doctor visits, check up
9. -
10. ?
11. -
12. ?
13. -
14. Relinquished if not used in current year
15. -
16. In dire emergency only—problem getting substitute
17. -
18. -

ARE THERE ANY OTHER BENEFITS?

1. -
2. No
3. -
4. -
5. School gives noninterest loans for educational purposes
6. $15 per month classroom allowance
7. Warm friendly supportive administration
8. -
9. No
10. This school in the South pays a lower salary than in Midwest, East or West with the justification that living costs are lower. We have found this to be a misrepresentation which everyone who moves here from elsewhere soon discovers. The high tuition probable more adequately reflects costs here.
11. -
12. -
13. -
14. Has paid for subscription to Elementary Newsletter
15. -
16. NO! NO! NO!
17. -
18. No

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RESULTS OF QUESTIONNAIRE

ACTUAL AND IDEAL MONTESSORI ELEMENTARY CLASSES

Thirteen replies to this questionnaire were received. Each reply was assigned a letter. To follow one person's questionnaire all the way through, look for the identifying letter under each question.

	Where Trained	Years of Teaching Elementary
A	Bergamo	7
B	Bergamo	2
C	Bergamo	1
D	Bergamo	1
E	Bergamo	2
F	Bergamo	5
G	Bergamo	3
H	Bergamo	
I	W.M.I	2
J	Bergamo	3
K	Bergamo	2
L	Bergamo	2
M	Bergamo	2

(1) Number of children in the class

(2) With how many children could you work comfortably at this stage in your development?

(3) Age span of the class

(4) With what age span could you work comfortably at this stage in your development?

(5) Length of class day

(6) Head teachers

(7) Assistants

(8) Special teachers

	Year	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
A	73-74	24	30	6-11	6-9, 10	6 hrs	1	1	2
	72-73	26	30	6-11	6-9, 10	6 hrs	1	1	2
	71-72	25	30	6-11	6-9, 10	6 hrs	1	1	1
	70-71	25	30	6-10	6-9, 10	6 hrs	1	1	2
	69-70	28	30	6-10	6-9, 10	6 hrs	1	1	2
	68-69	25	25	6-9	6-9, 10	6 hrs	1	1	2
	67-68	20	25	6-8	6-9	6 hrs	1	1	2
B	73-74	16-21	25	5, 5-8	5, 5-7	9:00-2:30	1	0	0
	71-72	43	6-10			8:30-1:40	2	0	1
C	73-74	28	30	6-8½ or 9	Same	8:30-2:30	1	2	3
D	73-74	19	25	4.7-7.4	6-8	5 hrs.	1	1 a.m. Art 1 p.m. French	1 Phys Ed
E	72-73	15	20	5½-8	5½-7	9:00-2:30	1	0	0
	73-74	15	15	6-9	5½-6	9:00-2:30	1	1	0

	Year	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
F	69-70	25	25-30	6-10	6-10	6 hrs.	1	1	1
	70-71			6-12		6 hrs	4	1	1
	71-72			6-12		6 hrs	5		
	72-73			6-12		6 hrs	5	1	1
	73-74		6-12			6 hrs	4	1	2
G	71-72	16		7-11		6 hrs	2 (for total 50)	1	0
	72-73	11		8-12		6 hrs	3 (for total 50)	1	0
	73-74	12	25	6-9	6-9 or 9-12	6 hrs	1	0	0

NOTE: As to columns 2 and 4, I was certain that more children would destroy me the first two years. Now I feel comfortable and see the advantages of a larger class. Also, I started with the 9-12 age group—*A MISTAKE FOR ANYONE NEW.*

H	73-74	18	15-20	6-10	6-9	9:00-2:30	1	1	1
I	73-74	30	15-20	6-10	6-8	9:00-3:00	1	0	0
J	71-72	30	14	2½-7½	5-7½	5½ hrs	2 (Shared environment with a Ch's Hse teacher)		
	72-73	15	18	6-8	5-8	6¼ hrs	1	1	0
	73-74	14	18-20	6-9	6-9	6 hrs	1	0	0
K	66-67	14	20	6-9	6-7	5 hrs	1	0	0
	67-68	21	25	5-9	6-8	5 hrs	1	½	5

NOTE: I would not have choosen to have special teachers but they were forced upon me.

L	72-73	20	20	6-9	6-9	6¼	1	0	1
	73-74	28	35-40	6-11	6-9	6¼	1	1	0
M	72-73	19	19	8-12	10-12	9:00-2:30	1	0	0
	73-74	34	30 (Depending)	6-9	6-9 or 9-12	9:00-3:30	2	0	1

YOUR CURRENT SITUATION

	Total In Class	Age Span	Number of children continuous Montessori experience since age: 18 mos.	2	3	4	5	New to Montessori at age: 6	7	8	9	10
A	24	6-11	0	0	23					1		
B	20	6-8.4	0	0	12	4	1	1	2			
C	28	6-9			28							
D	19	4.7-7.4						1				
E	15	5½-8			13			2				
F	Administrator											
G	12	5½-9										
H	18	6-10	0	1	3	1	1	3	2	2	2	1

One of the children attended 1-2 years preschool and re-entered at age 9. Another 9 year old had 3 years preschool, public first grade and ½ second grade.

Class	Total In Class	Age Span	Number of children continuously in Montessori since age: 18 mos.	2	3	4	5	6	7	8	9	10	New to Montessori this year
I	30	6-10			5	20	5						
			Three returned after one year of absence										
J	14	6-9				3	2	5	1		1	2	
K	Not currently teaching												
	28	6-9	3	2		1							3 (Transfers)
M	34	6-9	3			10							3

CAN YOU MAKE ANY GENERALIZATIONS ABOUT CHILDREN WHO HAVE HAD CONSISTENT MONTESSORI EXPERIENCE THROUGHOUT THEIR SCHOOL YEARS AS COMPARED TO THOSE CHILDREN WHO ENTERED MONTESSORI IN THE ELEMENTARY FOR THE FIRST TIME, OR WENT TO CHILDREN'S HOUSE, TRADITIONAL FIRST OR SECOND GRADE AND THEN RETURNED TO MONTESSORI? ARE THESE CHILDREN DIFFERENT? HOW ARE THEY DIFFERENT?

A Children from good homes (security, acceptance) and from *good* primary classes are more normalized. They exhibit a greater tendency to dwell with an exploration, have a greater sense of expectation that their work will unfold mysteries. Conversely, those who have been programmed by schools look for the "answers" then expect something new to be given to them.

B Less Montessori background = more dependence on the teacher. Having children from thirteen different Montessori preschools, I see the children coming from different experiences within the Montessori background, too—in terms of discipline and development of skills.

C All children come to me with a complete preschool background, in fact, I taught most of them in preschool.

D We started the year with three non-Montessori children. Only one adapted. The other two were confused by so much activity and they were not used to choosing on their own. Montessori children are more self disciplined. One child receiving to Montessori school after public school found adjustment hard. Could no longer compete with neighborhood peers; is liking school more now.

E "Montessori Children" can choose, think, move on their own, while "other" children need to be disciplined from without; lack spontaneous intellectual movement. (The above based on *very* sketchy experience, but . . .)

F Montessori children are more self confident and self directing. They are not afraid to enter a new situation. More responsible individuals. The "other" children go through an adjustment period, but bound back quickly. We have had some experience where they benefit from leaving and returning—they are more appreciative of what they have available.

G Before this year I could generalize—but now I have some beautiful exceptions . . . which make me wonder. This is a new class this year in only one way. It is now called a Junior class and they have me as the director and a new environment. For three years the Children's House directress has had these children with her in a large preschool class (35-45 children). Six of the twelve children are 3 years and older, the others six are 6 and 5's. These older children have been with her four to three years, most coming after 4 years of age and the

oldest who is 9, came into her preschool when he was 6 years old from public school. She seems to have broken all the rules—but these children have responded to her working with them and the materials—beautifully! I had a bad experience at the first Montessori school at which I worked with "non-Montessori children" but now I'm having a fabulous year with children—maybe they are more the children of an environment divised by a lady who is convinced that *all children* are worthy of Montessori!

H Generally, those with consistent Montessori experience are self motivated in their work and require much less direction than the others. They require (demand) much less adult time. (An exception is a girl who has had Montessori since age 4 but has an emotional disorder.) The children who transfer into Montessori elementary seem to have learning disabilities or personality problems.

