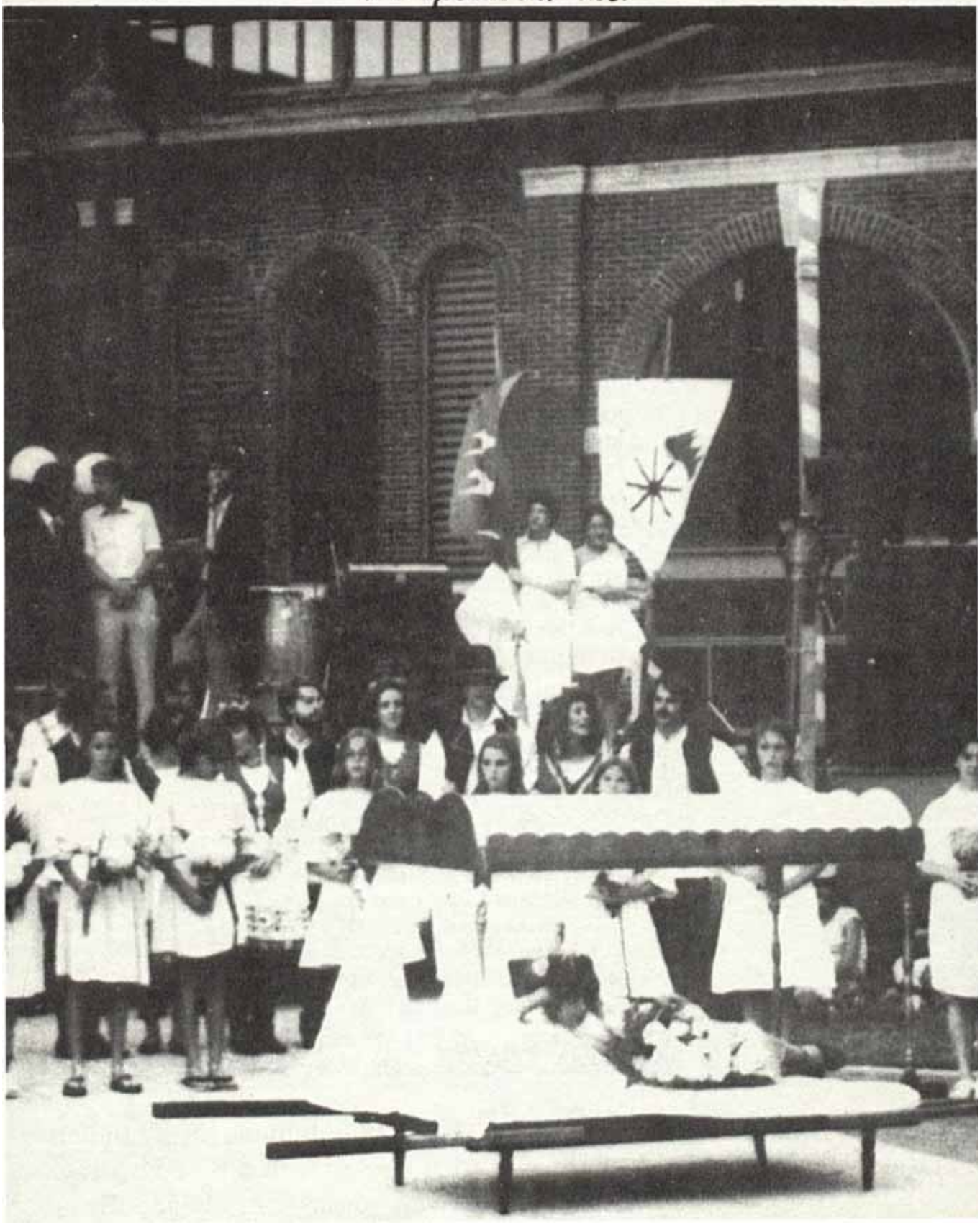
Newsletter

VOL. V, No. 1 *Pompeiiana, Inc.* September, 197



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COVER PICTURE: Girl Scout Troop 283, Indianapolis, Indiana, participating in the Roman parade orchestrated by Pompeiiana, Inc. for the Midsummer Festival in downtown Indianapolis.

POMPEIIANAE PRAEFECTUS SALUTEM DICIT
LITTERARUM CLASSICARUM STUDIOSIS!

We are now entering a school year most promising both for the future of Classical Studies and for Pompeiiana, Inc., a year which will take us to the commemoration of the nineteen hundredth year since Pompeii and Herculaneum were preserved for our study on August 24, A.D. 79. Public awareness of Classical Studies (encouraged by the POMPEII A.D. 79 Exhibit currently touring the country) will be at its highest. It is a school year no class of Latin should let pass without organizing some special public display or program celebrating the wealth of Roman culture preserved for us at Pompeii and Herculaneum.

By January, 1979, Pompeiiana, Inc. will be circulating a new filmstrip/cassette presentation entitled THE VILLA OF THE PAPIRI As Reconstructed by J. Paul Getty, as part of its program to commemorate the year.

