FLAKED LITHIC TOOLS FROM RECENT INVESTIGATIONS ON THE SALTON SEA TEST BASE

Tanya Wahoff
KEA Environmental, Inc.
1420 Kettner Boulevard
Suite 620
San Diego, California 92101

ABSTRACT

During a recent survey of approximately 10 square miles on the Salton Sea Test Base, a variety of flaked lithic tools were recovered, including projectile points and unusual crescentics. While the majority of the tools represent an expedient lithic reduction technology, several projectile points characteristic of the Paleoindian and Archaic Periods were identified. Raw materials and distribution of these items are considered in terms of their implications relating to prehistoric mobility and procurement ranges.

INTRODUCTION

During recent archaeological investigations on the Salton Sea Test Base (SSTB) a variety of flaked lithic tools were identified (Apple et al. 1997). A total of 68 tools were collected. Many of these are informal or "expedient" flake-based or core-based tools with minimal retouch. The lithic assemblage also contains a number of formally-shaped, extensively worked tools, including bifaces, projectile points, crescentics, and a drill tip fragment. Overall artifact density within sites is low, and based on field observations and laboratory results, flaked stone tools are generally rare within the project area. In addition to the overall sparsity of tools, the lithic assemblage analyzed was somewhat skewed by the surface collection methods. These methods included collection of all observed projectile points, while other tools were judgmentally sampled. Most of the flaked stone tools were surface finds, with only two recovered subsurface.

LATE PREHISTORIC AND PROTOHISTORIC PERIODS

Thirty items, or over 44% of the total flaked tool assemblage recovered from the SSTB project, can be attributed to the Late Prehistoric or Protohistoric Periods. This assignment is based on diagnostic traits or association with dated components. Five of these tools are well-shaped small projectile points, and the remaining 25 are informal flake- and core-based tools.

Projectile Points

Since there is currently no typology developed specifically for the Colorado Desert, the projectile point analysis for this paper was conducted using typologies by Thomas (1981) and Vaughan and Warren (1987). Only about 13% of the projectile points or bifaces recovered from the SSTB project are from the Late Prehistoric or Protohistoric Periods, and these are represented by three Cottonwood Triangular points and two Desert Side-notched points. Some examples of these projectile points are illustrated in Figure 1a. The points are finely made from locally available quartz or fine-grained metavolcanic material, or non-local cherts.

Flake and Core-based Stone Tools

Most of the 25 informal stone tools collected during the SSTB project are flake-based; only two core-based tools were recovered, a core-scraper and a biface preform. Utilized or retouched flakes comprise about 60% of the flake- and core-based tools. Minimally flaked scrapers were the next most common tool type, comprising approximately 33% of the assemblage. A single chopper and a biface preform complete the inventory. Although the recovery of small points indicate some Late Prehistoric or Protohistoric hunting activities in the

area, the preponderance of flake-based tools suggest that subsistence in these late periods was more strongly linked to activities other than hunting. Archaeological testing at sites in the SSTB project area suggest that subsistence in the Late Prehistoric and Protohistoric was linked to fishing (Apple et al. 1997), and the flaked lithic artifact assemblages are consistent with subsistence activities directed primarily at fishing.

Lithic Materials

Expedient tools from SSTB are predominately quartzite (66%), with volcanic the next most common tool material (15%). The remaining expedient tool inventory was comprised of single examples of obsidian, quartz, basalt, chert, and petrified wood (4% each). The volcanic, quartzite, and quartz lithic materials used in manufacturing the informal tools can be found within the project area. This is a typical pattern for expedient manufacture, whereby locally available materials are used to manufacture minimally-shaped tools for immediate use. Cherts are not typically present in the sedimentary materials within the project area, and would most likely have been imported from the Chocolate Mountains and Cargo Muchacho Mountains to the east. Small amounts of chert and a piece of local obsidian were identified during the study. This includes a distinctive white chert that is found at the Rainbow Rock Wonderstone source near the Salton Sea. The obsidian was sourced to Obsidian Butte, located about 16 km southeast of the project area.