I Children who are new to Montessori at the elementary age:

. Attention span is generally poorer.

. Repetition is less likely.

. They have some difficulty with the concept of freedom in the classroom and with self discipline.

J Pure Montessori kids are fabulous—seem to work with virtually a minimum of direction or none—just stimulating presentations. Kids entering new at 6 or 7 bring so much garbage with them—I see they can get absorbed in work but have no real ability to find new tasks and need redirection or else get into disruptive "try the teacher" patterns. Also, new 6's and 7's seem to have great needs for Children's House type Practical Life—so we make that available to them.

K Children who have had consistent Montessori seem more together, sure of themselves and are able to make appropriate, constructive choices for themselves. In my experience, children, who return to Montessori after experience in a traditional school, seem to have difficulty in managing their time, in making choices and in focusing their concentration.

L Self motivation of Montessori children is in most cases much higher. However, transfers from traditional education many times bring discipline and *enthusiasm* to Montessori because they have never had such experiences before and they appreciate what is being done for them.

M Generally . . . the few children in our class who have come up from 2-1/3 or 3 years, seem to be very confident, relaxed—relaxed is a key word.

SOCIOECONOMIC BACKGROUND OF THE CHILDREN?

ADVANTAGES AND DISADVANTAGES OF THIS TYPE OF BACKGROUND

A Upper middle class—ennui too often

B Middle class to upper middle class. Good parent participation and interest—willingness to help with both hands and money when needed.

C Middle class, generally speaking.

D Generally well to do or upper middle class. Advantages—generally their cultureal exposure is very high, vocabulary extensive. This does not give a realistic cross section from society. Already they have experienced what is presented in the class to some degree, others not so well or may have not.

E Most come from upper middle, which means parents with professional backgrounds, usually an intellectual environment of some sort at home. A few lower middle: little intellectual stimulation at home but great concern over their children's futures—want children to have solid education but can't define that.

F Our school is mainly a middle class school—most parents must sacrifice to send their children. We have had a few upper class as well as some from below average socioeconomic backgrounds. I cannot comment on advantages or disadvantages—*all* children can benefit greatly from a good Montessori experience!

G I have a mixed bag from lower-middle to middle-upper. I see a "stability-love quotient" being the most important. My child with the wealthiest parents is the lonely-bored-baron desert. The two children with nine brothers and sisters and loving parents who help pay tuition by delivering papers are the first "normalized" children I've ever met. They started Montessori when they were 5 and 6 years old.

H Lower middle class to upper middle class, all white, Catholic and Protestant. Advantage: no class conflict or pressure within the group. Children have had many experiences and some are well traveled. Disadvantage: ignorance of other ways of life and ethnic minority groups. Some are real racists.

I Middle class children can tend to the "uptight" in movement, free expression, etc. They have the advantage of exposure to museums, trips, books and general knowledge given by parents as well as good English.

J Middle, upper middle suburb. Some solid working class.

K Middle and upper middle. Too one sided a view of life.

L Upper middle class. Learning is quite natural to this group. Families are stable and interested. Divorces are handled with relative evenness. In many cases upper class families lack common sense limits. Lesser endowed families impart a more workable sense of limit although not always psychologically correct.

M Upper middle class. There is an arrogance that goes with the type of economic background we serve. It's not a healthy feeling for a 6 year old to have. Result is a very narrow interpretation of society.

DO YOU HAVE ANY CHILDREN WITH HANDICAPS IN THE AREAS OF EMOTIONAL, PHYSICAL AND/OR INTELLECTUAL DEVELOPMENT? DESCRIBE.

A Nothing outstanding this year.

B Two hyperactive children. One emotionally suppressed child (with family therapy this problem is being beautifully solved). Three children without self discipline, one of which comes from public school first grade.

C One boy is minimally brain damaged and has some learning disabilities.

D Yes, one boy age 6 years is a slow learner. Areas of difficulty in particular are letters and numbers. Does not differentiate between the two. Cannot count to 5 yet.

E One with hearing. One with possible learning disability. One-half of my class come from one parent homes.

F We have had emotionally distrubed children and brain damaged. We have the support of several psychiatrists in the area. We are careful not to attract too many special children for then we would become a special education program and thus negate the advantages we can offer the special child.

G I have one severely emotionally disturbed child who is currently being diagnosed. She has been in Montessori for three years, since age 3. Her symptoms and outward behavior are not disruptive to the group so she'll probably stay with me for the remainder of the year.

H Four severe reading problems, one motor control problem with possible brain damage, one hearing and perceptual problem, several allergies, six present (or past history) hyperactive boys, two overly agressive boys, three emotionally disturbed (one extremely so), one emotionally immature. At least four of the children see psychologists. At least two of the children have outside tutoring or special education classes.

I Emotional: not able to cope with assignments, peer pressure. Physical: poor movement and coordination. Intellectual: inability to conceptualize quickly. Most problems are minor ones.

J One diagnosed learning disabled—not reading at 7, male. One emotional wreck; undiagnosed—probably not pathological, just neurotic; spent two weeks (age 7) doing nothing but practical life and it really seemed to help.

K Had a number of children with *extreme* emotional problems. The principal insisted that I make them engage solely in academics in the classroom. I was not allowed to explore other avenues to normalization with them (i.e., through art, woodworking, etc.) as those were the sole domaine of the "specialty" teachers.

L Not at present, although I have had both severely handicapped children emotionally and physically. They add to the social and personal experience of the classroom.

M Three children described as "hyper active" and currently gulping Ritalin. I've discussed dietary adjustments but the doctors and parents are reluctant to try. Three children with emotional (depression) problems that need *only* positive reinforcement.

HOW MANY SIX-YEAR-OLD NONREADERS DID YOU HAVE IN SEPTEMBER?

A	B	C	D	E	F	G	H	I	J	K	L	M
4	2	2	-	1	-	-	0	1	2	All but 1	6	18

HOW MANY SIX-YEAR-OLDS DID YOU HAVE IN SEPTEMBER WHO HAD NOT MEMORIZED THE FACTS FOR + AND - ?

A	B	C	D	E	F	G	H	I	J	K	L	M
6	All	5	-	All	-	-	0 6-yr. 2 7-yr.	12	10	All	9	22

SHOULD A SIX TO NINE CLASS HAVE CHILDREN OLDER OR YOUNGER THAN SIX TO NINE, i.e., AGES FIVE OR TEN? WHY?

A No. Our 6-9 means children of that definable stage of development. Younger lack the energy—strength to hold their own in the group. Older require a more monastic, reflective, less material environment. Most cannot provide for 6-9 and 9-12.

B Yes. Not *should*, but *could*, since all 5 year olds are not alike as are not all 10 year olds. Also, a small group over 9 isolated is not ideal—they would be better off in a larger group even with younger children.

C I would prefer that all children be within the 6-9 range, unless a child would be exceptional in any way.

D No. I have a very bright child, presently #7 in the class. She is reading and writing better than most. She can do many math exercises with comprehension, etc., but she is socially immature in this setting. NOTE: Would like others' input on this.

E Yes. Intellectual development is *not* bound by age.

F Yes, if needed. We cannot limit ourselves to age divisions. We must look to the needs of the individual child.

G Maybe. Depends on the children. Not too many nonreaders—unless they are *all* nonreaders. Then again, my readers teach the nonreaders. The older children? ? ?

H Not younger—maybe older. There is a big break between age 5 and 6. They must be able to read and do basic math skills in an elementary class. Older children who are self motivated won't be held back by being with younger children.

I No. Five year olds and young 6's need to mature in primary class which gives them security and fits their needs. Our 9 and 10 year olds tend to work together and not mex with younger children, even 8's, except to give an occasional lesson.

J More than a three year age spread seems (at least in a class of fourteen) to be too much.

K No. A three year age span is enough (with possible exceptions for certain children).

L Yes. Readiness is relative to the individual.

M It depends on the class and child. We had a one year old working in a class with 12 year olds, but not successfully. A balanced academic level os obviously easier.

ENVIRONMENT. SIZE OF YOUR ENVIRONMENT IN SQUARE FEET. IS IT TOO LITTLE, JUST RIGHT, TOO MUCH? IS YOUR ENVIRONMENT IN ONE ROOM OR IN SEVERAL? IF SEVERAL, HOW MANY AND ARE THEY CONNECTED?