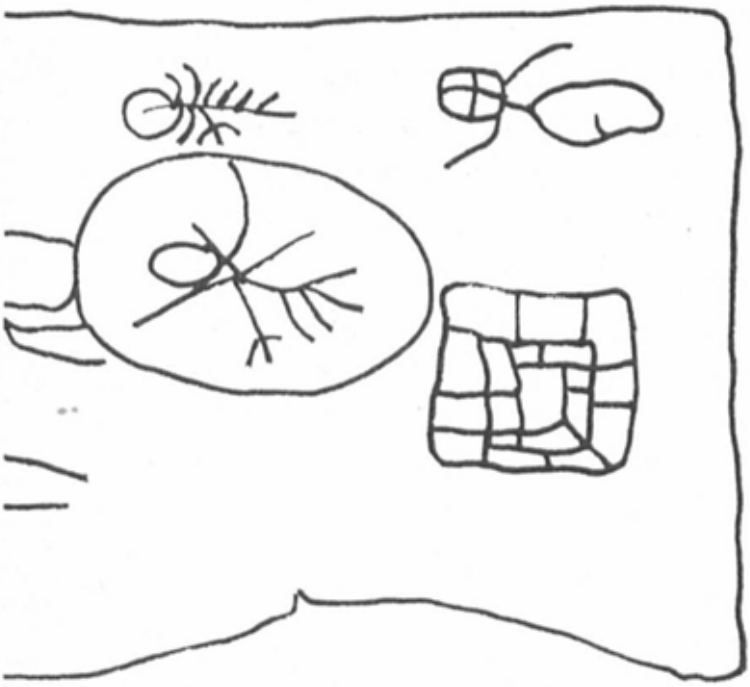
Ongoing challenges offered to all by Pompeiiana, Inc. include I) the challenge to set new records in catapulting--a project now entering its 14th year, and II) the challenge to become a member of the $1,000 Club explained elsewhere in this Newsletter.

Contributions to this Newsletter continue to be invited from all members, be they community supporters of classical studies, students or teachers.

As director of Pompeiiana, Inc. I will continue to generate new materials for the promotion of classical studies, to supply members with materials already amassed, to publicize the values of classical studies and to explain the role of Pompeiiana, Inc. in promoting these values.

B. F. Barcio

ROMANS AT PLAY

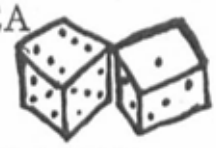


A NINE MEN'S MORRIS DIAGRAM CARVED WITH ROMAN GRAFFITI ON THE FLOOR SLABS OF THE FORTRESS ANTONIO IN JERUSALEM.

While most readers are familiar with Roman public games and bloody exhibitions, few may have stopped to think that Romans both young and old whiled away hours at a variety of private games.

Latin names for the games mentioned below have survived in literature, but there were others such as hopscotch and nine men's morris that are identifiable only from game boards etched on ancient pavements from the Forum Romanum to Jerusalem.

ALEA



Also called "tesserae," this was the game of dice using two cubes marked so that opposite sides always totaled seven.

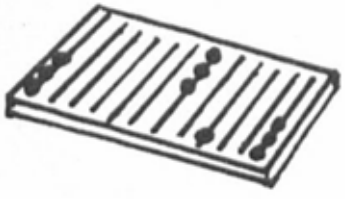
ASTRAGOLI

Known as "knucklebones" today, this game was played with joints obtained from sheep legs. The various throws and catches of the bones resemble the modern game of "jacks".

BUCCA, BUCCA

Described by Petronius, this game is like leap frog. When a player lands on another's back, he calls out "Bucca, bucca, quot sunt hic?"

DUODECIM SCRIPTA

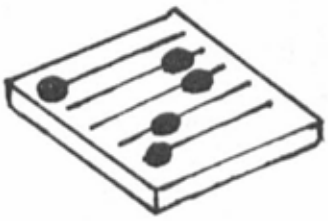


This was the ancient game of backgammon at which the emperor Nero gambled away vast sums of money. In the first century A.D. this game became TABULA and was known throughout medieval Europe as "tables".

FOLLIS

This game was played with a leather covered ball inflated with an animal's bladder. Like soccer, the object was to move the ball across the field to a "goal", but players could use only their arms and hands to hit the ball, not their legs and feet.

LATRUNCULI



This is the very old game of "checkers" which, in fact, dates back to Egyptian times. The earliest boards found have five lines and held five pieces. An additional six lines were added later, and the board was divided into squares. Roman game pieces were known as "common soldiers" and "rovers" -- our "kings".

MICARE DIGITIS

Known as the game of "Morra" by modern Italians, this game involves two players who quickly show different numbers of fingers on one hand while trying, simultaneously, to guess the total number of fingers held up by both opponents. An honest Roman was one "qui cum in tenebris mices."

PUPPAE

Playing with dolls is probably as old as children themselves. Several Roman dolls survive intact to this day.

TALI

This game was one of transitional development between ASTRAGOLI and ALEA, and was played with knucklebones having four flat sides.

TURBINES

Judging from game circles scratched onto Roman pavements, spinning tops was a popular children's pastime. The game circles are divided into ten unequal segments with the largest numbered I and the smallest X. The top was spun in the center of the circle, and it scored according to where it fell. The "yoyo" is a variety of top, the spinning of which is depicted on Greek vases.

HOW EFFICIENT IS THE CATAPULT "ZEPHYRUS" ?

An Engineer's Analysis

(Editor's note: Since 1972, 31 trebuchets have been built for the National Catapult Contest. Of these, the range of only one exceeded 200 yards. This trebuchet is called ZEPHYRUS, and is a sophisticated machine which holds all modern trebuchet records. The following analysis has been excerpted by permission of Bob Schadewald from his article entitled "The Trebuchet" that appeared in Scientiae Draconis 2, pp. 11-14. Copyright August 1978.)

Zephyrus has a hollow wooden throwing arm which is stiffened by stays and spreaders, like a sailboat's mast. The counterweight is 2,000 pounds of [pipe] in two 55 gallon drums, and its center of gravity is about 14 feet from the pivot. The throwing arm is 33 feet long from the pivot to the sling pin, and the sling is 31.5 feet. When cocked, the counterweight is about 53^{o} above horizontal. Rotating from the cocked position to where the arm is upright, the center of mass of the counterweight drops through a vertical distance of slightly more than 25 feet, giving up over 50,000 foot-pounds of energy.

