A DATABANK FOR EXCAVATION RECORDING

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In the early 1970's Brown University began to use the computer as a primary component of excavation recording. Today there exists a variety of integrated computer tools (software and hardware) for artefact recording and analysis. The core database design is the driving force, the addition of a microcomputer in the field, while enormously useful, is secondary support. The system developed to date encompasses a number of features, primary among them flexible input, data validation, sorting by any keyword, limitless population selection capabilities and logical searches of any desired complexity. Additionally, it can readily interface with stand-alone statistical packages like SPSS or SAS. This paper will sketch the history of this computer system at Brown and outline the current design and its uses.

Initial Development

Brown University started using computers for artefact recording in 1972.[1] At this time, the material from the Early Bronze settlement of Tufariello was coded onto paper forms during the excavation and keypunched on return to the States. The raw data for this site was analyzed through SPSS, but there was no attempt at this stage to design an overall scheme into which the material could be permanently incorporated.[2] The materials recovered from this settlement were overwhelmingly ceramic (60,000+ potsherds) and emphasis, quite naturally, was on designing the proper records for this material. Working with sherds rather than whole vessels necessitates a different set of records, since it is usually impossible to reconstruct the complete shape of a pot from fragments alone. After the completion of this excavation, the codes for recording potsherds were refined so that today a general shape for the entire pot, or some limits to possibilities, can be established from the knowledge of the shape of the potsherd.

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The next step in development was in the later 1970's when a database to organize research material on Bronze Age sites from Italy was developed.[3] Part of the design were files for excavation records (Figure 1). At this time, study of a large quantity of ceramic material recovered from the Biferno Valley, Molise was undertaken.[4] This material was analyzed in Italy at the storehouse in Saepinum, coded on paper and keyed on return to the States. This time, however, the records were entered into the database and are available today along with other Bronze Age material which has also been incorporated. With the implementation of this database, not only are the reporting capabilities and analyses greatly enhanced, but possibilities for comparative analysis have become much greater.

Two primary files are currently used for the excavation records: the first describes the various trenches or loci from which material is recovered; the second describes the material recovered. The "locus" file contains information on the absolute coordinates of the 3-dimensional locus, a description of the fill and a relative order. It is possible as well to include indications of features or other characteristics. Because of the quantity of material and short excavation season that has traditionally faced Brown's expedition, recovered material is recorded as part of an excavated block of material; it is the coordinates of this block which are available. Cubic meters for each locus can readily be calculated for referencing counts per cubic meter. This locus description is tied to each corresponding artefact record by a unique identifier.

The second file, records on the artefacts themselves, today emphasizes detailed descriptions of ceramic vessals (either whole or fragmentary). The coding sheet (Figure 2) gives a quick summary of attributes available for each record. Detailed coding for artefacts other than ceramic material can be developed when the need arises. As mentioned above, recording and analysis of sherds requires a different set of coding options than recording whole vessels. From the attributes recorded, it is possible to determine the general shape or a range of shapes for the whole vessel. The determination requires descriptions of primary parts of the vessel: rim, neck, body, base, all of which are attributes of each artefact record. Additional information recorded includes a description of the overall part remaining (e.g., profile, rim,

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base), ware type, ware color, handle type, an interpreted function (e.g., storage pot) and decoration. Some examples of the codes used for these attributes are presented in Figure 3. Over the last few years, there has developed a more or less routine analysis of the parts of the pot remaining, in which a combination of certain primary parts generates a range of possible shapes. Figure 4 shows standard Bronze Age shapes which were determined in this fashion. The general shapes group ellipses and spheres together since it is generally impossible to differentiate between them based on fragments. For this reason, spheres and ellipses form one class, while hemispheres and semiellipsoidal shapes form another (contrast A1 - E1 with A2 - E2). If it is possible to determine a general shape in this fashion, it is stored as part of the orginal record. Once this shape is made part of the record itself, it is possible to study site material in terms of general pot shapes (Figure 5). For example, it will be interesting and fruitful to compare different sites of the same culture on the basis of percentage of pot shapes recovered. Indeed, roughly contemporary sites of differing cultures may yield interesting results when so compared.

Since the ceramic material from Tufariello was undecorated, a good deal of effort went into developing appropriate codes for recording the fragment and determining pot shape. The material from the Molise and that from the current excavations in Sicily, however, is decorated; in the first instance through the techniques of incision and excision, in the second through painting the surface of the vessel. Consequently it is only recently that we have begun developing codes for recording decoration patterns and techniques for analyzing them, and this effort is still in its infancy. The file has available a series of attributes for this purpose (Figure 2). A primary one describes the overall type of decoration (plastic, painted etc.). In addition, there are available five sets of attributes to describe the decoration pattern: each set contains an indication of the decoration schema as well as the part of the vessel on which it is found. Figure 7 is an example of the decoration patterns recorded at La Muculufa. (The patterns in this illustration were created and stored on the microcomputer.) And finally, it is possible to record three colors (used for painted ware). Ongoing work is currently attempting to use parts of patterns (for example, whatever remains on a sherd) to interpret the overall pattern on the pot. Since, of course, far more fragments than whole pots exist, and hence far more fragmentary patterns than whole patterns, this is at best a risky business. Should it be possible to develop this so that an overall pattern or range of patterns may be established, another field would be added to record this information (overall pattern). Distributions of decoration patterns can be achieved, but in a similar fashion to shape studies, they will be much more meaningful if a hypothesized overall pattern is available.

Finally, there are available in this record fields for whatever measurements of various parts of the pot are available (rim

diameter, height, neck diameter, body diameter, base diameter). Although it is possible to take measurements from potsherds in only a relatively few instances, their potential value has been demonstrated and we continue to collect where-ever possible. In some instances we may achieve no more than a range of rim diameters.[5] Figure 6 is a sample report of measurements ordered by the interpreted form within the sites represented in the database. With such evidence in hand it becomes possible to contemplate attaching size ranges to specific pot shapes or even cultural groups.

