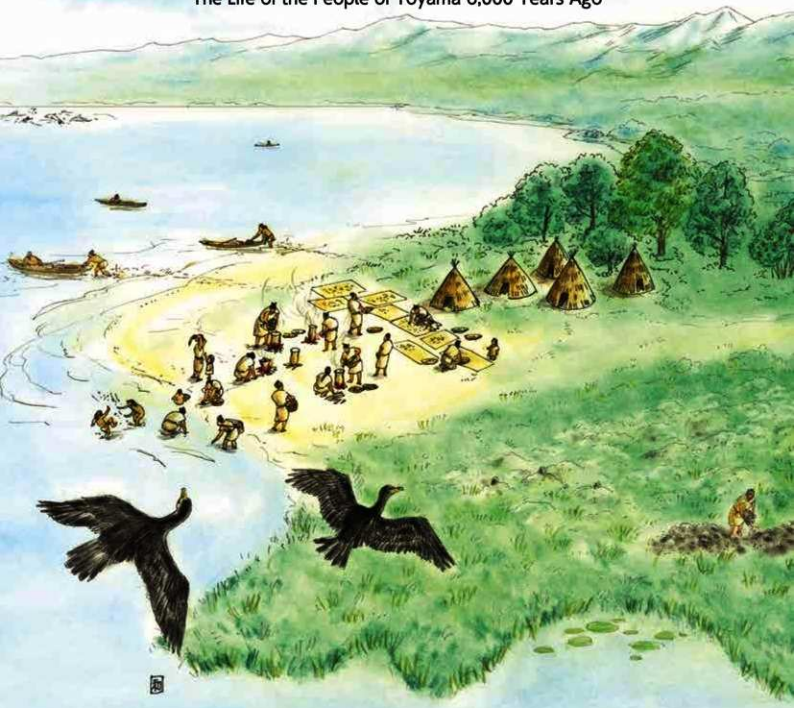
小竹貝塚

Odake Shell Midden

― 6,000年前のとやま人のくらし ―

The Life of the People of Toyama 6,000 Years Ago



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富山県埋蔵文化財センター

Toyama Archaeological Museum

Toyama Prefectural Center for Archaeological Operations

小竹ムラの暮らし
Life in "Odake-Mura"

6,000年前のある初夏の日の午後 ──

今日は朝から汗ばむような陽気です。
風もなく穏やかな日なので、ムラ人総出で朝からシジミ漁に精を出しています。
沖ではイルカが跳ねています。残雪の立山連峰がきれいです。

小竹貝塚の概要

小竹貝塚は、富山県のほぼ中央に位置する呉羽丘陵と、その北側に広がる射水平野との接点にあり、現在の海岸線から約４㎞離れた標高約３mの内陸部に位置しています。しかし、縄文時代には海水面が上昇し、貝塚のすぐそばまで潟湖（現在の富山新港）の汽水域（海水と淡水が混じり合った水域）が広がっていました。

平成21～22年度の北陸新幹線建設工事に先立つ発掘調査の結果、この遺跡は、貝塚以外にも、墓域・居住域・生産加工域などをもつ定住型の集落であることがわかりました。貝層の厚さは２mを超え、日本海側では最大級です。墓域からは、縄文時代前期としては全国最多となる91体の埋葬人骨が見つかり、木製品や骨角器なども非常に良好な状態で出土しました。

縄文時代 ……縄文時代は狩猟と採集を主な生業とした時代で、今から13,000～15,000年前から2,300～3,000年前の約1万年間続きました。

15,000　14,000　13,000　12,000　11,000　10,000　9,000　8,000

旧石器時代
Paleolithic period

縄文時代
Jōmon period

草創期
Incipient Jōmon period

早期
Initial Jōmon period

One early summer afternoon, 6,000 years ago —

The weather has been muggy since this morning.
It's a calm day with no wind, so all the inhabitants of *"Odake-mura* (settlement)" are busy tide fishing in the morning.
Dolphins are diving around offshore. The Tateyama Mountain Range's lingering snow is beautiful.

小竹貝塚の初夏の頃の復元図です。
人々はシジミ漁や漁労に精を出しています。
This is an imaginary drawing of the Odake shell midden in early summer. People are busy clam digging and fishing.

❶遠浅の内湾でシジミを採っています
Digging clams in a shallow inner bay.

❷採ったシジミを土器で煮ます
Boil the gathered clams in Jōmon potteries.

❸貝殻から身を出し、ゴザなどに広げて干します
Remove the meat from the shell and spread it out on a mat to dry.

❹貝殻をくぼ地に捨てます（これが貝塚となります）
Discard the shells in a hollow area. (This becomes a shell midden.)

❺木製品の加工場で丸木舟を作っています
Making a dugout canoe in the wood products processing area.

❻古い貝塚はお墓にも使います
The old shell middens are also used for graves.

❼丸木舟に乗り漁に出かけるところです Going fishing in a dugout canoe.

❽イルカが回遊してきました Dolphins are migrating.

❾イヌと戯れる子どもたち（この頃すでにイヌが飼われており、小竹貝塚からもイヌの墓が見つかっています）
Children playing with dogs. (Dogs were already being kept at this time, and their graves have been found in the Odake shell midden.)

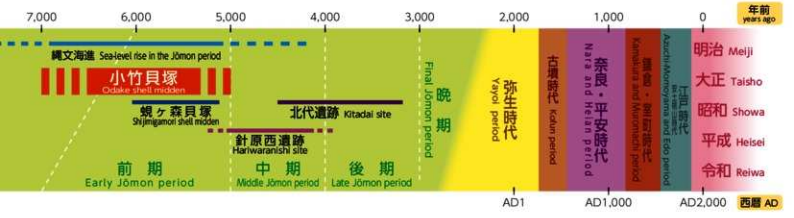
❿食用となるクリやオニグルミの木（貝塚からこれらの木の実がたくさん出ており、食料とするため集落のそばで管理されていたと思われます）
Edible chestnut and walnut trees. (Many of these nuts have been excavated from shell middens, and it is thought that they were kept near the village to be used as food.)