The following table shows the actual distances to which ZEPHYRUS threw various projectiles, and some other figures which will be explained in a moment. Actual range of a trebuchet is traditionally measured from below the pivot.

TREBUCHET RANGE RECORDS OF ZEPHYRUS

Projectile	Actual Range	Adjusted Range	Mass Ratio	Efficiency
10 lb.	779.5 ft.	844 ft.	200	8%
20	737	801.5	100	16
30	763	827.5	66.67	25
40	798	862.5	50	35
50	750	814.5	40	41
75	623	687.5	26.67	52
100	579	643.5	20	64

We can estimate the minimum energy of a projectile without knowing its velocity, if we know its weight and the distance it travelled. Neglecting air resistance, a projectile beginning and ending its flight at the same altitude will travel a maximum distance when fired at a 45^{o} angle above the ground. If projectile weight = w, range = x, and minimum energy = E, then

$$E = \frac{wx}{2}.$$

A trebuchet, however, releases its projectile high above the ground (about 70 feet, in the case of ZEPHYRUS), which complicates matters. The problem can be avoided by extending the projectile's parabolic trajectory back to the ground. It's difficult to do this precisely, but a good approximation can be got simply by adding the length of the throwing arm plus the length of the sling (for ZEPHYRUS, 33 + 31.5 = 64.5 feet) to the actual range as measured from below the pivot, and calling the adjusted range x'.

The energy given up by the counterweight is its weight W times the height h through which it drops (for ZEPHYRUS, 2,000 x 25= 50,000 foot-pounds). Only part of the energy goes into the projectile, however, and if we call the fraction e, efficiency, then,

$$x' = 2eh\left(\frac{W}{w}\right).$$

If efficiency is a function of geometry (relationship of various parts to each other) and mass ratio, then, if these are held constant, range is directly related to scale.

I built a small trebuchet with approximately the same geometry as ZEPHYRUS. Its 100 pound counterweight drops 41 inches (3.42 feet). The sling and throwing arm combined measure 134 inches (11.17 feet). With a little experimenting, I was able to throw a 5 pound rock 69.5 feet from the pivot. Therefore, at a mass ratio of 20, my trebuchet achieved an efficiency of 59%, compared with 64% for ZEPHYRUS. Considering the approximations involved, and the fact that the two machines differ in scale by about a factor of seven, that's pretty good agreement, and suggests that the formula can be used with confidence.

We can now check up on Payne-Gallwey, who estimated that a trebuchet with a 50 foot arm (presumably total length) and a 20,000 pound counterweight might throw a 300 pound rock 300 yards. Assuming similar geometry, this trebuchet would be the same size as ZEPHYRUS, but ten times as powerful. Payne-Gallwey assumes a mass ratio of 66.67 and, at that mass ratio, ZEPHYRUS achieved a range of 253.33 yards at an efficiency of only 25%. On this basis, Payne-Gallwey's trebuchet could throw a 500 pound rock nearly as far. As for the 1,000 pound horse, it might heave it--if nothing broke--200 yards.

The problem is that little is known about how trebuchet efficiency varies with geometry. For instance, for ZEPHYRUS, the length ratio of throwing arm to counterweight arm is 2.36, and slightly more for my machine. For a given total arm length, however, a much higher ratio, say 3.5 or 4.0, might boost efficiency enough with light projectiles so that range would increase, even though the decreased counterweight drop would reduce the total energy available.

The trebuchets illustrated in the appendix to Payne-Gallwey's Crossbow have a length ratio of about 4, and many of the modern engines entered in the annual Catapult Contests have length ratios of 4 or more. There are photographs of several of these machines in Barcio's book Catapult Design, Construction & Compeition, but dimensions and mass ratios aren't given, and it's not possible to calculate efficiency using only range.

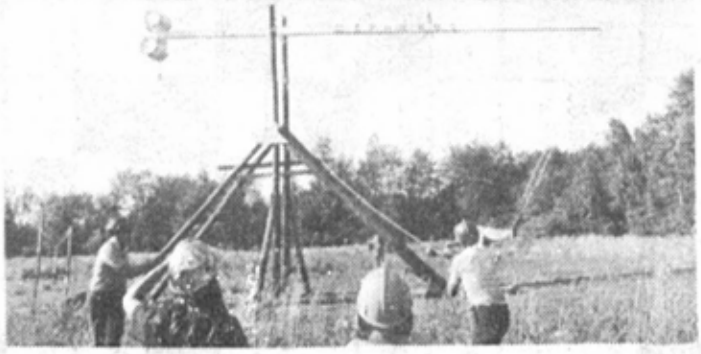
From the foregoing, it should be clear that trebuchets can be remarkably efficient energy conversion engines (I, for one, would like to see what ZEPHYRUS could do with a 150 pound projectile). Also, anyone proposing to build a trebuchet can immediately determine its maximum possible range by putting $e = 1$ into the range formula, along with mass ratio and counterweight drop. (If you can beat that, you should be building perpetual motion machines, not trebuchets.)

To me, the most intriguing question now is, how does efficiency vary with length ratio? Put another way, the question is, having built an arm and selected a mass ratio, where do I put the pivot? The answer will be found, not by speculation, but by data derived from models, mechanical or, perhaps, computer.