Completing the artefact record are fields which tie the record to its area of recovery and indicate the quantity of material included in the record (e.g., 50 coarse undecorated body sherds), as well as space for up to 6 special codes, very useful for flagging certain conditions (e.g., drawn, photographed, joining fragments, etc.). The indications 'drawn' or 'photographed' help associate two additional files for records kept on all drawn or photographed material. These files contain the unique registration number as well as detail on the photographs or drawing (e.g., contact number, roll number). It is thus easy to go from a particular fragment or pot shape or decoration pattern to a specific drawing or photgraph.

As soon as records are added to the database, a series of standard reports is immediately available. These include detailed reports of preserved features, pot shapes and decoration patterns as well as summary counts by any subdivision required (site or trench, for example) (Figures 8 and 10). Additionally, it is possible to produce useful graphs of absolute counts or counts per meter for any subpopulation of material (e.g., waretype, pot shape, decoration pattern, Figure 11). Naturally, as this database expands, studies will become more meaningful (e.g., intersite analysis of pot shapes). In time, excavation records from roughly contemporaneous sites across a known area could yield full intersite analyses. The database management system used for excavation records is, of course, the same one used for the

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research database, Focus.[6] Our flexibility in using this system is limited by very little. It is possible to enter data into the database by a number of methods: full screen data entry, data files on disk or tape (cards can be dumped to disk first), or through programs that prompt for record attributes; and data input methods can be designed to include pertinent validity checks. Reports can be planned in a wide variety of formats, detail or summary, and records can be selected and sorted by any keyword or set of keywords (e.g., site, locus, material, pot shape, decoration pattern). Additionally, while this database management system includes built-in statistical and graphing capabilities, when the data or analyses warrant we can output records (pre-selected and sorted, if desired) for input into standard, more powerful statistical and graphing packages. In short, with this system we find ourselves limited only by our imagination. While the capabilities just described are only available once the material has been entered into the database, we are not bereft of information in the field. And for this we turn to the microcomputer.

Microcomputer Support

The final step to date in the process of computerized excavation recording was added in 1982: a microcomputer was brought to the "field." In fact, it resides in the work area, which for the last two years has been a large residential villa lent to us for living and working quarters. Four pieces of equipment are essential to our operation: a transformer, which transforms the electric current as well as suppresses the effects of power surges, a central processing unit (CPU), a video screen and a printer. The CPU and the printer travel each year; there is no need for the transformer in the States, so it remains in Italy, and the video screen is inexpensive enough that an additional one is kept in the States.

While we had greatly appreciated the detailed information that was quickly available on return to the States, we soon became greedy for more: a sense at least while we were in the field of the distribution of artefacts, and, we hoped, more immediate and direct input to the mainframe database. Both these aims we accomplish with a microcomputer. The use of this machine as a stand-alone for computing needs was never seriously considered: the application is simply too large for micros.

The microcomputer we use is a first generation IBM/PC, soon to have new floppy disk drives. (The wear and tear produced by the high volume of dust as well as the advantages of dual sided drives spurred this step.) While we could enhance the stand-alone power of this machine if we were to add a harddisk, the configuration

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would never approach what is available on the mainframe. We choose to continue its use in the fashion described and expand other features of the overall system. Material recorded in 1983 filled over 6 disk sides and it took the machine more than an hour to read all the material; use of a hard disk would not greatly decrease this time. In contrast, the mainframe can read all the records (Molise and 2 seasons of La Muculufa) in about 1 minute. Power outages are a serious concern when we plan our analyses: if a process takes an hour and the electricity fails, as it does regularly in southern Sicily, the process must be restarted.

Nonetheless, because we knew before we began what the microcomputer could and couldn't do, we are delighted with the results. Material is still recorded on coding sheets: this provides good back-up in case of keying errors, allows for comments, and it is simply much faster to analyze and record large volumes of material in this fashion. The entry of these records, however, takes place within a short time of the coding, and the material is available for preliminary reports immediately. On return to the States, newly developed procedures allow direct transfer of these data to the mainframe where they are entered into the database.

Data entry screens, programmed in Basic, are available to enter and verify the records of the various files (DRAW, PHOTO, LOCUS, and EXCAV) (Figures 12 and 13). Full-screen formats allow the data entry person to move through the screen inputting record attributes in the same order indicated on the coding sheet; the design of these programs allows review of data before actual submission to the system as well as some built-in editing capabilities. The 'system' here is essentially a flat file of data records. This file is accessed by other programs during the course of the excavation. Generally reports are produced from a summary file which allows one general pass at the entire file of data records. This file (for which all the records must be read and summarized) can be built as often as is required (and the electricity holds) and many reports are then quickly generated after this one pass at the raw data. A variety of very useful summary reports are generated: one (Figure 14) summarizes artefacts recovered, locus by locus. These programs can be modified to summarize those artefacts of specific interest to a situation - e.g., in the case of La Muculufa, we are particularly interested in the quantity of sherds with white-banded decoration recovered. Another report, not illustrated here, demonstrates with bar charts similar summary information. It is this same file of raw data records which is dumped to the mainframe and entered into the database when we return to the States.

Additionally, the files of drawn and photographed records allow us to generate very useful reports which help the artist and photographer keep track of their records (Figure 10). And our acquisition of a word-processing facility allows us to speedily prepare the preliminary report necessary for the Italian government.