Discussion

Comparisons of sites within the SSTB project area with late sites from previous archaeological projects in the vicinity (Phillips 1982; Rosen 1985; Pigniolo 1994), including the Elmore site (CA-IMP-6427) (Laylander 1994), show similarities in the flaked stone assemblages. Among these late sites formal tools are generally restricted to small projectile points, while large points and other well-shaped, intensively worked flaked stone tools are rare or absent. The artifact assemblages generally appear to be composed of locally available cobble material, and represent expedient use of resources focusing on the production of informal flake tools.

PALEOINDIAN AND ARCHAIC PERIODS

Although most of the dated components on the SSTB are Late Prehistoric or Protohistoric, the majority of the projectile points and bifaces date to the Archaic, or possibly earlier to the Paleoindian. Eight of the 37 points, bifaces, scrapers, and crescentics attributed to these early periods are isolated finds. Most of the other Archaic and Paleoindian Period tools are found within sites with late materials, although the early period artifacts tend to be located near the edges of sites, away from concentrations of late period materials.

Early archaeological investigations identified numerous Paleoindian sites throughout the Colorado Desert (Rogers 1966; Treganza 1942); however, materials identified as Archaic are rare. In his surveys of the Colorado Desert, Rogers found no sites away from the Colorado River dating between San Dieguito I and Yuman II, a gap of about 6,500 years (Moratto 1984:404; Weide 1976:85). A few sites have since been found that appear to date within this period. During the recent investigations on the SSTB, several flaked lithic tools including projectile points and two crescentics characteristic of the Paleoindian and Archaic Periods were recovered, along with lithic materials in contexts dating to the Late Prehistoric and Protohistoric.

Projectile Points

A single obsidian Lake Mojave point (7609-4 in Figure 1b) was typed to the Paleoindian Period. This point has been heavily reworked, and is of material from the San Felipe obsidian source, located in Baja California approximately 240 km to the south-southwest of the project area.

The Archaic points recovered include three Pinto series points, two Elko series points, and nine untyped dart points. These untyped specimens are large stemmed and notched points, concave-based triangular, and straight-based triangular points. Examples of the points are illustrated in Figure 1b. While one of the stemmed points (7629-1) appears similar to some examples of Pinto points, it is too thin to fit the Vaughn and Warren (1987) typology used for this analysis. Stemmed point P-13-007833-1 is of obsidian sourced to Obsidian Butte. The

Obsidian Butte source (-185 to -200 ft) was submerged during part of the time the SSTB sites were in use, and was only accessible during low lake stands. Neither of the obsidian points recovered produced a reliable hydration band.

One of the points is a very deeply serrated tip and mid-section fragment of rhyolite (7506-1 in Figure 1b). This unusual artifact bears some resemblance to serrated points from the southwest (Gumerman and Haury 1979:82). Serrated points have been found at Ventana Cave in southwestern Arizona, some with exaggerated serrations. This is a feature which Haury attributed to Amargosa II, and which shows up again in some Hohokam points. The serrations are so exaggerated that the points may have had a ceremonial rather than practical use (Haury 1950:299-300).

Bifaces

The majority of the 18 bifaces recovered during this project were either leaf-shaped (44%) or indeterminable fragments (44%), and two are triangular with straight bases (11%). Most of the bifaces show evidence of extensive shaping and thinning, although two show minimal retouch on one or both sides. It is notable that 50% of these artifacts are of exotic materials, chert (39%) and wonderstone (11%). The locally available lithic materials used include quartz (22%), volcanic (17%), and metavolcanic (11%).

Crescentics

Two atypical eccentric crescentics were recovered from CA-IMP-7432 and CA-IMP-7438. Both are similar in appearance, and both are of volcanic material (Figure 2a). Crescentic 7432-2 is a black porphyritic volcanic material and 7438-1 is a highly siliceous greenish volcanic material. They measure between 5.5 cm and 5.9 cm long, 2.5 cm and 2.9 cm wide, and 6.5 cm and 8.6 cm thick.

