

The density of types and the dignity of the fragment
A website approach to archaeological typology¹

For

*Between variability and singularity:
crossing theoretical, qualitative and computer-based approaches
to types and typologies in archaeology*

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Typology hinges on categorization, and the two main axes of categorization are the roster and the lexicon: the first defines elements from an -emic, and the second from an (e)-tic point of view, i. e., as a closed or an open system, respectively. Archaeology poses a special problem with regard to the -emic dimension, since it deals essentially with broken traditions, i. e., with cultural wholes for which there are no living carriers. Dealing with this problem entails that one should engage in a very intensive type of distributional analysis, where density plays a major role. – Having so defined the universe of data, we deal with the question of how best to articulate and communicate the results. We propose in this regard the use of the website as a privileged epistemic system, one that allows to preserve the dignity of the fragment in its singularity while at the same time offering a full-fledged representation of the larger typological classes. The notion of digital discourse makes it possible to integrate the data within the flow of a coherent multi-planar argument. – The paper explains these principles using concrete evidence from Urkesh, one of the earliest known urban sites in Syro-Mesopotamia, with an excavated ceramic record of close to one million items.



¹

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Pensar es olvidar diferencias, es generalizar, abstraer.

En el abarrotado mundo de Funes no había sino detalles, casi inmediatos.

Borges, Funes

70 1 Introductory

71 One can "forget differences" (*olvidar diferencias*) only once they have been identified.

72 And one can go beyond a mass of purely contiguous facts (*detalles, casi inmediatos*) only
73 if one gains a sense of the whole.

74 That is the message we read in the Borges' text cited as epigram. And we will seek here
75 an answer to the implicit question along two main lines of inquiry.

76 The first is the nature of the categorization system, the one through which we establish
77 the differences. It refers to the way in which the data are organized.

78 The second issue concerns the process through which we can articulate and convey
79 knowledge relying on typological classification..

80 In the conclusion, we will see how all of this pertains to the central topic of the volume,
81 i. e., to the relationship between variability and singularity.

82 I. DATA ORGANIZATION

83 2 Categorization

84 2.1 (e)-tic and -emic

85 The terms (e)-tic and -emic have come to be in common use to refer to whether a given
86 cultural phenomenon is being studied from without or from within the culture to which it
87 belongs.

88 The term was borrowed from linguistics, and it is in recognition of this original use of
89 the terms that here we write (e)-tic instead of -etic: the (e) is in fact not part of the suffix, but
90 is rather derived from the word to which it is attached, in this case *phōnē*, while it is (o)-tic
91 in "antibiotic" or, with a consonant, (s)-tic in "fantastic." In this article we keep the form (e)-
92 tic throughout, though in point of fact one may well ignore this fine point of etymology and
93 follow the current use which has entrenched "etic" and "emic" in the dictionary, thus allow-
94 ing also for the (useful) adjectives "etical" and "emical."

95 What really matters, beyond terminology, are the concepts behind the two terms (Buc-
96 cellati 2006 "(e)tic" and Buccellati 2017 *Critique* 3.4.). They are powerful heuristic concepts,
97 which need to be better defined: it will then appear how useful they can be in approaching
98 the subject of typology, particularly with regard to variability and singularity.

99 2.2 Open and closed systems

100 Structurally, an (e)tic system is open and an -emic system is closed. To illustrate the con-
101 cepts we will use the cases of phonemics and of a street stoplight.

102 An (e)-tic system is open in the sense that there is no intrinsic limit on the number of
103 types that are possible within the system. An acoustic inventory of phones articulated by
104 different speakers is open ended because the "phonetic" variations that can be measured
105 acoustically are practically unlimited, and there is always room for new ones to be added.
106 Analogously, the measuring of chromatic differences among different embodiment of the
107 three basic colors of green, yellow and red in different street stoplights can yield great vari-
108 ations, and still leave room for more.²

109 An -emic system, on the other hand, is closed in the sense that, within a given system,
110 only a fixed number of possible realizations is found. There is a fixed set of phonemes in
111 any given language, and a fixed set of three colors in any given stoplight. The variable
112 acoustic realizations of a given phoneme must fit within a range of possibilities for commu-
113 nication to be possible, just as the variable chromatic realizations of a given color in a stop-
114 light must fit within a range of possibilities for the message to be understood (one will be
115 alerted to stop whatever shade of yellow or even orange the intermediate signal may have).

116 The elements of a closed system are mutually exclusive in the sense that their function
117 depends on this exclusivity: the red color of a stoplight entails the stopping of traffic not be-
118 cause of an intrinsic quality of the color red, but because of its contrast with the yellow and
119 green colors.

120 The elements of an open system, instead, are mutually exclusive because of an intrinsic
121 quality of the element: thus the chromatic value of a given shade of red is different not only
122 from that of yellow and green, but also from a multitude of other shades of red.

123 Several additional factors play a role in defining a closed system, for instance duration.
124 The length of a phone (i. e., how long the articulation of a phone lasts) may be -emic in
125 some languages and not in others. Analogously, in a stoplight in the US or Italy the red and
126 green signals appear for the same amount of time, whereas yellow appears for a shorter pe-
127 riod, the reason being that green and red are linked to the time when vehicular traffic may
128 or may not flow, whereas yellow is intended only as a brief warning – thus enhancing the
129 -emic status of the contrast among the three colors.

12 ²

13 We use the terms "speakers" and "phones" as they are in linguistics: a speaker is a native speaker, and a phone is
14 a sound as defined either by the way it is articulated in the human vocal apparatus or by the way it can be defined acousti-
15 cally. The stoplight, in turn, refers to the three color type that is most commonly in use, without regard for possible varia-
16 tions in the nature of the display; also, variations in the shade or intensity of color may be attributed to incrustations on
17 the face of the fixtures, to different manufacturers, to some alteration in the electrical connections, or the like.

130 It must be stressed that a closed system is closed not in the sense that it is unchangeable,
131 but in the sense that if a change occurs (deletion of an element or addition of another), then
132 the whole system has to be re-calibrated. That is because the system is endowed with an in-
133 ternal integrity that cannot be altered without the system changing its identity. For instance,
134 one might add a blue signal to a stoplight to indicate heavy traffic ahead, but this would
135 change the nature of the system, in this case simply because it would reduce the immediacy
136 of the messages conveyed by the signal, an immediacy that is especially important precisely
137 with heavy traffic.

138 2.3 Scalarity and congruence

139 An open system is scalar in the sense that any given element is seen in and of itself,
140 without a necessary relationship to other neighboring elements. Using our two examples,
141 the acoustic or the chromatic definition of a given sound or a given color does not depend
142 on a relationship of that element to any other elements in the system. Or rather, it depends
143 only in the sense that both are defined by the same external categorization system, not be-
144 cause of the way in which the two elements interact with each other.

145 A closed system, on the other hand, is congruent in the sense that any given element de-
146 pends on its relationship to one or more of its neighbors. Thus, in the phonemic system of a
147 given language, a voiced dental phoneme includes a range of phones that, in turn, exclude
148 the neighboring voiceless dental phoneme, while in another phonemic system (one that
149 does not recognize the distinction between voiced and voiceless), the range includes both
150 voiced and voiceless. Analogously, in a stoplight the import of the red signal is congruent
151 with that of the yellow and green signals: there is an equilibrium or balance among them so
152 that each depends on the other for its meaning to be fully perceived.

153 A more concrete example might be that of the organizational chart for a supermarket
154 display. It is scalar in the sense that any new product (e. g., a new brand of mustard), or any
155 new category (e.g., a curry condiment) may be added at will. It is simply a matter of mak-
156 ing room on the shelves, in the appropriate place. It is the model of the website seen as a
157 container, not as a system. Or again, the collection of photos on our cell phones is also
158 scalar, being generally organized by date, and thus remaining open for any possible future
159 addition.

160 2.4 Procedures and criteria

161 The procedures to categorize elements within the two systems differ depending on the
162 system.

163 The categorization of elements within an open system operates on the basis of criteria
164 that are *external to the system*. Neither acoustics nor chromatic analysis are concerned with

165 the communicative function of language or with vehicular traffic. They use wholly inde-
166 pendent standards, and for this reason they are seen as more "objective."

167 It appears then that, in effect, an open system is also closed – except that it is closed at a
168 higher level than that of its constitutive elements. Acoustic phonetics is a closed system, but
169 one that allows for an immensely larger set of possible realizations than the phonemic sys-
170 tem. Analogously, a chromatic scale includes a seemingly infinite set of possible realizations
171 of red, yellow or green, whereas the -emic version of a stoplight accepts only a set of three
172 "colors," each of which can include an immense variety of actual chromatic realizations.

