ANTHROPOLOGY 4115/5115: LITHIC ANALYSIS I

Time: W 4-6:30
Place: Anthropology 140
Instructor: R. Kelly
Office Hours: TWR 9:30 - noon, or by appointment, Anthropology Building 273
E-Mail: RLKELLY@uwyo.edu
Phone: 766-3135
Graduate Assistant: Paul Santarone, Anthropology 350 psantaro@uwyo.edu

Text: Andrefsky, Lithics: Macroscopic Approaches to Analysis; plus readings to be made available electronically.

Stones cannot be tamed
to the end they will look at us
with a calm very clear eye
–Milosz, The Stone

This course has three objectives: (1) to give you a basic understanding of and experience in the hands-on collection of data from lithics, (2) the analysis of those data, and (3) the ways archaeologists use to think about and interpret prehistoric technology. Chipped stone tools and waste flakes are the most abundant archaeological remains; this is especially true for hunter-gatherer cultures, and for the most ancient of these, stone tools comprise the entire prehistoric record. Any archaeologist of hunter-gatherers, therefore, must familiarize him or herself with the analysis of stone tools. We will do this through practice with flintknapping, experimentation, reading, and practice with data collection. This course will focus on chipped stone rather than groundstone tools, and some topics, e.g., blood residue, use-wear, sourcing analysis, trade, specialist production will not be covered or only covered briefly.

The emphasis will be on the stone tool technology of hunting and gathering peoples and on the practical issues involved in the analysis of debitage (waste flakes) and tools from archaeological sites. This is not a flintknapping course, although students will be introduced to flintknapping in the course’s beginning and are expected to continue to practice on their own throughout the course. Most of the course will be devoted to an overview of the various kinds of information that can be gleaned from stone tools and debitage, including technological reconstruction and
use-wear analysis. Several areas will command our attention: using stone tools to solve anthropological problems, the effects of raw material variability, the analysis of waste flakes, typology and measurement issues.

** Flintknapping.** Students are expected to participate in flintknapping. This is an inherently dangerous activity involving the production of many, sharp small bits of stone and glass. Stone tool raw material, antler batons and flakers, hammerstones, carpenter’s goggles, and leather hand patches will be provided. The use of protective eyewear is strongly recommended; also you should do all flintknapping outside to avoid breathing silica dust. Dress accordingly on the first two sessions of the course as we will be doing our flintknapping outside. Protective eyewear can be purchased at the UW bookstore for $3-4.

**Course Requirements:**

Two exams, 20% each. Because of our limited class time this semester (we only meet once a week and there are two conferences that will interrupt the class), exams will be take-home. They will consist of some essay questions and short answer. In addition, there is a practicum element that will arranged for each exam; students will have to arrange a time to meet with me to complete that aspect of the exam (this part of the exam will not take long). Exams will be e-mailed out on Wednesday, and must be returned by 5 PM on Friday (i.e., you have about 48 hours for them). Graduate exams are somewhat longer and are graded in accordance with their lofty status in life. Exams should be typed and proof-read; they should be e-mailed back to me (as WORD files, not a pdf).

Final project/paper, 40%; a project/paper of the student’s own design—I can also suggest a topic to you (see below). These can take the form of analysis of an archaeological or experimental assemblage; they also be a literature review of some aspect of lithic analysis (though I prefer papers that entail data collection and analysis). It is imperative that everyone decide on a topic and begin working on it soon. To this end, each student must make an appointment with me quickly to discuss potential topics. There are no specific limits on paper length, although you should never go beyond 40 pages (including text, bibliography, tables, figures); I would expect that most papers would be considerably shorter. The papers must be done professionally, typed, proofread, and with illustrations as needed. Please use the American Antiquity style guide and bibliographic format. I can go over this with you if you’d like. Your project should be essentially completed by Nov. 19.

In class presentation, 10%; each student will report on his/her project in the last week+ of class. I will invite others in the department to attend and will set time limits (once I see how many students are in the course). Your presentation should be a polished conference-style presentation using visuals. Computer and projector will be provided.

Class participation, 10%; subjective, and based on my impression of whether the student has done and thought about the readings. Graduate students may be asked to give summaries of assigned readings.
Potential Paper Topics
(you are NOT limited to one of these; these are merely suggestions)
1. Standard lithic analysis of existing data set from an archaeological site (I can give suggestions, and I have some assemblages just begging to be studied).
2. Why should we record which side of a flake is up in an excavation?
3. Flake Measurement accuracy/replicability
4. Collection of time data on stone tool production or use
5. Wyoming raw material identification
6. How do we know if a few broken rocks in a site are stone tools–or just fortuitously broken rocks?
7. projectile point typology (there are various issues that can be considered here)
8. What are the parameters of use of a class of stone tools (e.g., on what kinds of material can very fine drills be used)?