Summary of Odake Shell Midden (*Odake kaizuka*, 小竹貝塚)

The Odake shell midden is located some 4 km inland from the modern seacoast, at the junction of the Kureha hills (which are positioned roughly in the center of Toyama Prefecture) and Imizu Plain (which extends to their north, at an elevation of about 3 m above sea level). But in the Jōmon period, the sea level rose, and a region of brackish waters (where sea and fresh water mixed) creating a lagoon, extended very close to the midden.

As a result of the excavation prior to the construction of the Hokuriku Shinkansen in 2009-2010, it was found that this site was a sedentary settlement with a grave area, residential area, and a production and processing area in addition to the shell midden. The thickness of the shell layer exceeds 2 meters, making it one of the largest on the Sea of Japan side of Japan. In the grave area, 91 buried human skeletons were found, the most in Japan in the early Jōmon period. Wood and bone antler items were also excavated in very good condition.

※The Jōmon period was a time when hunting and gathering were people's main occupations, lasting for about 10,000 years, from 13,000-15,000 years ago to 2,300-3,000 years ago.



縄文時代の暮らし
Life in the Jōmon Period

小竹貝塚から発掘されたのは、約6,000年前の縄文時代の暮らしでした。縄文人の道具や生活の痕跡から、当時の暮らしを紐解きます。

What was excavated from the Odake shell midden is life in the Jōmon period, about 6,000 years ago. From the tools and traces of the Jōmon people's daily life, we will be able to understand how they lived at that time.

縄文海進

約6,000年前の縄文時代前期、世界的な気候温暖化により海水面が上昇し、今より4～5m高かったと言われています。富山県では現在の射水平野の範囲がほとんど水没し、潟湖（旧放生津潟、現富山新港）の汽水域が広がっていました。

この潟湖の湖岸付近には、小竹貝塚のほか、蜆ヶ森貝塚や針原西遺跡などの貝塚が立地していました。

Sea-level rise in the Jōmon period

In the early Jōmon period, about 6,000 years ago, the sea level rose due to global climate warming, and it is said to have been 4 to 5 meters higher than today. In Toyama Prefecture, the area of the present-day Imizu Plain was almost completely submerged, and the brackish waters of the lagoon (the former Hojozu Lagoon, now Toyama New Port) spread out.

In addition to the Odake shell midden, other shell middens such as the Shijimigamori shell midden and the Hariwaranishi site were located around the shore of this lagoon.

国土地理院発行の5万分の1地形図（富山）を使用
縄文海進の範囲は藤井昭二氏原案を一部改変

▲縄文時代の潟湖の様子
State of the lagoon in the Jōmon period.

小竹ムラの縄文カレンダー

縄文人の1年間の生業サイクルをまとめたものです。

春から秋にかけて、縄文人は山菜や堅果類などの植物を積極的に採取していました。エゴマやダイズ、ササゲの種実圧痕が縄文土器に残されていました。湖畔に生えるニワトコは酒の原料となっていた可能性があります。

シジミはほぼ一年中漁獲していました。潟湖や河川には、春から夏にかけて、スズキ、クロダイ、アユがやってきます。海では丸木舟に乗ってイルカを獲っていました。秋には川に戻るサケ、冬には活動が鈍くなるフナの仲間を獲っていたと考えられます。

秋から冬は陸上哺乳類に脂肪が蓄えられておいしい季節になります。冬の潟湖には多くの渡り鳥がやってきます。縄文人は自然と共生し、四季に適応した生活を送っていました。

小林達雄氏原案を一部改変

Jōmon Seasonal Calendar in *"Odake-Mura"*

This figure summarizes the annual occupational cycle of the Jōmon people.

From spring to autumn, the Jōmon people actively gathered plants such as wild vegetables and nuts. Impressions of sesame (*Perilla frutescens var. japonica*), soybean (*Glyine sp.*), and cowpea (*Vigna angularis*) were left on Jōmon pottery. It is possible that elderberry wine was brewed from the elderberries (*Sambucus racemosa subsp.sieboldiana*) that grew by the lake.

Clam digging was almost a year-round activity. From spring to summer, lagoons and rivers were filled with Japanese sea perch (*Lateolabrax sp.*), black sea bream (*Acanthopagrus sp.*), and sweetfish (*Plecoglossus altivelis*). At sea, they caught dolphins on a wooden boat. They are thought to have caught salmon, which returned to the river in the fall, and crucian carp, which were less active in the winter.

Since fats were stored inland animals from autumn to winter, it was a "Delicious season". Many passing birds came to the winter lagoon. The Jōmon people were able to coexist with nature and lived a life adapted to the four seasons.

春：山菜採り・潮干狩り
Spring: Picking edible wild plants, clam digging

夏：漁労・潮干狩り
Summer: Fishing, clam digging

秋：木の実などの採集
Autumn: Gathering nuts, etc.

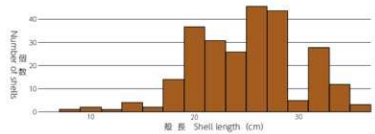
冬：狩猟
Winter: Hunting

小竹貝塚の貝層

貝層の厚さは2mを超え、南北約90m、東西約50mの範囲に広がっていたと推定されます。海水産の貝はごく少数で、大半は汽水産のヤマトシジミです。出土したヤマトシジミの殻長は20㎜を超える大粒のものが多く、成長には３～４年の年月が必要です。縄文人は、貝を採り尽くさないよう、一定の資源管理をおこなっていたことがわかります。

Shell layer of Odake Shell Midden

The thickness of the shell layer is estimated to have been more than 2 m, extending to about 90 meters long north to south and about 50 m east to west. Only a few shells are produced in seawater, and the majority are Shijimi clams (*Corbicula japonica*) from brackish water. Most of the excavated Shijimi clams are large, with shell lengths exceeding 20 mm, and require three to four years to grow. It is clear that the Jōmon people managed their resources in a certain way so as not to dig up all the shellfish.



▲ヤマトシジミの殻長分布
Distribution of shell length in the Corbicula japonica.

▲貝層の堆積状況　Thick deposit of shells.