173 An -emic closed system, in fact, operates on the basis of *internal contrasts* that have to be
174 identified through a sophisticated use of distributional analysis – especially where there is
175 no carrier of a living tradition to provide a verification of assumed contrasts. When such an
176 analysis is undertaken, the result is no less "objective" than with an open system.

177 2.5 Density

178 With the term "density" we mean the quantity of items documented for any given type
179 in its relationship to the total number of items in the inventory. The term is thus not used in
180 the sense it has in statistics: it rather refers to a scale of values for the population attested
181 within a type. Alternatively, we may say that density is a measure of percentage seen ex-
182 plicitly in function of the total to which it refers.

183 We may express density by means of a superscript referring to the total, added to the
184 percentage of the item in question in relationship to the same total. For our current purpos-
185 es, the superscript corresponds to a group of 100 items: thus the superscript ² stands for a
186 group of between 200 and 299 items, the superscript ²⁰ for a group of between 2,000 and
187 2,099 items, the superscript ²⁰⁰ for a group of between 20,000 and 20,099 items, and so forth.-
188 given

189 Let us consider two examples.

190 (1) If we have an inventory of 220 items, of which a given type includes 1 item, we may
191 express the density of this type with the formula $0\%^2$. The figure 0% gives the percentage of
192 1 item vis-à-vis the total of 220; it is a rounded figure for the longer 0.45454545454545% . The
193 superscript ² indicates that there are between 200 and 299 items in the inventory.

194 (2) If we have an inventory of 20,020 items, of which a given type includes again only 1
195 item, we would express the density of this type with the formula $0\%^{200}$. The percentage giv-
196 en is the rounded figure for 0.004995004995005% , and ²⁰⁰ is the abbreviated figure for the to-
197 tal 20,020.

198 This formalization is useful in giving a quick visible expression to the actual import of
199 percentages: $0\%^2$ expresses a much lower density than $0\%^{200}$. The deeper import of this no-
200 tion is that it indicates that a case with 0% occurrences within a total of between 200 and

201 299 items carries much less meaning than a case of 0% occurrences within a total of between
202 20,000 and 20,099 items. We may say the 0%² exhibits a thin, and 0%²⁰⁰ exhibits a thick den-
203 sity.

204 **3 Implementation**

205 3.1 Broken traditions

206 The definition of an -emic system is particularly difficult in the case of broken traditions,
207 i. e., cultures for which there are no living carriers capable of articulating their awareness
208 for the contrastive nature of the elements of the system. We can illustrate this with reference
209 to our two examples: the phonemic system of a language and the stoplight.

210 In the case of phonemics as applicable to "dead" languages, i. e., languages for which
211 there are no living speakers, we cannot ask questions as to whether a given difference in, e.
212 g., articulation is felt to be contrastive or not. We must deal with the additional filter of the
213 written medium, and in this case "decipherment" means establishing distributional classes
214 of the mute evidence that is assumed to match the spoken reality forever lost to us.

215 Or, from the point of view of an extraterrestrial who can watch the flow of traffic in one
216 of our cities (Buccellati 2006 "Mars"), the distributional class would be one that takes into
217 account the way in which the traffic flows, stops or begins to stop in correlation to the
218 changing of colors: a mere chromatic analysis of the colors would not yield any meaning.

219 3.2 Native digitality of the archaeological record

220 Archaeology deals by definition with broken traditions: there are no informants who
221 can share their awareness of an underlying typology. This forces us to define categorization
222 systems, or "grammars," solely on the basis of the identification of distributional classes
223 from within in the data, and, naturally, the larger the inventory, the higher is the probability
224 of success in this endeavor.

225 There is in fact one more difficulty that is specific to the archaeological record. At the
226 source, we only have disconnected fragments, as they come out of the ground: data are
227 scattered in ways that do not match any typological ordering. The most distinctive and
228 unique aspect of archaeology is, in fact, not the complete object that is brought to light – a
229 building, a statue, a text. What is distinctive and unique is what happens at the moment of
230 excavation, and at that moment we only have disconnected fragments, or rather: fragments
231 that are connected only by virtue of how they are situated in the ground, as the result of a
232 largely unplanned depositional process. This we call "emplacement." That is the only de-
233 gree of association we can objectively record.

234 It is in this sense that the fragments are natively digital: they are atoms that do not co-
235 here, emplacement-wise, into a typological whole. For instance, a text may be one of these
236 atoms, and then a whole new expertise is then called into question, one that deals with oth-
237 er wholes received as such, in fact, several such types of expertise: epigraphy, philology, lin-
238 guistics, literary analysis. But the atoms in their aggregation are a different matter: that par-
239 ticular text would have been found with sherds, bones, lithics, other texts, all in a matrix of
240 soil that has its own distinctive nature, and connected only through the vagaries of a depo-
241 sitional process that is, for the most part, unplanned.

242 3.3 The Urkesh Global Record

243 The Urkesh Global Record (UGR) is a recording system that is meant to address explicit-
244 ly these problems. For a general overview of the excavations we will refer to
245 urkesh.org/glance.

246 The foundation of the system is the Grammar of the Archaeological Record, which is
247 found in the digital book urkesh.org/grammar. As of this writing, the book is still unfin-
248 ished and will be completed during the tenure of the Balzan project mentioned above in
249 note 1; it is, however, sufficiently indicative of the approach and of the goals we have set.

250 Some of the central concerns of the system may be given as follows.

251 (1) While categorization systems are at the basis of all archaeological projects, what is
252 specific to the UGR is the explicit concern with *emplacement* and a theoretical framework
253 that integrates emplacement with all other aspects of fieldwork and subsequent analysis.
254 Emplacement is seen as the only factor that is exclusively and properly archaeological in
255 nature, meaning that it presents a set of problems that no other discipline faces.

256 (2) With regard to emplacement in particular, the record aims at being *global* in the sense
257 that it includes in perpetuity every single observation ever made during the excavation, in
258 the belief that this is the only objective data in view of the inability to repeat the experi-
259 ment.

260 (3) The *website* is adopted as the primary epistemic system, meaning that the data are
261 recorded from the start in a format that is natively digital so as to be ideally suited for inte-
262 gration in the format of a browser edition.

263 The urkesh.org website is in effect a cluster of websites, called digital books, each one
264 devoted to either individual excavation units or topical books. In the exemplification below
265 we will use the ceramic topical book (urkesh.org/ceramics; this website is a work in
266 progress, access is currently accessible with <cer> for both ID and PW) and some of the dig-
267 ital books dedicated to individual excavation units.

268 3.4 Rosters and lexica

269 An essential aspect of the UGR, and one that is of interest to us here, is the categoriza-
 270 tion system that is used on the excavation for the analysis of the data with regard to their
 271 emplacement in the first place, and then their general morphological classification. The two
 272 major components of this system are the roster and the lexicon. There are different rosters
 273 and lexica for each class of data, with regard to both emplacement and typology; in this ar-
 274 ticle we will use the ceramic data as an example. The whole ceramic inventory studied so
 275 far applies to different chronological horizons, spanning over some two millennia, and it
 276 applies to an inventory of some 300,000 between whole vessels and sherds that have been
 277 fully analyzed (out of a grand total of about one million that have been excavated and
 278 recorded as to emplacement, with only a preliminary typological analysis).

279 The roster is an -emic, closed system. Each slot records the typological categories that
 280 are seen as being mutually exclusive and congruent within the overall inventory of types.
 281 As an example, Fig. 1 lists the roster categories divided into various sub-categories. Thus,
 282 the twelve main shapes include vessels that are mutually exclusive in terms of how they
 283 can be handled and used: a bowl is primarily used for holding and can be held with two
 284 hands, a bottle for pouring with one hand, a jar for pouring with two hands, a cup for
 285 drinking, and so on.

286 The lexicon is an (e)-tic, open system. It includes an open ended list of attributes or defi-
 287 nitions that are mutually exclusive in terms not of their neighbors, but of an extrinsic hier-
 288 archy that determines the distinctive traits of each element. Thus a jar may be high necked,
 289 with handles, with a spout, or with none of these traits, and in addition it would be of one
 290 ware or another, with decoration or without – but it would always remain a jar.

291 Rosters and lexica may be seen respectively as a list of variables and a list of variants.
 292 Thus the stoplight, as an -emic system, includes three variables, meaning that each of the
 293 three colors may vary within itself: "red" can include a variety of hues from pink to purple,
 294 "yellow" can include lemon to orange, "green" can include jade or emerald. These alterna-
 295 tives are the variants that would be listed in a lexicon, should one wish to have a lexicon for
 296 such color variants.