An effort was made to use an existing frame of reference to describe the two artifacts, and the terminology used was adapted from Fenenga (1984). The crescentics are unusual in that the two artifacts are bilaterally symmetrical, instead of the more usual crescent shape. The items may also have been biaxially symmetrical; however, this cannot be determined since both have fractures at the axial edges.

While crescentics are not common, they are found throughout the Great Basin, Columbia Plateau, and California (Tadlock 1966; Koerper and Farmer 1987; Fenenga 1984). The majority of crescentics are lunate or crescent-shaped, although eccentric variants formed by the addition of notching have been found in a few areas of southern and northern California (Koerper and Farmer 1987) (Figure 2b). The function of these objects is unknown, and speculation ranges from ceremonial use as hunting amulets for the zoomorphic versions to more mundane use as spokeshaves, blunt bird points, slicing tools, and surgical instruments. Crescentics are considered to be characteristic of the Early Holocene, from about 7,000 B.P. to about 11,000 B.P.

Lithic Materials

Overall, the older bifaces and projectile points show a greater diversity of lithic materials than the more recent tools. Almost 46% of the early tool assemblage is comprised of imported materials: chert (35.9%); obsidian (5%) sourced to the Salton Sea area and Baja California; and wonderstone (5%). Two sources of wonderstone were available prehistorically, Rainbow Rock near the Salton Sea, and Cerro Colorado in the northern edge of Mexico. Nearly 54% of the older tool assemblage is local volcanic, quartz, and quartzite.

Discussion

The distribution of formal tools, including projectile points, bifaces and crescentics, showed no clear patterning. These mostly Paleoindian and Archaic artifacts are found throughout the area, although they are somewhat more common along ridgelines, as are the archaeological sites. While Paleoindian and Archaic period tools were found on sites with late assemblages, these were generally somewhat isolated, with no clear association between the older tools and the more recent assemblages.

Interestingly, while a majority of the projectile points and bifaces (86%) are attributed to the Paleoindian or Archaic Periods, most of the dated components are Late Prehistoric or Protohistoric. This disparity presents at least three possibilities: that 1) hunting-based subsistence activities were more prevalent in the Archaic than in the Late Prehistoric, resulting in relatively large early tool

assemblages; 2) the Archaic type tools were curated; or 3) there was more intensive use of the SSTB area during the Archaic Period than previously considered.

If these items were not curated, this raises the question of why they were not buried by sediments from the more recent lake stands. Perhaps wind and erosional patterns along the low ridges can account for relatively higher recovery of older points; however, not enough is currently known about the area to support such an hypothesis.

The absence of any clearly identifiable Paleoindian and Archaic sites is not unusual since early sites in the area tend to be ephemeral. Lake stand fluctuations may have also dispersed cultural materials. Identification of these sites can also be difficult due to the absence of diagnostic artifacts in some assemblages, and the fragility of many of the tools. Most of the tools attributed to these early periods are projectile points and bifaces, indicative of a wide-ranging, hunting-based culture. It is possible that Archaic Period use of the area was minimal and the artifacts attributed to this period are a result of later period reuse; however, it should be noted that no clear association was observed between these artifacts and concentrations of late contexts, as might be expected with curated materials.

CONCLUSIONS

Results of the SSTB investigations indicate change over time with respect to tool technology and the raw materials utilized. The early hunter-gatherer groups which occupied the area were highly mobile and exploited a large foraging range. The Paleoindian and Archaic tool assemblages from the SSTB indicate a wide-ranging pattern of procurement, based upon the exotic lithic materials which came from as far away as the San Felipe obsidian source in Baja California, and tool types that are consistent with a hunting-based economy. The Late Prehistoric and Protohistoric assemblages seem to follow a previously identified pattern of relying on local, and therefore easily obtainable, lithic materials for quickly made, informal tools. Late period projectile points, and other tools indicative of a hunting-based economy, are rare, while tool assemblages and faunal remains in late contexts are consistent with subsistence activities directed towards fishing.