▲現生シジミ（左）と小竹貝塚出土ヤマトシジミ（右）
The current Shijimi clams (left) and the Corbicula japonica excavated from the Odake shell midden. (right)

小竹貝塚のイルカ漁

日本近海には数多くの海棲ほ乳類が生息しており、小竹貝塚からはカマイルカやマイルカ属を主体として、ハナゴンドウ、ハンドウイルカ、シャチなどの骨が出土しています。鰭脚類では、現在は絶滅したニホンアシカもいます。

石器の先端が突き刺さったイルカ類の肋骨は、イルカ漁を直接的に示すものです。石器の刺さり方から、イルカの脇腹が水上に出た時に刺されたと考えられます。イルカを浅瀬や漁網に追い込み、槍や弓矢で狩ったのでしょう。

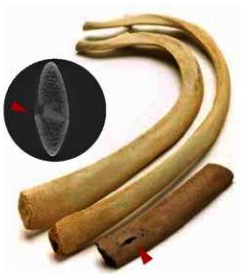
またイルカの骨には胴体を解体した痕跡が見られ、分割されたヒレ周辺の部位にはイヌの噛み跡が残っていました。縄文人は捕らえたイルカを解体し、その一部を飼っていたイヌに与えたと考えられます。

Dolphin fishing in Odake Shell Midden

A large number of marine mammals live in the seas around Japan, and bones of risso's dolphins, bottlenose dolphins and killer whales have been excavated from the Odake shell midden, mainly in the Pacific White-Sided Dolphins and Short-Beaked Common Dolphins. In pinnipeds, the now-extinct Japanese Sea Lion has also been found.

The presence of dolphin ribs pierced by the tips of stone tools is a direct indication of dolphin fishing. It is thought that the dolphin's flank was stabbed by a stone tool when it went above water. The dolphins were probably driven into shallow water or fishing nets and hunted with spears or bows and arrows.

There were also dismantling marks on the dolphin bones and dog bite marks on the parts around the split fins. It is thought that the Jōmon people dismembered the dolphins they caught and fed some of them to the dogs they kept.



▲石器が刺さったイルカ類の肋骨とそのCT画像
A dolphin rib with a stone tool lodged in it and its CT image.

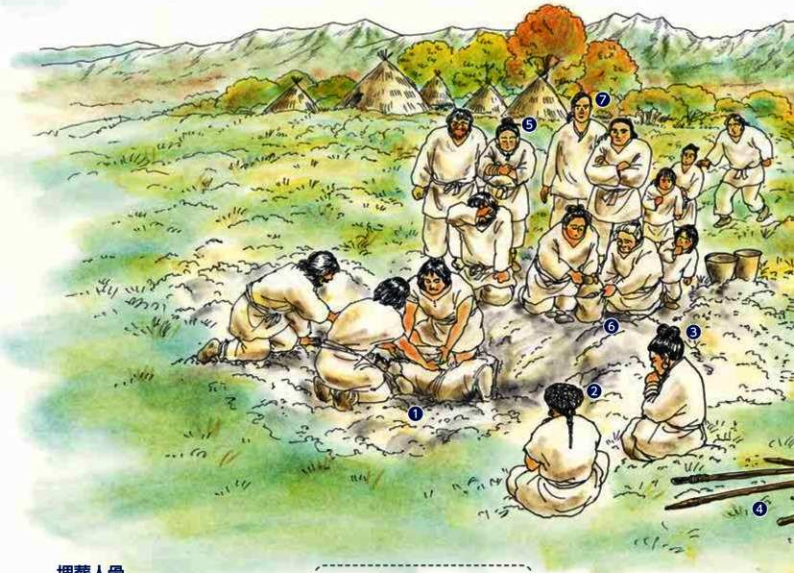
手前の1点が小竹貝塚出土資料、奥は現生標本。石器は石鏃か小型の尖頭器の先端部と考えられます。

The bone in the foreground is from the Odake shell midden, and bones in the background are living specimens. The stone tool is thought to be a stone arrowhead or the tip of a small point.

埋葬の風景
Burial Scene

ある秋の日の午後 ―

今日はムラのリーダーのお葬式。多くのムラ人が最後のお別れにやってきました。
安らかに眠れるように願ってか、胸の上に石を置きます。
生前使っていた石斧も一緒にお墓に入れます。
これからもここから私たちを見守って下さい。

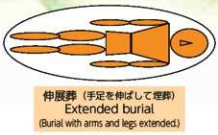


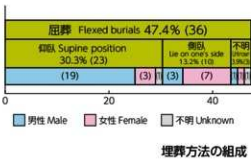
埋葬人骨

91体の人骨の埋葬方法は、手足を折り曲げた屈葬が大半で、体を伸ばした伸展葬が1体、この他、新生児を埋葬した土器棺葬が4例あります。

副葬品には男女差があり、男性では磨製石斧や牙玉、骨角製刺突具など強さを象徴する道具が、女性では玦状耳飾（けつじょうじかざり）や骨角製垂飾、鳥骨製管玉など装身具が主でした。これは縄文人の物の所有観を知る上で重要です。

埋葬人骨は青年期（10代後半～20代）が最も多く、体格や顔つきなど外見もさまざまなことから、他地域との交流が考えられます。





埋葬方法の組成

One autumn afternoon —

Today was the funeral of the chieftain. Many people came to pay their last respects.
A stone is placed on his chest, perhaps in the hope that he will rest in peace.
The stone axe that he used before his death is also placed in the grave.
Please continue to watch over us from here.

埋葬時の復元図です。膝を曲げ胸の上に石を置く抱石葬の状態で埋葬されています。
This is a reconstruction of the burial. He was buried with his knees bent and a stone placed on his chest.

❶遺体を埋葬しているところ　Burying a body.
モデルは12号埋葬人骨（中年男性）で、磨製石斧と石匙が副葬されていました。
The model is skeleton No.12, middle-aged man. Several polished stone axes and a tanged scraper were buried with him.

❷三つ編みの女性　Woman with braids.
富山市八尾町の長山遺跡出土のお下げ髪の土偶がモデルです。
The model is a clay figurine with pigtails excavated from the Nagayama site in Yatsuo Town, Toyama City.

❸玦状耳飾（けつじょうみみかざり）をした女性　A woman with slit stone earrings.

❹墓穴を掘った道具（掘り棒・横斧）
Tools used for digging graves. (digging sticks, stone axes)

❺垂飾をつけた女性　A woman wearing a pendant.

❻副葬品の石斧等を袋に入れている
Putting stone axes and other relics in a bag.
副葬品はかたまって出土していることから皮などの袋に入れて副葬したと考えられます。
Since the grave goods were excavated in clusters, it is thought that they were buried in leather bags.