297 In other words: *variability* implies the possibility of *variation*. This possibility is limited,
 298 from an -emic point of view, by the reciprocal contrast among variables, and from an (e)-tic
 299 point of view by the (much wider) range of possible variants. Which in turn speaks to *sin-*
 300 *gularity*. A variable retains its status whether it includes one or more variants, and whether
 301 it includes one or more specimens.

302 To summarize, we may list as follows the relevant terms:

<i>roster</i>	<i>lexicon</i>
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variables	variants
categories	attributes

303 INTERLUDE

304 4 Typology in action

305 Typology is not an end in itself. The classification effort that produces it assigns
306 categories that can be reconfigured in different ways. The common way in which this
307 happens is through spreadsheet programs, such as Microsoft EXCEL, that produce
308 tabulations in which the entries are sorted according to a variety of different categories.
309 This is the normal process through which typology is put to use.

310 What we propose in the next section is the implementation of the website as a parallel,
311 and more powerful, process for using typology. This approach offers not only a more
312 dynamic use of the data, but also the possibility of integrating data and argument in ways
313 that cannot be done with the printed medium. Not that databases are jettisoned, quite the
314 contrary; they are fully maintained, but integrated in the broader framework of a browser
315 edition.

316 We will discuss (6) the nature of the website as an epistemic system with regard in
317 particular to the notion of typology, and will then elaborate (7) on the notion of digital
318 discourse, which concerns specifically the way in which different arguments interact with
319 each other. In each case we will use examples from the ceramic inventory of the Urkesh
320 excavations.

321 5 Data processing

322 The categorization system that undergirds typology is essential for the data to be
323 coherently processed. And such processing is universally understood today as being digital
324 in nature. We can no longer think of a paper spreadsheet (even though the word retains a
325 reference to the paper format), it is second nature for everyone to use a digital version – and
326 this is inevitably based on a typology, however rudimentary and unexpressed it may be.

327 For our purposes, a dedicated programming platform is needed, one that adheres
328 closely to the grammar and its rosters and lexica, and one that produces outputs suited for
329 the kind of interweaving of planes which we will discuss. Such programming has been at
330 the forefront of our efforts since the late seventies, undergoing a variety of transformations,,
331 and in this phase we are indebted to Bernardo Forni for overseeing the entire current suite
332 of programs that underlie the system. The effort requires an in depth understanding of the

333 goals and the potential of the system, and Bernardo has proven to be as brilliant in this as
334 he is sophisticated in writing and **documenting the programs.**

335 II. THE PROCESS

336 6 The website as epistemic system

337 6.1 The concept

338 The browser format, as exemplified in a website, is ideally suited to serve as an epis-
339 temic system, i. e., a system for the articulation and communication of knowledge. Essen-
340 tially, we see websites as serving to integrate fragments into a new whole, and to develop a
341 new type of argumentation, in ways that are not possible with printed publications such as
342 books or articles.

343 We will mention here only two aspects of this system that are relevant for our current
344 concerns: the concept of inter-planarity (6.2) and the way in which a dynamic inter-planar
345 universe makes it possible to protect singularity (6.3). We will then give some examples
346 from the Urkesh record (6.4 and 6.5)

347 6.2 Multiplanarity

348 Critical thought is based on the concurrence of parallel planes of inquiry. With a printed
349 publication this functions in the sense that, while one follows the argument developed by
350 the author, one also develops parallel planes in one's own mind, adducing either additional
351 facts or additional arguments, which may support or contradict the author's reasoning. This
352 falls, in broad terms, within the notion of inter-planarity.³

353 Digital inter-planarity implies that these parallel planes are not only in one's own mind,
354 but are accessible directly within one and the same structural system, the website. We must
355 distinguish between multiplanarity and inter-planarity.

356 (1) The type in use in current websites may be called *incidental multiplanarity*. The planes
357 are there, but are independent of each other. In this case a hyperlink in a given text invokes
358 a target in what exists indeed as a parallel plane, but the "invocation" is exhausted the mo-
359 ment the target is reached. It is the kind of epistemic activity we engage in when looking up
360 a word in a dictionary: we are satisfied with the immediate answer the target gives, with-
361 out concerns for the structural whole, the dictionary, and what else it may tell us (from a list
362 of synonyms to matters of semantics or semiotics).

32 ³We distinguish between multiplanarity as implemented in standard websites and inter-planarity as implement-
33 ed in the digital discourse type of website. For the original notion of multiplanarity see Buccellati 2022 "Transformative";
34 Paolini 2022 "Modeling". Paolini was the first to call attention to the concept of planarity.

363 (2) The type we are arguing for is instead a *systemic inter-planarity*. Here the interaction
364 among planes presupposes the whole plane as a target, and not only the detail with which
365 we are incidentally concerned. There is a segment of the linear argument that is appropriat-
366 ed, but it is a segment that can be understood only within the larger context of its own
367 plane. We will give examples below (7.2 and 7.4).

368 A website has the potential of articulating these planes concurrently. It has to be "writ-
369 ten" with this in mind, and "read" in the same way. Such an approach to websites is not in
370 current use. The current best, and extremely valuable, use of scholarly websites is one that
371 sees them as *containers*: they are data bases of the known, from which one can draw at will
372 individual data through aimed queries that extract information. When and if, in current
373 use, a website develops an argument, it is in the form of texts that are analogical transposi-
374 tions of printed texts, generally in a .PDF format. But these are essentially static, and so are
375 the hyperlinks it contains: they direct us to a detail, but this detail is not incorporated in a
376 narrative that is presupposed as such in the originating text.

377 6.3 Protecting singularity: the dignity of the fragment

378 The notion of inter-planarity is relevant to the topic of our volume because it allows us
379 to give full recognition to even the most minute and seemingly unimportant element while
380 seeing it, at the same time, integrated in a web of related, parallel universes within which
381 this small piece may otherwise lose its identity and disappear. A website, conceived as a
382 new epistemic system, preserves the dignity of the fragment while at the same time allow-
383 ing for the whole, in fact, for multiple wholes, to be identified in their fullness.

384 The way in which this happens is by placing the single fragment, regardless of how
385 seemingly unimportant it may be, within a track or plane that is written exclusively for it,
386 and which is invoked, precisely as a plane, by other planes without the fragment losing its
387 identity. This creates a proper "digital discourse" among planes that gives pride of place to
388 each plane in its own integrity, one that includes and enhances the singularity and integrity
389 of the fragment.

390 6.4 Sherds, wares and shapes

391 We will show here how this happens with regard to Urkesh ceramics, in terms of wares
392 and shapes. We will illustrate this with screen shots taken from urkesh.org, which one may
393 want to access for a full dynamic "reading" of the results. Also, the figures give the full view
394 of a page as one scrolls down to the end: the purpose of the figures is to show the overall
395 structure of the page, even if one cannot read the content in this printed version; to do so,
396 one has to go to the website and actually scroll down to the end.

397 Fig. 2 shows a full page dedicated to a simple sherd from a cup (accessible at
398 urkesh.org/A16q779-p1). This is the biography, so to speak, of this sherd, with full details
399 about the emplacement and the typology.

400 Fig. 3 shows the frequency of the total inventory of sherds for unit A16 (accessible at
401 urkesh.org/A16-freq-ceram). This inventory includes 59,834 vessels and sherds. Clicking on
402 the "Fine Red-Orange Calcite Tempered" ware yields the total of 6,958 sherds of this ware,
403 each sherd being accessible individually with its own page, just as for A16q779-p1.

404 Fig. 4 takes us out of the digital book for unit A16 and into the topical book on Ceramics
405 (urkesh.org/cer) and shows the full description of the "Fine Red-Orange Calcite Tempered"
406 ware (accessible at urkesh.org/cer-RC1).

407 Fig. 5 shows the detailed analysis of the ware in the Ur III-Isin Larsa period with the il-
408 lustration of some sherds, including our sherd A16q779-p1 (both are accessible by scrolling
409 down on the page urkesh.org/cer-RC1).

410 Fig. 6 remains within the topical book of ceramics, and shows a synopsis of all the bowl
411 shape types from the urban contraction horizon at Urkesh, which corresponds to the Ur III /
412 Isin-Larsa period in Mesopotamia (accessible at urkesh.org/ceram-horiz-IL).

413 6.5 Densities

414 Tabulations are the universal method through which typology is used: even the simplest
415 spreadsheet is based on a categorization system, and tabulations correlate the data, which
416 have been so categorized, with sorts and computations that provide a variety of clustering
417 representations. It is only because of this underlying categorization that it is possible to ar-
418 rive at sophisticated methods of statistical analysis such as are now current in archaeology.

419 Statistics speaks to density (2.5). What a website approach offers is the opportunity to
420 have these densities speak to each other and to descend dynamically from the totals to the
421 individuals, and to have them interact with arguments that are properly digital and embed-
422 ded as such in the website.