While our first needs for capturing and reporting excavation records during the season and for transferring them to the mainframe have clearly been met, with the microcomputer we have reaped the additional benefits of easily keeping track of photography and drawing records and writing up preliminary reports. It is legitimate at this stage to pause and question the entire package developed to date. One might well ask if it is worth it, and if so, what comes next. Answers to the first question might easily vary, excavation by excavation, for the method employed here captures detailed data and argues that all material recovered be recorded rather than the "representative" selections sometimes made. The use of such a detailed system makes possible analyses based on percentages or quantities of material found as well as inter- and intra-site distributions. Studies such as these would not even be contemplated without a computer-aided system and so, in this narrow sense alone, the effort is certainly worthwhile. On the other hand, however, is the tremendous personnel time required to make this system work - detailed analysis and coding of the material as well as entry into the system, and the financial expense of the hardware and software development. It could be argued that only representative material be recorded but the objections here are clear: aside from the subjective determination of "representative" material, some of the foremost benefits to using a computer (manipulation of large quantities of material, meaningful statistical analyses, etc.) are lost if a subjective sample is chosen. For the moment, Brown is committed to this approach, and hence the computer system, believing that further effort in this direction will help gain better understandings of the raw material.

Then, "where do we go?" Or "where does the system go?" On our part there are two major areas of interest: mapping artefact distributions and additional techniques (and equipment) for pattern study. Since the latter is of more interest to me currently, given the proverbial constraints of time and money, it is likely that it will have the higher priority. Overall, this system was clearly designed for our excavations and use, not with the purpose of distributing it to other situations. Such distribution is not precluded but no single, unified package is currently proposed for external use. I have offered this paper to demonstrate what we have been able to accomplish and how we might continue to develop the system, acknowledging that, should the circumstances be right, we would be delighted to make this concept available to a wider-body of users.

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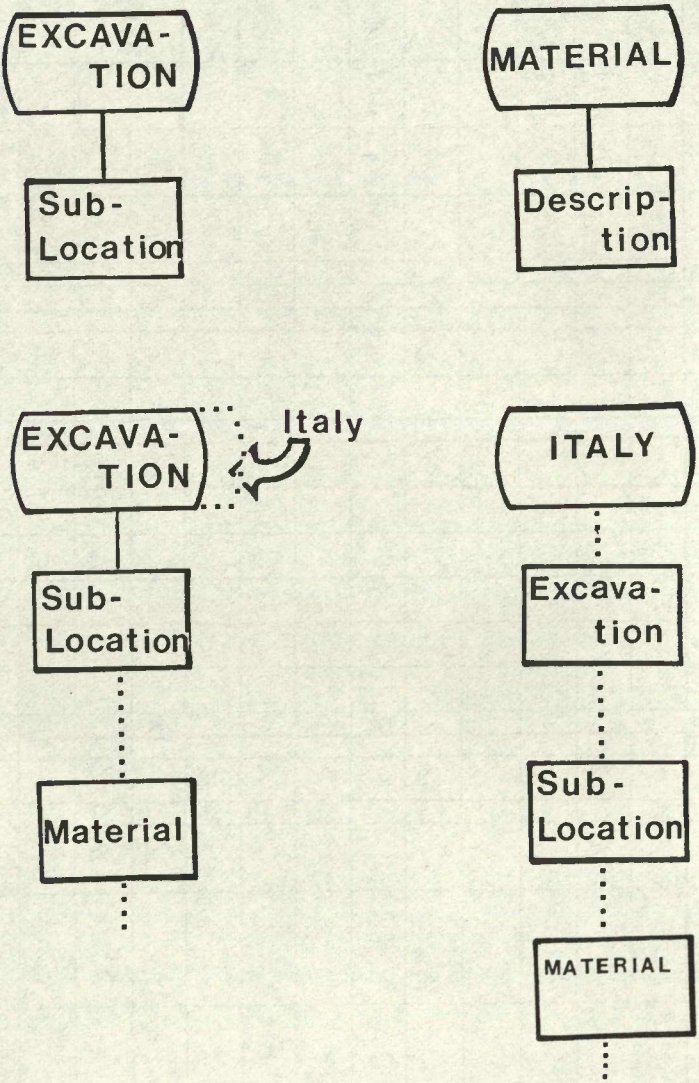
Figure 1 File Layouts



La Muculufa, Sicily — Brown University

Registration No.	Locus	Special	Quantity	Mat'l	Ware Typ	Ware Colr	Pres'd	Rim	Neck	Body	Base	Foot	Handle Typ	Handle Loc	Other	Func	Size	Decoration Type	Decoration Var	Decoration Pattern/Location 1	2	3	4	Color 1 2 3
7419	T8D A22318	A	1	C	11		0			AO								P		LV,O				B
7420		A	1	C	12		1	CC	BA									P		SH,5	SV,N	HP,N		B
7421		A	1	C	11		1	CC	BA									P		SH,5	HD,N	DH,N	LT,N	B
7422		A	1	C	12		5	CC										P		P3,N				B
7423		A	1	C	13		1	CC	BC									P		P3,N	UN,X			B
7424		D,N A	1	C	11		2	CC	BA	A4								P		SH,5	HB,N	SH,4	HD,O	B
7425		A	1	C	11		0											P		SM,O				B
7426		A	1	C	12		0											P		SV,O	BV,X			B
7427		A	1	C	12		0											P		SH,O	SO,O			B
7428		J,H A	2	C	12		H						2C					P		SH,H				B
7429		KN A	6	C	12		1	CC	BA		10		AC	N				L		A5,N				[illegible]
7430		DA	1	C	12		F									IF		P		LC,F	SH,F			B
7431	T80A0152A		1	C	12		0			AO								P		UN,O				B
7432			1	C	12		0			AO								P		SO,O				B
7433			1	C	11		2	CC	BA	AO								P		BW,N				B