❼牙玉を身につけた男性　A man wearing a fang pendant.

石匙（携帯用のナイフ）
Tanged scraper with retouched knob-like grips

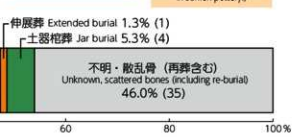
お下げ髪の土偶
（長山遺跡出土）
Clay figurine with pigtails

玦状耳飾
（縄文時代のピアス）
Slit stone earring

牙玉
（ツキノワグマの犬歯）
Fang of a moon bear

再葬
（再び掘り出して埋葬）
Re-burial
(Digging up and burying again.)

土器棺葬
（新生児を土器に入れて埋葬）
Jar burial
(Newborn baby was buried in Jōmon pottery.)



( )内は個体数、総数＝76 個体
( ) is the number of persons, seventy-six in total.

Composition of burial methods.

Buried skeletons

A flexed burial with the arms and legs folded was the method of interment for the majority of the 91 human skeletons. In addition, there were one extended burial and four jar burials of new born babies.

There were differences based on sex for the grave goods, with items symbolizing strength for males; such as polished stone axes, beads made from tusks, or thrusting implements of bone or antler, and personal ornaments for females; such as slit stone earrings or pendants of bone and antler or bird bone beads. This is important in understanding the Jōmon people's view of object ownership.

The greatest number of interred skeletons were of youths (late teens to twenties). Because of the variety in their appearance, such as size and facial features, interactions with other regions may possibly account for this.

多様な埋葬人骨
Various Skeletons

小竹貝塚の男女比は、女性18体、男性35体、不明28体で、男性の方が女性の2倍程多い人口構成でした。死亡年齢は青年が16体と最も多く、次いで中年10体、老年8体と続きます。若くして亡くなった青年や子どもも多く、かなり厳しい環境で生活していたようです。

埋葬と改葬（12・13号人骨）

12号人骨は中年男性で、砥石を抱石とする仰臥屈葬の状態で見つかりました。埋葬風景復元図のモデルです。副葬品には大小7本の磨製石斧があります。12号人骨の上には改葬された13号人骨（中年男性）があり、左上には周産期人骨を納めた4号土器棺も埋葬されています。

Buried and reburied skeletons (Nos.12 and 13)

Skeleton No.12, a middle-aged man, was found in a supine position with a large whetstone on his chest. He is the model for the "Burial Scene". Seven polished stone axes, large and small, were buried together with him. Above skeleton No.12 is a reburied skeleton, No.13 (a middle-aged male), and jar No.4 containing a new born baby or a stillbirth, was found buried to the north.

▲12・13号人骨と4号土器棺
Skeletons Nos.12,13 and jar No.4

28号人骨の復顔（監修：国立科学博物館）

28号人骨は、15～29歳の男性で、推定身長は157.3cmと考えられます。これは縄文時代の男性の平均的な身長です。彫りの深い顔立ちで鼻筋が通っており、吊り目がちで、精悍な印象を受けます。頬骨が張り、顎が細く、縄文時代早期の人々の特徴が見られます。また上顎の左右の側切歯を生前に抜いています。風習的な「抜歯」であれば、全国的に見ても最古級の事例となります。

Facial reconstruction of skeleton No.28
(supervised by the National Museum of Nature and Science)

Skeleton No.28 was a man who stood 157.3 cm tall and was between 15-29 years of age. This is the average height of a man in the Jōmon period. He has a chiseled face, a well-developed nose, and hanging eyes that give him a sharp look. Taut cheekbones and a narrow chin were characteristic of people from the earliest Jōmon period. He had his right and left maxillary lateral incisors pulled before he died. If it was a customary "tooth extraction," that would make it one of the oldest cases in Japan.

▲復顔された28号人骨
Skeleton No.28 with reconstructed face.

◀28号人骨　Skeleton No.28

仰臥屈葬で、頭のそばから副葬された可能性がある作りかけの石斧が見つかりました。ほぼ全身の骨が解剖学的位置を保っており、特に顔面の骨がきれいに残っていたため、頭骨からの復顔が可能となりました。

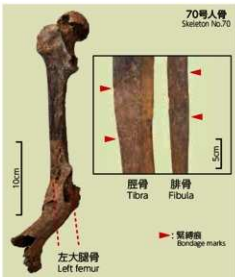
He was buried in a supine flexed position and a pre-made stone axe that may have been buried with him was found near his head. Almost all of his bones remained in their anatomical positions, especially the facial bones, which made it possible to reconstruct his face.

The sex ratio of the Odake shell midden people was 18 females, 35 males, and 28 unknowns, with about twice as many males as females in the group's population. Their age of death was highest in adolescence (16), middle age (10), and old age (8). Many people and children died at a young age, and it seems that they lived in a very harsh environment.

怪我と治癒（70号人骨）

老人男性です。磨製石斧や石匙、石鏃、骨角製刺突具など多様な副葬品が体の脇からまとまって出土しました。左大腿骨(太もも)に、大きな変形性治癒骨折が見られます。左の脛骨(すね)と腓骨(ふくらはぎ)に溝状の変形が確認できるので、骨折して動かなくなった足を折り曲げて強く縛り、生活していたようです。大怪我をした後、周囲の助けを得て、治療と看護を受けていたことを意味します。

▲70号人骨　Skeleton No.70



▲変形性治癒骨折と骨に残る緊縛痕

Osteoarthritic healed fractures and bondage marks on bones.

Injury and Healing
(Skeleton No.70)

This is an old man. A variety of grave goods such as polished stone axes, stone scrapers, stone arrowheads, and thrusting implements of bone or antler were excavated from the side of his body. There is a large deformed healing fracture of the left femur. Grooved deformities can be seen on the left tibia (shin) and fibula (calf), suggesting that the patient had been living with the fractured leg bent and tightly bound. It means that after he was badly injured, he was treated and nursed with the help of others.