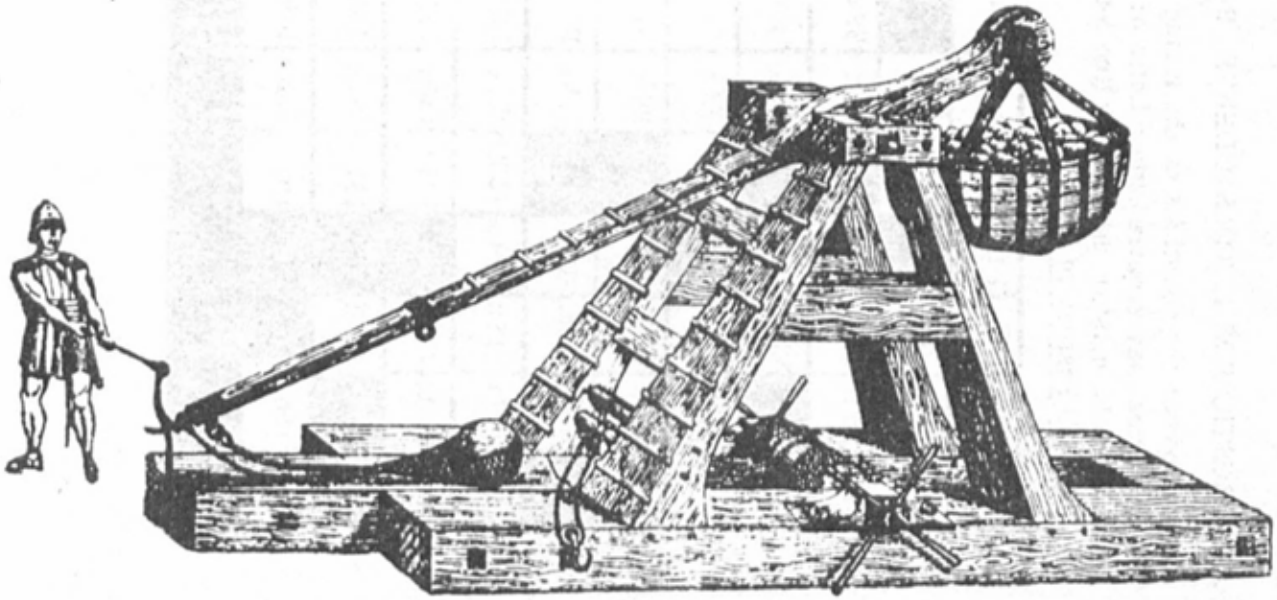
REFERENCES:

Barcio, Bernard. Catapult Design, Construction & Competition. (Available from Pompeiiana, Inc., 6026 Indianola Ave., Indianapolis, IN 46220, for $10.)

Payne-Gallwey, Ralph. The Crossbow. London: 1903.



ZEPHYRUS, built by Mary Hyde and fellow students of Latin, North Central H.S., Indianapolis, IN., 1975.



TREBUCHET from Payne-Gallwey's The Crossbow, 1903.

ANACROSTIC FOR LATIN STUDENTS By Donna Huffer, Latin Teacher, Carmel High School, Carmel, Indiana

As you answer the questions on the facing page, place a single letter in each answer blank (Latin clues require English answers; English clues may require either Latin or English answers). Then, by matching the numbers, transfer the individual letters to the squares on the master chart below (the letters in each square provide a cross reference to the questions) to read a quotation from Seignoboro's History of Rome.

1 c	2 p	3 r	4 f	5 z	6 h	7 a	8 p		9 w	10 f	11 h	12 o		13 g	14 l	15 j	16 bb		17 e	
18 x	19 k	20 t		21 w	22 g		23 k	24 x	25 d	26 s		27 j		28 a	29 r	30ee	31bb	32 l	33cc	
34 z	35 k	36 w	37 d		38 z	39 e	40 t	41 i	42 r	43 q	44 c	45 k	46 y		47 r	48 t	49 v		50 s	51 k
52 bb		53 q	54 bb		55 k	56 i	57 y	58 m	59 f	60 s	61 cc	62 j		63 o	64 l	65 c	66 t	67 i		
68 o	69 m	70 cc		71 h	72 y	73 l	74 s	75 aa	76 b	77 k	78 v		79 i	80 u		81 b		82 g	83 s	84 v
85 m	86 h	87 c	88 l		89 x	90 r		91 x	92 a	93 s		94 v	95 g	96 p	97 aa	98 s	99 l		100h	101dd
	102x	103cc	104 f		105 c	106ee	107aa	108 l	109 v	110 j	111 b		112 m		113n	114 f	115y			
116 k	117 i	118 a	119aa	120bb	121x	122 u	123dd		124k	125 q		126 g	127w	128u	129cc		130 z	131g		
132x	133bb	134a		135q	136u	137 t	138 b	139aa	140 x	141 n		142 d	143 g	144 x	145 p		146 r	147 q	148 v	149 o
		150 k		151 h	152 n	153aa	154 b	155 k	156 z		157 z	158cc	159 d	160dd		161 c		162 p	163d	164 g
165 v	166 f			167 n	168 h	169 j	170 a		171w	172 e	173 l			174 o	175 h	176 y			177 q	178bb
							179 k	180aa	181 i	182ee	183 a	184 p	185 e							

a. girls (nom.) ___ ___ ___ ___ ___ ___ ___
28 118 170 183 7 92 134

b. Julius Caesar's Praenomen ___ ___ ___ ___ ___
154 81 76 138 111

c. Roman orator ___ ___ ___ ___ ___ ___
105 161 1 87 65 44

d. I draw, drag ___ ___ ___ ___ ___
142 159 25 37 163

e. Author of Metamorphoses ___ ___ ___ ___
172 39 17 185

f. Vergil's poem ___ ___ ___ ___ ___ ___
114 59 10 104 4 166

g. for the enemies ___ ___ ___ ___ ___ ___ ___ ___
143 22 13 131 95 82 164 126

h. love poet ___ ___ ___ ___ ___ ___ ___ ___
11 168 100 86 71 175 6 151

i. De Rerum _____ ___ ___ ___ ___ ___ ___
181 79 67 56 41 117

j. Roman historian ___ ___ ___ ___
110 27 169 62

k. Roman fortification in Britain (2 words) ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___
124 51 45 179 35 19 77 55 23 150 116 155