The overall scarcity of tools on the SSTB can most likely be explained by a combination of artifact preservation and subsistence orientation. As is true for most cultural assemblages at open air sites, wooden and fiber tools and utensils would have deteriorated fairly rapidly. Lithic implements such as projectile points, choppers, scrapers for processing game and yucca, and metates and handstones for grinding seeds would survive. Based on the large amounts of fish bone recovered during this project, it seems likely that Lake Cahuilla was part of a subsistence strategy directed specifically toward exploiting lacustrine resources. This diet was supplemented by collecting various plants and hard seeds. The nets, bows and sometimes wood-tipped arrows (Bean and Bourgeault 1989:34), hooks, and basketry scoops used ethnographically for fishing (Barker 1976:28) are perishable, and not much in terms of flaked stone tools was required for fishing or seed collecting. While the preponderance of older projectile points and bifaces might be attributed to the Late Prehistoric reuse of early tools, the relative abundance of these artifacts raises the intriguing possibility of a more intensive use of the area than previously considered.

Although some sites near Lake Cahuilla have been found with Archaic materials, few sites are identified as dating to the Archaic period. Future research in the area might be directed toward identifying associations between lithic scatters and Archaic materials, specifically by examining debitage for evidence of biface reduction, and analyzing collections for evidence of extensive use of non-local materials.

REFERENCES CITED

Apple, Rebecca McCorkle, Andrew York, Andrew Pigniolo, James H. Cleland, and Stephen Van Wormer
1997 Archeological Survey and Evaluation Program for the Salton Sea Test Base Imperial County, California. KEA Environmental, Inc., San Diego, California. Submitted to U.S. Department of the Navy, Southwest Division, San Diego.

Barker, James P.
1976 Ethnographic sketch of the Yuha Desert Region. In *Background to Prehistory of the Yuha Desert Region* pp. 21-42. Phillip J. Wilke, editor. Ballena Press Anthropological Papers No. 5, Ballena Press, Ramona, California. Reprinted from *Background to Prehistory of the Yuha Desert Region*, prepared for the United States Department of Interior, Bureau of Land Management, Riverside, CA, 1974.

Bean, Lowell John and Lisa Bourgeault
1989 *The Cahuilla.* Chelsea House Publishers, New York.

Fenenga, Gerrit L.
1984 A Typological Analysis of the Temporal and Geographic Distribution of the Eccentric Crescent in Western North America. Department of Anthropology, University of California, Berkeley.

Gumerman, George J. and Emil W. Haury
1979 Prehistory: Hohokam, in *Southwest*, edited by Alfonso Ortiz, pp.75-90. Handbook of North American Indians Vol. 9, Smithsonian Institution, Washington, D.C.

Haury, Emil W.
1950 *The Stratigraphy and Archaeology of Ventana Cave.* University of Arizona Press, Tucson.

Koerper, Henry C. and Malcolm F. Farmer
1987 A Bear-shaped Crescentic from Northern San Diego County, California. *Journal of California and Great Basin Anthropology* 9(2):282-288.

Laylander, Don
1994 Phase III Data Recovery at the Elmore Site (CA-SDI-6427) Imperial County California, 11-IMP-86, P.M. 33.6/43.2, 11221-194860, 11221-100710. Caltrans District 11, San Diego.

Moratto, Michael J.
1984 *California Archaeology.* Academic Press, New York.

Phillips, Roxana
1982 Archaeological Data Recovery Program: Northern IT corporation Imperial Valley Site. Report on file at the Southeast Information Center, Imperial Valley College Museum, El Centro.