Figure 2 Sample Coding Sheet

Figure 3 Coding Tables

EXCAVATION CODES
EXCNECK (06/10/82)
03/05/84

DESCRIPTION OF SHAPE OF VESSEL NECK	
	UNKNOWN
BA	CYLINDRICAL
BB	CONE / \
BC	FRUSTRUM OF A CONE \ /
B0	STRAIGHT-SIDED, UNSPECIFIED
CA	HYPERBOLID) (
C1	MILD HYPERBOLID
ZZ	NO SEPARATE NECK

EXCAVATION CODES
EXCBODY (06/10/82)
03/05/84

DESCRIPTION OF VESSEL BODY SHAPE	
A0	ROUND, UNSPECIFIED
A1	HEMISPHERICAL
A2	SEMI-ELLIPSOIDAL, VERTICAL
A3	SEMI-ELLIPSOIDAL, HORIZONTAL
A4	SPHERICAL
A5	ELLIPSOIDAL, VERTICAL
A6	ELLIPSOIDAL, HORIZONTAL
BA	CYLINDRICAL
BB	CONE / \
BC	FRUSTRUM OF A CONE \ /
BD	EITHER BB OR BC
B0	STRAIGHT-SIDED, UNSPECIFIED
D0	ANGULAR < >

EXCAVATION CODES
EXCPRESF (06/10/82)
03/05/84

PRESERVED FEATURE (REMAINING PORTION) OF CERAMIC ARTIFACT	
	BODY
F	FOOT
H	HANDLE ONLY
I	INNER BASE (FRUITERIA)
J	HANDLE & BODY
N	NECK (BETWEEN RIM AND SHOULDER)
X	OTHER (INTERIOR IF DECORATION PLACE)
0	BODY
1	RIM TO SHOULDER
2	RIM TO BODY
3	RIM TO BASE (FULL PROFILE)
4	SHOULDER
5	RIM
6	BODY TO BASE
7	BASE
8	SHOULDER TO BODY
9	SHOULDER TO BASE