l. 1st emperor ___ ___ ___ ___ ___ ___ ___ ___
14 173 99 73 108 88 64 32

m. What? ___ ___ ___ ___
85 69 112 58

n. Cum ___ ___ ___ ___
113 152 141 167

o. I have ___ ___ ___ ___ ___
149 174 63 12 68

p. _____emptor! ___ ___ ___ ___ ___ ___
162 8 96 184 2 145

q. Pyramus' girl friend ___ ___ ___ ___ ___ ___
135 53 147 177 43 125

r. flavus or croceus ___ ___ ___ ___ ___ ___
42 90 29 3 47 146

s. stans ___ ___ ___ ___ ___ ___ ___ ___
93 26 83 98 50 15 60 74

t. the 5th or 7th of a Roman month ___ ___ ___ ___ ___
48 137 20 40 66

u. nox ___ ___ ___ ___ ___
122 128 78 136 80

v. they are reading ___ ___ ___ ___ ___ ___
165 49 94 109 84 148

w. hodie ___ ___ ___ ___ ___
36 9 21 127 171

x. id quod (2 words) ___ ___ ___ ___ ___ ___ ___ ___ ___
102 89 144 132 91 24 121 18 140

y. tristiter ___ ___ ___ ___ ___
115 72 57 176 46

z. gerimus (2 words) ___ ___ ___ ___ ___ ___
34 38 157 130 5 156

aa. pendens ___ ___ ___ ___ ___ ___ ___
75 180 153 139 97 107 119

bb. habebant (2 words) ___ ___ ___ ___ ___ ___ ___
178 133 54 52 120 31 16

cc. narravit (2 words) ___ ___ ___ ___ ___ ___
103 33 70 158 61 129

dd. Deus ___ ___ ___
123 101 160

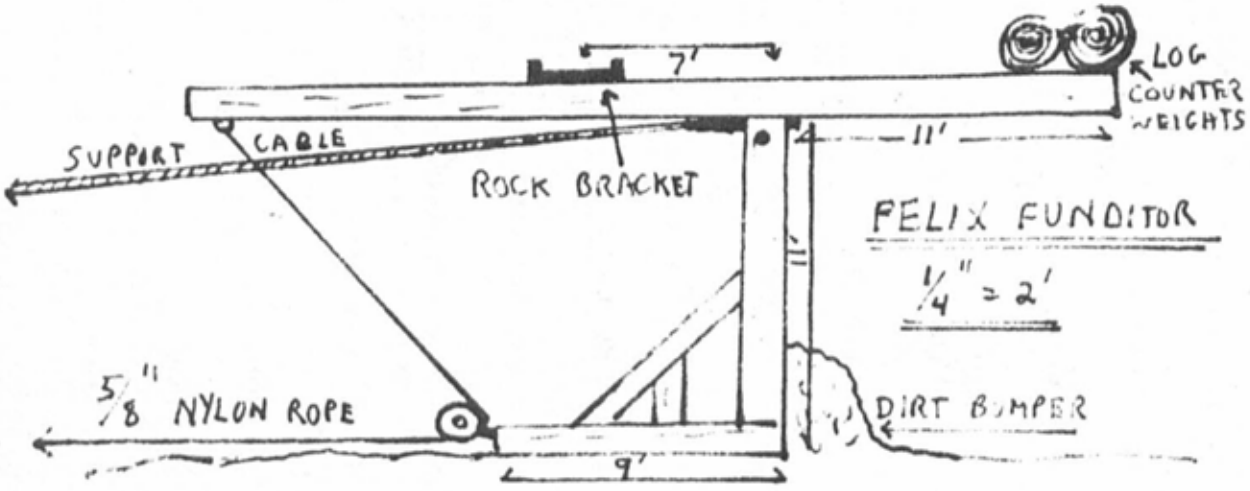
ee. I ___ ___ ___
30 182 106

FELIX FUNDITOR Smashes Its Own Catapult Record !

Although fifteen attempts were made during the '77-'78 school year to set new catapult records, only one record fell before the onslaught--that of the Heaviest Rock Successfully Thrown.