Pigniolo, Andrew R.
1994 Historic Properties Inventory and Resource Evaluation of the Proposed Monofill Land Exchange, Imperial County, California. Ogden Environmental and Energy Services. Prepared for Magma Operating Company.

Rogers, Malcolm J.
1966 *Ancient Hunters of the Far West*, Richard Pourade, ed. Union-tribune Publishing Company, San Diego. Rosen, Martin D.

1985 Report of Archaeological Test Investigations at Five Sites Located Along Highway 86 in Imperial County, California: CA-IMP-3675, CA-IMP-3676, CA-IMP-3678, CA-IMP-5099, and CA-IMP-5101. 11-IMP-86, 60.9/67.8, 11208-182641. Caltrans District 11, San Diego.

Tadlock, W.L.
1966 Certain Crescentic Stone Objects as a Time Marker in the Western United States. *American Antiquity* 31:622-675.

Thomas, David Hurst
1981 How to Classify the Projectile Points from Monitor Valley, Nevada. *Journal of California and Great Basin Anthropology* 3(1):7-43.

Treganza, Adan E.
1942 An Archaeological Reconnaissance of Northeastern Baja California and Southeastern California. *American Antiquity* 8:152-163.

Vaughan, Sheila J. and Claude N. Warren
1987 Toward a Definition of Pinto Points. *Journal of California and Great Basin Anthropology* 9(2):199- 213.

Weide, Margaret L.
1976 A cultural Sequence for the Yuha Desert. In *Background to Prehistory of the Yuha Desert Region* pp. 81-94. Phillip J. Wilke, editor. Ballena Press Anthropological Papers No. 5, Ballena Press, Ramona, California. Reprinted from *Background to Prehistory of the Yuha Desert Region* prepared for United States Department of Interior, Bureau of Land Management, 1974.