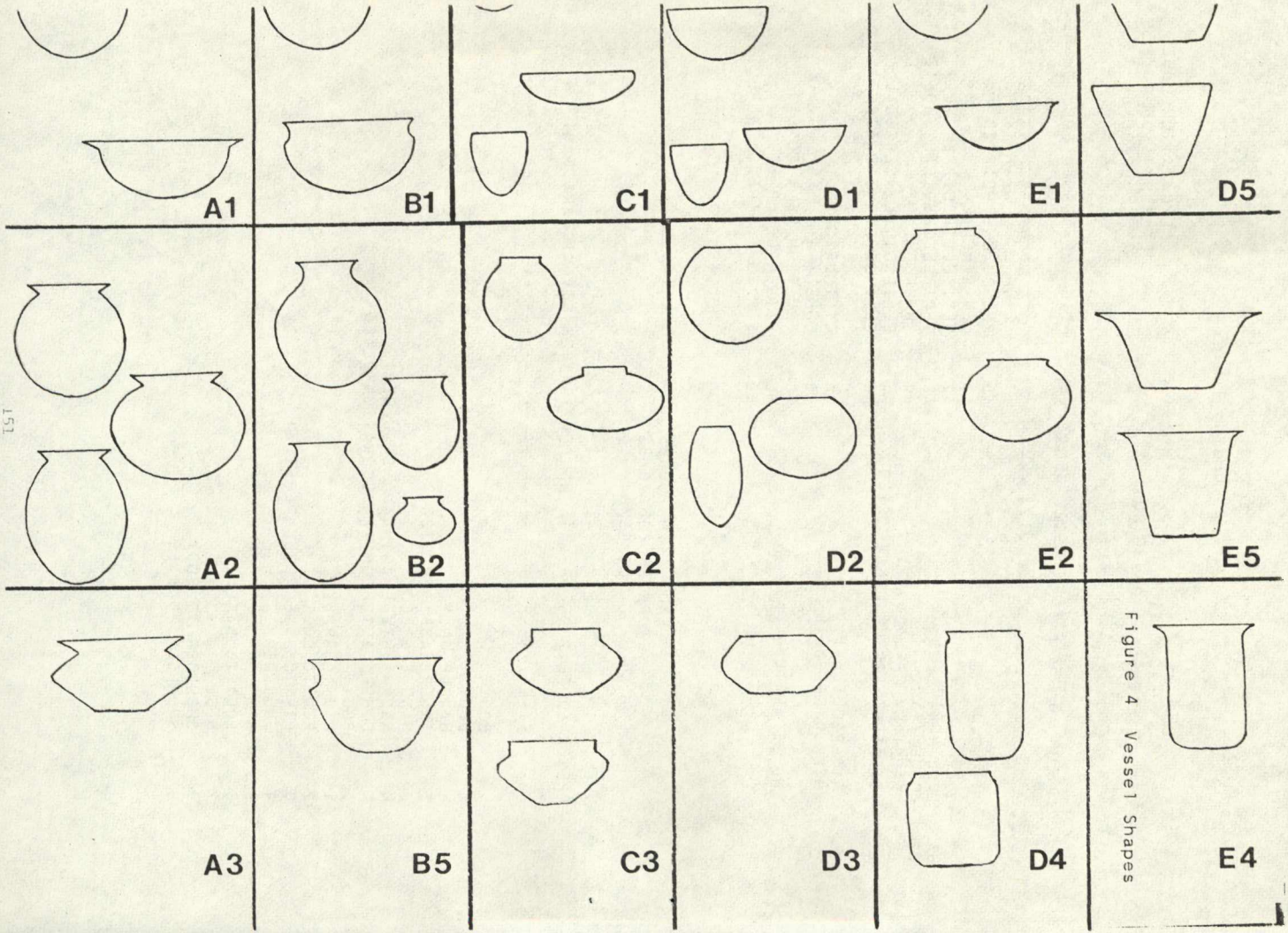


Figure 4 Vessel Shapes

BRONZE AGE FORMS - 03/10/84

FORM	ABR0026	ABR0057	ABR0058	ABR0059	ABR0062	SIC0168
??	.	.	.	.	.	4
A	.	.	.	.	.	1
AX	2	.	1	1	.	3
AZ	5	.	3	.	.	.
A1	9	1	3	.	.	3
A2	6	.	2	3	.	5
A3	8	.	.	1	.	.
A4	.	.	.	.	.	1
BL	.	.	.	.	.	1
BX	.	.	.	1	.	3
BZ	5	.	.	.	.	.
B1	8	1	3	.	1	43
B2	.	3	2	1	.	8
B5	4	1	3	.	1	.
CX	5	1	6	.	.	33
CZ	3	.	.	.	.	.
C1	5	.	.	.	.	52
C2	4	.	.	.	.	75
C3	2	.	2	.	.	2
C5	.	.	.	.	.	1
DX	28	1	4	4	.	3
DY	2	9	6	2	.	.
D1	6	6	1	.	.	117
D2	2	2	.	.	.	33
D3	.	.	1	.	.	1
D4	31	18	.	14	.	5
D5	11	13	.	10	.	16
EX	3	.	.	.	.	3
EY	1	1	.	.	.	.
E1	2	1	.	.	.	.
E2	2	.	.	.	.	.
E4	8	9	.	1	.	.
E5	26	41	1	1	.	3
GX	.	.	.	.	.	3
G1	.	.	.	.	.	15
G2	.	.	.	.	.	3
SP	.	.	.	.	.	2
UW	.	.	.	.	.	2
VO	.	.	.	.	.	1
XB	.	.	.	.	.	1
X6	.	.	.	.	.	2
1C	.	.	.	.	.	11
1F	.	.	.	.	.	313
1G	.	.	.	.	.	15
1H	.	.	.	.	.	1
1K	.	.	.	.	.	3
1M	.	.	.	.	.	1
1N	.	.	.	.	.	2
1P	.	.	.	.	.	1
1S	.	.	.	.	.	4

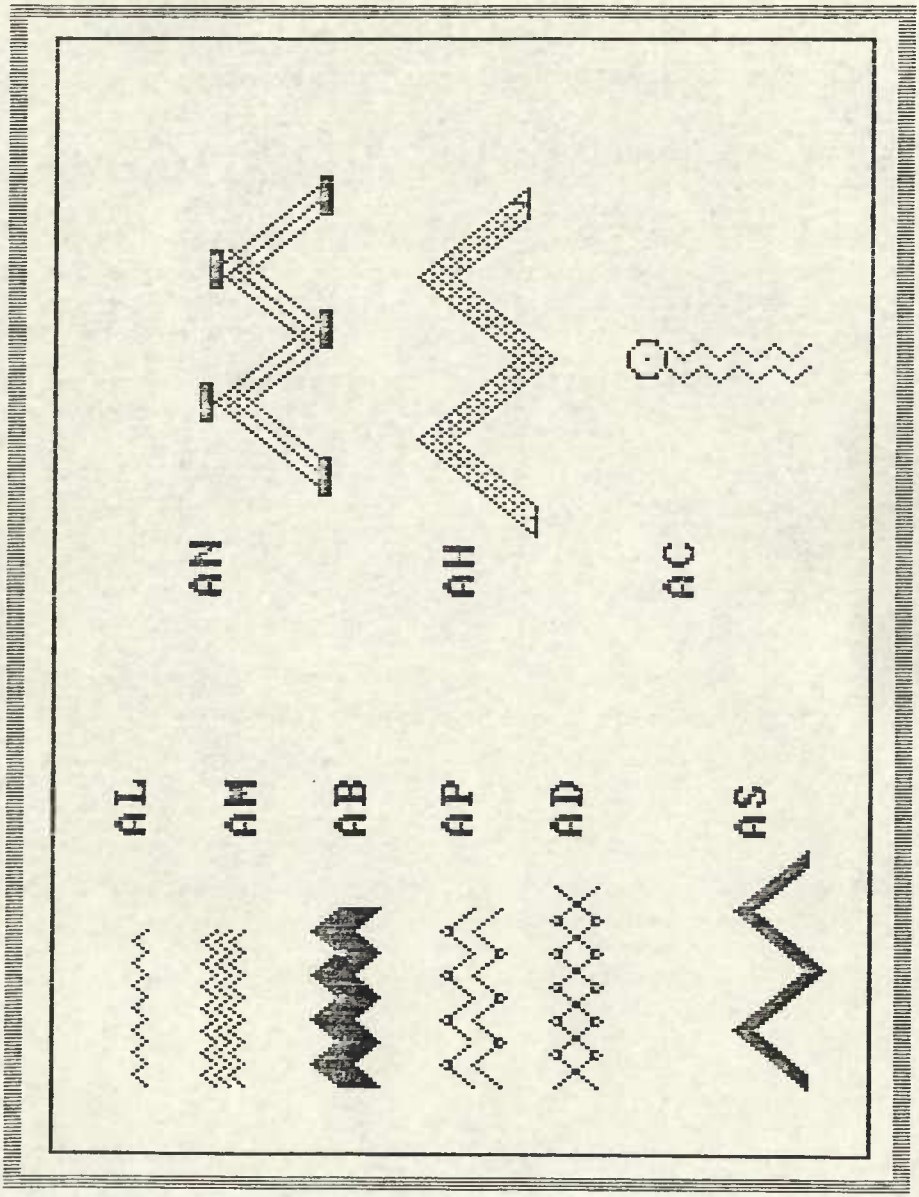
Figure 5 Bronze Age Forms Report

MEASUREMENTS BY SITE
(D = DIAMETER; H = HEIGHT)

