

The Second Social Science and Humanities Forum between  
Japan and Russia

# The Old Stone Age of Japanese Archipelago and Siberia, with special reference to lithic use-wear analysis

October 11, 2013  
Kaoru Akoshima  
Tohoku University  
Sendai, Japan



At the  
Araya Site,  
1988



In Novosibirsk, 1995

Academic exchange in Kyoto, Japan,  
1968 (UISPP)

(From Serizawa 2003, Forty years of Palaeolithic  
Research. The Archaeological Journal, no. 503)



## ДОГОВОР

ОБ АКАДЕМИЧЕСКОМ ОБМЕНЕ И СОТРУДНИЧЕСТВЕ В ОБЛАСТИ АРХЕОЛОГИЧЕСКИХ  
ИССЛЕДОВАНИЙ МЕЖДУ ЛАБОРАТОРИЕЙ АРХЕОЛОГИЧЕСКИХ ИССЛЕДОВАНИЙ  
НАУЧНО- ИССЛЕДОВАТЕЛЬСКОГО ИНСТИТУТА ЧЕЛОВЕКА САХАЛИНСКОГО ГОСУДАРСТВЕННОГО  
УНИВЕРСИТЕТА И ОТДЕЛЕНИЯ АРХЕОЛОГИИ ВЫСШЕЙ ШКОЛЫ ИСКУССТВА И ФИЛОЛОГИИ  
УНИВЕРСИТЕТА ТОХОКУ

Директор Научно-исследовательского института Человека и заведующий лабораторией археологических исследований НИИ Человека Сахалинского государственного университета, с одной стороны и Декан Высшей школы искусств и филологии, и заведующий отделением (лабораторией) археологии Высшей школы искусств и филологии Университета Тохоку, с другой стороны, на основе общности интересов в области истории и доистории народов Дальнего Востока и проявляя стремление к развитию международного обмена, заключили настоящий Договор о нижеследующем:

1. Обе лаборатории соглашаются сотрудничать в следующих областях на принципах равенства и взаимности:
  - (1) Обеспечивать обмен учеными.
  - (2) По мере возможности, обеспечивать совместные исследовательские проекты.
  - (3) Оказывать поддержку в дальнейшем обучении молодых ученых.
  - (4) Обмениваться академическими материалами и академическими публикациями.
2. Каждая лаборатория будет прилагать усилия для приема ученых
3. Обе лаборатории понимают, что все финансовые договоренности должны обсуждаться в каждом отдельном случае и будут зависеть от наличия средств.
4. Договор вступает в силу с момента его подписания представителями обоих университетов на срок пять лет. Договор будет автоматически возобновляться каждые пять лет до тех пор, пока один из университетов не предложит изменения или отмены данного Договора в письменной форме за шесть месяцев до даты истечения срока его действия.
5. Договор напечатан на русском и японском языках в двух экземплярах, оба из которых являются одинаковыми и подлинными.

21 августа 2001 года

Директор НИИ Человека,  
Заведующий лабораторией  
Археологических исследований  
Сахалинского  
Государственного университета  
Василевский А.А.

21 августа 2001 года

Декан Высшей школы  
искусств и филологии  
Норио Мацумото

Заведующий отделением  
археологии Высшей школы  
искусств и филологии  
Университета Тохоку  
Такаси Сүто

## 東北大学大学院文学研究科考古学専攻分野(研究室)と サハリン国立大学人類科学研究所考古学研究室との 間における考古学の学術交流に関する協定書

東北大学大学院文学研究科長および大学院文学研究科考古学専攻分野主任と、サハリン国立大学人類科学研究所長および人類科学研究所考古学研究室長は、学術交流の増進が望ましいことを認識し、また極東諸民族の歴史および先史についての共通の関心のため、次の通り協定を締結する。

1. 両研究室は、平等互惠の精神をもって、次の事項について合意する。
  - (1) 研究者の交流を促進する。
  - (2) 可能な限り共同研究を促進する。
  - (3) 若手研究者の高度な訓練を支援する。
  - (4) 学術資料及び刊行物の交換を行う。
2. 両研究室は、研究者の受け入れに努力する。
3. 両研究室は、すべての財政上の処置についてそれぞれ特定の場合ごとに協議し、利用可能な資金に制約されることを了解する。
4. 本協定は両校の代表者による署名の日から5年間の有効期間とし、以降はどちらかの大学が有効期間満了6ヶ月以前に文書により本協定の改廃を通知しない限り、5年毎に自動延長される。
5. 本協定は、日本語およびロシア語により各2通作成するものとし、いずれも等しく正文である。

2001年 8 月 21 日

2001年 8 月 21 日

東北大学大学院文学研究科長  
松本 宣郎

サハリン国立大学人類科学研究所長  
兼考古学研究室長  
A. アレクサンダー・ワシレフスキー

松本 宣郎

東北大学大学院文学研究科  
考古学専攻分野主任

須藤 隆

須藤 隆

Agreement with the Sakhalin State University (2001)





Prof. A. Vasilevski, Sakhalin  
State University, at the Soni site,  
Early Neolithic period  
(Kuznetsovo site)

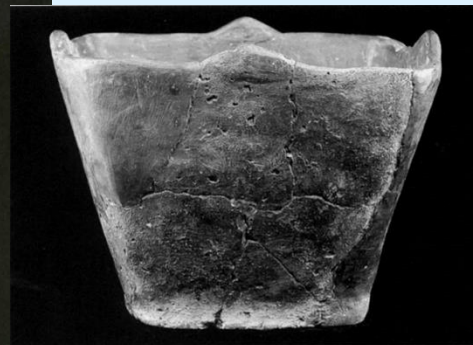
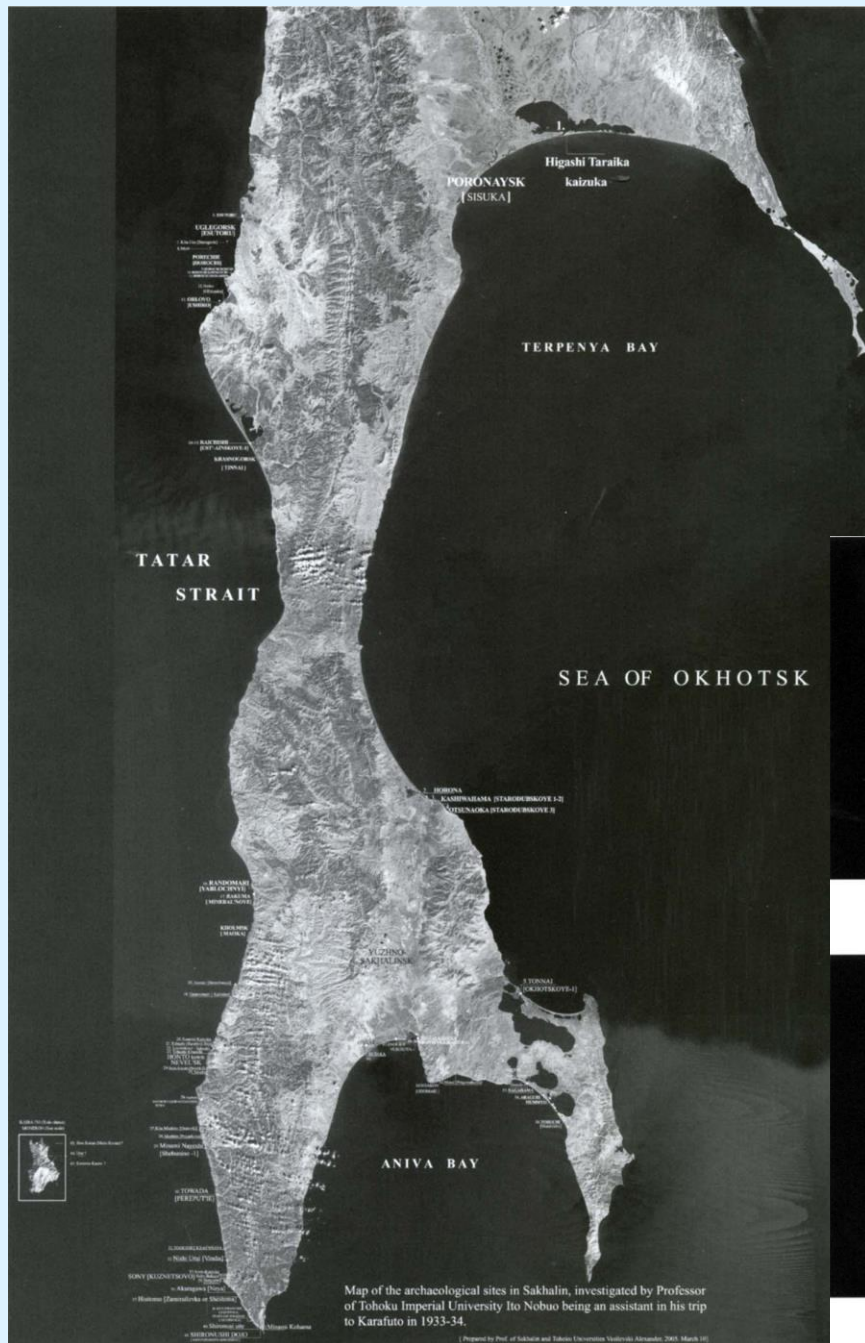




# Prof. Nobuo Ito of Tohoku Univ. Expedition to South Sakhalin in 1933, 1934

(from Bulletin of the Tohoku  
University Museum, no.5, 2006)

Archaeological collections in  
Tohoku Univ. Fac. of Arts and Letters



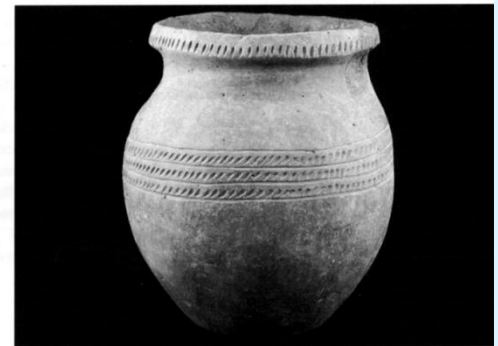
221.13-2 Otsunaoka (Soni type)  
Overall height, 10.0 cm.



221.18-2 Randomari (Susuya type)  
Overall height, 12.5 cm.



221.11-2 Tarantomari (Esutoru-Nabil type)  
Overall height, 11.2 cm.



221.15-3 Kashiwahama (Enoura type)  
Overall height, 15.5 cm.