Readings: There is a great deal written on stone tools and debitage. I’ve tried to keep the required readings down to a reasonable amount. The recommended readings are, obviously, not required (but they are recommended).

Course Schedule:
1. 8/27 Introduction and flintknapping workshop (we will be outside)
2. 9/3 More flintknapping, and world overview of stone tool technology (students should be discussing projects with Kelly through separate appointments)
3. 9/10 Thinking about Technology, raw materials
4. 9/17 Raw Materials, debitage data collection
5. 9/21 Sunday, field trip to Spanish Diggings quarry (not required)
6. 9/24 Debitage Data Collection
   First exam handed out. Due: Friday 9/27 by 5 PM.
6. 10/1 NO CLASS: Plains conference (lots of time to work on projects this week and next; students should schedule conference with Kelly to discuss project progress)
7. 10/8 NO CLASS: Great Basin Conference
8. 10/15 Stone tool typology
9. 10/22 Analyzing assemblages (artifact refitting, MANA, cumulative curves, mass analysis, size/diversity)
10. 10/29 Analyzing assemblages continued
11. 11/5 To be announced
12. 11/12 Performance Characteristics: projectile points, flake utility
13. 11/19 A return to thinking about technology (might start project presentations) Second exam handed out. Due Friday 11/20 by 5 PM
14. 11/26 NO CLASS (Thanksgiving)
15. 12/3 Project presentations
Week 1
Andrefsky, chapters 1 and 2
Binford, L.R., and J.F. O’Connell

Week 2
Andrefsky, chapter 4

Week 3
Binford, L.R.

Kelly, R.L

Nelson, M.

Week 4-5
Andrefsky, chapter 3, 5-6

Quarrying, raw materials:
Carambelas, K.R., and R.G. Elston

Reher, C.A.

Cooper, C.

Dibble, H.

Debitage data collection and analysis:
Andrefsky, W.A.

Carr, P.J., and A.P. Bradbury

Bradbury, A.P., and P.J. Carr

Larson, M.L., and J. Finley

**Week 6**
**No Class, Plains Conference**

**Week 7**
**No Class, Great Basin Conference**

**Week 8**
Andrefsky, chap 7
Flenniken, J.J., and P.J. Wilke

Dibble, H.

Thomas, D.H.

Weedman, Kathryn.

**Week 9-10**
Andrefsky, chapter 8

Hall, C.

Morrow, T.M.

Kelly, R.L.

Laughlin, J. and R. L. Kelly
2007 Experimental Analysis of the Practical Limits of Lithic Refitting. *Lithic Technology*.

**Week 11: TBA**

**Week 12**

Schiffer, M.B., and J.M. Skibo
Nelson, M.
Christenson, A.L.
Cheshier, J. and R. L. Kelly
Prasciunas, M.

**Week 13**
Bettinger, R. L., B. Winterhalder and R. McElreath
Ugan, A., J. Bright, and A. Rogers
Bright, J., A. Ugan, and L. Hunsaker
Pfaffenberger, B.

**Week 14 (No Class, Thanksgiving)**

**Week 15: Class Presentations**
Recommended Readings

**Overviews, flintknapping basics**

Odell, G.H.


Wilmsen, E.S.

Cotterell, B. and J. Kamminga

Crabtree, D.

Callahan, E.

Flenniken, J.J., and J.P. White

Holmes, W.H.

Speth, J.D.

Swanson, E. (ed.)

Luedtke, B.

**Quarrying**

Ericson, J.E., and B.A. Purdy (eds.)

Luedtke, B.L.

Holmes, W.H.

Bloomer, W.W., K. Ataman, E. Ingbar, and M.W. Moore

Vehik, S.(ed.)
1985  

Bamforth, D.

1992  

Purdy, B.A.

1984  

**Ethnographic Accounts**


1985  

Oswalt, W.H.

1973  

Hampton, O.W.

1999  
*Culture of Stone: Sacred and Profane Uses of Stone among the Dani*. College Station, Texas A&M Press.

Jones, R., and N. White

1988  

Miller, Jr., T.O.

1979  

Gould, R.

1980  

Hayden, B.

1977  

1979  
*Paleolithic Reflections: Lithic Technology of the Australian Western Desert*. Canberra, Australian Institute of Aboriginal Studies.

Hayden, B., and M. Nelson

1981  

Binford, L.R.

1986  

Binford, L.R.

1977  

Ellis, C.

Gallagher, J.P.


Gould, R., D. Koster, and A. Sontz


Hayden, B. (ed.)


Sillitoe, P.