SEQ	FORM	HT	NECK H	RIM D	NECK D	BODY D	BASE D
SITE: ABR0026	PETRELLA BIFERNINA						
32	B1	9.50	4.50	19.00	17.50	22.00	.00
39		.00	.00	.00	.00	.00	7.00
40		.00	.00	.00	.00	.00	20.00
52	A3	.00	3.30	11.00	10.00	14.50	.00
181	D4	3.70	.00	.00	.00	.00	.00
271		.00	.00	.00	.00	.00	16.00
272		.00	.00	.00	.00	.00	13.00
273		.00	.00	.00	.00	.00	9.00
274		.00	.00	.00	.00	.00	5.00
290		.00	.00	.00	.00	.00	19.00
298		4.30	.00	.00	.00	.00	.00
321		.00	.00	.00	.00	.00	13.00
339		.00	.00	.00	.00	.00	13.00
348		.00	.00	.00	.00	.00	8.00
SITE: ABR0057	MASSERIA MAMMARELLA						
1	A1	5.10	3.40	10.20	9.40	9.80	.00
77		.00	.00	.00	.00	.00	6.00
101		.00	.00	.00	.00	.00	14.00
103	D4	.00	.00	15.00	.00	.00	.00
SITE: ABR0058	GUGLIONESI						
1	C3	.00	2.10	19.00	18.60	22.00	.00
2	B1	3.40	1.30	9.00	8.80	9.60	.00
3	B1	3.80	1.40	9.00	8.50	9.00	.00
4	A1	.00	.00	21.00	.00	.00	.00
6	A1	.00	1.90	.00	.00	.00	.00
7	B2	3.50	1.60	3.00	2.80	4.20	.00
8	B5	.00	.80	19.00	18.50	19.00	.00
9	C3	.00	2.60	21.00	21.00	25.20	.00
10	B5	.00	2.30	24.00	24.00	26.60	.00
11	B2	.00	3.80	21.00	.00	21.50	.00
12	A2	.00	1.90	.00	.00	.00	.00
13	D3	.00	2.70	22.00	.00	26.00	.00
SITE: ABR0059	BIFERNO VALLEY <E10>						
3		.00	.00	.00	.00	.00	6.00
10	BX	.00	6.00	39.00	.00	.00	.00
11	A2	.00	.00	15.00	.00	.00	.00
32	A2	.00	1.90	.00	20.00	.00	.00
33	B2	.00	1.20	.00	21.00	.00	.00

Figure 6 Measurements by Form

Figure 7 Sample Decoration Patterns



LA MUCULFA PAINTED DECORATION PATTERNS
12/07/83 (DECPRNT)

FORM	TRENCH	QUAN	DEC1	DEC2	DEC3	DEC4	DEC5	VAR	PF	WARE	SEQ
C2	T	1	HB-N	AM-N	HB-0				2	11	002022
		1	HB-N	HB-0	SH-N				4	12	002288
		1	LH-N						2	11	006535
		1	LH-0	LV-0				P	2	12	006657*
		1	NI-N	UN-0					2	11	002029
		2	PS-0	SV-0					4	12	002283
		1	P5-0						2	11	002284
		1	P5-0						4	11	002289
		1	P5-0	SV-0					4	12	002285
		1	P6-N	SH-N	HB-0				2	12	016547*
		1	P6-N	SV-0					2	11	009739*
		1	SH-5	AB-N	LP-N				2	11	015590*
		1	SH-5	BV-N	SH-N	HB-0	SV-0		2	11	015544*
		1	SH-5	HB-N	SH-4	HD-0			2	11	007424*
		1	SH-5	HB-N	SH-4	HB-0			2	12	008063*
		1	SH-5	NI-5	UN-0	HK-N			2	11	016551
		1	UN-N						2	11	006358
		1	UN-0	HS-H					5		014103
*TOTAL TR T		19									
C3	F	4	SV-0	UN-N					2	11	004754*
*TOTAL TR F		4									
	T	1	SH-4	SH-5					3	11	005945*
*TOTAL TR T		1									
D1	F	2	AM-5	P6-N					2	12	003189*
		1	AI-0	HO-0	SH-0	WB-0			2	11	001811*
		2	DR-0	HT-0	WB-0				2	12	001446*
		1	HP-5	TH-N				P	2	12	003474
		1	HT-N						2	12	001231
		1	SD-N						1	13	002830
		1	SH-0						2	11	002171
		1	SH-5						2	12	002812*
		1	SH-5	DS-0					2	11	001777*
		2	SH-5	SH-N	SV-0	LS-0			2	11	001773*
		1	SV-0						2	11	001935*
		1	SV-0						1	12	002769
		1	SV-N						2	12	003346
		1	SV-N						2	13	003393
		1	TA-0						2	12	005632

'*' DRAWN

Figure 8 Painted Decoration Pattern Records

LA MUCULUFA DRAWING RECORDS
SEASON: 1982
03/10/84

ARTIFACT	REGIS	PAGE	DRWG
CERAMIC	1059	10	3
	1069	11	1
	1079	11	5
	1124	11	4
	1125	11	3
	1126	11	2
	1157	14	8
	1159	12	7
	1160	14	10
	1161	15	4
	1162	12	5
	1163	12	4
	1164	14	5
	1203	20	7
	1205	14	6
	1206	15	7
	1207	15	2
	1208	14	3
	1210	15	1
	1211	14	9
	1212	12	8
	1213	13	9
	1252	19	1
		20	2
	1253	19	9
	1254	13	7
	1255	12	9
	1256	14	11
	1257	13	4
	1258	13	3
	1259	20	5
	1260	13	5
	1262	14	1
	1268	19	2
	1281	19	5
	1283	19	11
	1288	20	9
	1345	18	8
	1346	19	12
	1348	20	12
	1349	15	6
	1350	15	8
	1355	15	5
	1362	20	4
	1389	19	3
	1446	18	7
	1451	18	6
	1452	19	4
	1511	18	4