A 1000 sq. ft class, too little. 3 rooms. Connected with junior class, one room is too isolated.

B Don't know. Connected but not satisfactory.

C 38 x 44', 1672 sq. ft., too little. One room.

D One main room, one room across the hall used ½ for art and ½ for French. It is satisfactory.

E One room. The carpeting gets in the way of good messy creative clay and general art work; also, lunch is a problem with no lunchroom. Wish we had a small room for music—real quiet.

F 4500 sq. ft. and gym and swimming pool. Could use a little more. In several rooms—six plus central hall. Could use one more room.

G 582 sq. ft. and a little hall. Just too small. We are in a real house though and we like the atmosphere—it make up for the lack of space. Environment in several room; three connected rooms with bathroom and adjoining dect. It is o.K. for this number of children although visibility (for me) is poor. Actually, though, it helps me to leave the children alone (with such a small group this is a problem for them and me).

H Approximately 600 sq. ft. Too little. It is a rectangular room with no side rooms, cloak room, closets, etc. and we don't have enough storage space, room for bells, large artwork, etc. Environment in one room. Definitely not satisfactory. We need a storage closet, a "loud" area, more division of space. We've added two large painted shipping crates as reading boxes and would like to build a treehouse type structure.

I 1500 sq. ft. Too little. One room.

J 500-550 sq. ft. Too little—enough room for the fourteen kids but not for the materials. One room. Will be adding another space mid year—I hope it will be satisfactory!

K One room.

L Approximately 2100 sq. ft. As I have organized it, the space is perfect. I could work with much less. Several rooms. I have used shelves to partition major areas. We have a "music room" which is closed off from the classroom mainly for the purpose of noise control for special activities.

M 900 - 1000 sq. ft. We are cramped!!! One room opening onto a room that is shared with two other classes. It is not satisfactory.

DO YOU HAVE SPACE FOR PHYSICAL EDUCATION? PLEASE DESCRIBE THE SPACE AND THE TYPE OF ACTIVITIES THAT TAKE PLACE. IS THIS ADEQUATE FOR THE NEEDS OF THE CHILDREN? DOES IT MEET THE STATE REQUIREMENTS FOR PHYSICAL EDUCATION?

A No. We utilize lunchroom for ball games and some square dancing. Too confined. We use outdoors in Fall and Spring.

B No

C Yes. We have a large section converted into a mini-gym which seems adequate for children of this age. The boys have typical gym classes. The girls have gym ballet.

D Yes. We have use of the gym in our rented premises. We have one physical education instructress who takes them for one hour, twice a week, 11:30-12:30. On these days they only get a half hour lunch. Group exercises. No equipment yet, aside from balls, tumbling mats, etc.

E No. Would like more room for physical stuff. We're cramped.

F Yes. Gym and swimming pool. Gym: 5000 sq. ft.; basketball, tumbling, 4-square, other games. Pool: 25 x 75'.

G (The State has no requirements.) We have a wonderful outdoor environment which I get poetic about. We have no space for rainy day work out, but this city fortunately has fine weather most of the time.

H Yes. A standard size gym allows for relay races, basketball, soccer, tumbling and trampoline. There is an enclosed playground with playground equipment, acres of land to use for hikes, touch football, 4-square, pom-pom pullaway, fort construction, rock hunts. We spend nearly an hour a day in recreation which is adequate for the children and assume meets the State requirements.

I Yes. Outdoor environment has playground equipment and paved area. Twice a week we use indoor facilities of Church for dancing and movement. Do not consider this adequate. Meets State requirements.

J Only outside. Don't know what State requires.

K Yes. In small, ugh, basement room with low ceiling. Greatly inhibits the children's activities. Outdoor area playground usually full of broken glass. This is difficult for the children because most ride ½ to one hour in a car to get to school and they need movement to compensate for the carpool situations.

L Yes. We swim at a neighboring YMCA weekly. I have a very large carpeted area (900 sq. ft.) which is used for both musical movement exercises as well as developmental exercises (e.g., parachute, tumbling exercises, games, etc.)

M Small. Sma-l basketball court. Small "playground" which allows a small kickball or football game, sawdust area with parallel bars, dome swings and jungle gym, four square and tether ball. (By January it has worn its welcome and is terribly boring.

PERSONNEL. HOW MANY ADULTS WORK IN THE CLASS?

		Number Full Time	Number Part Time	How Often Per Week	For a Total of How Many Hours
A	Head teacher	1		5 days	45-50 hours
	Assistant	1		5 days	40 hours
	Specialty		1 Phys. Ed.	1 day	2 hours
			1 Religion	2 days	4 hours
B	Head teacher				
C	Head teacher	1			
	Assistant	2			
	Specialty		1 French	1 day	1/2 hour
			1 Phys. Ed.	2 days	40 minutes
			1 Art	1 day	1/2 hour

		Number Full Time	Number Part Time	How Often Per Week	For a Total of How Many Hours
D	Directress	1		5 days	5 hrs. per day
	Assistant		1 Art	2 days	4 hrs. (takes lunch 1½ hrs)
	Specialty		1 Phys Ed	2 days	2 hours
			1 French used by other classes, too everyday, 5/6 hours Everyday in p.m.		
E	Head teacher	1			
F	Head teacher	4			
	Assistant		1	5 days	20 hours
				2 days	1 hour
	Specialty		2 Swimming	3 days	1½ hours
G	Head teacher	1			
	Specialty		1 Spanish	3 days	1½ hours
H	Head teacher	1		5 days	35-40 hrs (Paid for 27½ hr)
	Assistant	1		5 days	30-40 hours
	Specialty		1 Music	2 days	2 hours
		NOTE: We may switch to two part time aids instead of one full time.			
I	Head teacher	1			
	Team teacher	1			
	Parents		4	1 day	9 hours
J	Head teacher	1			
K	Head teacher	1		5 days	30 hrs. in classroom
	Assistant		1	3 mornings	9 hours
	Specialty		Phy Ed		
			German		
			French		
			Religion		
			Art		
L	Head teacher	1			
	Assistant	1			
M	Head teacher	1		5 days	
	Assistant		1	5 days	
	Specialty		Spanish		½ hr per child
			Violin (Suzuki Program)		1½ hrs per child

DO YOU TEAM TEACH AND/OR DEPARTMENTALIZE? WHY?

A No. (1) Not necessary for well educated adult to do so. (2) To do so eliminates possibilities of interpretation of discipline as child pursued his explorings.

B No

C Departmentalize. I feel that this is the best solution for the present. As the heat teacher, I am totally responsible for the class. My two assistants have specific roles in two different areas—math and cultural.

D No. At present, with ages 4.7-7.4, I teach all subjects except art (although I do some of this, too) and French. I make all the materials for this class at present. The other Bergamo teacher does French and as yet has not done much presenting.

E Just me!

F Yes. To be better prepared to meet the needs of all children in every area at all times.

G No. I'm it. Would like to team teach if had enough children. They could concentrate on making more materials and presentations in a couple of areas. I feel spread-thin in trying to cover everything.

H No. There is one 5-6 year class and there will be another one next year. It is presently self contained with one teacher and two aides full time. Mine is a first year class, so we haven't examined team teaching possibilities yet.

I Team teach. The class developed from 18 to 30, and will go to 40 next year. This is too much for one teacher new to elementary teaching. We help each other, capitalize on each other's strength in the curriculum. We share material making, decisions, etc. Eventually, one person will be responsible for 6-9, and the other for 9-12 ages.

J No. Next year we may.

K Would *ABSOLUTELY NOT* do this if given my choice. Marching around from teacher to teacher is inappropriate at the 6-9 age level. It means that the teacher loses sight of the *whole child* and, if the children are time scheduled between two or more teachers, the children lose the opportunity to experience a full work cycle. It also means that they are not free to pursue the needs of their sensitivities (i.e., I observed a child at the Maria Montessori School of Bergamo do a study.)

L No. N.B. Article.

M Yes. Because by team teaching we can departmentalize to a certain degree. Our concentration is deeper; the materials are produced more directly towards the child's needs; our awareness is sharper and we offer the child similar yet different points of view. There seems to be constant reinforcement towards our work.

DO YOU HAVE ANY ADMINISTRATION DUTIES? IF YES, WHAT ARE THEY?