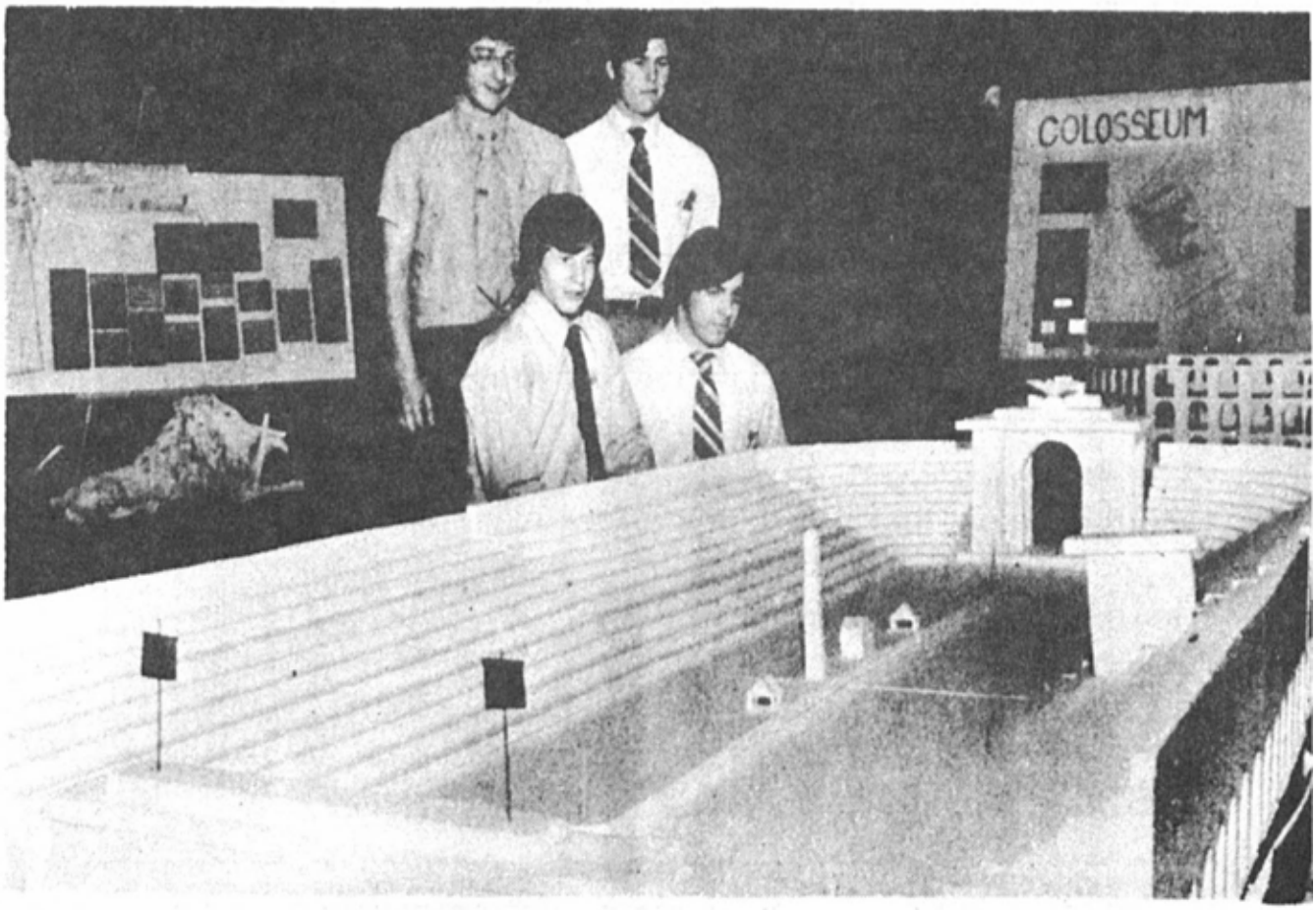
The old record, set in 1977 by the same catapult, was smashed when Latin students of Williamson High School, Williamson, New York, loaded their mighty machine with a 2,200 lb rock which they subsequently fired 9' ! The following area newspaper account reported the event:

> "On Sunday, May 8, Tom Moll's catapult broke the record he set last year in the National Catapult Contest. At that time, a rock weighing [1,400] lbs was hurled eight feet. This year, a gigantic rock weighing 2,200 lbs rumbled through the air for nine feet, seven inches. The monstrous catapult, which has served well in bringing awards to Tom and Williamson Central School for the past three years, has been retired. Earlier, Tom, ably assisted by his father, Mr. Edward Moll, used a smaller catapult [REX PARVUS] to fire a one pound rock a distance of 139 feet 7 inches.
>
> "A small group of spectators consisting of friends and Tom's mother, brother, and sister encouraged the firing team and had the thrill of witnessing an event which is not a common, everyday experience."



BETHLEHEM CATHOLIC HIGH SCHOOL

The Latin Club of Bethlehem Catholic High School had their Second Annual Latin Exhibit in May of 1978. The theme was "Panem et Circenses." The importance of Latin was presented by twenty panels prepared by the Freshman Latin Class. Models of the Circus Maximus and Colosseum were also a part of a tour given by some of the Latin students.



Globe-Times Photo

A model of Circus Maximus is being examined by Bethlehem Catholic High School Latin Club members James Kozo and Stephen Ornosky, front row, and William Anthony and Paul Ornosky, standing. There were 12 displays and three scale models describing Latin life and culture and its effects on the present.

(Submitted by Father Louis Solcia, Bethlehem Catholic High School, Bethlehem, Pennsylvania.)