Figure 9 Drawing Records Report

LA MUCULUFA COUNTS
03/11/84

LOCATION	RIMS	BASES	PROFILES	HANDLES	PLASTIC-DECOR	PTD-DEC	INC-DEC	IMP-DEC	TOTAL-SHERDS
T70A01S6A	0	0	0	0	0	0	0	0	8
T70A01S6B	63	1	12	4	0	117	0	0	123
T70A01S7A	0	0	0	0	0	0	0	0	5
T70A01S8A	0	0	0	0	0	0	0	0	7
T70A02S3A	0	0	0	0	0	0	0	0	12
T70A02S7A	0	0	0	0	0	0	0	0	1
T70A03S3A	0	0	0	0	0	0	0	0	1
T70A06S2A	4	0	0	2	0	0	0	0	11
T70A01S1B	0	0	0	0	0	0	0	0	61
T70A01S2A	0	0	0	0	0	0	0	0	168
T70A01S2B	15	3	6	7	0	71	0	0	435
T70A01S4A	17	2	6	5	0	44	0	0	363
T70A01S5A	0	5	0	1	0	18	0	0	19
T70A01S6A	10	2	5	3	1	45	1	0	458
T70A01S6B	7	2	1	11	0	65	0	0	1,494
T70A01S7A	12	1	2	1	0	59	0	0	674
T70A01S8A	5	0	4	0	0	20	0	0	728
T70A02S1B	10	2	1	4	0	21	0	0	121
T70A02S2A	0	0	0	0	0	0	0	0	22
T70A02S2B	0	0	0	0	0	0	0	0	17
T70A02S7A	0	0	0	1	0	1	0	0	177
T70A03S1B	11	0	1	8	0	28	0	0	329
T70A03S2A	0	0	0	0	0	0	0	0	21
T70A03S3A	0	0	0	0	0	0	0	0	214
T70A03S7A	4	17	3	31	0	41	0	0	41
T70A04S2A	0	0	0	0	0	0	0	0	84
T70A04S7B	1	0	1	1	0	1	0	0	25
T70A05S1B	14	1	0	21	0	62	0	0	902
T70A05S2A	0	0	0	0	0	0	0	0	9
T70A06S1B	0	0	0	0	0	0	0	0	456
T70A06S2A	0	0	0	0	0	2	0	0	116
T70A07S2A	0	0	0	0	0	0	0	0	24
T70A11S2B	0	0	0	0	0	0	0	0	130
T70A12S2B	0	0	0	0	0	0	0	0	18
T70A13S2B	0	0	0	0	0	0	0	0	15
T70A14S2B	0	0	0	0	0	0	0	0	68
T70A15S2B	0	0	0	0	0	0	0	0	4
T70A16S2B	0	0	0	0	0	0	0	0	9
T70A17S2B	0	0	0	0	0	0	0	0	7
T70A18S2B	0	0	0	0	0	0	0	0	7
T70A19S2B	0	0	0	0	0	0	0	0	6
T70A20S2B	0	0	0	0	0	0	0	0	18
T70A21S2B	0	0	0	0	0	0	0	0	149
T70A23S2B	0	0	0	0	0	0	0	0	9
T70A25S2B	1	0	0	1	0	6	0	0	35
T70A26S2B	0	0	0	0	0	0	0	0	32
T70A27S2B	0	0	0	0	0	0	0	0	9
T70A28S2A	0	0	0	0	0	0	0	0	30
T70A29S2B	0	0	0	0	0	0	0	0	26
T80---S1A	7	0	0	6	0	16	0	0	94