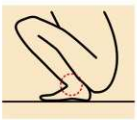
小竹ムラの人々の生活習慣と生業

① 蹲踞姿勢

お尻を地面に付けずにしゃがむ姿勢です。下半身の関節や足首の骨に負荷がかかり、常習すると骨に変形が現れます。小竹貝塚の人々全員の距骨（くるぶしの骨）に変形が認められ、常に蹲踞姿勢をとっていた集団だったと考えられます。

② 頭上運搬

小竹貝塚出土人骨17体で、頭蓋骨の頭頂部付近のブレグマ部と呼ばれる部分に骨肥厚が見られました。これはつむじ付近に負荷がかかって変形し、厚みを持った状態です。重い荷物を頭上に乗せて運搬する風習があったと考えられます。

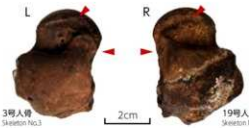


◀蹲踞姿勢

Squatting posture.

足首が強く屈曲し、負荷がかかります。

The ankle flexes strongly and takes a load.



▲距骨の変形　Deformation of the talus.

Lifestyle and livelihood of the inhabitants of *"Odake-Mura"*

① Squatting posture

This is the posture of squatting without putting your buttocks on the ground. It puts a lot of stress on the joints of the lower body and ankle bones, and with regular use, deformities appear in the bones. The talus bones (between the lower leg and heal bone) of all the people in the Odake shell midden are deformed, suggesting that the group was always in a squatting posture.

② Overhead transport

Seventeen human skeletons excavated from the Odake shell midden showed bone thickening in the bregma area near the top of the skull. These are deformities of the bones due to loads applied near the top of the head. It is thought that there was a custom to carry heavy cargo on one's head.

◀ブレグマ部の骨肥厚

Bone thickening in the bregma area.

骨増殖が見られ、表面が多孔質化しています。

Bone proliferation is observed, and the surface is porous.

骨の科学分析
Scientific Analysis

最新の科学技術を用いて骨を分析し、小竹貝塚人の解明に挑みます。

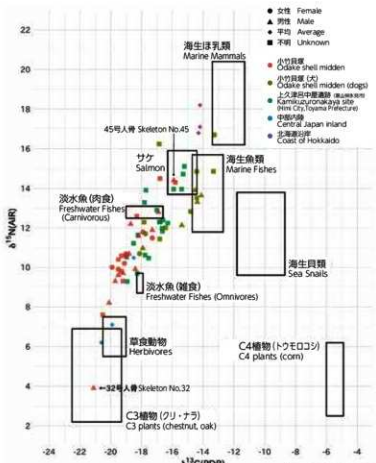
Using the latest scientific technology, we analyze the bones and try to understand the Odake shell midden people.

炭素・窒素安定同位体比による食性復元

骨に残存するコラーゲンの炭素・窒素同位体比を測定し、これを構成するアミノ酸の由来を推定する分析です。その個体が生前何を食べていたのか、大まかな食生活がわかります。

人骨の分析結果から、小竹貝塚の人々は陸上生態系と海洋生態系の両方を摂取していたものの女性よりも男性の方がばらつきが大きく、男性の中には食生活が明らかに他と異なる人もいたことがわかりました。

小竹貝塚からは埋葬された犬の骨も見つかっています。当時、犬は狩猟犬として飼われていた可能性があり、犬の噛み跡が残るシカやイノシシの骨もたくさん出土しています。しかし埋葬犬の骨も分析したところ、人と似た食性の犬もいれば、人よりも海洋資源に依存した犬もいたことがわかりました。分析結果から、狩猟対象の陸上動物ばかりを食べていたのではない犬の姿が明らかになりました。



◀データは覚張隆史氏提供
富山県埋蔵文化財センター編『MAIBUN小竹貝塚研究プロジェクトVol.3』掲載図をもとに作成

▲炭素・窒素安定同位体比分析

Carbon and nitrogen stable isotope ratio analysis.

女性よりも男性の方に大きな個体差が見られます。32号人骨はC3植物に依存し、45号人骨は海産物を多く摂取する生活をしていました。長期間にわたる移動や他地域との交易など、縄文社会のあり方も検討できる可能性を持っています。

Greater individual variation is seen in males than in females. Skeleton No.32 depended on C3 plants, while skeleton No.45 lived a life with a high intake of marine products. This also gives us the potential to examine the nature of Jōmon society, such as long term migration and trade with other regions.

Recovery of food properties by carbon and nitrogen stable isotope ratios

This analysis measures the carbon and nitrogen isotope ratios of collagen remaining in the bones and estimates the origin of the amino acids that make up this collagen. It shows what the individual was eating before he or she died, and the general diet.

The results of the analysis of human bones show that although the people of the Odake shell midden consumed both terrestrial and marine ecosystems, there was greater variation among males than females, and some males had diets that were clearly different from others.

The bones of a buried dog were also found in the Odake shell midden. It is possible that dogs were kept as hunting dogs at that time, and many bones of deer and wild boar with dog bite marks have been excavated. However, when the bones of buried dogs were also analyzed, it was found that some dogs had a similar diet to humans, while others were more dependent on marine resources than humans. The results of the analysis revealed that the dogs were eating more than the terrestrial animals they were hunting.

◀10号犬骨

イノシシやシカなどの食べられた動物の骨はバラバラに出土しましたが、イヌの骨は解剖学的位置を保って出土しました。イヌは縄文人に飼われ、死亡すれば埋葬されたのです。

▲Buried dog No.10

The bones of hunted animals such as wild boar and deer were excavated in pieces, but the bones of dogs were excavated with their anatomical positions preserved. Dogs were kept by the Jōmon people and buried when they died.

ミトコンドリアDNA分析

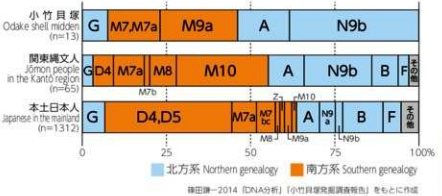
ミトコンドリアDNA（mtDNA）は細胞内のミトコンドリアにあり、母親から子どもに引き継がれる特性を持ちます。小竹貝塚人骨のmtDNA分析の結果、13個体でハプログループが決定され、遺伝的な特徴が明らかとなりました。確認された5種類のハプログループのうちN9bとM7aは、中期以降の縄文人や現代日本人の中に含まれます。これらは現代においては日本人以外にほとんど確認されないことから、小竹貝塚縄文人の遺伝的特徴が後世の縄文人や現代日本人に受け継がれていると言うことができます。

ハプログループの起源地は、N9b・A・Gは北方系、M7a・M9aは南方系と推定されます。前期縄文人が北方系、南方系双方の遺伝的特徴をすでに持っていたことが明らかになりました。

Mitochondrial DNA analysis

Mitochondrial DNA (mtDNA) is found in the mitochondria of cells and has characteristics that are passed from mother to child. As a result of mtDNA analysis of human bones in the Odake shell midden, haplogroups were determined in 13 individuals and their genetic characteristics were clarified. Of the five haplogroups identified, N9b and M7a have been found in the mid and later Jōmon and modern Japanese. Since these haplogroups are rarely identified in modern times except in the Japanese, it can be said that the genetic characteristics of the Odake shell midden people have been passed on to later generations of Jōmon people and modern Japanese.