A Yes. Director of school, handling all personnel and education matters.

B No, but I am board member representing the Junior Class

C No

D No

E No

F Yes. Total administration of Montessori Academy and Montessori Educational Research Center. Have the assistance of a competent secretary and program coordinator.

G No, except for keeping track of petty cash and ordering my materials, sending home notes and "dealing" with parents.

H No

I Yes. Administrate school—six primary classes with help of assistant.

J Yes. All staff share all the duties needed to run the school.

K No

L No

M No. We are responsible pedagogically

WHAT IS THE LENGTH OF THE SCHOOL DAY? WHAT HOURS? DESCRIBE SCHEDULE.

A 6 hours: 8:30 a.m. to 2:30 p.m.
8:30 - 11:30 Independent work
11:30 - 12:45 Lunch and recreation
1:00 - 2:30 Collective and large group lessons

B 5½ hours: 9:00 a.m. to 2:30 p.m.
9:00 - 11:40
Lunch
12:40 - 2:30

C 6 hours: 8:30 a.m. to 2:30 p.m.
8:30 - 12:15 class
12:15 - 1:00 lunch and play period
1:00 - 2:30 class

D 5 hours: 9:00 a.m to 11:30 a.m. and 1:00 p.m. to 3:30 p.m.
9:00 - 11:30 class
11:30 - 1:00 lunch and recreation
1:-0 - 3:30 class

E 6 hours: 9:00 a.m. to 3:00 p.m. (clean up at 2:30)
9:00 - 12:00 class
12:00 - 12:30 outside play
12:30 - 1:15 lunch with reading, discussions and clean up
1:15 - 2:30 group lessons, individual work, etc.

F 6¼ hours: 8:45 a.m. to 3:00 p.m..
Flexibility and versatility are required. The program and schedule must be able to change when the need for change is indicated. We operate on the basis of weekly "contracts" for work to be accomplished. The morning is entirely devoted to this pursuit of completing contracts & the necessary presentations. Afternoons are more organized with physical education, foreign languages, art presentations, swimming, special projects (i.e. drama, etc.) music.

G 6 hours: 9:00 a.m. to 3:00 p.m.
9:00 - 11:30 Work time
11:30 - 12:00 Clean up and lunch
12:00 - 12:45 Playtime
12:45 - 1:30 Rest, storytime (whole group time lesson)-calming down time, we call it.
1:30 - 3:00 Work time

H 5½ hours: 9:00 a.m. to 2:30 p.m.
9:00 - 11:30 Classroom
11:30 - 12:30 Recreation (gym or outdoor activities)
12:30 - 1:00 Lunch (some have taken the option of coming in at 12:00 for early lunch)
1:00 - 2:30 Classroom
We show films on Thursday mornings. We have music from 1:30 - 2:30 on Wednesday and Friday. Small groups may present plays, skits, magic show, etc. on Friday.

I 6 hours: 9:00 a.m. to 3:00 p.m.
9:00 - 12:00 Class
12:00 - 12:30 Lunch
12:30 - 1:00 Recreation
1:00 - 3:00 Class
Thursday afternoon from 3:15 - 4:30 is craft session

J 6 hours: 8:30 a.m. to 2:30 p.m.
Varies day to day—usually collect for some musical activity around 11:15; then lunch. Afternoon work usually begins with a story or another collective.

K 5 hours, plus 1 hour for lunch: 9:00 a.m. to 3:00 p.m.
9:00 - 11:45 Class
11:45 - 1:00 Lunch and recreation
1:00 - 3:00 Class
Please note that the day the children worked best was Monday when they were not going in and out of class for special activities. Wednesday and Friday mornings were also pretty good. The rest of the week was almost a total waste of time for them as there was little concentration and little normalized behavior (it took me one and three-quarter years to figure out what was wrong). This schedule was set up by the principal. I had *no choice* in this matter.

L 6¼ hours: 9:00 a.m. to 3:15 p.m.
9:00 - 9:30 Special group lessons
* 9:30 - 11:50 Individual work
11:50 - 12:00 "Line" activities
12:00 - 1:00 Lunch
* 1:00 - 1:30 Special group lessons
1:30 - 3:15 Work (individual)

* Denotes that only some children have group lessons each day.

M 6¼ hours: 8:45 a.m. to 3:00 p.m.
8:45 - 10:45 Work period
10:45 - 11:10 Playgroung
11:10 - 11:20 Snack, if child brings one
11:20 - 12:30 Work time
12:30 - 1:00 Lunch
1:00 - 1:30 Playground
1:30 - 2:45 Work time
2:45 - 3:20 Dismissal

HAVE YOU EVER USED ANY OTHER TYPE OF TIME SCHEDULE IN A MONTESSORI ELEMENTARY CLASS? IF SO, DESCRIBE.

A No, except for varying lunch periods.

B Yes. In public school in Sweden the schedule had to be arranged according to number of lessons of 1-3 grade: first; 20 children; second 24 children; third 30 children per week, arranged within 30 hours per week for the teacher.

C No

D No. As this is really a transitional class this year, we have not extended the hours.

E Yes. Children used to eat before playing. When they came in from outside they were chaotic. We make a real *ritual* out of lunch now. The children are much calmer. Lunch emphasizes courtesy and inner control.

F Yes. As stated, our schedule is not static—it changes with needs, talents and facility. We have had several types of schedules used or tried over the past four years.

G Yes.
9:00 - 12:00 Work
12:00 - 1:00 Play and lunch
1:00 - 2:30 Work
NOTE: I found the children starving by 11:30 since I serve no snacks. Also, they need a calming time and rest.

H No

I No

J No

K Have observed several elementary classes that have one teacher only. Assistant teacher takes lunch hours and there are no specialty teachers doing regular school hours. *BEAUTIFUL!* Concentration, self development—just like in the books!

L I do not believe that elementary children need the three hour work period as intensely is preschool. It should not be an arbitrary standard.

M Yes.
9:00 - 11:30 Work time
11:30 - 12:00 Lunch time
12:00 - 1:00 Playground
1:00 - 2:30 Work
2:30 - 3:00 Dismissal

PARENTS. DO YOU PROVIDE ANY PARENT EDUCATION? IF YES, DESCRIBE.

A. Yes. Three class meetings per year in which aspects of curriculum are explained by lecture, demonstration, etc. Collective conferences (e.g., all parents of 6-7) to discuss nonschool environments to their implication for children.

B Yes. Obligatory study groups six times per year.

C Not yet

D Yes. Before Christmas I gave talks and presented sequences of material every other Thursday night. I will give one main talk to the whole school on advantages of keeping the child on in Montessori beyond Children's House.

E Yes. The Directress holds several "study group" meetings with primary parents. I usually give several demonstrations per year on elementary. We had Margot Waltuch in to speak.

F Yes. We have parent workshops—small groups of parents meeting with a teacher exploring in some depth the program and approaches used. Montessori psychology is one of the subjects explored.

G Yes. I have a study group each month—Tuesdays at 7:30. I planned the first four and we will plan the last four together. First meeting was general introductions to practical matters, second was discussion of language, third was discussion of math, fourth will be observation techniques to prepare them for spending a day in the class.

H Yes. Regular meetings are scheduled for speakers, along with open house, Mother's Night, pot luck suppers, parent conferences. The school organizes Montessori study groups, Dreiker's Children: The Challenge Course and Parent Effectiveness Training.

I Yes. Conferences, lectures, open house, father-child night (very successful!)

J Yes. (1) This fall I'm doing a rap group. My goal is consciousness raising—not prescriptive. Our first topic was sibling rivalry. Next week will be parental anger toward children; also later, the problem of home values versus external values, etc. (2) This spring I will do one on 6-12 in Montessori

K Yes. Parent and classes in order to become full members of the organization. Once a year all day Saturday—for a superficial into the Montessori materials and pnd phylosophy. Inadequate.

L Yes. (1) Two parent meetings a year where all parents come. (2) Monthly parent seminars (3) Articles

M ? School: only in forms of book lists. Me: we have two conferences during the year (30 minutes) when I try to verbalize my goals, etc. Nothing direct yet.