Figure 10 La Muculufa Counts

Figure 11 Artefact per Cubic Meter

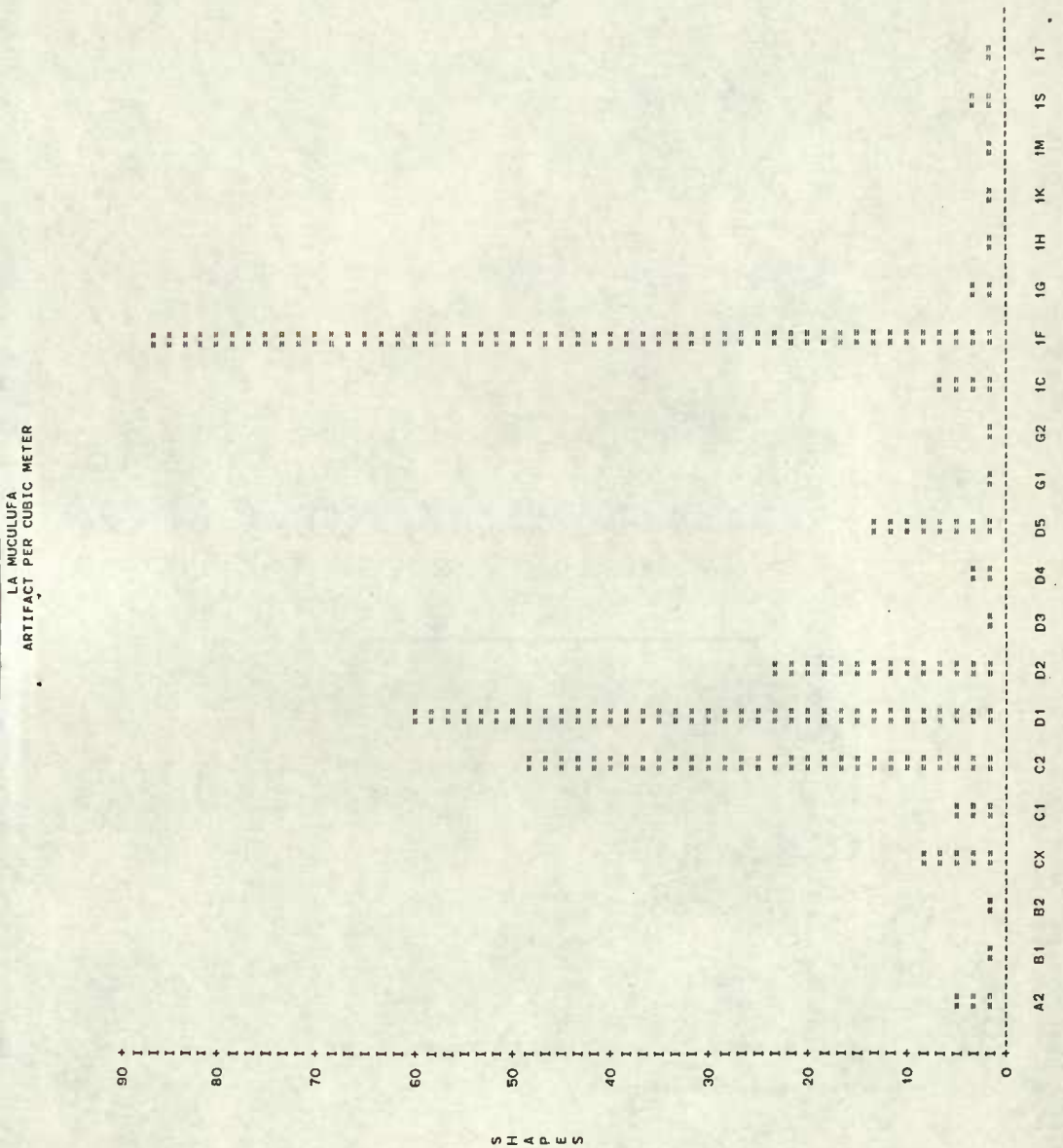


Figure 12 Input Screens: Drawing Records/Locus Coordinates

Brown University
La Muculufa Drawing Records

Volume: Page:

Drawing #: Regis #:

Enter '*' for volume to end session
Enter '#' for volume to save input

PRESS 'Ins' KEY TO ENTER DATA

Brown University
La Muculufa Locus Coordinates

Locus:

South 1: South 2:
East 1: East 2:
BD 1: BD 2:

Cubic Meters:

Fill Order: Fill Type:

Fill Description:

Enter numeric data as 'nnn.nn' - use '0', e.g., 010.20.

Enter '*' for Locus to end session

PRESS 'Ins' KEY TO ENTER DATA

Figure 13 Input Screens: Excavation Records

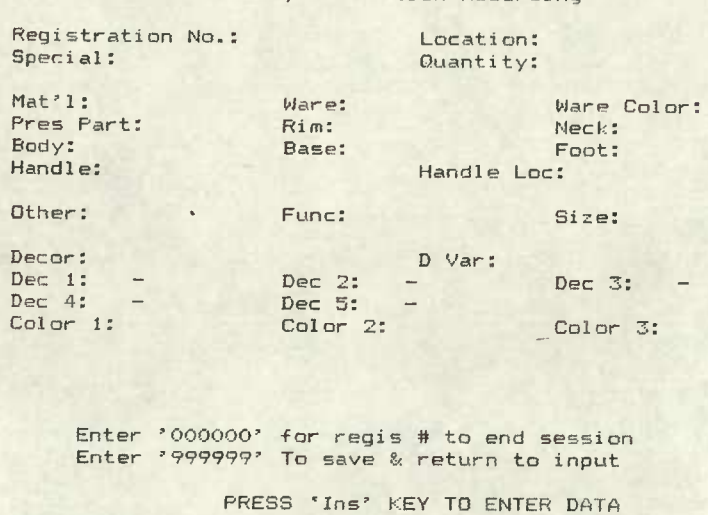


Figure 14 Artefact Recovery Summary

```
.ARRAYSUM)                    La Muculufa
                    Recovery Summary for : Field 1983
                              03-12-1984

:cccccccccccccccccccccccccccccccccccccccccccccccccccccccccccccccccccccccccccccccccccccccccccccccccccccccccc

'2A---S1-  Total sherds:  23          Flints:  0          Daub: 0

        Feature :  9
           Profiles:   0   Rims:  2   Bases:  1   Handles:  6

        Decorated:  10
           Painted (excluding white-banded):  10      White-banded:  0
           Other decorated:  0

-------------------------------------------------------------------------------

'50---S6-  Total sherds:  293         Flints:  0          Daub: 1

        Feature :  31
           Profiles:   0   Rims:  22   Bases:  1   Handles:  8

        Decorated:  87
           Painted (excluding white-banded):  87      White-banded:  0
           Other decorated:  0

-------------------------------------------------------------------------------

'50---S4-  Total sherds:  770         Flints:  0          Daub: 31

        Feature :  141
           Profiles:   0   Rims:  92   Bases:  5   Handles:  44

        Decorated:  317
           Painted (excluding white-banded):  302     White-banded:  8
           Other decorated:  7

-------------------------------------------------------------------------------

'50---S2-  Total sherds:  2034        Flints:  0          Daub: 17

        Feature :  328
           Profiles:   0   Rims:  246  Bases:  7   Handles:  75

        Decorated:  818
           Painted (excluding white-banded):  773     White-banded:  31
           Other decorated:  14

-------------------------------------------------------------------------------
```