COMPUTER APPLICATION IN CLASSICAL ARCHAEOLOGY. (Pottery)

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This paper introduces an experimental system of marking and preparing for the computer the types and locations of pottery finds in classical archaeology. In this system the computer programmer will be able to classify the pottery by merely registering the identifying elements of the pottery and indicating the locations in three dimensions in conjunction with the corresponding stratigraphical and cultural data. This method is a simple substitute for widely used triangulation method for determining points in depth.

By partially or totally retrieving data during or at the end of excavations archaeologists can find the computer an extremely useful aid for directing and analysing excavations.

The suggested coding scheme is designed for clay pottery but it can be extended for any kinds of materials or objects. The subdivision and technical terms, used here, follows mainly from Folsom's Handbook of Greek Pottery and Shephard's Ceramics for Archaeologists. The chief inspiration for the numerical divisions was Dr. Agnes Salamon's method of Computerization of Avaric pottery The "SELGEM", the "PLUTARCH" and "LAFLIN"s system were also observed. LENGYEL's complete system computerizing the pottery of Aegeans, Greeks, Romans and Etruscans will be published by Northern Kentucky State College Printing Office and distributed to classical archaeologists. Only the outlines concerning coding sites and finds are given here.

All grids in this system are presented in 3 dimensional projections (3-D) within the site diagram. If the site is complicated or extremely large the site diagram should be divided by sections.

It is important to choose for computerization the type of "TERMINAL" by which can be produced the site diagram in 3-D. The Terminal should be equipped with switches for the rotation of geometrical axes, zooming in and out, panning right and left. In addition, the Terminal should be able to print "hard copies" in publishable form.

In most cases it is impossible to use Terminal in situ. In order to overcome this disadvantage a specially designed card system is useful to code at the site and computerize later.

Any kind of numerical system could be used for computerization, but the main division should be clearly differentiated by use of CODE SERIAL NUMBERS. The main divisions coded in the same way as mosaic particles, can give the total picture of the site and its finds.

Making a series of 3-D stratigraphical drawings or drawings of critical "Features" is helpful to the computer programmer, who should also understand fully the technique of excavation in order to be able to manipulate the data optimally.

The system begins by coding the site itself by the numbers from 01-000 to 13-000 inclusively.

First the country and location of the site are coded:

EXAMPLE: 01-o18-CARC-I-74
o1-o18 = Italy
CARC-I-74 = Castellare di Casanova di Radda in Chinati. Site #1.-1974.

o1-1oo The site code number is subdivided by the numbers of the specific terms of information concerning the site; such as: The reason for the excavation, Ordnance Survey Map References, sea level elevation of the permanent bench mark, the grid measurement, names and addresses of the director and the staff and geological, topographical, historical, archival and bibliographical references, etc.

Next the exact location of the site is coded. Since it is divided into grids the location of the finds is indicated by two grid codes: one for the grid area (o2-ooo) and the other for the exact find spot within a grid (o3-ooo). This obviates the need for triangulation.

The coordinates of the grid are NORTH-SOUTH and EAST-WEST. Coded as North = 1oo; East = 2oo; South = 3oo; and West = 4oo.

In order to identify a "Grid quadrant area" separate the areas from the ZERO coordinates toward East and West by alphabetical arrangement, such as : EA,EB,EC,ED, etc., and WA,WB,WC,WD, etc.; toward North by positive and toward South by negative numerical progression, such as: North +1,+2,+3; and South -1,-2,-3. The identification of the "Grid quadrant area" is made by the intersecting letters and numbers.

EXAMPLE: The intersection of ED and -2 is coded as
o2-ooo--2O4 /-/2
since E(ast) is 2oo and D is 4

The most frequently used grid measurements are 2x2 meters; 3x3 meters; and 4x4 meters or larger. On the intersecting grid lines indicate the absolute or relative elevation, which corresponds to the data indicated on the grid map. If the grid is 4x4 meters, every intersection of the grid from the ZERO coordinates toward North, East, South and West should be in multiples of 4.

To register a specific point within the grid, first locate it on the horizontal plane, by dropping a plumb-bob from the surface level of the grid to the object to establish a vertical axis above the finds. The point of intersection with the surface grid gives the exact find spot within the coordinate system.

Second, indicate the correct depth of the find.