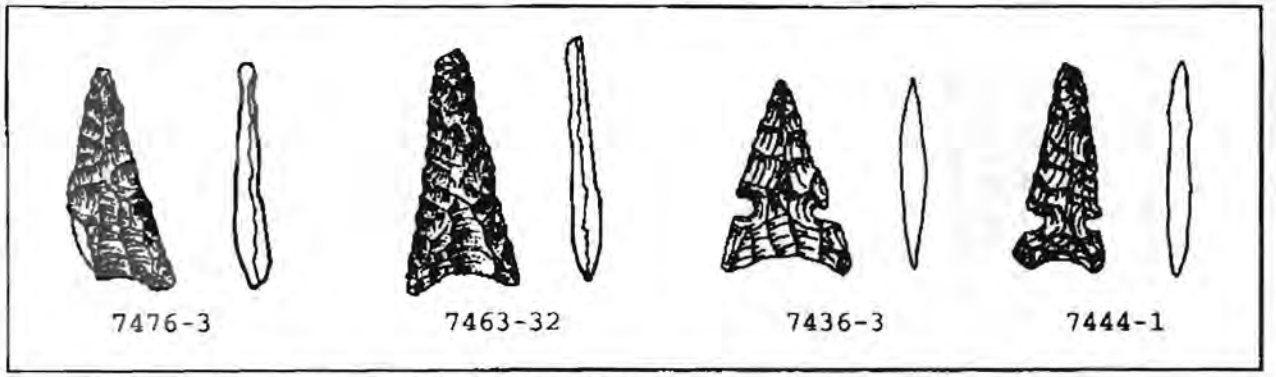

Figure 1a. Late Prehistoric Points

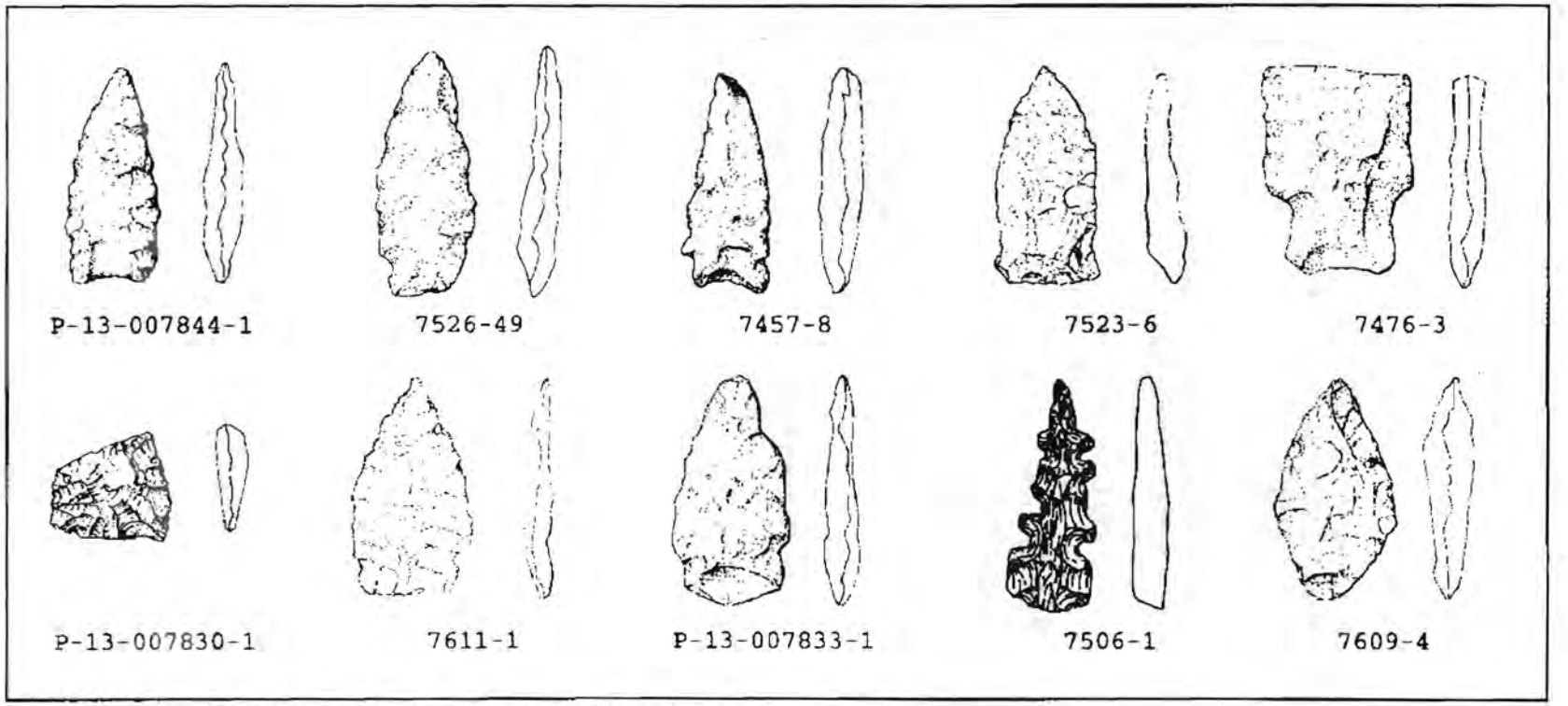

Figure 1b. Paleoindian and Archaic Points