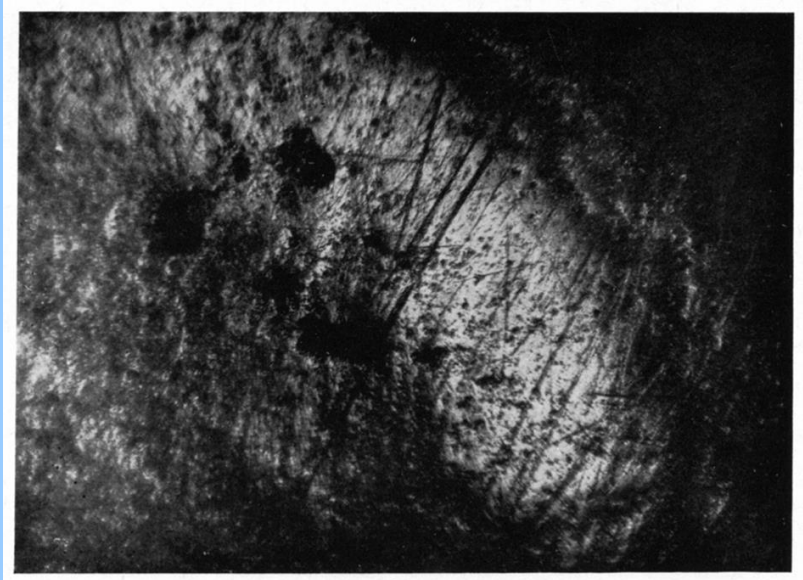
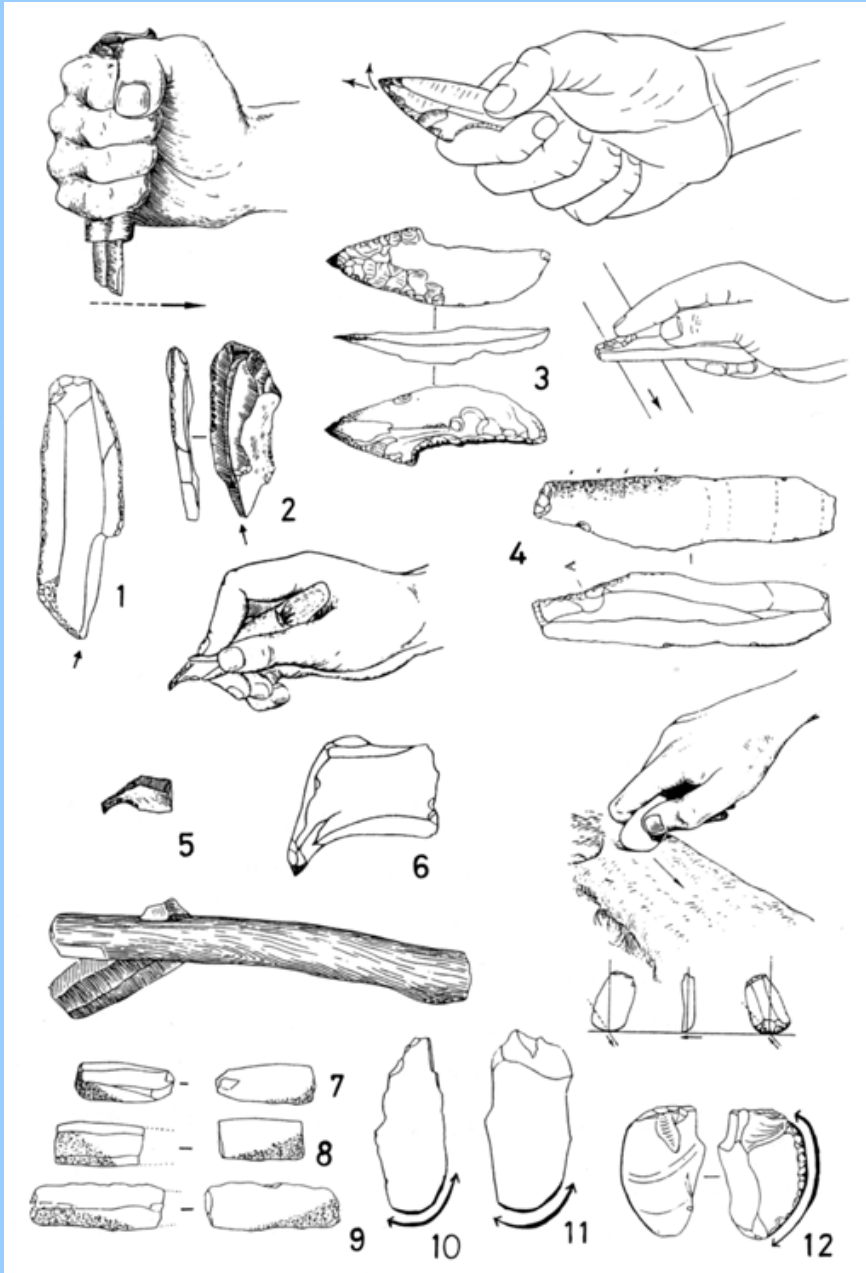
Twin Ainu armors from Higashi  
Taraika, Sakhalin, found in 1934



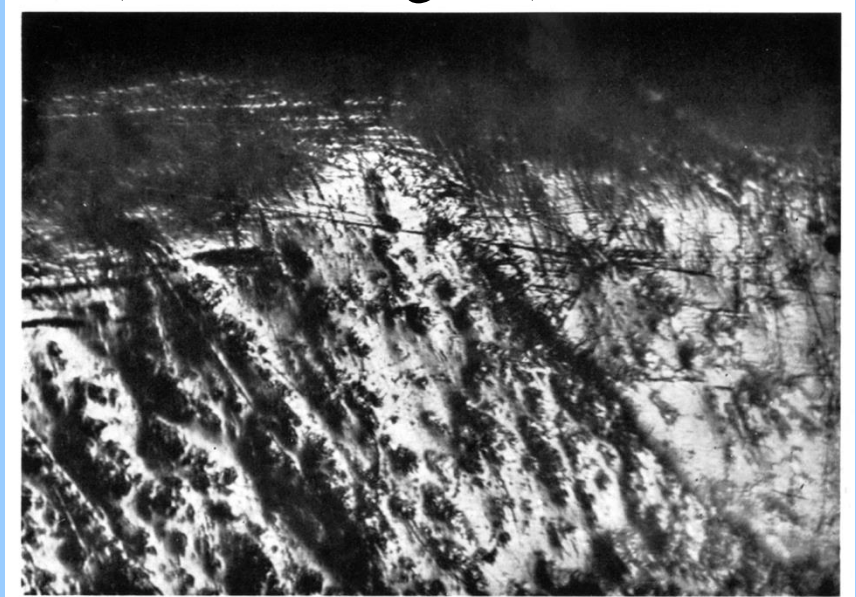
Curated in Tohoku Univ. and  
The Sakhalin State Museum



# Use-wear study by S. Semenov (1957)



“Prehistoric Technology”  
(1964 in English)



47 Wear on a whittling knife from Kostenki I in fig. 45.A magnified 300 ×.

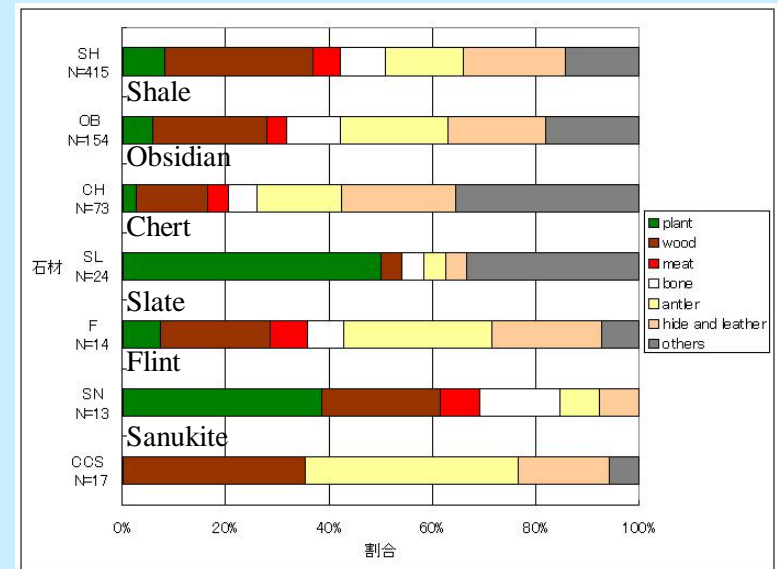
Whittling knife from Kostenki I



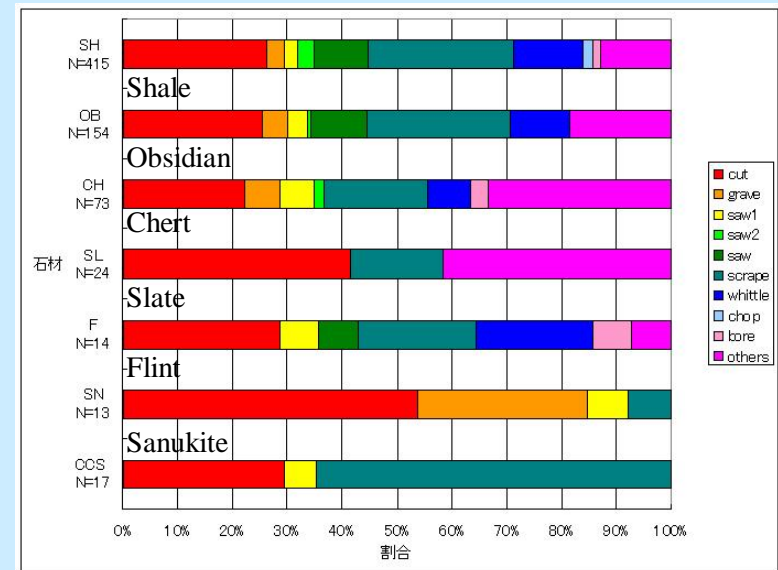
Prof. Chosuke Serizawa (1919.10.21~2006.3.16)



Prof. Serizawa with Olympus BHM microscope at Tohoku Univ. with lithic artifacts from the Hoshino site (in 1981)



Experimental summary of Tohoku Univ. project (1976 to 2007)  
Rock type (Shale, Obsidian, Chert, Slate, Flint, Sanukite, other CCS),  
and worked materials (plant, wood, meat, bone, antler, hide, leather)



Experimental summary of Tohoku Univ. project (1976 to 2007)  
Rock type and kind of motion (cut, grave, saw, scrape whittle, chop, bore)