PARENTS PARTICIPATION IN MAKING AND REPAIRING MATERIALS AND HELPING TO BUILD CLASSROOM FURNITURE

	Make Materials	Repair Materials	Help Build Classroom Furniture	Other
A	No	No	No	
B	No	-	Yes	Provide library books, transportation on field trips
C	No	No	No	

	Make Materials	Repair Materials	Help Build Classroom Furniture	Other
D	Mostly cutting	Library books only	No	
E	No, too chaotic	Yes	No	Plan trips, help with open houses
F	Yes	Yes	Yes	
G	Yes	-	Yes	Everything. They practically built the school; remodeled the old house over the summer; spent much time and money.
H	No	No	No	Only drive groups on field trips; substitute for aides.
I	Yes	Yes	Yes	Teach Italic writing, arts and crafts, dancing, occasionally science.
J	Some	Don't know	Not yet	Build/create playground equipment
K	A few do	-	Yes	In general, the principal discourages participation partly as a way to keep a distance between the teachers and the parents and partly to keep the management of everything to herself.
L	Some	No	Yes	Contribute money for special books and experiences. Give praise! Occasionally direct art and cooking and dancing.
M	No	No	No	Organize Christmas, Easter, Halloween and Valentine Day parties. Sweet extravaganzas.

IF PARENTS HELP THE SCHOOL, IS THERE ANY SORT OF REDUCTION IN TUITION IN EXCHANGE FOR SERVICES? IF YES, EXPLAIN.

A No

B No

C Yes. Both of my assistants work for a tuition exchange. Each has three children enrolled in our school.

D No

E No

F No

G Sometimes. The parents are asked to help on a regular basis as a condition for entry. Some parents who need tuition help do take on extra work, i.e., one woman is responsible for all the janitorial work in the building in exchange for her child's tuition. She doesn't *do* the work, but arranges for volunteer parent help on a regular basis.

H Not that I know of

I No

J No

K No

L No

M No

ARE THERE ANY OTHER QUESTIONS WHICH YOU WOULD LIKE ASKED IN FUTURE QUESTIONNAIRES?

A Periodic tabulation of salaries and benefits.

B --

C --

D Yes. How do you organize your day?:
Morning Group Yes No
Mostly group lessons Yes No
Group lessons with entire class or small group lessons according to aptitudes. Still very much individual instruction.
When starting an elementary class, can it run effectively with only eight or ten students age 6 to begin with?
What are the requirements for entry into elementary class? Age 6 by September? Children enter on 6th birthday? Reading? What level in math? Children enter during school year?

E --

F I would like a list of all Montessori elementary programs in the United States:
Number of elementary trained teachers
Number of elementary age children
How divided into groups, classes
Age range
I am sure most elementary schools are questioned about Montessori elementary schools in other parts of the United States, especially when someone moves.

G --

H Do you believe that you can adequately "teach" all subject areas on the basis of the Bergamo training and currently available materials? If not, explain.
What is your policy of admission?
Do you attempt to teach any foreign languages?
Can an assistant best be used as a general aide, for classroom preparation (materials), or for individual help, as in oral reading?
What help do you have in preparation of materials?

H Continued. How much tuition is charged for your elementary class? How often do you order books and supplies, and do you have a ceiling on spending?

I --

J How many years does it take to develop all the materials really necessary for a 6-9 class? I'm in my third year and see no end in sight.

K --

L Breakdown of curricular success and failure could be measured by questionnaire; e.g., What cultural materials have you developed and how successful? Perhaps a check list might help.

M What is the true motivational force behind the school? The child? The teacher? The administration? Money?

WHAT DO YOU THINK ARE THE IDEAL CIRCUMSTANCES FOR A MONTESSORI ELEMENTARY CLASS? NUMBER OF CHILDREN? AGE RANGE? DESCRIBE SIZE OF AND INDOOR ENVIRONMENT. DESCRIBE SIZE OF AND OUTDOOR FACILITIES. NUMBER OF ADULTS AND IN WHAT CAPACITIES DO THEY PARTICIPATE? WHAT IS AN IDEAL SCHEDULE AND LENGTH OF CLASS DAY? WHAT SHOULD BE THE RELATIONSHIP OF THE PARENTS TO THE CLASS?

A 30 children of 6-9 or 10-12. Indoor: 1500 to 1800 sq. ft.; open area or fully articulating room (arches, not doorways) except for visually available but acoustically isolated music room and separate craft area. Also need large area for live work and other physical exercises—this beyond the 1800 sq. ft. Outdoor: Good size playing field, large enough for soccer, softball, etc. Also area for gardening to keeping small mammals. Some climbing apparatus, rope swings, etc. One to two adults; one head director/directress who has craft or physical education talent. Aid's contact with children as instructor in her specialty to noon time supervisor. Otherwise, aide gives support work of materials, etc.
6½ - 7 hr. day as follows:
8:30 - 11:00 Class
11:00 - 12:30 Lunch and recreation
12:30 - 3:00 Class
Relationship of parents initially be aware of child's work through seeing it, visiting school, conferences and meetings. Work not necessary but a tool to achieve their level of knowing and caring.

B 45 children of 6-10 age range with two teachers as a team.
Indoor: don't know, depends on building.
Outdoor: don't know
2 adults in capacities as teachers
9:00 - 3:00 length of class day
Relationship of parents: supporting and willing to participate (but not as part of administration)

C 30 children of 6-8½ or 9 age range. Indoor: 18 sq ft, spacious, well-lighted (low windows preferably) warm in color, furniture, carpeting and arrangement.
Outdoor: property adequate for play, walks, planting, etc.
Three adults; the assistants help the head teacher with various classroom duties. They can be particularly helpful if confined to an area.
I am pleased with our present schedule.

C Continued. Relationship of parents: the parents are free to observe at anytime. I often confer with them regarding their child's progress, problems, etc. They are a great resource for projects, displays, trips, etc.

D 25 children of 6-9 age range; not certain as this is my first year with older ones, so I'll speculate from experience to date; preferable start with age 6 and add an age a year. Indoor: Classes should be very large to enable large muscu lar movement. Individual desks for older children; facility for work on mats (is this usual in most schools, or do teachers prefer table work?) Outdoor: Plenty of parkland, trees and facilities for nature study. Opportunity for large muscle activity.
One adult is sufficient in my estimation. My assistant helps with art two times per week (two groups). The remainder of the time she helps me make material; hears children read and helps with remedial work.
5 hour day as follows:
9:00 - 11:30
1:00 - 3:30
Complete work periods morning and afternoon. So set juice time. Juice table so they can satisfy need as necessary (only once). Gym two times per week, one hour 11:30 - 12:30; French, one group 1:00; then French teacher comes back with group and works in main class with us; 2:40 second group goes out to French.

E 20-25 children of 6-9 age range, i.e., readers and children who know concepts of addition and subtraction—forget age!! Indoor: Long, narrow room with only two windows at one end. Very cheerful though, cozy, a tiny, private world; not enough *LIGHT* for nature, etc. Sometimes clostrophobic. Outdoor: Large back-yard with apple trees, old boat, tree stumps. Ample running room. Need more gym equipment.
One adult. "Just li'l' ol' me!"
9:00 - 12:00
12:00 - 12:30
1:15 - 4:00 Like to go to 4:00 p.m. with older kids for concentrated discussions, projects, films, advanced math.
Relationship of parents: *INTERESTED!* Asking ??? Waiting to know, as observer, etc.

F The subject to be discussed on Page 5, is highly subjective. This will vary with each teacher—their training, experience, background; the environment and facility; the climate; the outside resources; the background and normalization of the children, etc., etc., etc., etc. . . Therefore, the questions (in my opinion) are of little value to the questionnaire except to determine the vase range of others' opinions. I cannot find the answer to even one of the questions because they are all so interrelated and each is subject to variation by so many factors. Any one person, by changing one factor, could answer this page in many different ways. In my opinion, this is of interest value only and hardly research or statistically oriented.