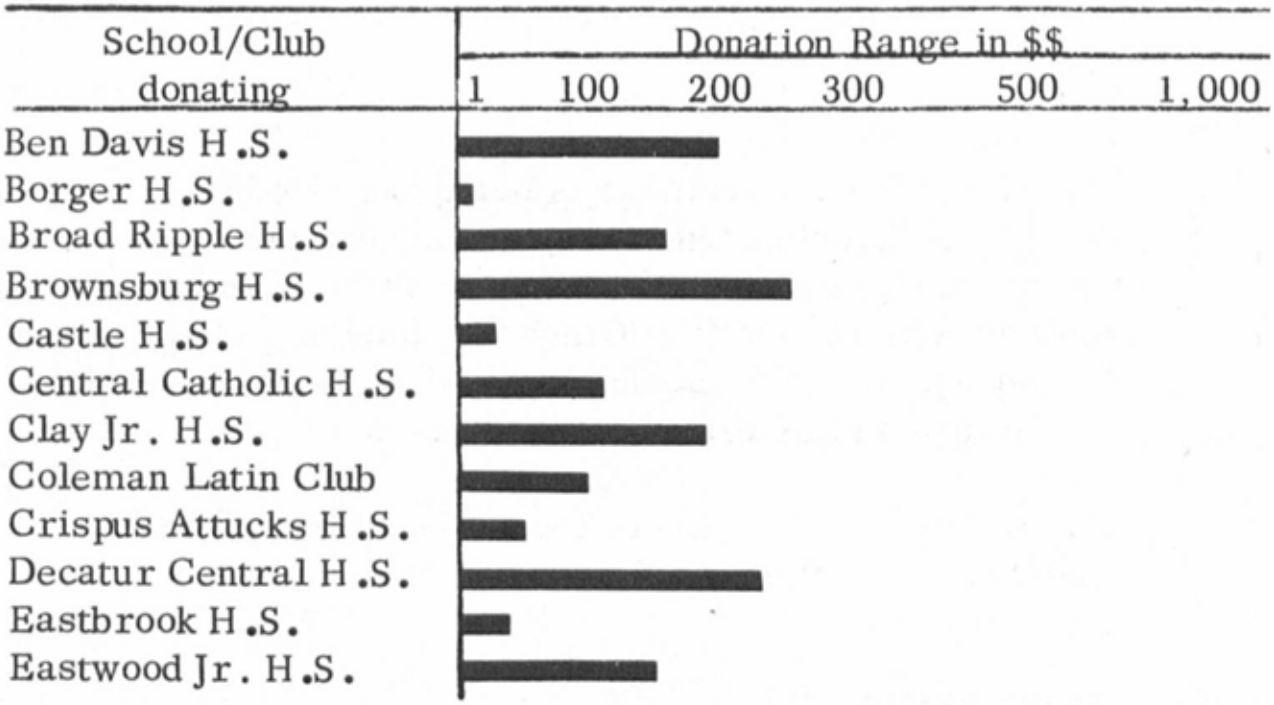
MUSEUM OF CLASSICAL HERITAGE

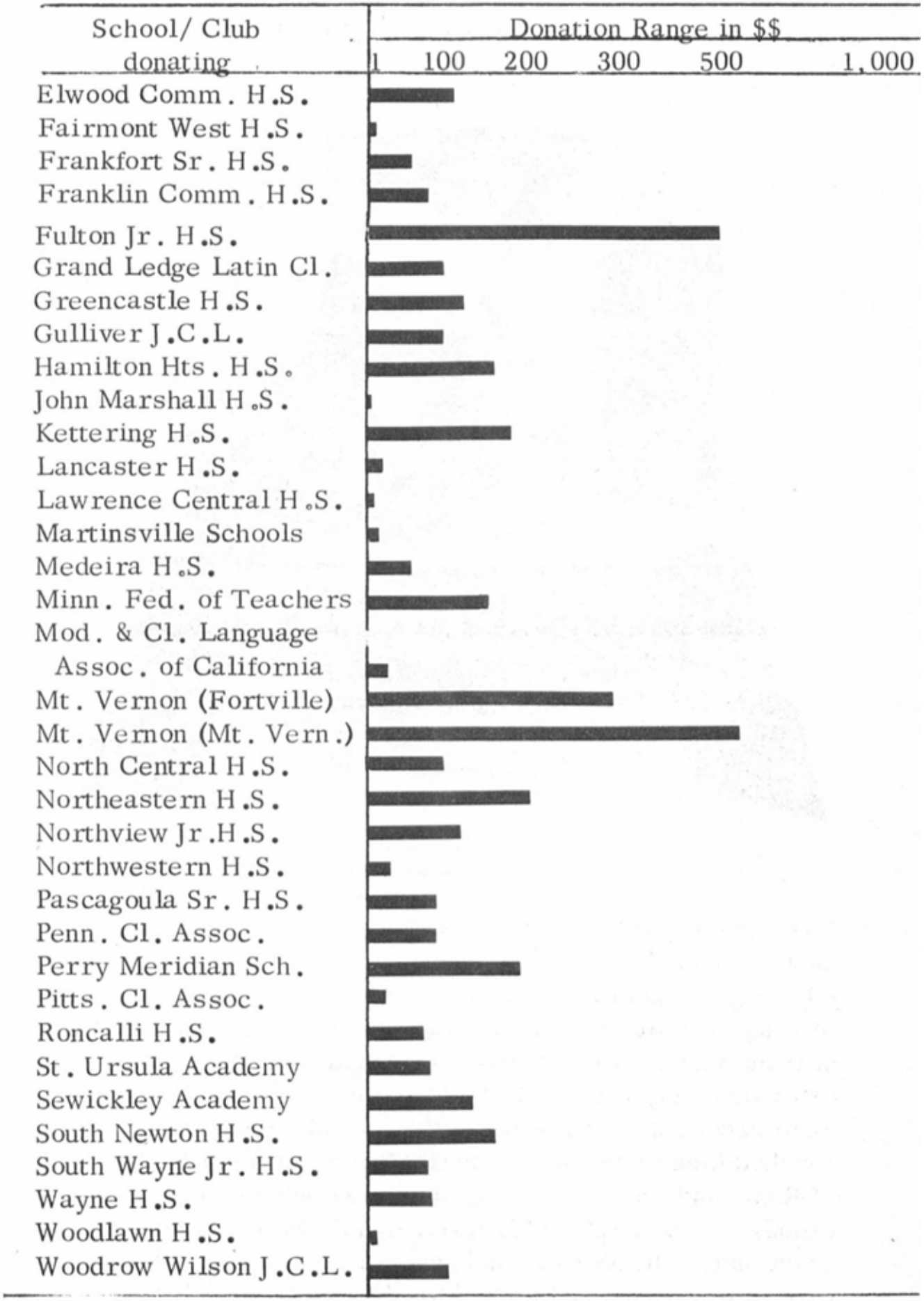
FUND RAISING DRIVE

As of August 19, 1978, slightly over $8,000 had been raised toward the goal of raising $2,000,000 for the construction and endowment of a Museum of Classical Heritage in America.

While the ultimate completion of the fund raising drive will depend heavily on several major donors, it is essential that teachers and students of Latin across the country show their support of the project as enthusiastically as possible. To encourage such support, Pompeiiana, Inc. proposes to create a $1,000 Club to give public recognition to all schools, clubs and organizations that successfully raise $1,000 or more for the building fund. All such donors will be permanently commemorated on a plaque which will be displayed in the completed Museum of Classical Heritage.