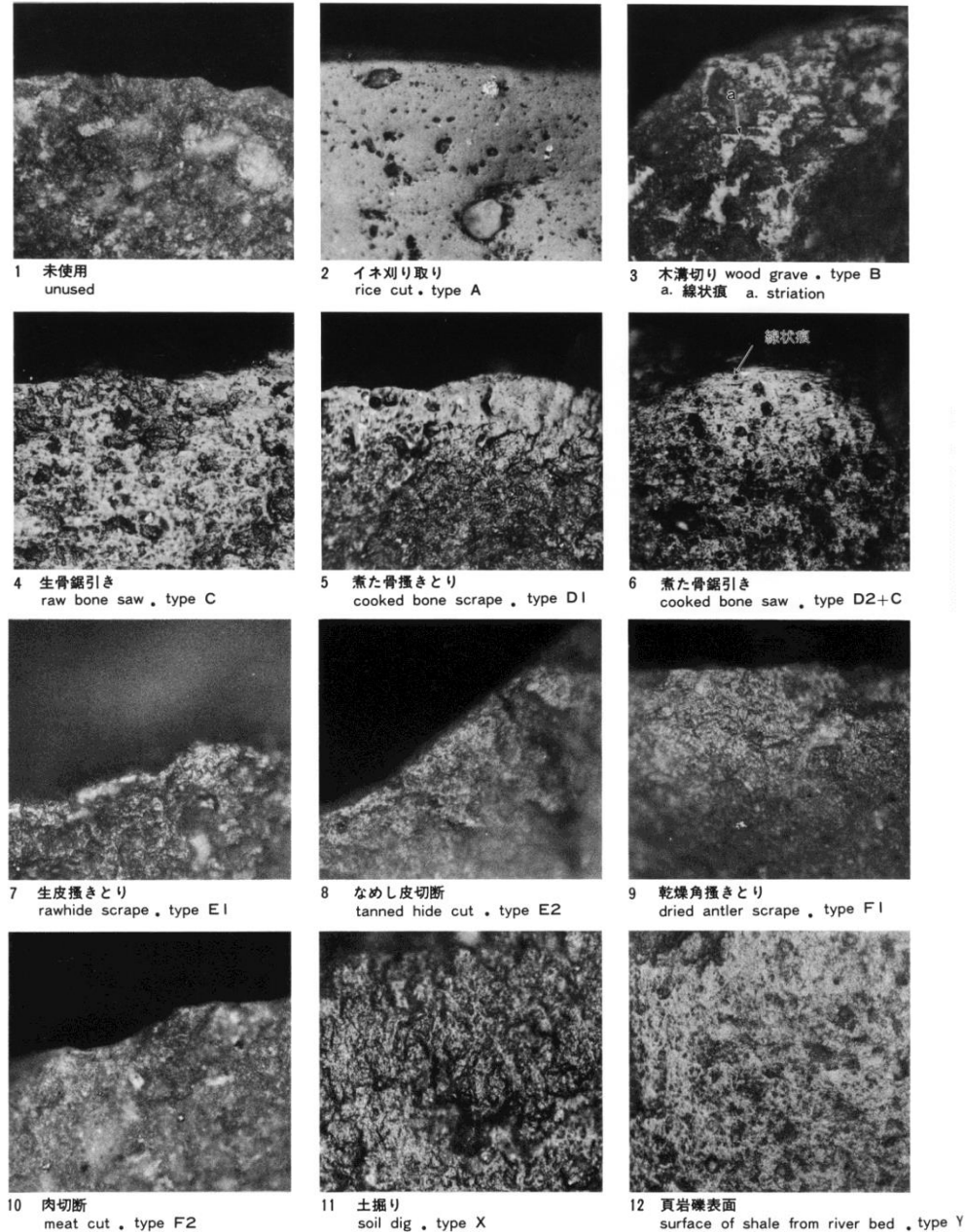


PLATE 58 Classification of polish on "shale"

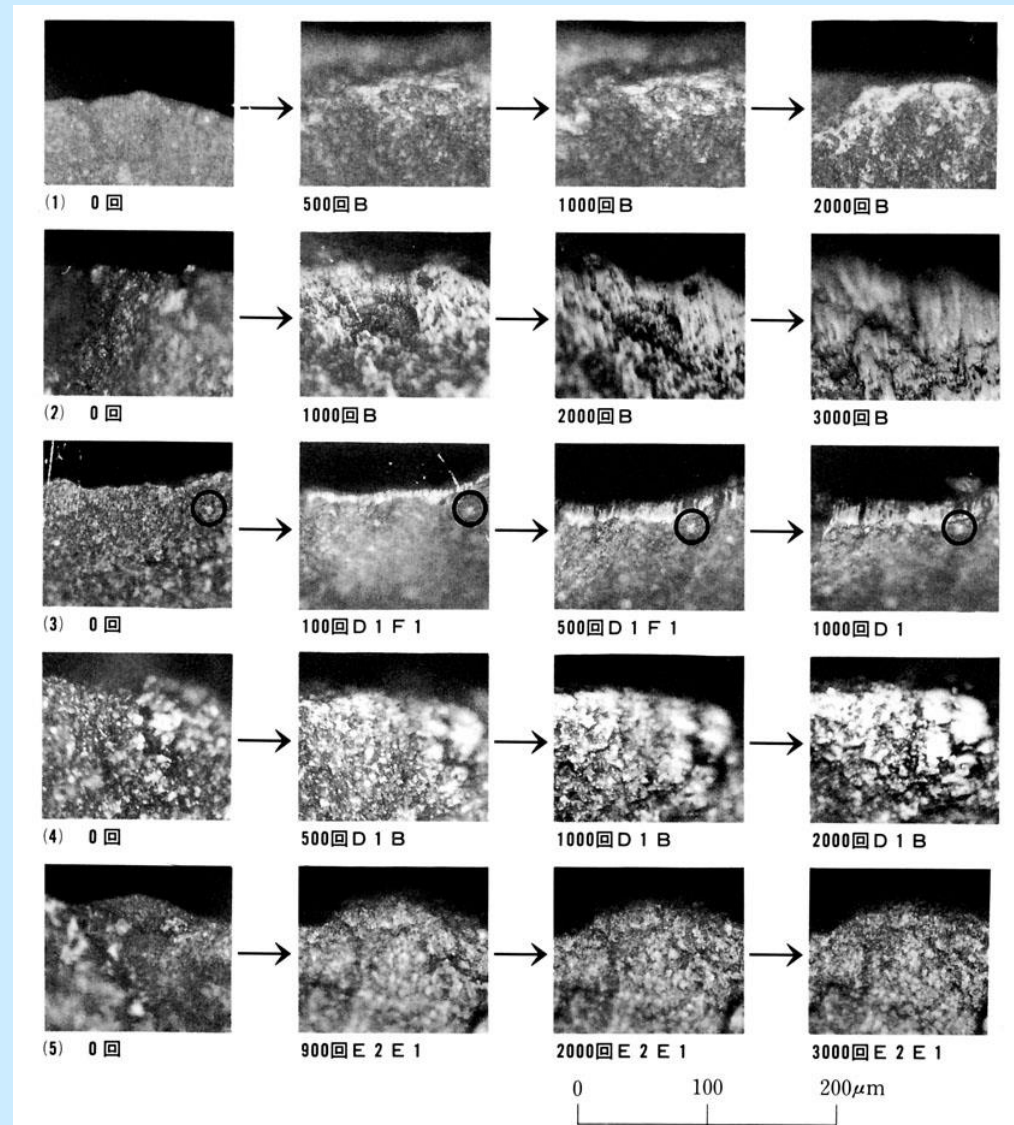
200X

Tohoku Univ. team classification of microwear polish  
(from Serizawa ed. 1982, Mosanru)

Table 4.1 Polish Types on Siliceous Hard Shale (Tohoku University Classification)

POLISH TYPE	CONTRAST AND TEXTURE	EXTENSION	OTHER CHARACTERISTICS	WORKED MATERIALS (LESS COMMON MATERIALS)
A	Very bright and smooth	Covers wide area rather evenly	"Filled-in" striations, "Comet-shaped" pits; when underdeveloped resembles type B	Nonwoody plants, (bamboo)
B	Bright and smooth, round and "domed" appearance	Well-defined patches develop on high points	Clear striations	Wood, bamboo, (bone, nonwoody plants)
C	Relatively bright but rough	Covers wide area rather evenly with flat patches; patches are ill-defined	With numerous pits of various size/shape, depressions, striation; often surrounds types D1 and D2	Sawing soaked antler (and bone)
D1	Bright and smooth; very flat and lacks "roundness"; includes "melted snow" type	Flat polish patches are well-defined	Directional undulations often constitute wide striated features	Bone, antler, (wood)
D2	Bright but less smooth than D1	Polish patches are well-defined	Patch surface undulates with numerous parallel, sharp striations	Bone, antler, wood, (bamboo)
E1	Dull and relatively rough	Polish patches are small and confined	Numerous tiny pits and very minutely rugged (= "rugose"); usually accompanies types E2, F1, F2	Hide, meat, (wood)
E2	Dull and relatively rough, "mat" texture	Patches are less confined and sometimes flat; when developed, patches grow and "roundness" increases	Numerous tiny pits and very minutely rugged (= "rugose"); usually accompanies types E1, F1, F2	Hide, meat
F1	Dull and rough, sometimes "greasy luster"	Patches are not well-defined; polish follows micro-topography (on both elevations and depressions)	Coarse "rugged" appearance; type F1 often develops into type D1 on antler/bone	Dry antler, bone, hide, meat, wood
F2	Very dull, weak	Polish follows micro-topography	Often accompanies other types	Generic polish, hide, meat, (wood, bone)

from Akoshima (1993) Microwear patterns and distributional variability in Terminal Palaeolithic site structure.

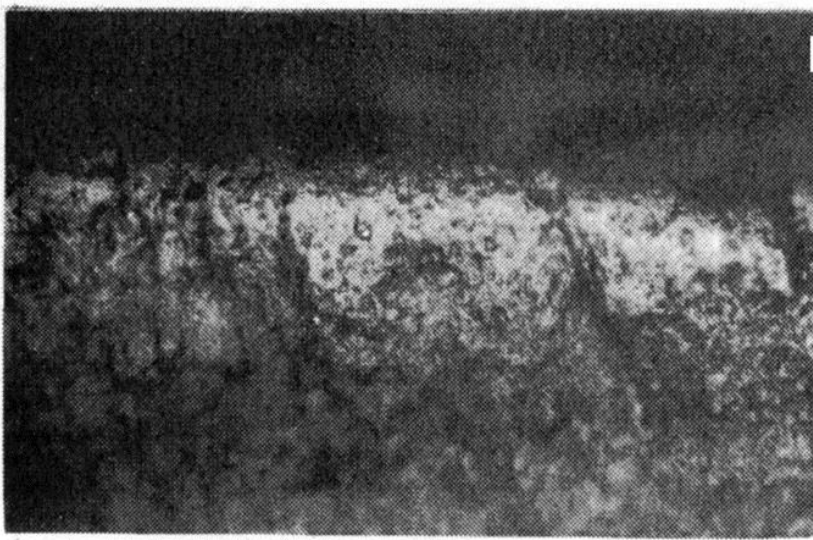


from Tohoku Univ. Annual Review 2010

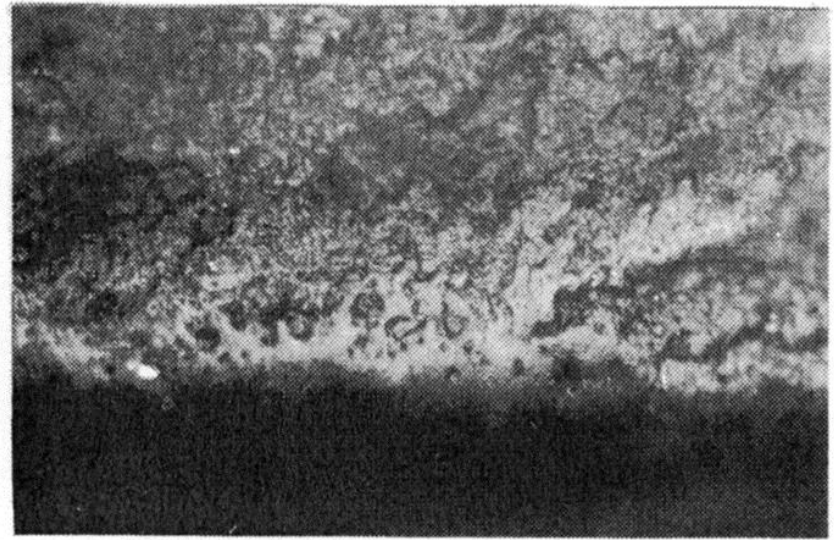
# **Tohoku Univ. Microwear Research Team(1976~2012)**

Some developmental stages of microwear polish formation (from Serizawa, Kajiwara, Akoshima 1982): (1) cutting wood, (2) boring wood, (3) whittling bone, (4) cutting soaked antler, (5) scraping dry hide. Numbers of strokes and polish types are shown for each photograph.