423 For an example, we may look at Fig. 3. We see that in our total population of 59,834 ce-
424 ramic vessels and sherds, from the excavation unit A16 there are only 10 for the Early Tran-
425 s-Caucasian ware, for an effective percentage value of 0%, in contrast with the highest den-
426 sity of 57% for the Chaff Tempered ware. And here, too, we can have a full page for each
427 one of the ten sherds, as in the case of urkesh.org/A16q314-p5. Using the formula given
428 above (2.5) the two figures for Early Trans-Caucasian ware and Chaff Tempered ware
429 would be rendered respectively as 0%⁵⁹⁰ and as 57%⁵⁹⁰.

430 These figures must be assessed with regard the total volume of the excavated area in the
431 unit in question, A16 (see urkesh.org/A16-overview). It consists of eight 5x5 squares, for a

432 total of approximately 350 cubic meters, with a large number of elements recorded (see
433 urkesh.org/A16-dataset).

434 Obviously, the value of any density calculation has to be assessed in relationship to the
435 universe of data to which it applies (see 2.5). In this regard, it is especially meaningful to
436 consider the value of a statement of non-occurrence. For example, in the Urkesh ceramic
437 roster, based, as we said, on some 300,000 specimens, we have no dishes. Should even just
438 one single dish be found, we would have to create a roster category for it, and we would
439 then also create a single lexical definition of this one lonely example. On the other hand, the
440 lack of dishes implies a type of functional use of foodstuff that it correlative to the kind of
441 flatware that might have been used, if any, and which certainly did not include any knives.

442 7 Digital discourse

443 7.1 The concept: the fragments and the whole

444 With the term "digital discourse" we refer to the way in which a website goes beyond
445 serving as a mere container, however well articulated, and develops mechanisms for the ar-
446 ticulation of a narrative flow among the data and their interpretation (d-discourse.net; this
447 website is a work in progress; access is currently possible with <discourse> for both ID and
448 PW). Digital discourse presupposes distinct but congruent categorization systems (2.3), and
449 it provides avenues for them to "discourse" with each other.

450 Typological analysis aims at distinguishing and breaking up a given universe into cate-
451 gories and attributes. Statistics (6.5) is the dominant way in which these fragments are re-
452 composed into a whole. Digital discourse, as implemented in a website, adds a major new
453 dimension: it allows the integration of statistics into a higher level argument that is made
454 possible through inter-planarity (6.2), and in this fashion one can obtain a different under-
455 standing of the underlying relationships. It is in this sense that digital discourse shows the
456 full epistemic value of the website model.

457 We will first stress the importance of dynamically integrating argument and data into a
458 unified system, or "discourse," rather than just aiming for a static juxtaposition as is the case
459 with current scholarly websites (7.2). This entails an understanding of non-linearity as be-
460 ing in effect *multi-linear*, in ways that are complementary with inter-planarity.

461 Examples from the Urkesh Global Record are given, to show how we may obtain a nar-
462 rative flow that integrates data and interpretation (7.3) and how we may create conditions
463 through which a dynamic interaction among different planes is possible (7.4).

464 7.2 Multilinearity

465 In current practice, when a website develops an argument it does so in ways that are not
466 properly digital. It is essentially a static text, whether as an analog of a printed text (such
467 as .PDF) or as formatted text in a browser format (such as .HTML). They do certainly con-
468 tain hyperlinks to other texts or to data (this is formally embedded in the HTML acronym).
469 But these links are anecdotal, they are not systemic.

470 A systemic link means that the target is written concurrently with the invoking text, and
471 vice versa. Such concurrence is functional: the invoking argument expects the target argu-
472 ment to unfold as an argument, and expects therefore its premises and its conclusions. This
473 applies also to the data, in the measure in which a single piece of information is expected to
474 be based on a given system which is shared by the invoking argument.

475 An anecdotal link, on the other hand, invokes only the detail. It does, certainly, assume
476 that this detail is embedded in a rational overarching system, but this system is not shared,
477 much less has it been written in function of the invoking text. The target is not the system,
478 but only the detail. It is not inter-planar.

479 Now, an argument is intrinsically linear, in the sense that it leads linearly from a
480 premise to a conclusion, adducing facts and references to other arguments in the process.
481 Multilinearity is what makes it possible for inter-planarity to develop into a proper dis-
482 course. Inter-planarity implies in fact the existence of parallel linear tracks, written in view
483 of each other, where each expects a given linear development in the others. It is in this sense
484 that we can speak of multilinearity. As one "reads" a website, the argument flows integrat-
485 ing linear segments from parallel tracks into a single unitary linear (or "multi"-linear) se-
486 quence (Fig. 7).

487 One normally speaks of "*non*-linearity" as a positive aspect of website use. It is indeed
488 what we are all accustomed to doing, and the term "browsing" describes it well: one "nib-
489 bles" at this or that, without an explicit sequential flow. We do not in fact "read" websites in
490 common use: we "surf" on the surface, led by the casualness of what carries us. With schol-
491 arly websites it ought to be different, and that is what our websites are doing. We will see
492 now, with some concrete examples, what this means for a study of typology.

493 The difference between incidental multiplanarity and systemic inter-planarity (6.2) de-
494 pends precisely on the application of multilinearity. Planes exist, *in nuce*, in any form of crit-
495 ical thought; they also exist, digitally, in any website, as soon as there is a link. For a sys-
496 temic approach to inter-planarity, however, it is necessary to expect multilinearity linking
497 the planes, For an example see below, (7.4).

498 7.3 A narrative flow – staccato and legato

499 The UGR categorization system based on the (e)-tic and -emic systems is the presuppo-
500 sition for digital discourse, and this particularly in an archaeological context. By applying
501 rigorously this categorization, especially at the moment of excavation (see above, 3.2), the
502 data are not only available as such; they also enter into a narrative flow that distinguishes
503 in essential ways this presentation from what happens with a database (Buccellati 2020 "De-
504 grees"; Buccellati and Kelly-Buccellati 2020 "Narratives; forthc. "Clustering"). The difference
505 lies in the fact that the individual data are not given as independent cells, where one cell re-
506 lates to the other only in function of the slot in which it fits within the overarching architec-
507 ture of the database; rather, the individual data are linked to each other through a sequen-
508 tial logic that highlights the interdependence of the data.

509 In the Urkesh Global Record we have two types of such narrative, which we define with
510 terms derived from musical notation.

511 The staccato type consists of segments that are created individually, at different mo-
512 ments in time and by different people. It is by virtue of the categorization system, which
513 defines each segment at the moment it is created, that these segments cohere into a sequen-
514 tial flow. We may refer to Fig. 2 for an example of this type (and one would have to look at
515 the website page urkesh.org/A16q879-p1 for the details). There is a logical sequence that
516 rests on a variety of different inputs. After the first two sections that give a general over-
517 view and details of identification, there are:

- 518 • a section on stratigraphy that gives first the date of discovery (2002-9-23) and the
519 feature within which it was found (the feature can be accessed for full detail), and
520 then the assignment to a stratum, which was finalized at a much later date (2015-5-
521 20)
- 522 • a section on typology that gives details of measurement and morphology, written up
523 in the ceramic lab some three weeks after discovery (2002-10-12)
- 524 • a section on reference which gives photos (taken in 2006 and 2009) and a drawing
525 (done in 2003).

526 The legato type is instead produced as a normal text file that corresponds to a single dis-
527 play page. It is written as a whole, generally by a single author; there may be revisions and
528 additions, but the page as such is always seen as a complete whole, not as an aggregate of
529 segments coming from different sources. What distinguishes it is the fact that the target is
530 seen as an integral part of the invoking argument. Thus, for example, Fig. 8 (accessible at
531 urkesh.org/J5-surfaces) gives a page from unit J5 which describes one type of emplacement
532 (horizontal surfaces), with links to each of the features in the unit that fit in that category.
533 Thus the link to f288 (Fig. 9; accessible at urkesh.org/J5f288) expects a full knowledge of that
534 feature, as if it were included in the legato argument, while conversely, a link in the f288

535 page expects full knowledge of the other surfaces defined by discrete components as pre-
536 sented in the pertinent page (Fig. 8).

537 The relevance for typology will be clear from the example just cited. The notion of pave-
538 ment as a "surface defined by discrete components" is made clear not just by a verbal de-
539 scription, but by examples of the same type as exposed in the same excavation unit (and, at
540 a different referential level, for the entire site). A "pavement" is not just a label accompanied
541 by a number giving the total of actual occurrences; it is an assemblage of concrete individu-
542 als, seen in their individuality and identity (8.2).

543 7.4 Interaction among planes – inter-planar and multilinear

544 The multilinear approach constructs a full argument that expects portions of the argu-
545 ment to come from parallel planes. Only if it is multilinear does inter-planarity serve the
546 purposes of digital discourse (7.2; Buccellati and Kelly-Buccellati forthc. "Clustering").