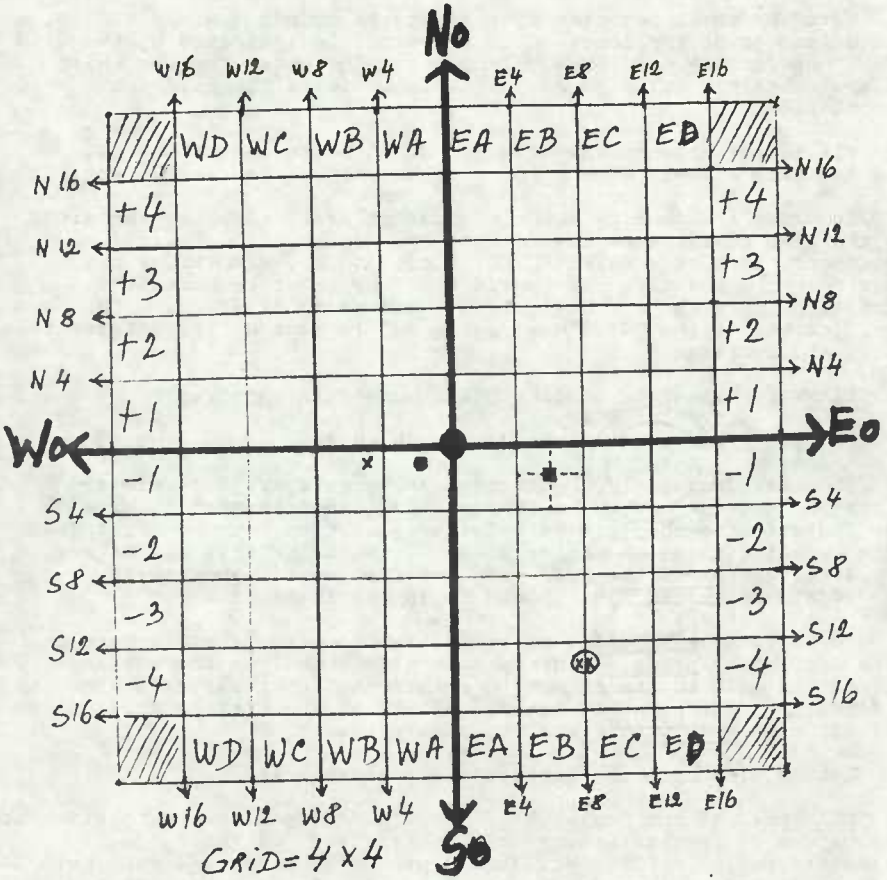
EXAMPLE: If the position of the find is read in the intersection of W4 meters 25 centimeters, o4 millimeters and S.1 meter, 3o centimeters and o7 millimeters at a depth of 82 meters 64 centimeters and o4 millimeters (in relation to the depth of the permanent benchmark, loo meters). The find spot is coded as: o3-ooo--4ooMo4,C25,MMo4--3oo, Mo1,C3o,MMo7 / M82,C64,MMo5.

M= Meter; C= Centimeter; MM= Millimeter; W= 4oo; S= 3oo.

Note:

General rules for measurements:

1. Measure from the corner of the grid which is closest to the find spot.
2. If the find spot is under the point of intersection of the supplementary coordinates, measure from the grid corner which is closest to the ZERO point of the main coordinates.


No
So
Wo
Eo
W16 W12 W8 W4
E4 E8 E12 E16
WD WC WB WA EA EB EC ED
N16 N12 N8 N4
S4 S8 S12 S16
+4 +3 +2 +1
-1 -2 -3 -4
GRID=4 X 4

EXAMPLE: If the find is at the exact intersection of E6 and S2, the measurement should be taken from the intersection of E4 and S-Zero.

3. If the find is under any grid line, it should be measured from the nearest main intersection.

EXAMPLE: S12 meters 92 centimeters and o1 millimeters - E8
The measurement should be taken from the intersection of S12 meters and E8 meters.

o4-ooo Bag numbers. Small findings should be transported to the Central Registration Area in bags. Larger artifacts should be individually numbered indicating the exact level of the find. Bags are numbered by grid position and levels.

Bag # 1= between o-2o centimeters
Bag # 2= " 21-4o "
Bag # 3= " 41-6o " etc.

Note: If there is more than one bag within levels the bag should be marked a,b,c,d, etc.

EXAMPLE: If the material came from NS-8 grid from the depth of 45 centimeters, (measured from the surface) the Bag # is 3; if it is the second bag of the same level, it should be indicated with the small letter b. and coded as: o4-ooo--CARC-I-74-1o3+8--3.2.
b=2

Serial numbers from o5-ooo to 11-ooo inclusively dealing with the number of Artifact, Central Cataloguing, drawing, photograph, skeleton, Laboratory analysis, restauration. The serial number of 12-ooo gives data for stratigraphical projection.

12-ooo Top soil
12-oo2 Clay
12-oo3 Stone, etc. etc.