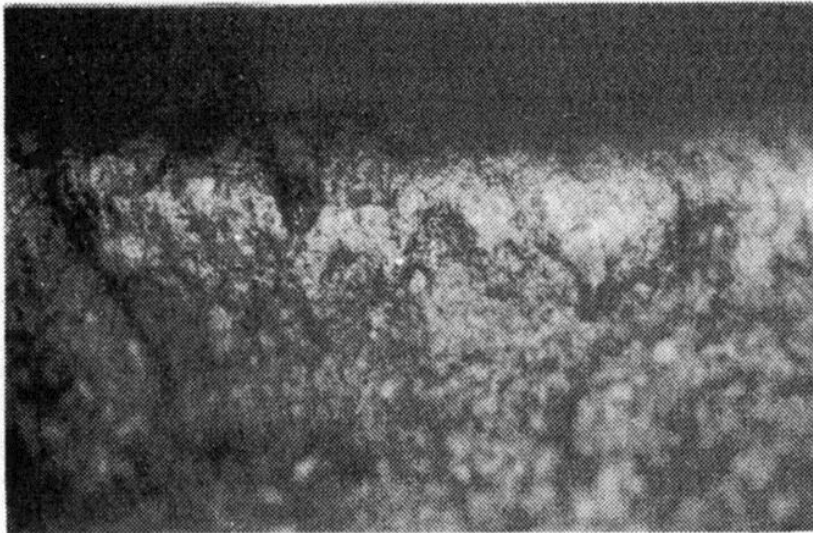




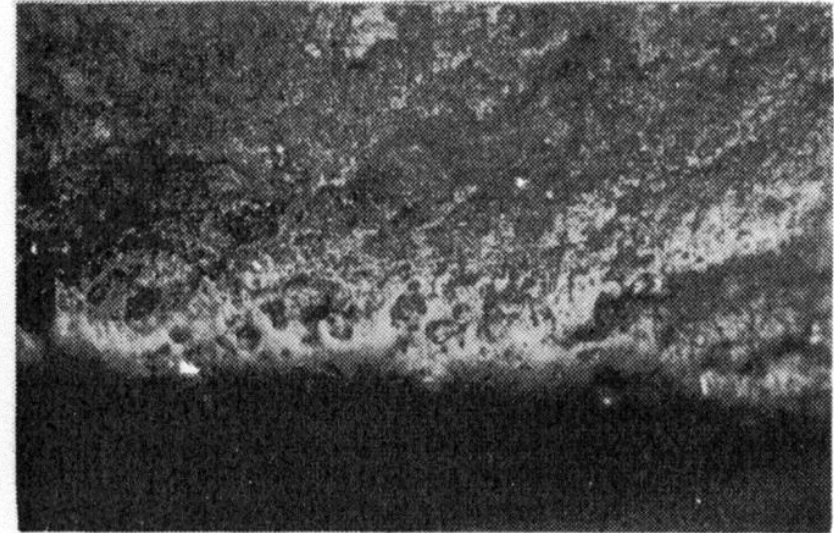
1 乾燥皮 45 分→鹿角 30 分→乾燥皮 5 分



5 乾燥皮鞣し 45 分→鹿角削り 20 分



2 乾燥皮 45 分→鹿角 30 分→乾燥皮 10 分



6 乾燥皮鞣し 45 分→鹿角削り 30 分

Experiments of microwear polishes, different worked materials used in succession.  
 1 dry hide to antler to dry hide.    5 dry hide tanning to antler whittling.  
 2 dry hide to antler to dry hide.    6 dry hide tanning to antler whittling.  
 (From Kanomata 2002, Bunka, vol.66, nos.1-2, pp.57-76)



- The Araya site was excavated originally in 1958 by Prof. Serizawa. It was well known as the type site of the “Araya type burin. The site was re-excavated in 1988 and 1989.

(From Akoshima and Kanomata, 2013, Site structure and human behavior at the Araya site, Northeastern Japan. The 16th international symposium: Suyangae and her Neighbours in Nihewan, pp.173-192. Ocean Press, Beijing).

Source of siliceous hard shale







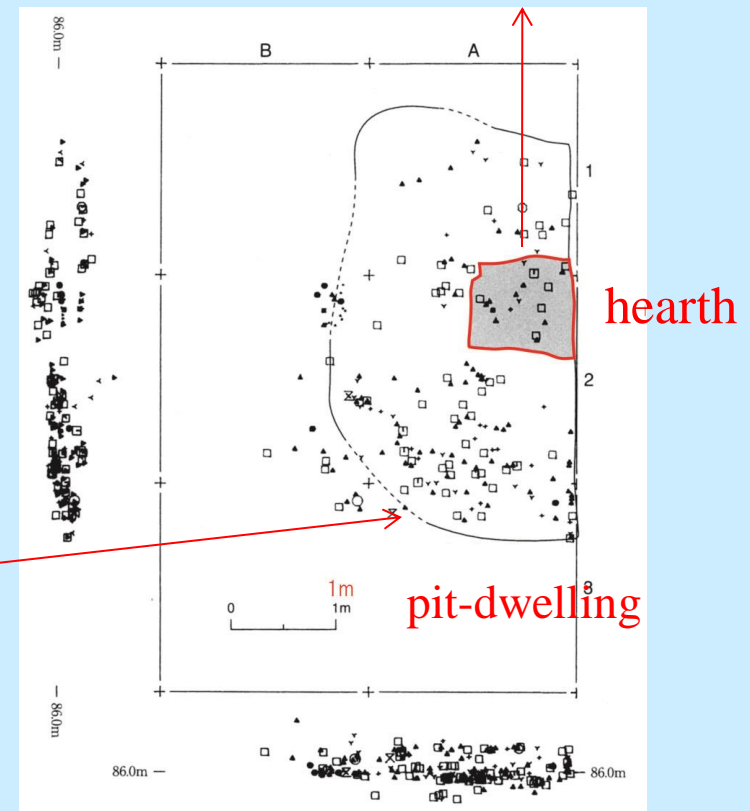
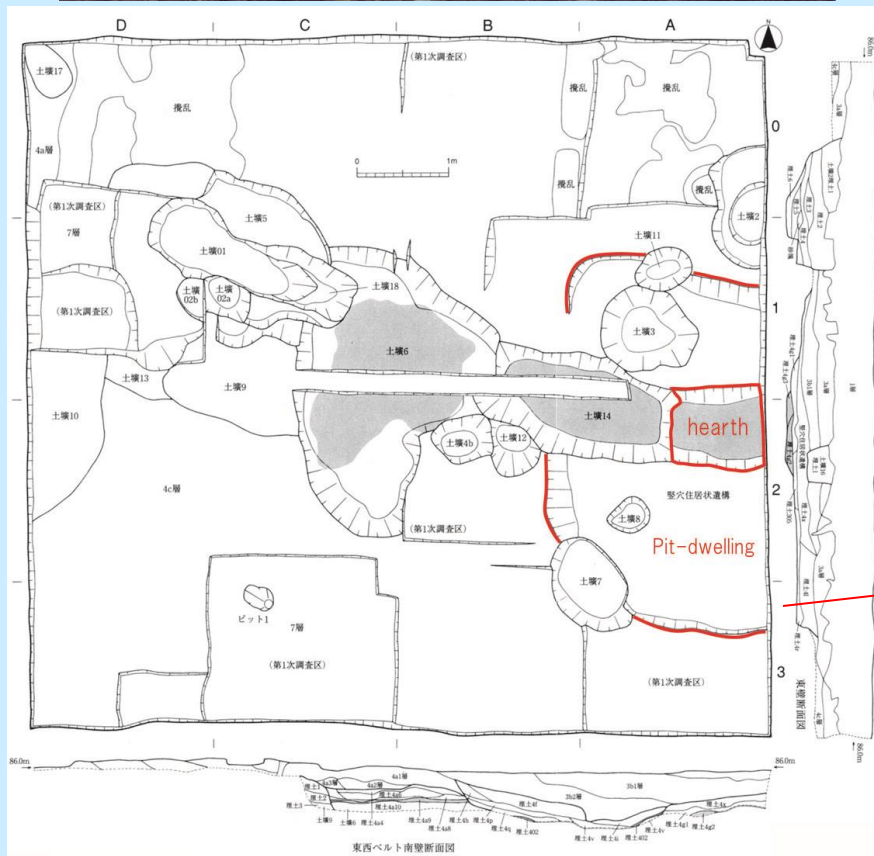
The Araya type burin conjoined with spalls.

The Araya Site, Niigata Pref.  
Northeastern Japan.

Excavation by Tohoku Univ.  
(1988 and 1989).

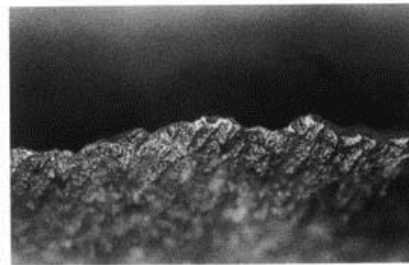
Microblade industry with burins.