Tindale, N.


Watson, V.D.


**Stone tool making methods**

Amick, D. (ed.)


Crabtree, D.E.


Rosen, S.A.


Boldurian, A.T.


Bordaz, J.


Bradley, B.A.


Frison, G.A., and B. Bradley

1980  *Folsom tools and technology at the Hanson Site, Wyoming*. University of New Mexico Press, Albuquerque.

Frison, G., and B. Bradley


Organization of technology


Grace, R. 1998 The Chaîne Opératoire approach to lithic analysis.

http://www.hf.uio.no/iakk/roger/lithic/opchainpaper.html


Ingbar, E.E.

Amick, D.


Amick, D.


Basgall, M.E.


Beck, C., and G.T. Jones


Wenzel, K.E., and P.H. Shelley


Andrefsky, W.


Jones, G.T., C. Beck, and E. Jones


Heat Treatment

Ahler, S.A.


Bleed, P., and M. Meier


Borradaile, G.J., S.A. Kissin, J.D. Stewart, W.A. Ross, and T. Werner


Collins, M.B., and J.M. Fenwick


Cooper, C.


Crabtree, D.E. and R.B. Butler


Bamforth, D.

Close, A.


Newman, J.


**Debitage Analysis**

Bradbury, A.P., and P.J. Carr


Ahler, S.


Larson, M.L., and M. Kornfeld


Sullivan, A.P., and K.C. Rozen


Shott, M.


Ingbar, E.E., Larson, M.L., and B.A. Bradley


Shott, M.


Prentiss, W.C., and E. J. Romanski


Amick, D.S., and R.P. Mauldin


Dibble, H.L., and A. Pelcin


Dibble, H.L., and J. Whittaker


Pelcin, A.W.

1997 The effect of core’s surface morphology on flake attributes: evidence from a controlled


Jeske, R.J. and R. Lurie

Shott, M.J.

Goodyear, A.C.

LeBlanc, R.

Larson, M.L.

Morrow, T.A.

Magne, M.

Magne, M.

Mauldin, R.P., and D.S. Amick

**Style**

Bettinger, R.L., J.F. O’Connell, and D.H. Thomas

Binford, L.R., and S.R. Binford

Bordes, F., and D. deSonneville-Bordes

Beck, C.
Read, D., and G. Russell

Kuhn, S.

Flenniken, J.J., and A. Raymond

Thomas, D.H.

Rondeau, M.F.

Dibble, H.L.

Towner, R.H., and M. Warburton

Dunnell, R.C.

Ford, James A.

Spaulding, A.C.

Krieger, A.D.

Conkey, M.W., and C.A. Hastorf (eds.)

Yerkes, R., and N. Kardulias
1993  Recent developments in the analysis of lithic artifacts. *Journal of Archaeological Research* 1: 89-119

**Style**

Eerkens, J., and R.L. Bettinger

Bettinger, R.L., and J. Eerkens
Close, A.

Weissner, P.

Morrow, J.E., and T.A. Morrow

Knecht, H.

Griffin, P.B.

Clark, G.A.

Flenniken, J.J.

White, J.P., N. Mojeska, and I. Hipuya

**Microwear**

Cahen, D., Keeley, L.H., and F.L. Van Nooten

Hayden, B. (ed.)

Nance, J.D.

Bamforth, D.

Hayden, B.

Juel-Jensen, H.
1988 Functional analysis of prehistoric flint tools by high-power microscopy: a review of West


**Groundstone**


**Week 9: recommended**


**Refitting**
Close, A.  

Cooper, C.  

McBreaty, S., Bishop, L., Plummer, T., Dewer, R., and N. Conard  

Hiscock, P.  

### Technological Organization

Parry, W.J., and R.L. Kelly  

Andrefsky, W.  

Bamforth, D.  

Tomka, S.  

Hughes, S.  

Lemonier, P.  

### Regional Studies

Kelly, R.L.  

Amick, D.S.  

Thacker, P.T.  
1996  Hunter-gatherer lithic economy and settlement systems: understanding regional

Roth, B.J., and H.L. Dibble

Macdonald, D.

Vierra, B.

**Other recommended**

Greaves, R.D.

Torrence, R.

Metcalfe, D., and K.R. Barlow

Amick, D.

Hiscock, P.

Schiffer, M.B., and J.M. Skibo

Odell, G.H.

Shott, M.J.

Shott, M.

Bamforth, D.
Bleed, P.
Keeley, L.
Gero, J.
Sassaman, K.
Hitchcock, R., and P. Bleed
Jeske, R.J.
Carr, P.
Henry, D.O.
Lurie, R.
Odell, G.H.

Patterson, L.W.


Shott, M.