G 25 - 40 children, with 1 adult per 25 children and 2 adults per 40 children; 6-9 age range. Indoor: 50 to 60 sq. ft per child. Personally, I like the scale—human—of a hours—old house with large rooms—lots of closets—high ceilings—large windows—but if I were to build, I would want one large room with possibility for several small adjacent specialty rooms; art, lab, music, kitchen and an adjoining outdoor work area, deck or terrace.
Outdoor: As large as possible. The size of the outdoor area can be endless—from house lot to State Park. I'm happily using a half acre with good trees—

G Continued. garden space—log cabin materials—tires—junk—boards—turtle pond—sandbox—tarzan ropes.
Adult participation: two adults. We would like to team teach in a large class of 40. We each have strengths which the other lacks. Also, we would like to put our energies into making materials in special subject areas—not always having to duplicate for two separate classes.
Ideal schedule: 6 - 7 hours as follows:
9:00 - 11:30 Work
11:30 - 12:00 Lunch
12:00 - 12:45 Play
12:45 - 3:00 Work This is the schedule I'm using now and I like it very much (an hour longer in some communities where children can get to their homes quickly—do not have—they spend too much time on the road.)
Parent relationship: Parents should be supportive and feel a part of a team with the teachers and kids.

H 20 children, perhaps 25 if they are normalized; 3 year span, 6-9 and 9-12.
Indoor: 25 x 40'. Off of the large room a 10 x 15' room equaipped with gas outlet and running water. Another side room 15' sq. to be used as a library and oral reading area. A third small room (8 x 12') could be used for music. The large room could contain a two-level wooden structure with one large "room" on the bottom and several partitioned "rooms" on top.
Outdoor: Several acres. Large field, wooded area nearby, orchard, stream, marsh in the general vicinity. There must be enough open space to play team sports. There should also be areas where children can play alone unsupervised.
Adult participation: One to two full time adults and one to two part time. Director makes presentations to individuals and small groups, joins in group games, leads all recreation or any subject area of special interest or competence. Makes records of children's work. Assistants; one to make materials, one to do oral reading and daily language activities, one to do special subjects like languages or one general full time aide who can present materials.
Ideal schedule: 9:00 - 3:30. The children must be normalized for a longer day. 9:00 - 2:30 is maximum if there are hyperactive children or emotionally disturbed children.
Relationship of parents: They should be willing to help with driving on field trips, making materials or furniture, special projects. They should not be required to help. They should understand the basics of Montessori philosophy before their child is admitted. There could be required attendance in a study group the first year in which their child is enrolled.

I 20 children of 6+-9 and 9-12 age range. Indoor: 1500 sq. ft., 1 girls' bathroom, 1 boys' bathroom, vestibule and cloakroom also to contain art supplies, mainroom, cabinets, library, tables and chairs, piano, stage area used for map work, time lines, special lessons. Outdoor: 2 acres. Playground has sandbox, climb around, slide, grassy area for ball games, hardtop surface for rainy weather activities.
Two adults to participate in team teaching.
6 hour length of class day. We extended one day to include craft session as we find it difficult to work everybing into six hours.
Relationship of parents: We welcome parent participation and have encouraged them. The result is good for children and parents and teachers alike. We all learn from each other.

J 20 - 25 children in the 6-9 age range for the experienced teacher.
Indoor: 900 to 1100 sq. ft. of open space, low windows all around to natural setting, small stage at one end (raised a couple of feet) for work, etc. Perhaps another space for gymnastic, physical education stuff if you're in colder climates where the outside is often not suitable for gym; two sinks.
Outdoor: the world; balance beams, balance beams, climbing ranges and poles, a field for soccer or whatever, woods, fields, streams, the ocean, etc. in easy walking distance.

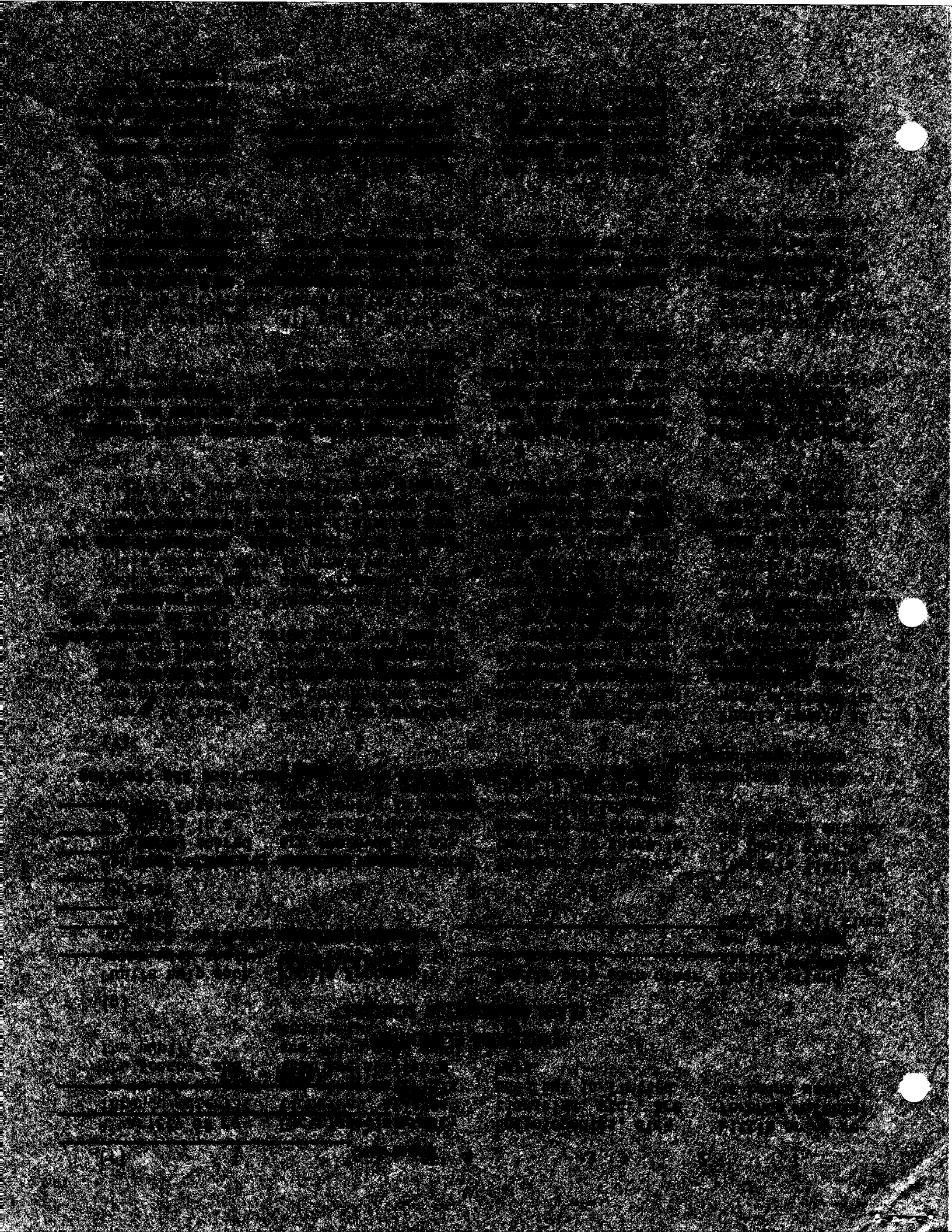
K 30 - 40 children in the 6-9 age range.
Indoor: I think a 6-9 needs more space than a 3-6 because the areas are so greatly expanded. 1500 sq. ft. should have natural sunlight, immediately adjacent bathroom facilities, no flourescent lighting, light colored walls, white shelves, wooden tables and chairs, many plants and animals, wooden floor, carpeting in library only.
Outdoor: As large as possible with space for gardening, animals, woods, a stream, play yard, swimming pool.
One adult in teaching role, one assistant for making materials, supervising recreation time, being available for emergencies, answering telephone—but not for teaching.
9:00 - 12:00 and 1:00 - 4:00 class day. The best elementary classes I have seen have time for a full work cycle in both morning and afternoons.
Relationship of parents: Actively involved in material making, helping with field trips, etc.