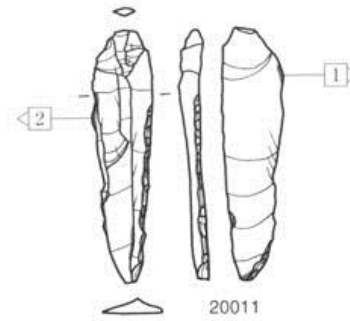


Features at the Araya site (1988, 1989) from Serizawa and Suto, ed. 2003



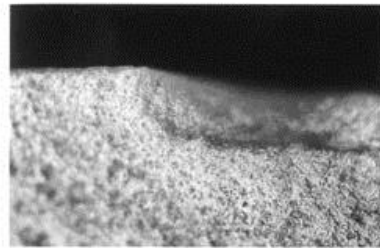


1 D1タイプ

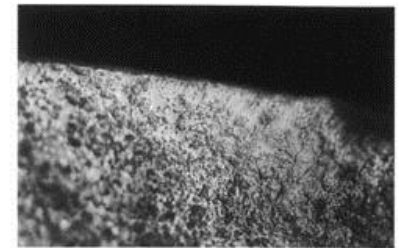
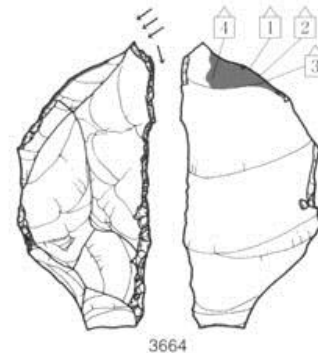


2 DIF1タイプ

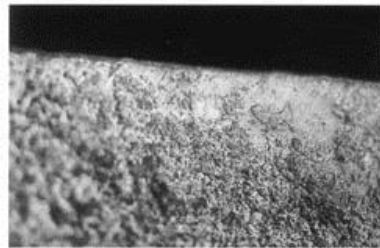
## Use-wear on a microblade (bone/antler type)



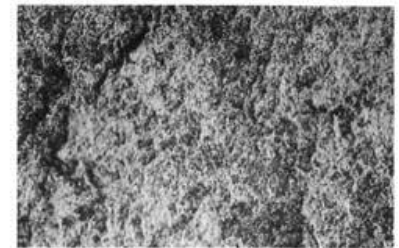
1 DIF1タイプ



2 DIF1タイプ



3 DIF1タイプ



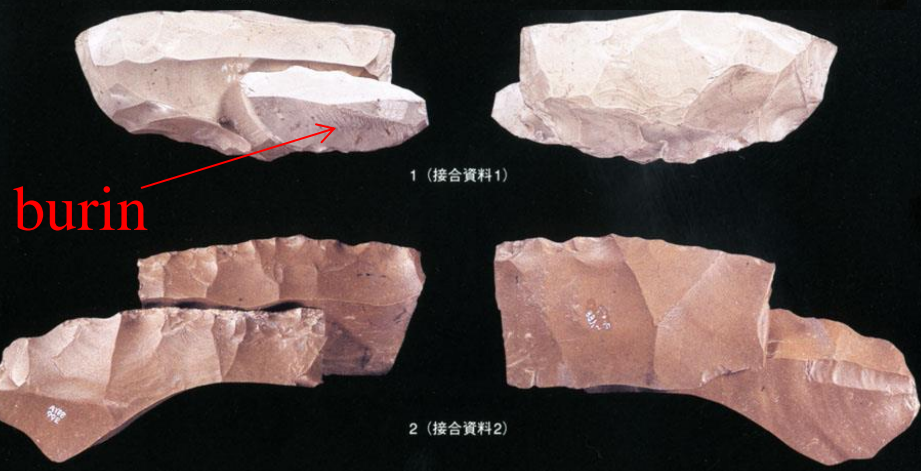
4 F1タイプ

## Use-wear on an Araya type burin (bone/antler type)



Excavation of the Araya site, Niigata Prefecture (1988) by Tohoku Univ.

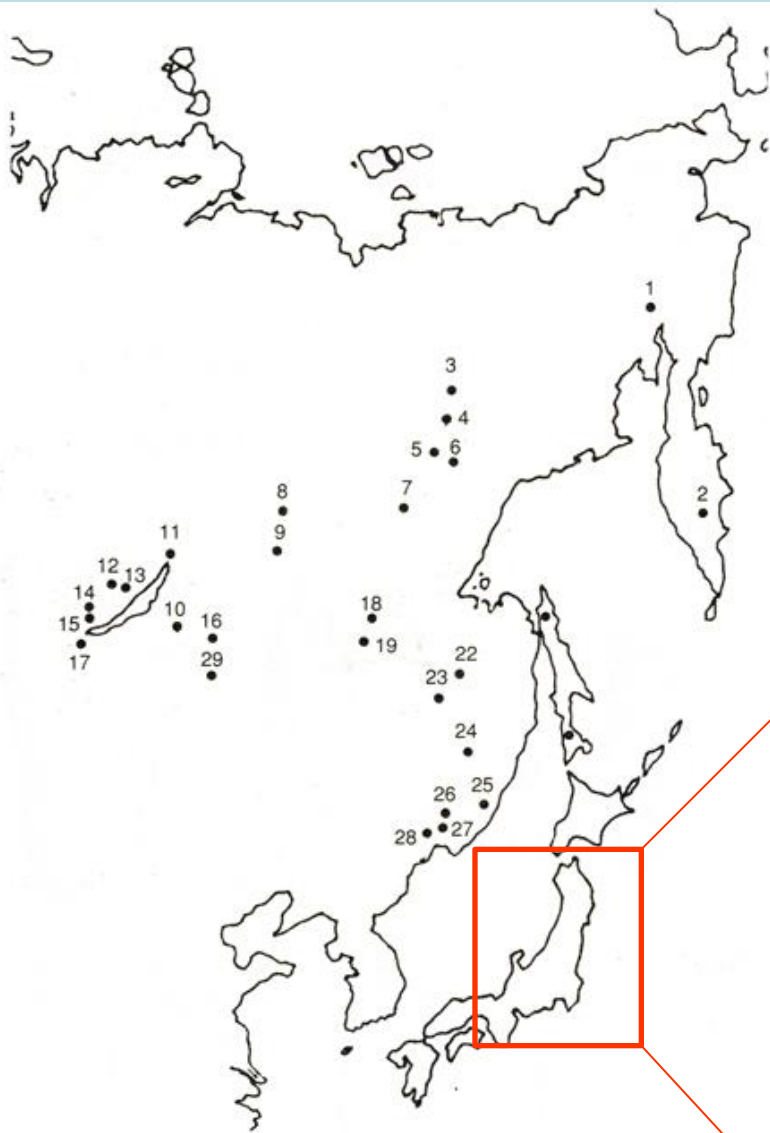




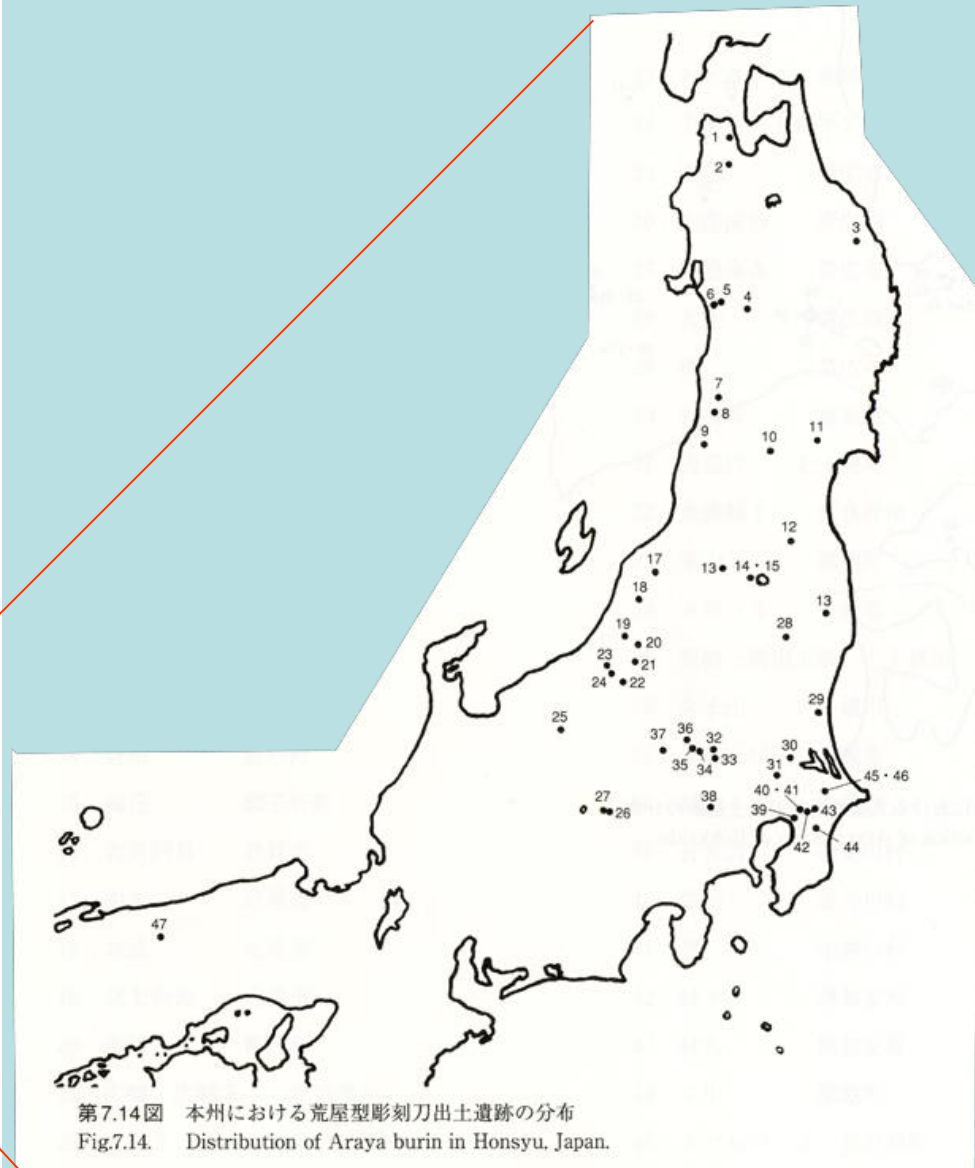
50 mm

Lithic assemblage and refits from the Araya site  
(from Serizawa and Suto 2003)