547 Fig. 10 shows diagrammatically how the examples we have seen earlier fit into this pic-
548 ture. The "biography" of a simple sherd (A16q979-1), given as plane A, is placed in the
549 much larger context of the RC1 ware, both in terms of the density within the entire ceramic
550 inventory for unit A16 (plane B) and in terms of the precise definition of the ware itself
551 (plane C, from the distinct website dedicated to ceramic typology). Planes B and C are in-
552 voked from within plane A, and so are a number of other planes, in particular the one about
553 the emplacement of a given feature and the one about the stratum and phase to which the
554 feature (hence the sherd) belongs. In other words, a variety of different planes, from differ-
555 ent digital books or websites, are all tightly interlaced and "written" with each other in
556 mind.

557 Once again, the relevance for typology will be clear from the example just cited. The as-
558 signment of this sherd's ware to category RC1 is much more substantial than a simple code
559 in a spreadsheet. The interaction between staccato and legato types of text is particularly in-
560 dicative of the way in which typology emerges not just as a list, but as an argument, one
561 that is construed from a variety of different inputs that cohere into a single whole.

562 A website conceived as a digital discourse, then, presents multiple parallel tracks which
563 are "written" as arguments that are linked *qua* arguments, and not just mined for individu-
564 al, isolated words or concepts. The difficulty lies in developing a disciplined approach to
565 "writing" and "reading," which we put here in quotation marks precisely because the notion
566 is alien to our current mindset regarding websites. Currently one "constructs" a website,
567 meaning that one prepares a container which can be altered **at will** and within which one
568 can place data **at will**; one does not "write" it as a cogent narrative that develops an argu-
569 ment from a premise to a conclusion. And one "uses" a website by "surfing," "browsing,"

570 "querying," but without ever gaining a sense of the whole – without ever even thinking of
571 "reading" it "from cover to cover."

572 7.5 Big data

573 The notions of inter-planarity and multilinearity add one important dimension to what
574 is known as big data.

575 On the face of it, the term may be taken to refer simply to a large inventory of items. But
576 that would be misleading, because what is really meant is a very rich and complex catego-
577 rization system, based on rosters and lexica, so that, for any single item there is a highly dif-
578 ferentiated set of attributes that fit into an equally highly differentiated set of categories, ex-
579 ponentially multiplying the amount of detail that can be set in correlation with each other.

580 Digital discourse adds one more degree of complexity, and a major one at that: the cor-
581 relation among planes, a correlation that is made explicit because of the flow among planes
582 that multilinearity makes possible. In other words, multilinearity affords a higher degree of
583 control on an even greater amount of detail than either the sheer size of the inventory or the
584 complexity of the categorization system imply. The Urkesh Global Record may rightfully be
585 seen as a good example of such inter-planar and multilinear big data system in action: the
586 interaction among planes within a single digital book, or website, and then among parallel
587 digital books, happens on account of the inter-planar and multilinear design with which
588 they have been written, always allowing for a fully dynamic interaction among the overall
589 narrative on the one hand and, on the other, the most minute of details that is found in the
590 inventory.

591 CONCLUSION

592 8 Variability and singularity

593 8.1 An assessment

594 By way of conclusion, we may now consider how all of this affects a discussion about
595 variability and singularity. In this article, we have emphasized two major aspects.

596 The first about the data (sections 2 and 3) is the relationship between (e)-tic and -emic
597 systems. The distinction is fundamental for an appreciation of what typology is, and while
598 it stresses the difference between the two, it also shows how inextricably linked they are:
599 there cannot be one without the other.

600 The second about the process (sections 6 and 7) deals with the role that the website, as a
601 re-imagined epistemic system, must have in allowing for this reciprocal distinctiveness and
602 interaction to be fully implemented. The dynamics intrinsic in such a system is structurally

603 different from other static systems, in essence from the printed page or its analogous elec-
604 tronic equivalent. It is different because it allows variability and singularity to talk to each
605 other in real time.

606 When applied to typology, this approach yields a much richer picture, which we may
607 here view from two particular perspectives (8.2 and 8.3), both of them speaking to the dig-
608 nity of the fragment (see above, 6.3).

609 8.2 Anonymity and identity

610 The first perspective is the one through which we can best appreciate the identity of the
611 fragments in their singularity and distinctiveness. Multilinearity in the sense described
612 above (7.2) means that every single fragment, even the smallest sherd, is present at all times
613 in its full identity. A detail of Fig. 3 deserves special attention in this regard: every single
614 sherd that is included in the total of 59,834 for unit A16 is accessible through the list in the
615 lower portion of the right hand sidebar.

616 The interplay between roster and lexicon (3.4) can best be appreciated in this light. The
617 insistence on typological classification does contribute to the loss of individuality. We cer-
618 tainly need to reduce a real item to the status of a type in order to control how it is dis-
619 tributed in a given universe. But we must be aware that we are in fact "reducing" it. On the
620 one hand we are contributing to a better understanding of its properties by seeing it in its
621 similarity to others. And yet, on the other hand, we must not make of the reduction the ulti-
622 mate tool for understanding. Variability tells us where the fragment fits, but singularity can
623 still only be appreciated outside of a controlled variability. With some exaggeration, we
624 may say that even the most non-distinctive of sherds has a dignity of its own that should
625 not be jettisoned and lost in the anonymity of group membership. We must remain aware
626 of the fact that the statistical whirl, while pivoting around individuals and thriving on vari-
627 ability, inevitably erases their very singularity and individuality.

628 To go back to our two examples of the phonemic system and the stoplight (2.2), we may
629 say that the timber or tone of the voice of a friend will remain open to our perception re-
630 gardless of how clearly we may define the phonemic classes or the acoustic parameters.
631 And even a modest stoplight may acquire as if a personality once we notice that, at a famil-
632 iar intersection, the welcoming "Go!" sign has, for some unknown reason, gained greater
633 brilliance and turned into a brighter shade of green...

634 8.3 Density and globality

635 The second perspective concerns the notion of density (2.5). Here the dignity of the frag-
636 ment emerges in a different light: precisely because every fragment counts, nothing is dis-
637 carded without being recorded, so that density is not based on a sample, but on the totality

638 of the data. It is obviously not the totality of the elements available in antiquity, but the to-
639 tality of the deposit as it took shape in antiquity and as it is found in the excavation.

640 It is in this sense that the notion of a *global* record is important. Every single fragment is
641 important enough to be recorded, without any sampling, which, when applied on an exca-
642 vation, often depends on unstated criteria. A density that is determined within a global uni-
643 verse acquires a special value, because it is the best possible mirror of the real world. In par-
644 ticular, we may say that, within a global universe, a density of zero (3.4) is much more sig-
645 nificant: a statement of non-occurrence is of major import for any typological analysis, and
646 its actual relevance is obviously proportional to the universe to which it relates. We may
647 then confidently say that, paradoxically, a missing type is as important as the ones that have
648 been defined in the overall typological system.

649

650

651 Statement about conflicts and funding

652

653 The authors declare that they comply with the PCI rule of having no financial conflicts
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657

References

We refer only to some of our publications that expand on the themes taken up in the article, without consideration for the extensive literature on the subject, for which one may look at the excellent recent volume by E. Giannichedda, in addition to the many contributions in this volume.

- Buccellati, Giorgio
- 2006 "An Archaeologist on Mars," in Seymour Gitin, J. Edward Wright and J.P. Dessel (eds) 2006, *Confronting the Past. Archaeological and Historical Essays on Ancient Israel in Honor of William G. Dever*, Winona Lake, Indiana: Eisenbrauns, pp. 17-21 (online at giorgiobuccellati.net/2006Mars).
- 2006 "On (e)-tic and -emic," in *Backdirt. The Annual Review of News, Research & Activities of the Cotsen Institute of Archaeology at UCLA*. pp. 12-13 (online at [giorgiobuccellati.net/2006\(e\)tic](http://giorgiobuccellati.net/2006(e)tic))
- 2017 *A Critique of Archaeological Reason. Structural, Digital and Philosophical Aspects of the Excavated Record*, Cambridge: Cambridge University Press (see critique-of-AR.net)
- 2020 "Degrees of Digitality. The Case of Excavation Reports," in Nadja Cholidis, Elisabeth Katzy, and Sabina Kulemann-Ossen (eds.), *Zwischen Ausgrabung und Ausstellung. Beiträge zur Archäologie Vorderasiens. Festschrift für Lutz Martin*, marru: Studien zur Vorderasiatischen Archäologie, Vol. 9, Münster: Zaphon, pp. 247-258 (online at urkesh.org/BuccellatiG2020a)
- 2022 "Transformative Transitions: Learning from a Distant Past," *DirittoPolitecnico.*, 1/2022, pp. 127-139. (online at urkesh.org/BuccellatiG2022a)
- Buccellati, Giorgio and Marilyn Kelly-Buccellati
- 2020 "Archaeological Digital Narratives: The Case of Urkesh Ceramics," in Alexander Ahrens, Dörte Rokitta-Krumnow, Franziska Bloch, and Claudia Bührig (eds.), *Drawing the Threads Together. Studies on Archaeology in Honour of Karin Bartl*, marru: Studien zur Vorderasiatischen Archäologie, Vol. 10, Münster: Zaphon, pp. 380-397 (online at urkesh.org/BuccellatiKellyBuccellati2020Digital)
- forthc. "Temporal clustering at Urkesh. A structural analysis of strata, phases, horizons"
- Giannichedda, Enrico
- 2021 *Fulmini e spazzatura. Classificare in archeologia*. Guide. Temi e luoghi del passato e del presente, vol. 21. Bari: Edipuglia.
- Paolini, Paolo