The origin of the haplogroups is estimated to be northern for N9b, A and G, and southern for M7a and M9a. It has become clear that the people of the Early Jōmon period already possessed genetic characteristics of both northern and southern descent.



▲小竹貝塚（縄文前期）、関東縄文人（縄文中期以降）、本土日本人（現代）のmtDNAハプログループの比較

Comparison of mtDNA haplogroups among Odake shell midden (Early Jōmon), Kantō Jōmon (Middle Jōmon and later), and Mainland Japanese (Modern).

▲現代のmtDNAハプログループの分布と小竹貝塚縄文人のルーツ

Distribution of modern mtDNA haplogroups and the origin of the Jōmon people of Odake.

古代ゲノム解析

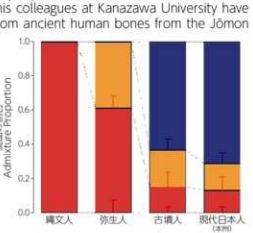
日本人は、縄文人と大陸から来た人々が混血して成立したとされてきました（二重構造モデル）。金沢大学の覚張隆史助教らが小竹貝塚の人骨4体を含む縄文～古墳時代の人骨から抽出したゲノムを解析したところ、現代日本人は、縄文人に、弥生時代と古墳時代に大陸から来たルーツの異なる人々が混血して成立したことがわかりました。これが世界で初めて明らかになった「日本人の三重構造モデル」です。

今後も小竹貝塚人骨のゲノム解析を進める予定です。その成果が日本人の成り立ちを探るための基準資料となることが期待されます。

Ancient Genomic Analysis

It has been hypothesized that the Japanese people were descended from a mixture of Jōmon and continental peoples (Dual structure model). Assistant Professor GAKUHARI Takashi and his colleagues at Kanazawa University have analyzed the genomes extracted from ancient human bones from the Jōmon to Kofun periods, including four bones from the Odake shell midden, and found that modern Japanese people came from a mixture of Jōmon people and people with different roots who came from the continent during the Yayoi and Kofun periods. This is the world's first "tri-structure model of Japanese populations".

We plan to continue our genome analysis of the human bones from the Odake shell midden. We hope that these bones will serve as a reference material for exploring the origins of the Japanese people.



▲日本人ゲノムの変遷

Transition of the Japanese genome.

さまざまな出土品
Various Excavated Relics

小竹貝塚は低湿地性貝塚のため、台地上で営まれた集落遺跡では腐ってなくなってしまう有機質の生活道具が大量に出土しました。

Because the Odake shell midden is located in a low marshy area, a large number of organic tools that would have been lost due to decay in the ruins of settlements on the plateau were excavated.

▲様々な骨角器　Various items of bone and antler

動物の骨や角・牙などを利用して、髪飾りや牙玉などの装飾品や、釣針・ヤスなどの生活用品を作っていました。

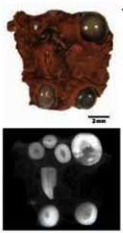
The Jōmon people used animal bones, horns, and tusks to make accessories such as hair pins and tusk pendants, as well as tools for daily life such as fish hooks and harpoons.

▲イノシシ形土製品

Wild boar-shaped clay figure

日本最古のイノシシ形土製品で、長さ7.5cm、高さ3.2cmです。胴部全体に丸い斑点が付けられており、イノシシの子ども「瓜坊」をかたどったものと思われます。多産なイノシシは、縄文人にとって豊かさの象徴だったのでしょう。

This is the oldest boar-shaped clay figure in Japan, measuring 7.5 cm in length and 3.2 cm in height. The entire body is covered with round spots, probably in the shape of a "uriboh," a child of the wild boar. The prolific wild boar may have been a symbol of fertility for the Jōmon people.



◀鯛の歯を象嵌した漆製品とそのX線透過画像

Lacquer ware (Lacaverware) inlaid with sea bream's teeth and its X-ray transmission image

竹笹類の稈(かん、中空になっている茎)を縦に割り裂いたものに漆を塗り重ねて、タイ科の魚の犬歯と臼歯を象嵌した製品です。鑑胎漆器など容器の一部である可能性が指摘されています。

This relic was made by cutting bamboo stems lengthwise, lacquering them, and inlaying the canines and molars of a sea bream. It may be part of a container such as a lacquerware basket.

縄文土器　Jōmon pottery▶

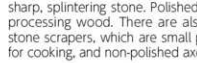
貝塚からは、たくさんの捨てられた土器が出土します。小竹貝塚から、縄文時代前期中葉～末葉の土器が出土しましたが、小竹の地で作られた在地系土器と他の地域の影響を強く受けた外来系土器があります。土器を調べることで、小竹縄文人が他地域とどのような交流や移動をしたのか推察することができます。

A lot of discarded pottery can be found in shell middens. Pottery from the middle to end of the early Jōmon period was excavated from the Odake shell midden. There are two types of pottery: those produced in the countryside and those influenced by other regions. By examining the pottery, we can infer how the inhabitants of "*Odake-Mura*" interacted and traveled with other regions.

▲石器　Stone tools

用途に適した石材を入手し、打ち割ったり磨いたりして製作しました。石槍や石鏃は鋭く割れる石材で作られた狩猟道具です。磨製石斧は樹木の伐採や木材の加工に使われました。この他にも、小型の携帯用ナイフである石匙、調理用の石皿やすり石、土掘り具の打製石斧など多くの石器があります。

Stones suitable for being used as tools were obtained, broken and polished to make them. Stone spears and arrowheads are hunting tools made of sharp, splintering stone. Polished stone axes were used for felling trees and processing wood. There are also many other stone tools such as tanged stone scrapers, which are small portable knives, querns and grinding stones for cooking, and non-polished axes for digging.