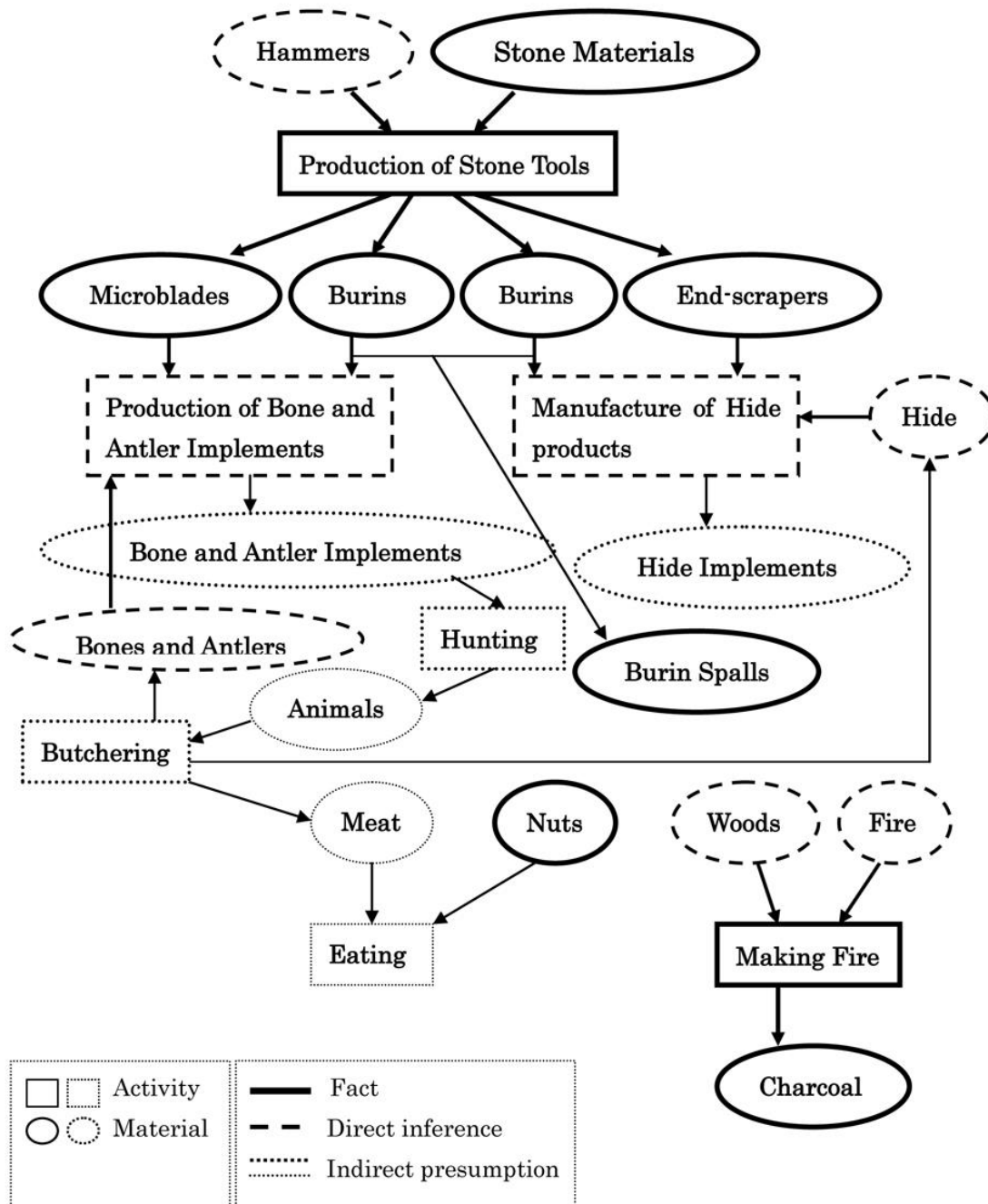
第7.17図 シベリアにおける荒屋型彫刻刀出土遺跡の分布  
Fig.7.17. Distribution of Araya burin in Siberia.



第7.14図 本州における荒屋型彫刻刀出土遺跡の分布  
Fig.7.14. Distribution of Araya burin in Honsyu, Japan.

# The Araya type burins in Northeast Asia (Serizawa 2003)

# Reconstruction of Aspects of Technological Organization at the Araya Site (from Kanomata 2007)

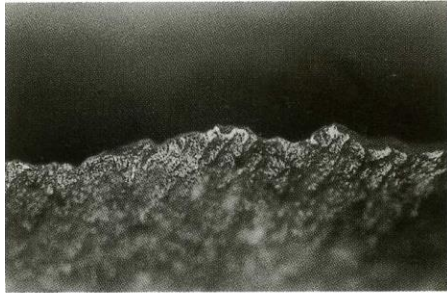


Burins from the Araya Site  
(from Serizawa and Suto, 2003, Fig. 43)

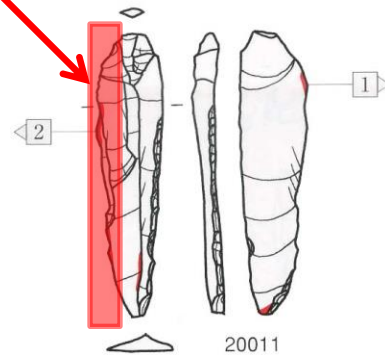


# Use-wear polish on microblades from the Araya site

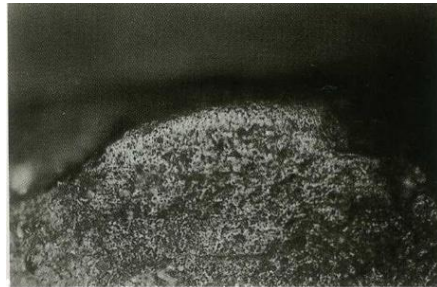
Used edge



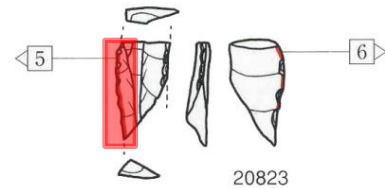
1 D1タイプ



2 D1F1タイプ



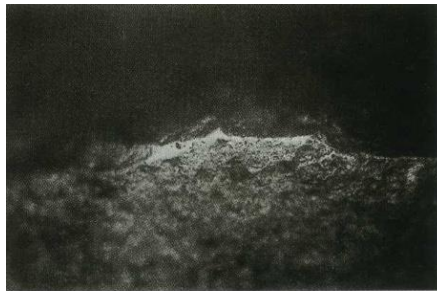
5 E2タイプ



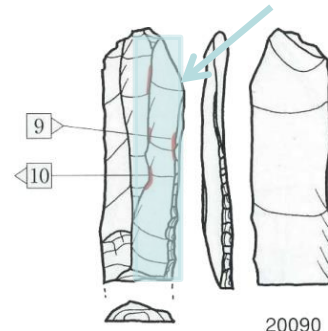
Hafted edge



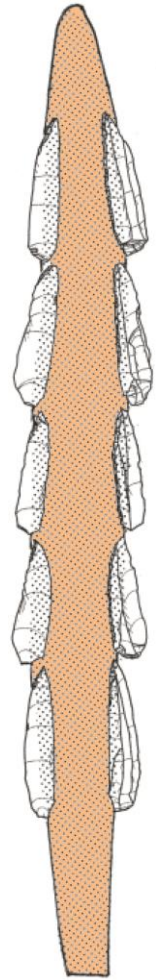
6 E2タイプ



9 1類



10 1類



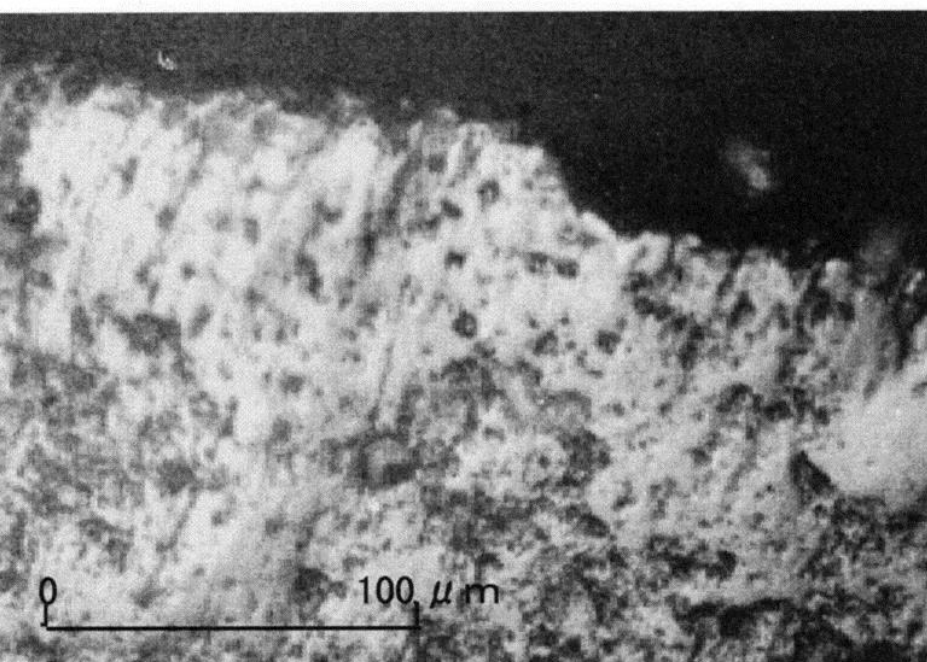
Reconstruction  
of hafting

(from Kanomata 2004)

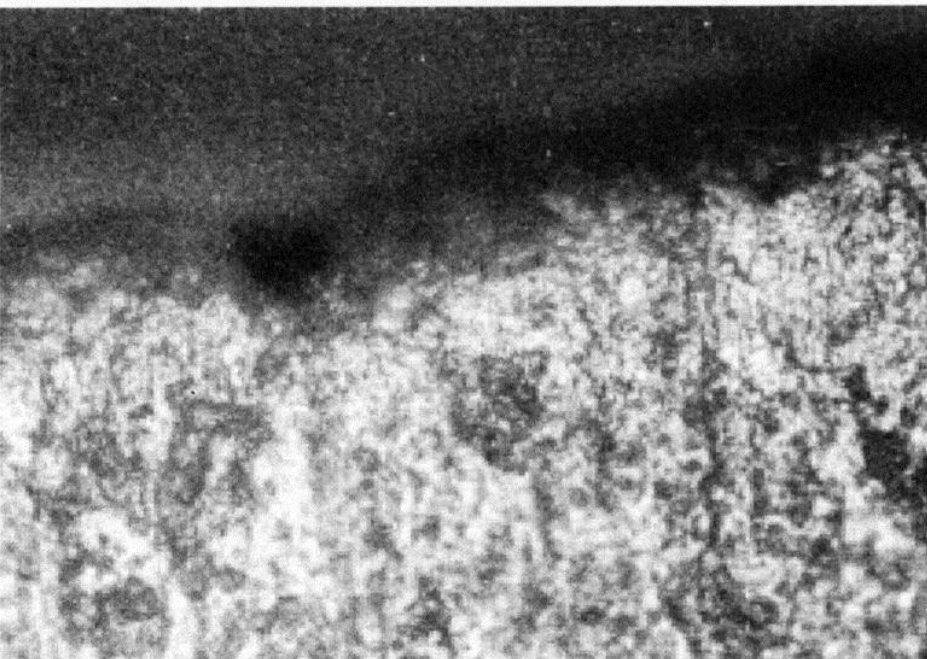
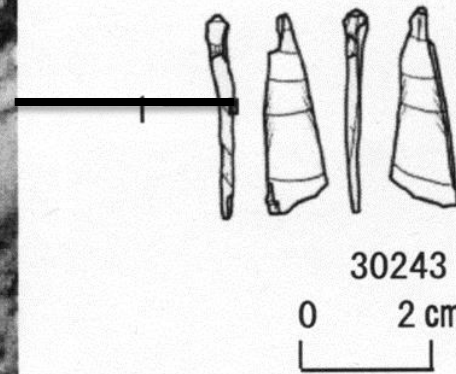
- Normal use-wear on the left side and un-usual wear on the right side.

Microwear polish on burin spalls.