693 2022 "Information Modeling and Multilinear Digital Discourse," *DirittoPolitecnico.*,
694 1/2022, pp. 140-151)
695

696 **Figures**

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<i>roster</i>		<i>lexicon (entries)</i>	
<i>main category</i>	<i>secondary category</i>		
shape	type	bowls	286
		cups	51
		stands	14
		pitchers	3
		jars	258
		workdisk	1
		platters	28
		other	12
		pots	23
		strainers	11
		bottles	18
	family	17	
	sub-family	21	
	rims,base,handle	rims	60
		handles	18
		bases	28
other		2	
forming techniques	4		
ware	main ware	25	
	main temper	1	
	other temper	1	
	surface (interior)	8	
	surface (exterior)	7	
	inclusion	7	
	inclusion frequency	3	
	firing	4	
	fracture	8	
	subfamily	1	
decoration	technique	5	
	applique	9	
	bitumen	8	
	incised	10	
	Khabur painted	14	
	Mittani painted	32	
	stamped	3	
measurement	1		
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function	8		
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7	36	1025	

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Roster	Date	Author	Record
Category	!!	!!	clay artifact
Best definition	2002-10-12	!!	cup <small>[Input: ZA823S.]</small>
Best image	2009-08-02	!!	 <small>[Input: A16V22CM.]</small>

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2. IDENTIFICATION

Labeling

Roster	Date	Author	Record
Reference to q-lot	!!	!!	q879

Designation

Roster	Date	Author	Record
Definition	2002-10-12	hh	cup <small>[Input: ZA823S.]</small>
Quantity of components	2002-10-12	hh	1 <small>[Input: ZA823S.]</small>

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3. STRATIGRAPHY

Contact Association

Roster	Date	Author	Record
Type of contact: contemporary events/movable items	2002-09-23	!!	q879-p1 (cup) sits in f325 (^ly) <small>[Input: MX12LR.]</small>

Time Sequencing

Roster	Date	Author	Record
Stratum (to which element belongs)	2015-05-20	!!	s380AAH <small>[Input: ZA520CJC.]</small>
Phase (to which element belongs)	2015-05-20	!!	h5cAAH <small>[Input: ZA520CJC.]</small>

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4. TYPOLOGY

Measurements

Roster	Date	Author	Record
Width l or diameter of rim	2002-10-12	hh	11 <small>[Input: ZA823S.]</small>







Morphology

Roster	Date	Author	Record
Ware or Material, species	2002-10-12	hh	Fine Red Orange Calcite Temper Ware <small>[Input: ZA823S.]</small>
Shape, form	2002-10-12	hh	cup <small>[Input: ZA823S.]</small>
Zca.MEASUREMENTS: Percentage of rim	2002-10-12	hh	17.5% <small>[Input: ZA823S.]</small>
Zca.SHAPE: Family	2002-10-12	hh	conical (cup) <small>[Input: ZA823S.]</small>
Zca.SHAPE: Type	2002-10-12	hh	2 <small>[Input: ZA823S.]</small>

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6. REFERENCE

Analogical Record

Roster	Date	Author	Record
			
	2006-02-21	!!! <small>[Input: A16V23CM.]</small>	2009-08-02 mn <small>[Input: A16V22CM.]</small>
Photo of individual elements (studio)			
	2009-08-02	mn <small>[Input: A16V22CM.]</small>	2009-08-02 mn <small>[Input: A16V22CM.]</small>
			
	2009-08-02	mn <small>[Input: A16V22CM.]</small>	
Drawing of individual element (studio)			
	2003-06-04	kf <small>[Input: A16W16.]</small>	

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A16 Frequency Computations

Ceramic vessels and sherds in order of frequency by ware

Processed on 10-10-2016

Note. Included in this category are ceramic vessels, whether complete objects or sherds, and whether [items](#) or [q-items](#).

59834	Grand total		
34171	57 %		Chaff Tempered
7687	13 %		Fine Chaff
5958	10 %		Finer Red-Orange Calcite Tempered
4285	7 %		Pebble Tempered
4194	7 %		Red Orange Calcite Tempered
1379	2 %		Wet Smoothed
501	1 %		Simple
439	1 %		Khabur
255	0 %		Metallic
220	0 %		Rough
201	0 %		Imitation Metallic
179	0 %		Dark Red Burnished
84	0 %		H?
80	0 %		Gray
69	0 %		Fine Pebble Tempered
62	0 %		Bi-Colored
48	0 %		INC
10	0 %		Early Trans-Caucasian
8	0 %		Ninevite V
2	0 %		Brick red
1	0 %		DBR
1	0 %		FC BUT POSSIBLE WS

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Finer Red-Orange Calcite Tempered
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Categorization

Ceramic wares

1. Introduction

2. 4th mill.

3. 3rd-2nd mill.

Attributes: Wares 3rd and 2nd Millennium

Fine Red Orange Calcite Temper Ware (RC1)

April 2006 - Marilyn Kelly-Buccellati
Updated May 2016 - L. Recht

[General Description](#)

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[Phase 7 - Mittani](#)

[Sherd Illustrations](#)

General Description

Fine Red Orange Calcite Temper ware is very similar to the Red Orange Calcite Temper ware with a red-orange color and much calcite temper. The finer RC1 type can be distinguished from the RC by the finer temper. Additionally, the shapes are also smaller and finer than the RC types.

Horizons

[2. Temple Terrace \(LC3\)](#)

3. Urban growth

[1 \(EDII\)](#)

[2 \(EDIII\)](#)

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[LCF: Fine Ware](#)
[LCT: Tan Slipped Ware](#)
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Buff Slipped Ware](#)

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[NIN: Ninevite 5 Ware](#)
[CH: Chaff Temper Ware](#)
[FC: Fine Chaff Temper Ware](#)
[RC: Calcite Temper Ware](#)
[RC1: Fine Calcite Temper W](#)
[R: Rough Ware](#)
[P: Pebble Temper Ware](#)
[FP: Fine Pebble Temper Wan](#)
[S: Simple Ware](#)
[WS: Wet Smooth Ware](#)
[G: Gray Ware](#)
[M: Metallic Ware](#)
[IM: Imitation Metallic Ware](#)
[ETC: Early Transcaucasian Y](#)
[BC: Bi-Color Ware](#)
[DBR: Dark Brick Red Ware](#)

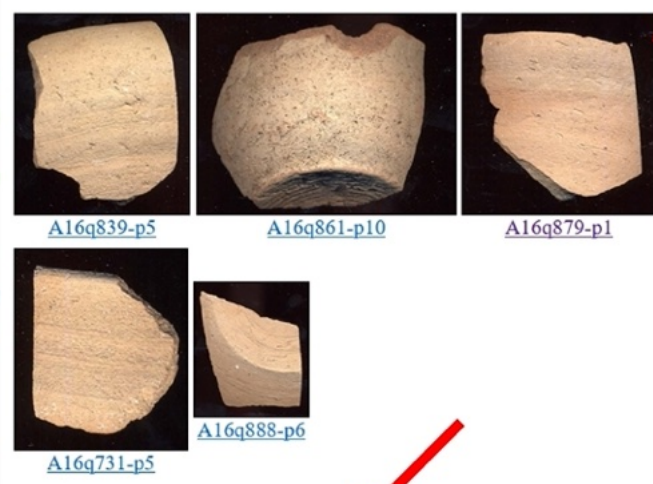
Phase 5 - UrIII/Isin-Larsa

Decoration	Small to medium carinated bowls can have template lines on the upper body.
Comments	Phase 5 examples of this ware are very close to those made in Phase 4.