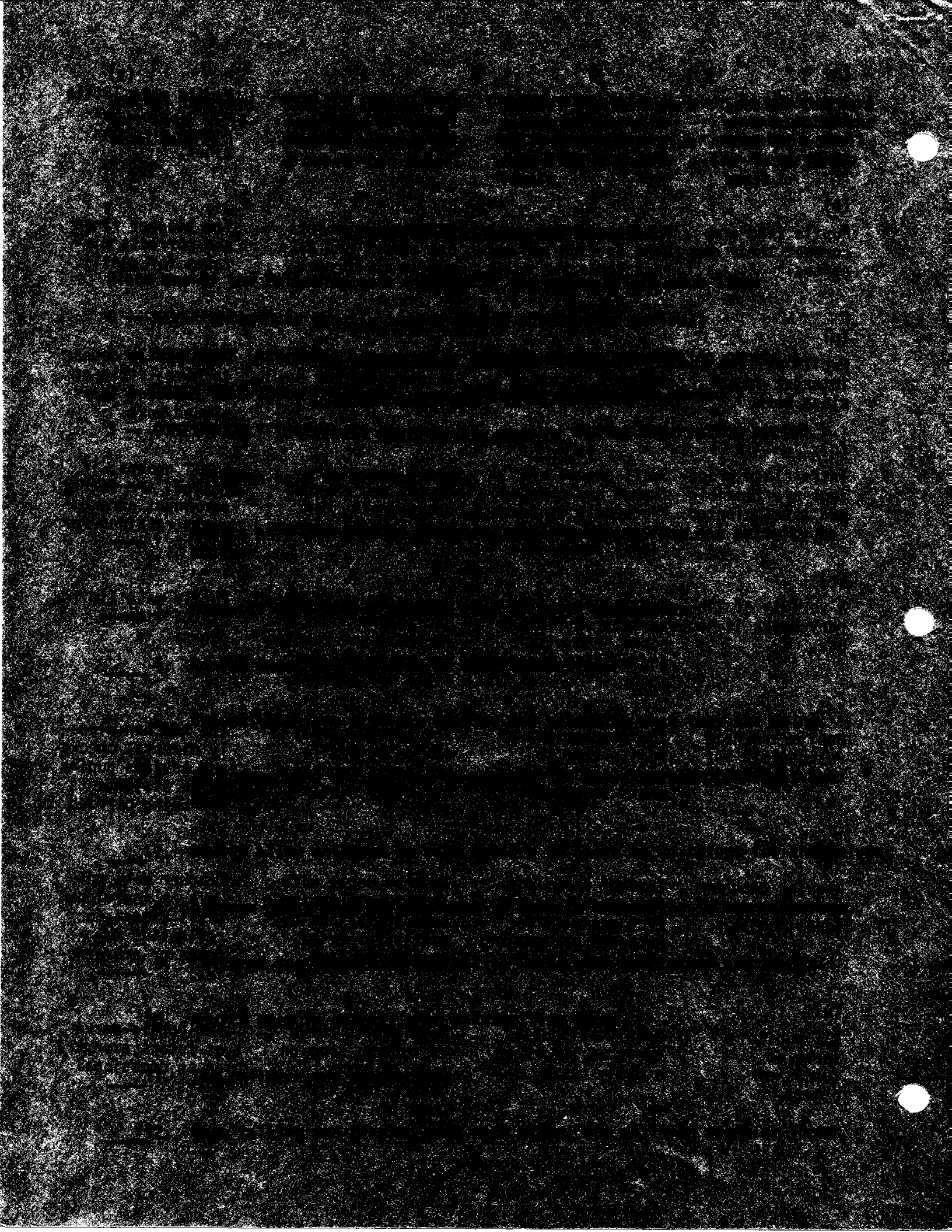
L 30 children of the 6-9 age range.
Indoor: 1500 sq. ft. Space should be conceived in terms of academic integration. Tables should be selected for both individual and group use. Windows should look out onto natural environment, etc..
Outdoor: 2 - 3 acres. All outdoor facilities should have at least one playing field and hopefully, a strip of woods.
Adults: 2 (one director, one assistant). This question is not clear! I believe that the adult should direct when a child cannot work by himself. I do at times reserve the child's right not to work. I believe in consistent and organized group lessons.
Ideal schedule: 6¼ hours. My schedule is good. We do not want to overburden the teacher with 7 - 8 hour day.
Parent relationship: Minimum. Parents should know what's happening but should not "spy" on their children. Contact with class invites "spying," and "testing." The classroom is for the kids. I use parents' expertise for special activities (e.g., arts and crafts, cooking, engineering, etc.), also donations. Parent education is essential.

M 25 children of the 6-9 or 9-12 age range.
Indoor: 1000 - 1200 sq. ft. of spacious and ordered environment. A set area for each type of material. It must have a certain "warmth" that plastic chairs and tables don't seem to produce. Natural light. . . windows and skylights. Wall space or stands for charts and display. Easy access to materials and books. Good temperate circulation.
Outdoor: 1 acre or more. Need not adjoin classroom, ideally yes. Areas for traditional games are good, but space is very important. Different tactile areas, dirt, grass, sand, sawdust, etc. Trees, hills, holes are as essential as a jungle gym type apparatus or swing set. Movable apparatus is essential; crates, boxes, modules, etc.
Two adults to set up the pedagogy of the class. Present the materials, direct children to their work. Design and produce (direct) the making of materials. Confer with parents as to progress of child and meaning of program. Maintain environment.

Ideal length of class day is six hours. Four hours of 'work' time and two hours of play and eating, however, it fits into the structure of the school.

Relationship of parents: They must fully understand the purpose and meaning and benefit of the "Cosmic Education" program; if that is understood there is usually something that they can share with the class and you with them.





[redacted]

CONDUCTING RESEARCH

by Constance Hollinger

Maria Montessori had an intuitive feel, a genuine understanding of children. Few individuals, even of those not considered to be advocates of Montessori education, would dispute this fact. For those closely associated with Maria Montessori and her pedagogy, no doubt exists that her insight into children, her intuitive feel for their sensitive periods of development and her ability to structure the environment in a way most conducive to learning are indicative of genius. For those individuals trained in Montessori, no need "exists" to "prove" that her techniques are valid, that her approach to education is sound. However, if one can consider for the moment, that evaluation of Montessori education is not designed solely for proving the validity of her work but rather for further exploration of what is actually occurring within the child as he interacts with his environment, the value of research and evaluation become apparent. If the ongoing process of Montessori education is to be monitored, if demonstrations and materials are to be assessed; in other words, if Montessori education is to grow, the ongoing process of adjustment to the needs of children must be evaluated. In addition, if Montessori practices are to gain wide acceptance so that more than a select few can benefit from her approach to education, objective proof of the superiority of her practices must be presented. In order to obtain state accreditation, data providing evidence of cognitive, social and emotional development must be presented. Those unfamiliar with, or in opposition to, the philosophy and beliefs of Maria Montessori need to be given statistical evidence that the development of the Montessori educated child is comparable to that of the child educated in the public school system. The evaluation of this development can be left to chance, to trial and error testing, or to practical experience. However, if new knowledge is to be acquired systematically and efficiently, procedures of scientific and statistical research need to be employed. Proponents of Montessori education need to become competent researchers.

There is no completely comprehensive list of problems in education which need to be researched. Therefore, it is suggested that an individual enters into research primarily to answer those problems or questions which arise during the course of his/her teaching. The interaction between the teacher-researcher and the child provides a rich source of personally meaningful problems which can be explored through research. Once a problem area or general question has been identified, a formal research proposal should be drafted. A research proposal is simply a systematic plan which organizes the preliminary steps needed to be taken if the original purpose of the study is to be achieved. The proposal

should contain the following components: (1) a title, (2) a statement of the problem, (3) theoretical, (4) operational hypotheses, (5) theoretical background of the hypotheses, (6) importance of the study, (7) definition of terms, (8) limitations of the study, (9) basic assumptions underlying the study, (10) data collection, (11) data analysis.

The selection of an appropriate title for the research project identifies the general problem area. The title should also identify specific concepts or characteristics being investigated as well as the nature of the relationships between the concepts. It is also noted that the title should be stated as precisely and succinctly as possible.

Once the problem has been defined, it must be evaluated. Evaluation of the selected problem consists of determining whether the problem is researchable. Frequently, problems present themselves in the form of value questions. An example of a value question would be, "Should Montessori education focus primarily upon cognitive development, or should it also focus upon affective and social development as well?" Such questions can be answered only on the basis of a value orientation and are not within the realm of empirical research.

To evaluate the researchability of a given problem, a review of past as well as current research is suggested. Such comprehensive indices as the *Education Index*, the *Encyclopedia of Educational Research*, the *Review of Educational Research*, the *Psychological Abstracts* and the *Sociological Abstracts* should be consulted. Investigation of the original studies cited in these indices will identify major issues and research methodologies related to the problem area of interest.