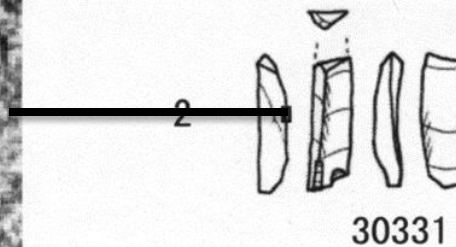
Use wear  
analyzed in terms  
of life cycle of  
stone tools, and  
“Organization of  
Technology”  
(Binford 1979)



1 彫刻刀スポール 30243 (D2C タイプ)

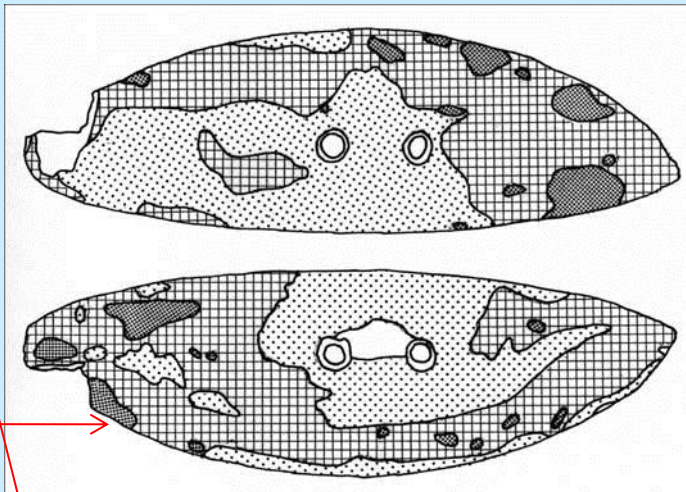


2 彫刻刀スポール 30331 (E2 タイプ)



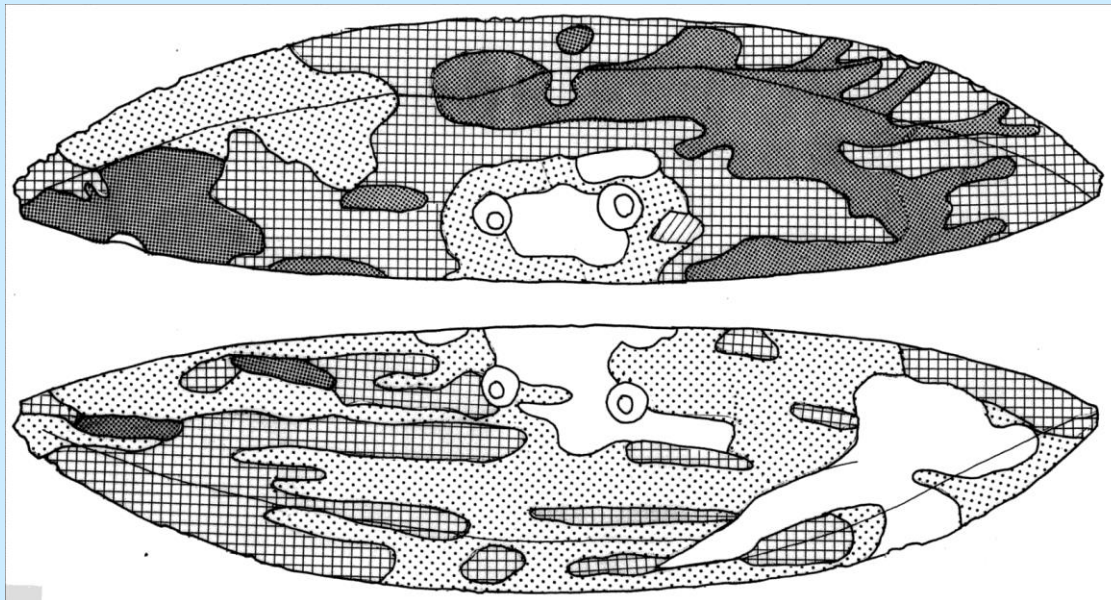
(The Araya site, Niigata pref. Kanomata 2005)





Rice reaping knives  
(the Minami-koizumi site, Sendai City)

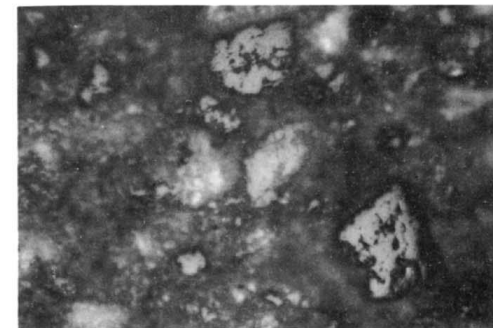
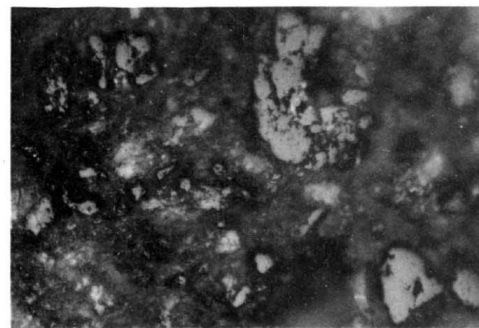
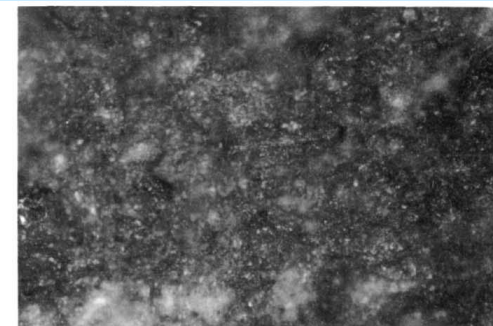
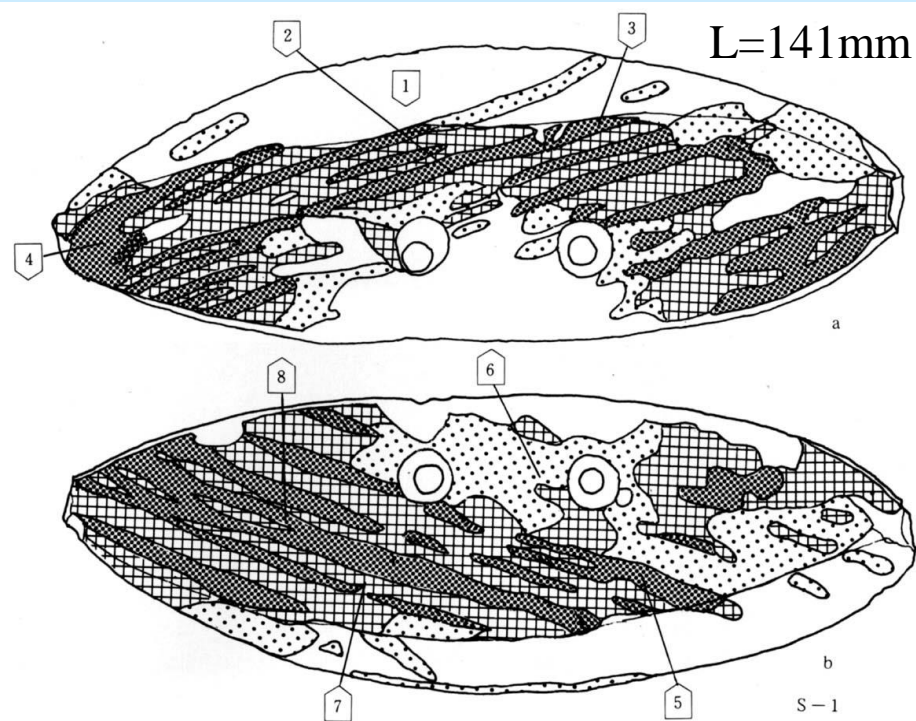
Cf. Akoshima and Aoyama, 2013, In Bulletin of  
the Tohoku University Museum, no.12, pp.77-89.



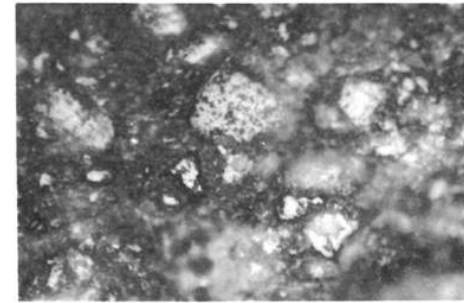
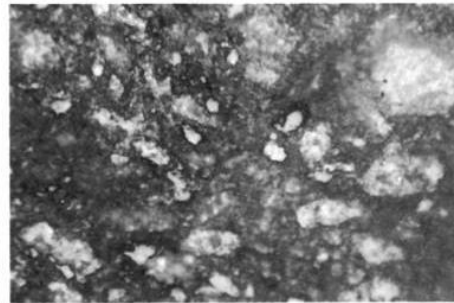
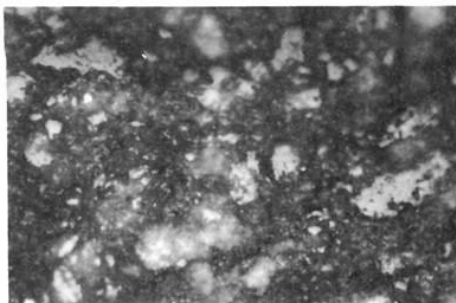
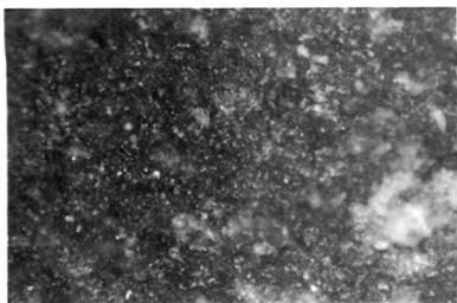
Harvest method using a slate knife,  
based on microwear evidence

Distribution of corn gloss micropolish on rice reaping knife  
the Minami-koizumi site, Sendai City





Distribution of "corn gloss" polish on a rice reaping knife of slate.  
Burial pit SK2, the Shimonouchi-ura site, Sendai city, Northeastern Japan. (From Suto and Akoshima, 1984)



Corn gloss polish patches on another reaping knife in the same burial pit

200micron



# Palaeolithic Research along the Mogami River Basin

Tohoku University, Sendai

## Marumori 1 site

- 1) 2008, August 25 – August 29
- 2) 2009, August 21 – August 31
- 3) 2010, August 21 – August 31