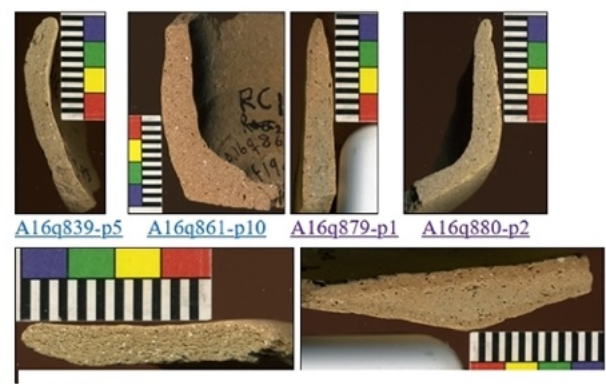
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Phase 5 Sherd Illustrations

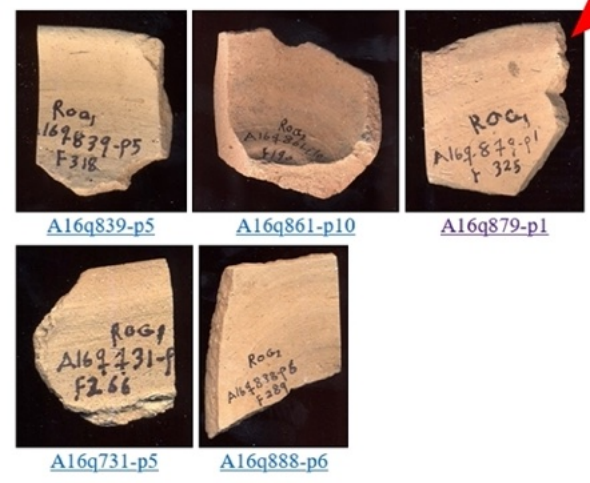
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Urban Contraction
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June 2013 - [Airship](#)
 Updated August 2017

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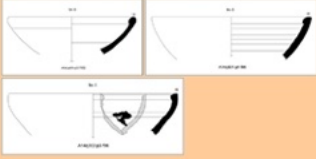
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Round Sided Bows

bc-5



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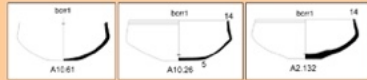


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Carinated Bows

Carinated bows with rounded carination

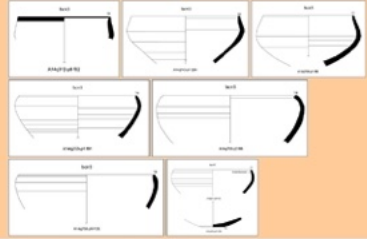
bcr1



bcr2



bcr3

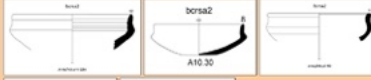


Carinated bows with sharp carination

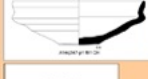
bcrs1



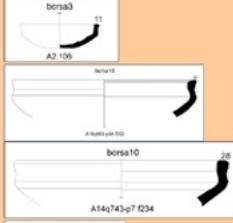
bcrs2



bcrs3



bcrs10



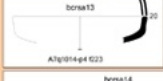
bcrs11



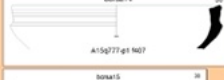
bcrs12



bcrs13



bcrs14



bcrs15



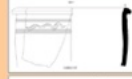
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Deep Bows

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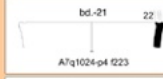
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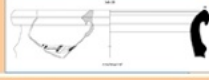
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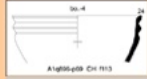


bd-23

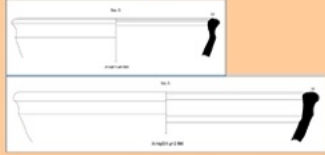


Other Bows

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B

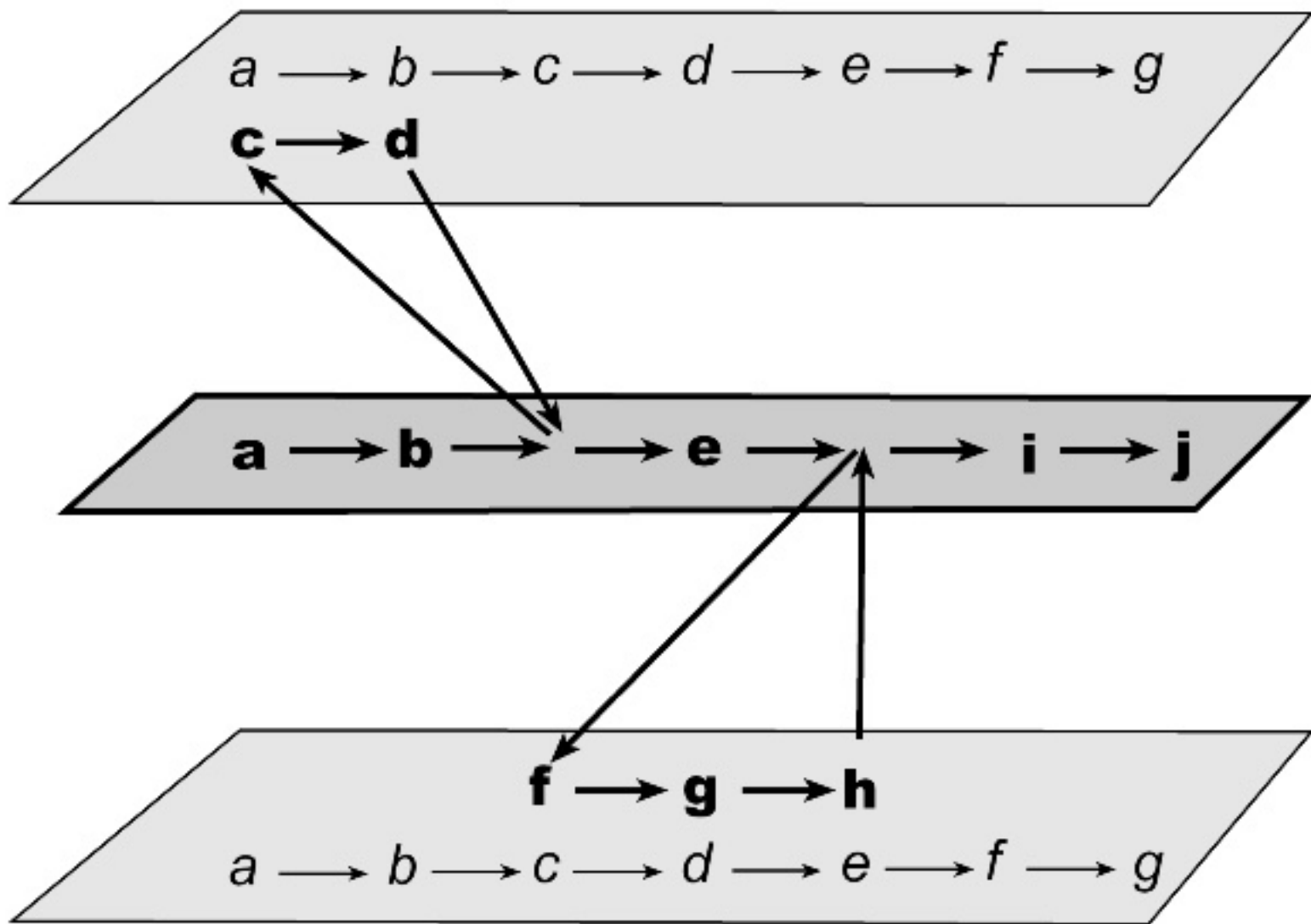
$a \rightarrow b \rightarrow c \rightarrow d \rightarrow e \rightarrow f \rightarrow g$
 $c \rightarrow d$

A

$a \rightarrow b \rightarrow \quad \rightarrow e \rightarrow \quad \rightarrow i \rightarrow j$

C

$f \rightarrow g \rightarrow h$
 $a \rightarrow b \rightarrow c \rightarrow d \rightarrow e \rightarrow f \rightarrow g$



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Emplacement for unit J5 Horizontal surfaces

September 2011 - [James Walker](#)

The home for this page is [J5](#)

[Surfaces defined by discrete components \(pavements\)](#)

[Surfaces defined by soil compaction \(floors\)](#)

In the Main Lexicon there are 19 defined [horizontal surfaces](#) reflecting alignment in a single plane. There are 5 pavements defined by their composition and 14 floors generally defined by the degree of compaction.