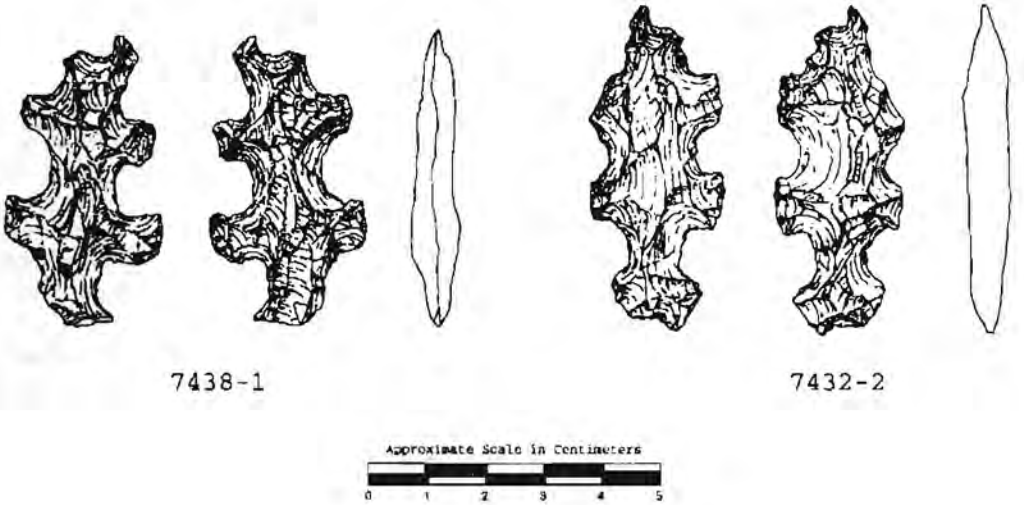

Figure 2a. SSTB Crescentics

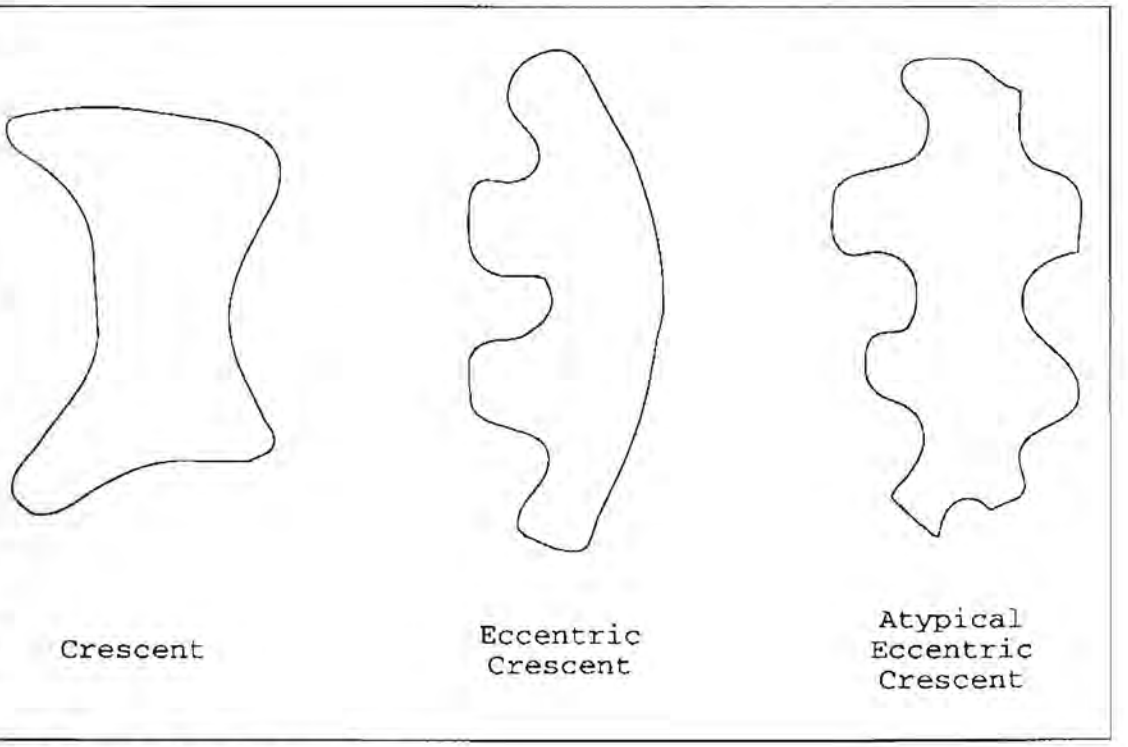

Figure 2b. Crescentics