◀クルミの垂飾　Walnut Pendants

クルミの殻に穿孔や研磨を施した垂飾です。

These pendants are made from walnut shells that have been drilled and polished.

▲貝輪　Shell bracelets

貝殻に穴を空け、磨いて作った腕輪です。完成品のほか未成品もあり、小竹貝塚で貝輪が作られていたことがわかりました。貝の種類には、ベンケイガイ、サトウガイなどの他、オオツタノハ（左下）があります。オオツタノハは伊豆諸島南部と薩南諸島でのみ採れる貝で、縄文時代では太平洋沿岸の遺跡でしか出土がなく、日本海側で初めての発見例となりました。当時の交易の広さがうかがえます。

These bracelets are made by making holes in shells and polishing them. In addition to the finished pieces, there were also unfinished pieces, indicating that shell bracelets were being made at the Odake shell midden. The shells are large bivalve mollusks (e.g., *Glycymeris albolineata, Scapharca satowi*), and there is also a *Patella flexuosa optima* (lower left). *Patella flexuosa optima* is a shellfish that can only be found in the southern sea region such as Izu Islands and the Satsunan Islands. In the Jōmon period, these were only found at sites on the Pacific Ocean side of Japan, and this is the first find on the Sea of Japan side. This shows the vastness of the trading area at that time.

◀ヒスイ垂飾未成品
Jade pendant (unfinished)

ヒスイの加工品としては日本最古級の資料です。

It is one of the oldest processed jade products in Japan.

▲ヒノキの樹皮の編物
A basket woven from the bark of a Japanese cypress tree.

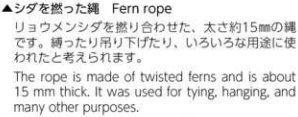
細く割り削ったヒノキ科の木の枝を芯とし、樹皮をもじり編みして作ったカゴです。

This basket is made by weaving bark around a thinly split cypress branch.

▲シダを撚った縄　Fern rope

リョウメンシダを撚り合わせた、太さ約15㎜の縄です。縛ったり吊り下げたり、いろいろな用途に使われたと考えられます。

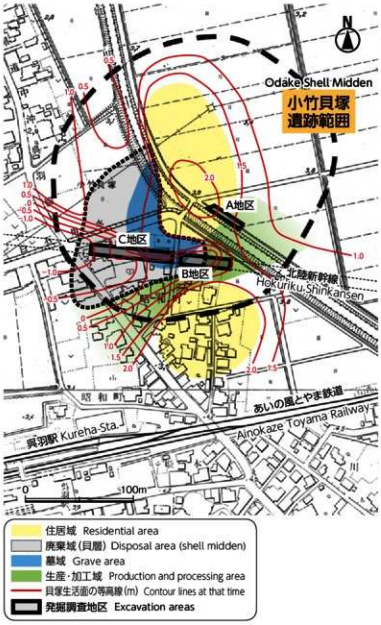
The rope is made of twisted ferns and is about 15 mm thick. It was used for tying, hanging, and many other purposes.



▲丸木舟　Dugout canoe

太いトチノキを石器で刳り抜いて作った舟です。現存長184㎝、幅60㎝を測り、全長5～6mはあったものと推測されます。波打ち際の足場に転用された状態で出土しました。

This canoe was made by hollowing out a thick horse chestnut tree with a stone tool. It is 184 cm long and 60 cm wide, and is estimated to have originally been 5 to 6 meters long. It was found in a state where it had been converted into scaffolding for the beach.



小竹貝塚周辺の土地利用

これまでの発掘調査のデータを基に周辺の微地形を復元し、遺跡内の土地利用を推定しました。

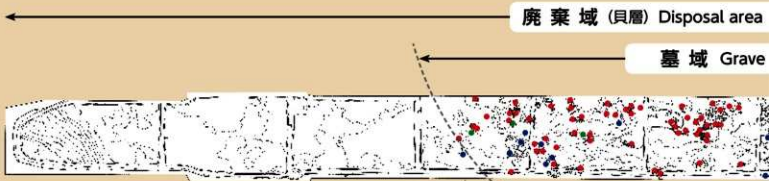
遺跡は比較的標高の高い土地が南から舌状に張り出す地形で、竪穴住居は標高の高い場所に設けられました。西側には浅い谷がのび、谷の落ち際には古い廃棄場を利用した墓域があります。墓域の外側にも廃棄域(貝塚)が広がっていました。谷の奥からは木製品などの加工場が見つかっています。

Land use around Odake Shell Midden

Based on the data from previous excavations, we reconstructed the microtopography of the surrounding area and estimated the land use within the site.

The topography of the site is that of a tongue-shaped piece of land of relatively high elevation stretching out from the south, and the pit houses were built at higher elevations. To the west is a shallow valley, and at the edge of the valley is a grave area made from an old disposal area. Outside the grave area, there was also a disposal area (shell midden). A processing plant for wood products has been found within the depths of the valley.

小竹貝塚遠景(北西から)▶
Distant view of Odake shell midden (from the northwest)
発掘調査中のB・C地区が手前に見えます。
Areas *B* and *C*, which are under excavation, can be seen in the foreground.