Note:

1. Establish the code in numerical progression according to the occurrence of stratigraphical changes of the site.

2. In order to record the outline of each individual stratum, and project it, in 3-D measure a series of components along the edges of the stratigraphically dividing zones in depth and code by the method of registering finds. After connecting the registered components the computer could draw and project in 3-D the complete stratiphication of the site.

Coding "FEATURES" are also important. The serial code 13-ooo could be subdivided according to the following details: Architectural levels, pits, ditches, disturbances.

In order to be able to project the "Features" in 3-D use the same method of coding as for stratigraphical projection.

For computerising potteries or shards (14-ooo) the identifying factors should be divided by capital alphabets.

A. Site identification's number

B. Central Catalogue number

C. Bag number or artifact number

D. Main area of origin (Style)

D.o1 Pre-Historic (Outside of Egypt, Mesopotamia, Aegean.)
D.o2 Egypt
D.o3 Mesopotamia and Middle East
D.o4 Aegean
D.o5 Greek world and pre-Roman Italy
D.o6 Roman world
D.o7 Phoenician and Punic world

The sub-types could be further divided:

EXAMPLE: D.o4=Aegean
D.o4-1oo Minoan
D.o4-11o Neolithic
12o Subneolithic
13O Early Minoan
14o Middle Minoan
15o Late Minoan
151 Late Minoan I
152 Late Minoan II
153 Late Minoan III

Note: Further subdivisions are open.

E. Material

Eo1 Clay
Eo2 Wood
Eo3 Bronze
etc.etc.etc.

F. Regular and irregular forms or shards

F.o1 Amphora
F.o2 Hydria
F.o3 Cinochoie
etc.etc....

all forms could be divided into subtypes, such as:

14.oo -- F.o1-1oo Geometric neck amphora
2oo Proto-attic neck amphora
3oo Attic neck amphora
etc.etc...

all subtypes could be further divided

EXAMPLE: 14-ooo--F.o1-32o = Attic neck amphora, Nolan type.

Note: For shards should be used the identifying numbers of section G.

G. Major form of parts of pottery with measurements

GA Neck
GB Lip or Mouth
GC Rim

all parts could be subdivided such as:

GA-o1 High narrow neck
GA-o2 High large neck
GA-o3 Conical neck
etc.etc....

Note: Measurement added: Height first then diameter (or width) in centimeter and millimeter.

H. Size

H.o1 Height
H.o2 Width

I. Volume

I.o1 Large
I.o2 Small
I.o3 Miniature. etc.etc..

J. Proportion

J.o1 Slender, slim
J.o2 Clumsy
J.o3 Well proportioned (Ballanced)
etc.etc..

K. Technique of make

K.o1 None wheel made
K.o2 Well made
K.o3 Coil constructed
etc.etc..

L. Surface treatment

L.o1 Wet smoothed
L.o2 Slipped
L.o3 etc.etc..

M. Surface condition

M.o1 Smooth, polished
M.o2 Crude
M.o3 Coarse
etc.etc..

N. Wall conditions

N.o1 Thin walled
N.o2 Heavy walled
N.o3 Well fired
etc.etc...

O. Physico-chemical conditions

OA Strength
OB Porosity
OC Water absorbent capability
OD Shrinkage
OE Purity

all characteristics could be further specified

14-ooo-OA.o1 Hard
o2 Medium
o3 Fragile
etc.etc..

P. Painted decoration

PA Brush technique of pottery paintings
PB Incised technique
PC Background colour
PD Surface colour
PE Intensity and value of the colour

all characteristics could be further specified

14-ooo-PA.o1 Broad Line
o2 Sharp Line
o3 Use of guide line or net
o4 Extension stroke beyond intersection of lines
etc.etc..

Q. Incise technique

Q.o1 Deeply incised
Q.o2 Incised on the surface
etc.etc..

further subdivision for specific characteristics could be made.

14-ooo-Q.o2-1 Incized on the surface by guidelines.

R. Stamped

S. Moulded

T. Pattern of design

TA Pattern
TB Cables
TC Chevron
TD Circles
TE Eyes
etc.etc...

all main divisions could be subdivided

EXAMPLE:

14-ooo-TD.o1 Concentric circles
o2 Solid concentric circles
o3 Dotted concentric circles
etc.etc...

Note: Parts could be indicated for locating the design by using code G. Mode of decoration could be indicated by adding P.Q.R.S.

U. Graphic presentation of potteries or shards

In scale, draw the cross section of the pottery or shard by indicating the thickness of the wall.

The system is only completed for Aegean, Greek, Etruscan and Roman pottery but could be expanded for computerizing the total finds. The major advantage of the system is to avoid any rigidity and leave open the entire system for further expansion. Everyone who wishes to help to expand it will be welcomed.

References

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