Few floor surfaces and pavements have been excavated in this unit, despite a large amount of construction over several millennia. There were two pebble pavements, [f288](#) and [f246](#), associated with the Early Dynastic period first escarpment, [^esc1](#). In the Mitanni period there were a number of floors - most were associated with a monumental staircase constructed during the late Mitanni extension of the sacral complex to the west. Floor [f45](#) is one example

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Surfaces defined by discrete components (pavements)

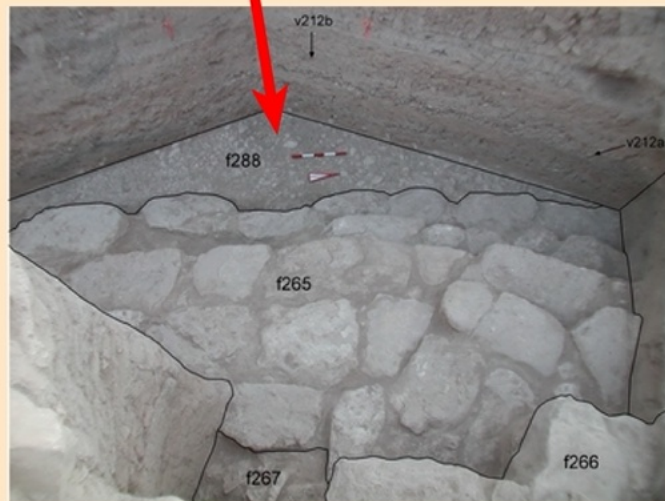
The most significant pavement, [f288](#), was located to the southwest of the revetment wall and its protective escarpment. Further to the east there was a similar pavement, [f249](#) at a similar, but slightly higher elevation. There was insufficient exposure of either to determine what purpose they may have served or how they may have been related.

Another pavement, [f246](#), was associated with the early Mittani staircase, [^strc1](#) that provided access to the revetment wall top. One other Mittani pavement [f247](#), directly covered Early Dynastic pavement [f249](#) (described above) with no evidence of intermediate occupation.

These five pavements excavated were classified as [pavement type C](#). A brick surface, [f196](#) is problematical. It may be a [pavement type B](#), or the top of a substantial wall. Unfortunately excavation was paused before the true nature of this feature could be determined.

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Surfaces defined by soil compaction (floors)



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on one of
constituents above

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- 2. Identification
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- 6. Reference

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1. OVERVIEW

Roster	Date	Author	Record
Best definition	2009-08-26	jN	pavement, type c <small>Export file: 20090826</small>
Summary	2012-12-16	jW	Pavement of pebbles and soil in k105 below accumulation f282 and that abuts the lowest stones of escarpment f265 . <small>Export file: 20121216</small>
Best image	2010-08-18	eA	 v212 <small>Export file: 10081810</small>

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2. IDENTIFICATION

[Designation](#)

Roster	Date	Author	Record
Description (summary)	2009-08-27	jW	A stone pavement in k105 which abuts the lowest line of stones of ^esc1 f265 . The stones range from fist size downward and are laid in a matrix of brown silty soil. <small>Export file: 20090827</small>

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3. STRATIGRAPHY

[Volumetric Localization](#)

Roster	Date	Author	Record
Locus	2009-08-26	jN	k105 <small>Export file: 20090826</small>
	2009-08-27	eAJ	1610 (42748 45687 - 8718 / Relay location: N) <small>Export file: 20090827</small>
	2009-08-27	eAJ	1611 (42440 45713 - 8717 / Relay location: NW) <small>Export file: 20090827</small>
Relays (applicable to elements)	2009-08-27	eAJ	1612 (42247 45913 - 8715 / Relay location: S) <small>Export file: 20090827</small>
	2009-08-27	eAJ	1613 (42309 45906 - 8719 / Relay location: E) <small>Export file: 20090827</small>
	2009-08-27	eAJ	1614 (42500 45799 - 8715 / Relay location: NE) <small>Export file: 20090827</small>
M#^elev @top	2009-08-26	jN	m6239 <small>Export file: 20090826</small>
Height @top	2009-08-26	jN	42 <small>Export file: 20090826</small>
H-eye @top	2009-08-26	jN	158 <small>Export file: 20090826</small>

[Contact Association](#)

Roster	Date	Author	Record
Type of contact, contemporary events/movable items	2009-08-26	eE	q481 (pottery) sits in f288 (pavement, type c) <small>Export file: 20090826</small>
	2009-09-30	jW	q482 (items) sits in f288 (pavement, type c) <small>Export file: 20090930</small>
Type of contact, earliest events	2012-12-31	jW	f282 (accumulation A) covers f288 (pavement, type c) <small>Export file: 20121231</small>
	2012-12-31	jW	f288 (pavement, type c) abuts f265 (escarpment) <small>Export file: 20121231</small>

[Time Sequencing](#)

Roster	Date	Author	Record
Stratum (to which element belongs)	2012-10-16	jW	s660 ^{JSB} (Pebble floor abutting stone escarpment) <small>Export file: 20121016</small>
Phase (to which element belongs)	2012-10-16	jI	s31 ^{JSB} <small>Export file: 20121016</small>

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4. TYPOLOGY

[Morphology](#)

Roster	Date	Author	Record
Ware or Material, species	2009-08-26	jN	t0 <small>Export file: 20090826</small>
Color	2009-08-26	jN	brownish yellow <small>Export file: 20090826</small>
Color number (Munsell)	2009-08-26	jN	10YR 6/6 <small>Export file: 20090826</small>
Hardness, compaction	2009-08-26	jN	3.5 <small>Export file: 20090826</small>
Texture, surface finish	2009-08-26	jN	sandy clay <small>Export file: 20090826</small>

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6. REFERENCE

[Analogical Record](#)

Roster	Date	Author	Record
View/drawings of features			
	v212 2009-08-26 jN <small>Export file: 20090826</small>	v212a 2009-08-26 jN <small>Export file: 20090826</small>	v212b 2009-08-26 jN <small>Export file: 20090826</small>
			
	v214 2009-08-30 jN <small>Export file: 20090830</small>	v215 2009-08-30 jN <small>Export file: 20090830</small>	v215a 2009-08-30 jN <small>Export file: 20090830</small>
			
	v217 2009-08-30 jN <small>Export file: 20090830</small>	v218a 2009-08-30 jN <small>Export file: 20090830</small>	v219 2009-08-30 jN <small>Export file: 20090830</small>

J5 Constituents

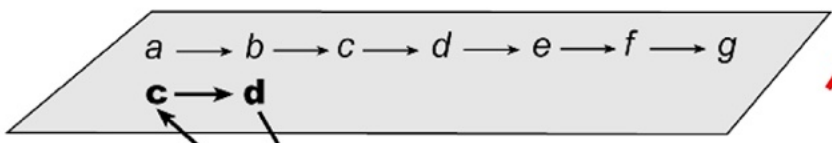
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J5 features

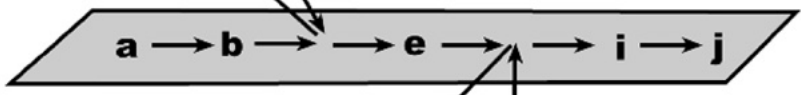
298
 f288

[Synonymical \(large file\)](#)
 Total: 295

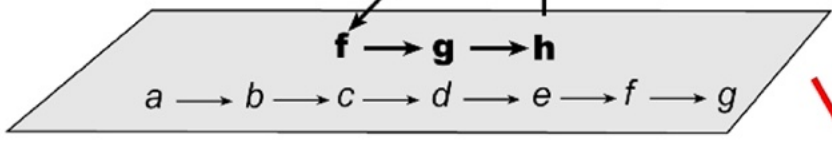
B



A



C



ware frequencies

A16 Frequency Computations
Ceramic vessels and sherds
in order of frequency
by ware

Processed on 10-10-2016

Note. Included in this category are ceramic vessels, whether complete objects or sherds, and whether [items](#) or [q-items](#).

59834	Grand total		
34171	57 %		Cluff Tempered
7687	13 %		Fine Cluff
5958	10 %		Finer Red-Orange Calcite Tempered
4285	7 %		Pebble Tempered

sherd "biography"

A16q879-p1


File: "MZ/A/A16/D/QP/887901.htm".
Processed on 2022-10-19.

(Expand)

- OVERVIEW
- IDENTIFICATION
- STRATIGRAPHY
- TYPOLGY
- REFERENCE

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1. OVERVIEW

Roster	Date	Author	Record
Category	!!	!!	clay artifact
Best definition	2002-10-12	!!	cup <small>Depot: ZAR218.p</small>
Best image	2009-08-02	!!	 <small>Depot: A16P202M.p</small>

ware description for a given horizon

Ceramic Typology

Ceramic wares

Phase 5 - Ur III/Isin-Larsa

Decoration: Small to medium carinated bowls can have template lines on the upper body.
Comments: Phase 5 examples of this ware are very close to those made in Phase 4.

Phase 5 Sherd Illustrations

Exterior

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