▲平成22年度発掘調査地区(B・C地区)遺構平面図
Plan of the archeological excavation areas in 2010 (Areas *B* and *C*)

小竹貝塚の発掘史

小竹貝塚は昭和20年代にその存在が推定され、当時、呉羽中学校教員であった高瀬保氏らによりその存在が確認されました。初期の調査には地元の方をはじめ、呉羽中学校の生徒達も協力しています。

平成22年度の調査以外でも9体の人骨が出土し、現時点では合わせて100体の人骨が出土しています。

主な調査

年代	調査内容
昭和20年代 (1945-55)	海老江久良氏が踏査で貝塚の存在を確信
昭和33年 (1958)	高瀬保氏が北陸電力の高圧鉄塔建設工事中の出土遺物について聞き取り
	高瀬氏が猪島吉安氏らの協力を得て、呉羽中学校生徒と共に貝塚確認の試掘調査を行う
	高瀬氏が付近の民家から井戸掘削時の様子を聴取
昭和39年 (1964)	岡崎卯一氏が富山大学生・富山北部高校生と試掘調査を行う (出土遺物のC14年代測定を実施)
昭和46年 (1971)	富山県教育委員会が発掘調査を実施 (貝層と人骨1体を確認)
	吉久登氏・本江洋氏が新鍛冶川の川底で資料採取
昭和47年 (1972)	富山市教育委員会が富山大学の協力を得て、貝塚の範囲確認調査を実施
平成19年 (2007)	富山県文化振興財団埋蔵文化財調査事務所（以下、埋蔵文化財調査事務所）が北陸新幹線建設に先立つ試掘調査を実施
平成20年 (2008)	富山市教育委員会が新鍛冶川の護岸工事に先立つ発掘調査を実施（人骨・貝層・竪穴住居を確認）
平成21年 (2009)	**埋蔵文化財調査事務所が北陸新幹線建設に先立つ発掘調査を実施［A地区］（竪穴住居を確認）**
平成22年 (2010)	**埋蔵文化財調査事務所が北陸新幹線建設に先立つ発掘調査を実施［B・C地区］（貝層から91体の人骨が出土）**
平成25年 (2013)	富山市教育委員会が道水路付け替えに先立つ発掘調査を実施

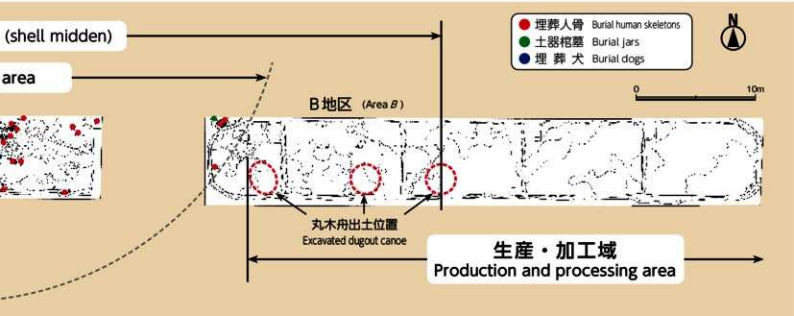
Archaeological survey history of Odake Shell Midden

The existence of Odake shell midden was first estimated around 1945 and confirmed by Mr.TAKASE Tamotsu, a teacher at Kureha Junior High School at the time, and others. Local people and Kureha Junior High School students helped with the initial surveys.

In addition to the 2010 survey, nine more human skeletons have been unearthed, bringing the total number of unearthed skeletons to 100.

Main survey

Year	Survey details
1945-55	Mr. EBIE Hisayoshi conducted a field survey and became convinced of the existence of shell midden.
1958	Mr. TAKASE Tamotsu interviewed about artifacts excavated during the construction of a high-voltage elevated line tower for Hokuriku Electric Power Company.
	Mr. TAKASE, with the cooperation of Mr. INOSHIMA Yoshiyasu and students of Kureha Junior High School, conducted a trial excavation to confirm a shell midden.
	Mr. TAKASE interviewed residents in the vicinity about what was going on when the well was drilled.
1964	Mr. OKAZAKI Uichi conducted a trial excavation with University of Toyama and Toyama Hokubu High School students. (Radiocarbon dating of excavated artifacts was conducted.)
1971	Excavations were conducted by the Toyama Prefectural Board of Education. (A shell layer and a human skeleton were identified.)
	Mr. YOSHIHISA Noboru and Mr. HONGŌ Hiroshi collected artifacts from the riverbed of the Shinkaji River.
1972	The Toyama Municipal Board of Education conducted a survey to confirm the extent of shell midden with the cooperation of the Toyama University.
2007	The Toyama Cultural Foundation, Archaeological Survey Office (hereinafter referred to as the Archaeological Survey Office) conducted a trial excavation survey prior to the construction of the Hokuriku Shinkansen.
2008	The Toyama Municipal Board of Education conducted an excavation survey prior to the construction of the Shinkaji river revetment. (Skeletons, shell layers, and pit houses were confirmed.)
2009	**The Archaeological Survey Office conducted excavations prior to the construction of the Hokuriku Shinkansen. [Area *A*] (Pit houses were confirmed.)**
2010	**The Archaeological Survey Office conducted excavations prior to the construction of the Hokuriku Shinkansen. [Area *B/C*] (91 human skeletons were unearthed from the shell layer.)**
2013	The Toyama Municipal Board of Education conducted an excavation survey prior to the replacement of the road and waterway.



1 蜆ヶ森貝塚(白鬚神社) (富山市北代)
Shijimigamori Shell Midden (Shirahige Shrine)

境内の下に小竹貝塚とほぼ同時期の貝塚が広がっています。
A shell midden of about the same period as the Odake shell midden is spread out under the shrine grounds.

2 姉倉比賣神社 (富山市呉羽町地本1813)
Anekurahime Shrine

蜆ヶ森貝塚にまつわる伝説が伝わっています。
There is a legend about the Shijimigamori shell midden here.

3 北代縄文館 (富山市北代3871-1)
Toyama Kitadai Jōmon Museum

国指定史跡「北代遺跡」の展示施設です。
This is an exhibition facility for the Kitadai Site, a national historic site.

〈 TEL 076-436-3664
休館日：月曜日・年末年始 〉

5 考古学の博物館
富山県埋蔵文化財センター (富山市茶屋町206-3)
Toyama Archaeological Museum
Toyama Prefectural Center for Archaeological Operations

小竹貝塚をはじめ、県内の遺跡から発掘された出土品を**多数**、収蔵・展示しています。
This museum keeps and displays many archaeological artifacts excavated from sites in Toyama Prefecture, including the Odake Shell Midden.

〈 TEL 076-434-2814
入場無料
休館日：金曜日・年末年始 〉

4 富山市民俗民芸村 (富山市安養坊)
Toyama Municipal Folkcraft Village

郷土の自然景観と調和した建造物集落の性格を生かした歴史、民俗、民芸、美術に関する保存・活用施設です。
This is a facility for the preservation and utilization of history, folklore, folk art, and art, taking advantage of the character of the architectural village in harmony with the local natural landscape.

〈 TEL 076-433-8270　休館日：年末年始 〉

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