The following chart is produced in this Newsletter to show which schools and clubs have already begun to lend their support to the fund drive and to encourage them to continue in their efforts to reach the $1,000 mark. There are close to 500 schools represented among the membership of Pompeiiana, Inc., and if each school aimed at this mark, $500,000 could be raised in two to three years. Are you personally willing to accept this challenge?




School/ Club donating
Donation Range in $$
1
100
200
300
500
1,000
Elwood Comm. H.S.
Fairmont West H.S.
Frankfort Sr. H.S.
Franklin Comm. H.S.
Fulton Jr. H.S.
Grand Ledge Latin Cl.
Greencastle H.S.
Gulliver J.C.L.
Hamilton Hts. H.S.
John Marshall H.S.
Kettering H.S.
Lancaster H.S.
Lawrence Central H.S.
Martinsville Schools
Medeira H.S.
Minn. Fed. of Teachers
Mod. & Cl. Language Assoc. of California
Mt. Vernon (Fortville)
Mt. Vernon (Mt. Vern.)
North Central H.S.
Northeastern H.S.
Northview Jr.H.S.
Northwestern H.S.
Pascagoula Sr. H.S.
Penn. Cl. Assoc.
Perry Meridian Sch.
Pitts. Cl. Assoc.
Roncalli H.S.
St. Ursula Academy
Sewickley Academy
South Newton H.S.
South Wayne Jr. H.S.
Wayne H.S.
Woodlawn H.S.
Woodrow Wilson J.C.L.

A

LIVING LATIN LABEL

EST! EST!! EST!!! Students of Latin will note that EST means "it is." In the year 1111, a German bishop named John Fuger embarked on a trip to Rome. By way of locating suitable accommodations en route, he sent his servant ahead with instructions to write the EST on the exterior of any inn where the food and especially the wine were excellent. According to the legend, the servant reached Montefiascone, a small town about 60 miles north of Rome and was so impressed with the wine that in his exuberance he wrote EST! EST!! EST!!! on the outside of the inn. The appellation became synonymous with the wine of the region and is still used to label wine produced there.

ADMISSION TO THE POMPEII A.D. 79 EXHIBIT IN CHICAGO

August 12 thru November 12, 1978

The Art Institute of Chicago will be hosting the exhibition Pompeii A.D. 79 from August 12 thru November 12, 1978. The hours of the special exhibition are:

Mon., Tues., Wed. & Fri. from 10:30 a.m. to 4:30 p.m.
Sat., Sun. and holidays from 10:00 a.m. to 5:00 p.m.
Thursdays from 10:30 a.m. to 8:00 p.m.

Admission to the exhibition will be by one of two means:

I) A special system has been set up to give Art Institute members priority admission. Each member will receive a limited number of complimentary passes, and the opportunity to purchase additional priority passes for specific days and times. To obtain priority passes one must be a member of the Art Institute. Memberships are available by contacting the membership department by mail or by phoning (312) 443-3622. Once a member, priority passes are available during museum hours at the Priority Pass Booth located at the Columbus Dr. lobby. Members should come to this booth to obtain their passes, to pick up any pre-ordered passes or to exchange passes.

II) General admission to Pompeii A.D. 79 for the public will be available on a first come first serve basis each day of the exhibition. Tickets will be numbered and visitors will learn entrance times from monitor screens throughout the museum. The Pompeii admission price is included in the admission to the Art Institute: $2.00 for adults and $1.00 for children, students and senior citizens. On Thursdays, although there is no admission charge to the museum, the regular admission price will be required of visitors to the Pompeii exhibition.

$1.00 half-hour lectures will be given Mon. thru Fri., 10:45 a.m. and 1:15 p.m. Free half-hour lectures will be given Mon. thru Sat. at 12:15 p.m. Free one hour lectures will be given at 6:00 p.m. on Thursdays and at 3:00 p.m. on Sundays. For further information call (312) 443-3774 Mon. thru Fri., 9 - 5, and from 9:30 to 4:30 on Sat., Sun. and holidays.

SPECIAL POMPEII A.D. 79 POSTERS

Available only from Pompeiiana, Inc. and sponsoring museums.

"MOSAIC LADY"
$2.50

"POMPEII" didactic poster
$5.00

Each poster is printed in full color on standard poster stock and measures 24 1/2" x 35".

The "Mosaic Lady" poster was produced by the Boston Museum of Fine Arts especially for the exhibit, and the "Pompeii" didactic poster, depicting many of the items in the exhibit as they were used in a Pompeian home, was produced in England by New World Arts Ltd. of London for the Daily Telegraph. Supplies of both posters are limited.

To order posters, use the Order Blank on the back page of this Newsletter.

TO: Pompeiiana, Inc.
6026 Indianola Avenue
Indianapolis, IN 46220

I) Please issue the following '78-'79 memberships (student: $1.00; Adult: $5.00; Contributing: $10.00):

A) Personal membership. . . . . .$_____

B) Gift membership for:
Name _____
Address _____
City/State _____ $_____

C) (Number:) _____ student memberships for my students. I will distribute all materials and Newsletters as they are sent to me. $_____

II) Please send ____ copies of the "Mosaic Lady" poster @ $2.50. . . . . $_____

III) Please send ____ copies of the "Pompeii" didactic poster @ $5.00. . . . . $_____

IV) Please send ____ copies of the book Catapult Design, Construction & Competition @ $10.00. $_____

☐ Please send me a free copy of the 1978 CATALOG.

☐ Please send me a free copy of the 1978 Guidelines for official attempts to set new catapult records.

Enclosed is a check for the following total. . . . . $_____

Name _____
School _____
School Address _____
_____
(Home Address, if preferred) _____
_____

Pompeiiana, Inc.
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