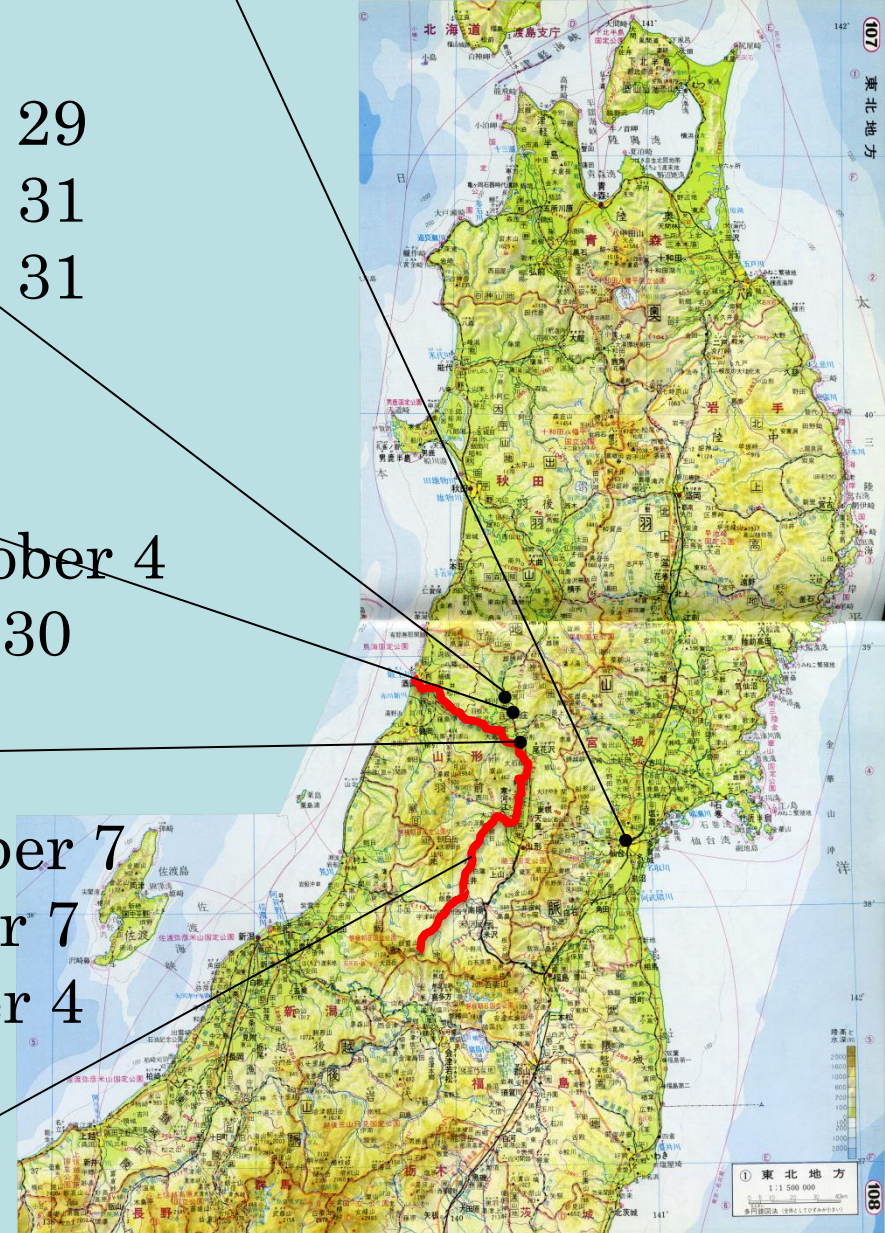
## Kamino A site

- 1) 1987, May 6 – May 16
- 2) 1991, September 21 – October 4
- 3) 2000, August 21 – August 30

## Takakurayama site

- 1) 2010, November 3 – November 7
- 2) 2011, August 27 – September 7
- 3) 2012, August 24 – September 4

**Mogami River**

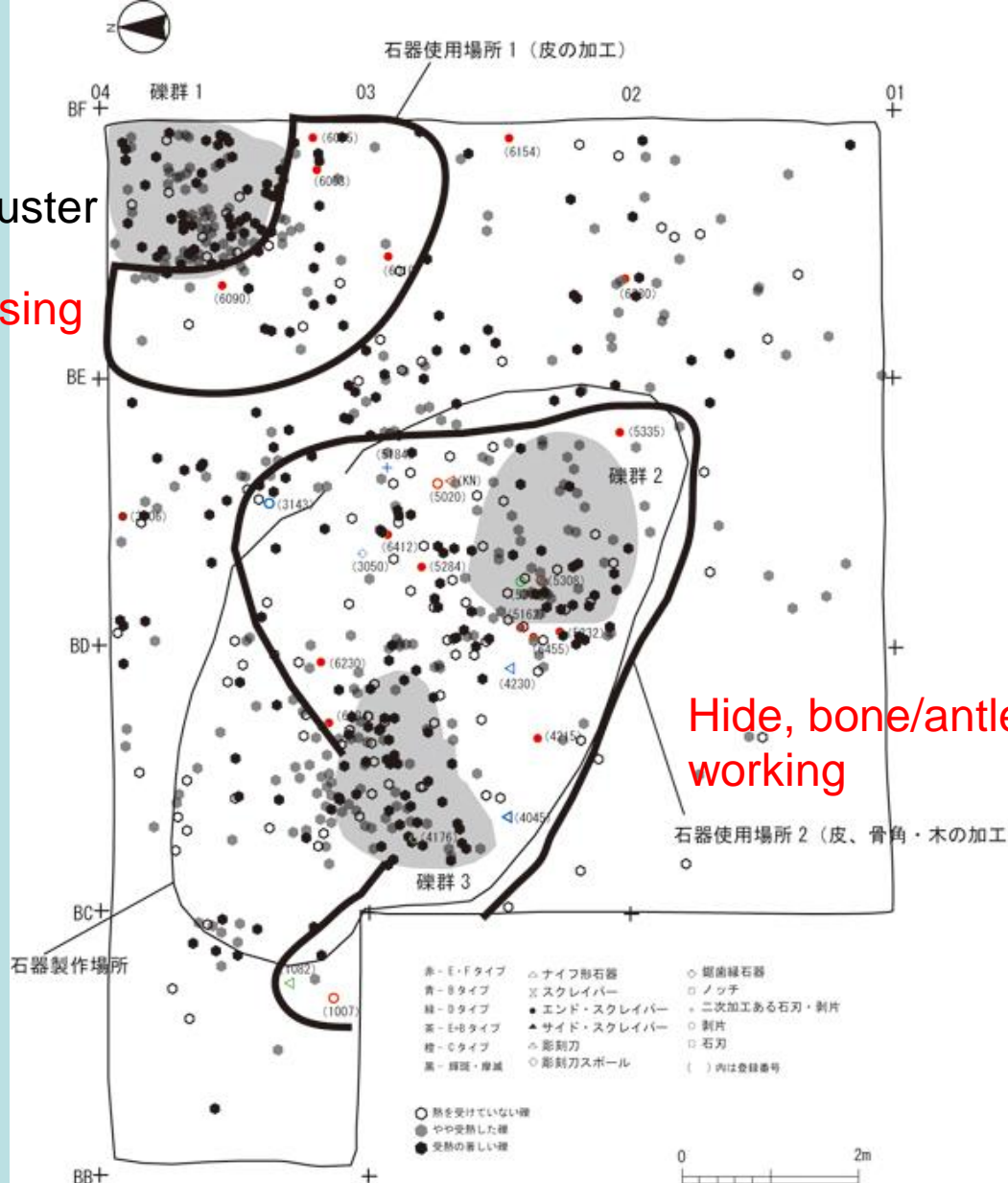


# Activity areas

Cobble cluster

Hide processing

Kamino A  
1987,1991



Hide, bone/antler, wood  
working

Studies of the Late Palaeolithic Culture in the Mogami River Basin Vol. 2

The Kamino-A site Report of the third term excavation.

Yoshitaka Denda, Tomoo Sasaki, Yoshitaka Kanomata, Kaoru Akoshima, Toshio Yanagida., 2012.

Bull.Tohoku Univ. Museum, No.11, pp.1-200



# Kamino A (2000)

## Phase A

## Phase B

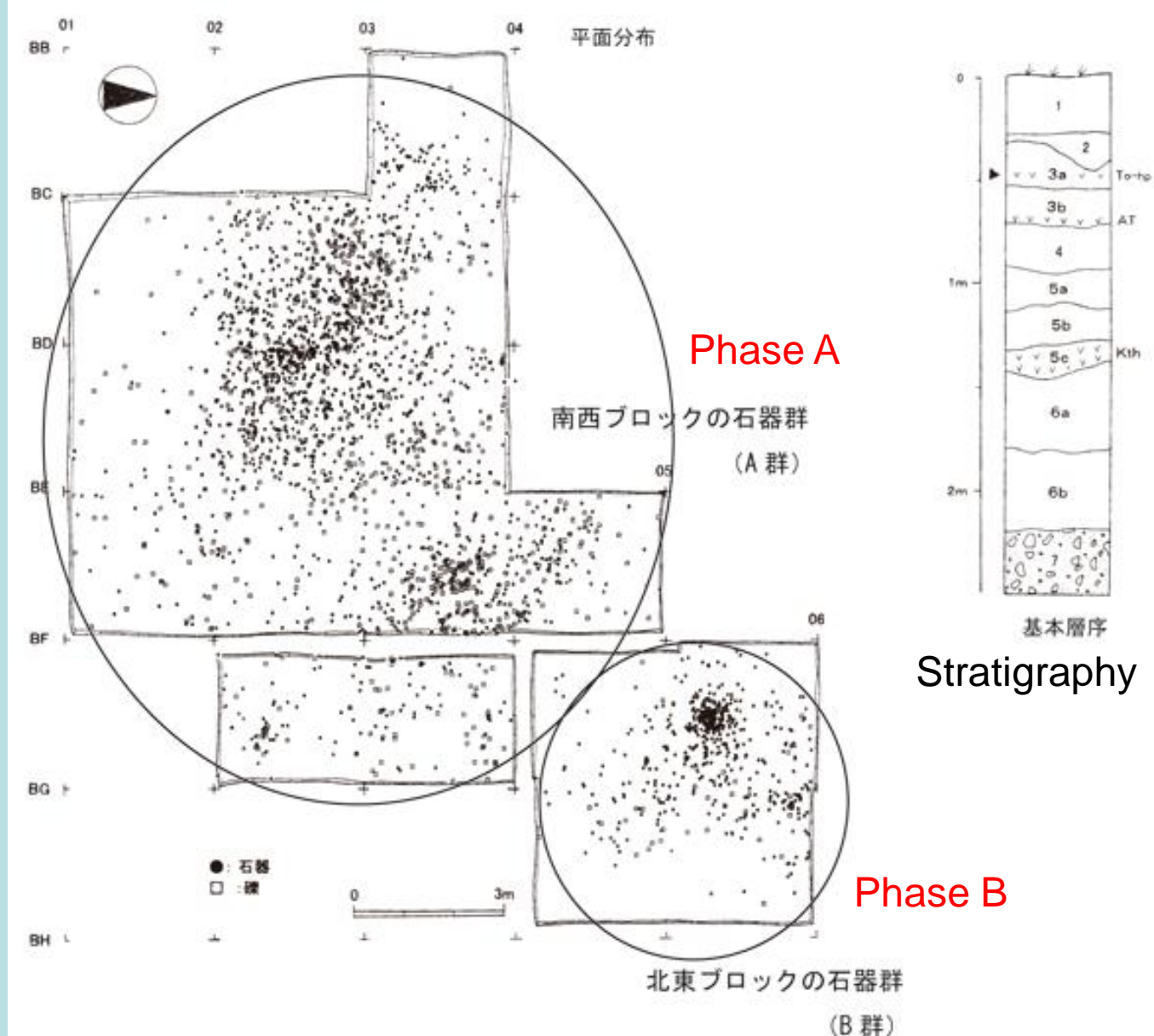


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Kamino A  
1987  
1991  
2000

Activity areas

Two phases

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