A review of the literature will also provide information regarding the availability of adequate instrumentation for the measurement of the attributes or behaviors under investigation. Much time and effort have been spent attempting to measure human attributes or characteristics with instruments of questionable validity. Concepts such as creativity, self confidence, self actualization, etc. are difficult to measure. Since agreement upon an adequate operational definition for such constructs does not exist, the instrumentation developed by a given individual will measure the construct as he defines it. As a result, low correlations often exists among tests purporting to measure the exact same phenomenon in a given individual.

Provided the problem is researchable, the formal statement of the problem is constructed. This statement is presented in either question or declarative form. Regardless of the form, the statement of the problem implies the question or

questions which are to be answered by the study. The declarative form is usually reserved for those instances in which the declarative statement introduces or precedes the questions or in instances in which the declarative statement implies the main question while subsequent questions cite subproblems to be answered by the study. As in constructing the title, the statement of the problem should be presented in precise, succinct terms. For example:

> What is the relative effectiveness of Montessori education as compared to traditional early childhood education programs?

The next step in writing the research proposal is to formulate hypotheses concerning the predicted outcome of the study. These hypotheses are developed from the statement of the problem and represent tentative answers to the questions posed in the statement of the problem. These answers or predicted outcomes are derived from theory, previous research or experience and constitute the idea to be tested through the collection and analysis of data. Two types of statistical hypotheses need to be generated. A "null" hypothesis, useful in testing for statistically significant differences, is a statement that no significant difference or significant relationship exists. An example of a null hypothesis generated from the question presented above would be that, *"The skill of a Montessori trained child in classification of objects will not be significantly different from the skill demonstrated by a child educated in a traditional educational environment."* The second hypothesis to be designed, the alternative hypothesis, predicts the converse, that a significant difference does exist. *"The skill of a Montessori trained child in the classification of objects will be significantly different from the skill of a child educated in a traditional environment."* The alternative hypothesis can be stated in another form such that the "direction" of the difference is also predicted. An example of a "directional" alternative hypothesis would be:

> *The skill of a Montessori trained child in the classification of objects will be significantly greater than the skill of a child educated in a traditional educational environment.*

Much confusion and difficulty can be avoided at this point if the researcher includes an optional step in the drafting of his proposal. This additional step involves operationalizing the null and alternative hypotheses. The null and alternative hypotheses are usually constructed in theoretical terms such that abstract concepts, characteristics or constructs are used in describing the nature

of the relationships predicted to exist. To operationalize, each theoretical term is redefined in terms of a set of measurable or observable operations or behaviors. The following is an example of an alternative hypothesis presented in both its theoretical and operational forms:

> *A Montessori trained child will be more creative than a child educated in the public schools.*
>
> *A child who has experienced a minimum of three years in a Montessori environment will score higher on Torrence's Creativity Test than a child educated in the public school system.*

By operationalizing, the researcher has actually identified the processes or methods by which he will attempt to find an answer to his original problem. In addition, he has further defined the nature of his experimental group. (The Montessori children must have been exposed to a minimum of three years of Montessori education.)

After completely reviewing the existing literature, the researcher demonstrates his grasp of the theoretical underpinnings of his problem by justifying the significance of his proposed study and by relating his proposed study to current theory. A researcher can prove that a need ex ists for his research in several ways. First, he can cite other pieces of research in which other researchers indicate that a need exists for additional research in his specific area. Or, the researcher may emphasize the need for his study based on the fact that a considerable amount of time has lapsed since similar research had been conducted. A third reason that may be cited is the existence of completely discrepant findings among the various pieces of research. By citing methodological or interpretive differences between two conflicting research studies, the researcher can propose a study to resolve such differences. Finally, a researcher can justify his study by demonstrating that little, if any, research has been conducted in this specific problem area.

As mentioned above, further indication of the mastery of the existing theoretical background of the proposed study is demonstrated by actually relating the proposed study to theory. In doing so, the rationale underlying the hypothesized outcome of the study becomes apparent. In addition, the research is then partially justified by its contribution to the validation or elaboration of current theory.

A short section devoted to definition of terms as introduced at this point.

Only major constructs or valuables related to the study are defined. These definitions are stated as precisely as possible since elaboration of the definition follows in the succeeding section in discussing conceptual limiting factors.

The section of the proposal relegated to discussion of the limitations of the research discusses both the limitations of the terms or constructs under investigation and the limitations of the methodology employed. In discussing conceptual limiting factors, the specific interpretations or definitions of the concepts are explicitly defined. For example, such terms as "education," "learning," etc. are defined as they relate to the specific theoretical framework of the study. Methodological limitations are those factors which are inherent in the procedures used in the collection of data such as limitations of sampling procedures, sample size, instrumentation, etc. Certain methodological limitations are inherent in the specific methodology used. For example, data collection methods depending upon self-report instrumentation are limited to the degree to which each respondent fails to answer the questions with complete honesty. Likewise, the use of a questionnaire method is limited by the number of questionnaires returned as compared to the total number of questionnaires distributed.

Inherent in any piece of research is a set of basic assumptions, statements which the researcher has chosen to accept as true. In the section of the proposal designed for presenting these assumptions, the researcher demonstrates that he is aware of all these assumptions and is prepared to defend the validity of the assumptions on the basis of logic or reasoning.

For example, in a research study comparing the average I-Q mental ability of children attending Montessori schools to those children attending public schools, the basic assumption is made by the researcher that mental ability can be measured by the currently available tests of mental ability. It is also assumed that the Montessori trained students are attending a school which indeed adheres strictly to Montessori methodology. As true with all assumptions, these assumptions must be stated and must be logically defined by the researcher, since the validity of the study can be no greater than the assumptions on which it is based. By stating the assumptions in the proposal, the researcher demonstrates that he is aware of the assumptions upon which his research is based and that he is prepared to define the validity of the assumption.

Before actual data collection can begin, the sample or samples for the study must be selected. A sample is simply a finite set of persons or objects selected from an infinite or much larger set of such persons or objects known as a population. In most educational research, the sample consists of persons,

specifically students who in turn serve as the subjects for the experiment. Since one of the assumptions of most research is that the research findings can be generalized beyond the small sample group to statements concerning the entire population, the samples involved in the study must be as typical or representative of the entire population as possible. The most common method for insuring representativeness is by randomly selecting the members of the sample. In random selection, each member of the entire population must have an equal chance of being selected. Obviously, if one were to compare Montessori educated children with public school children, one would not be able to randomly select samples from the two populations involved, the population including all children in the United States in Montessori schools and the population including all children in the United States attending public schools. Such samples represent the ideal toward which the researcher strives. In reality, samples are selected from the total population of students available to the researcher. This large population. To the extent that the selection of the samples was randomized the researcher can be assured that his samples are not systematically biased and that they are truly representative of the total population.

A second consideration that must be made concerning samples is that of size. Obviously, one cannot base conclusions about all Montessori children on the knowledge of one Montessori child. One of the original criticisms of Piaget's early work was that he made generalizations about all children based upon his observation of only three children—his own. There is no magic number considered as being an adequate sample size. However, the larger the sample size, the greater the probability that the selected sample is representative of the entire population; hence, the greater the assurance that generalizations can accurately be made from the sample to the population.

Other characteristics of the sample should be noted—such as chronological age, sex, mental ability, etc. If two samples are used in a study such as a control group and an experimental group or such as a Montessori group and a traditional group, a disproportionate number of males in one group would be an intervening variable which could contaminate the conclusions drawn from the data collected.

For the selected samples to be compared along some characteristic or behavioral dimension, an instrument for measurement must be selected or devised. Such instruments will be identified and described in the section of the proposal designated for instrumentation. When selecting instrumentation for the study, each instrument is evaluated for its objectivity, reliability and validity. A

valid instrument measures what it purports to measure. A ruler is a valid instrument in that it is designed to measure length, and indeed, it measures length. When dealing with nebulous constructs such as creativity, the validity of the instruments available are questionable and depend heavily upon the specific definition of the concept used by the author when he constructed the instrument.

For the proper analysis of the collected data, the novice researcher should consult a statistician to determine which statistical procedure would be most appropriate. The section entitled, "Analysis of Date," is included in the proposal so that the researcher ascertains that the type of data to be collected can be handled appropriately by established statistical technique. By identifying those techniques in the proposal, the researcher is assured that his data can be analyzed properly before he ever begins the data collection process.