Literature Digest

Science

General Remarks

I need to make a few remarks to avoid getting more blame than I deserve. First I need to point out that the following list of publications is not even remotely complete. It does not contain all the relevant publications I'm not aware of. I'm an amateur after all, and can't be expected to find everything that has ever been written to the topics here. I also have not read publications that I did find but couldn't access without paying good money to some greedy journal. One must draw the line somewhere.
Then we have the publications I have read but did not find important enough to include here. I apologize for biased judgement or improper understanding of important works but that's the way it is.

General Literature

Haerinck, E.: **The Iron Age in Gullan - Proposal for a Chronology 1988**
State University, Gent, in (?): Bronzeworking Centres of Western Asia c. 1000 - 539 B.C. Edited by John Curtis available on-line.

- An important if old paper. Gets some system into the dating of finds in the Guilan region and unintentionally strengthens my point about not trusting the data from scientific digs. Haerinck doesn't either and says so in many words.
- However, his paper doesn't really contain anything about our "Leitfossilien" swords, just a little bit about double-disc hilt daggers. In a more general way, he states that iron stuff does not appear during the so-called iron age I (1500/14000 BC - 1100 BC) but most prominently during iron age III (800 BC - 600 BC)

Some quotes:

- "We have already mentioned how the extensive plundering of ancient sites in the Guilan region has caused serious - if not irreparable - loss in valuable artifacts, and by consequence, documentation, leaving us with a vast amount of material which remains unclassified and undated. This material is of much greater quantity than material found at scientifically excavated sites. It unfortunately remains unpublished, and runs the risk of never being published.
  The available reliable material is therefore quite limited. Yet even the published material may lead to confusion and a wrong interpretation of the facts. The latter possibility is particularly applicable to sites for which only preliminary reports or short notes have been published."
  Interesting! Here is my response
- "Throughout the entire Iron Age, decorative elements continued to be produced in bronze, whereas weapons were originally made of bronze in Iron Age I, continuing in Iron Age II also, although the blacksmiths experimented with bronze and iron, producing bi-metallic objects. For Iran Age III all weapons were made of iron, while decorative elements were still being made of bronze. The same phenomenon was for example also observed in Luristan. In this sense, Guilan follows the traditional pattern observed in regions of Western Iran during the Iron Age."
  For our "complex" items (=swords) this means that they appear not before 1000 BC / 900 BC; I guess.

Piller. C. K.: **Northern Iran in the Iron Age II and III: a neighbour of Urartu?**; **2010**
AJNES V/2, 2010, p. 53-75

- Investigates Uraturian influence on North Iran based on some specific finds from there and finds it rather marginal: "Moreover, it has to be said that there are almost no indications for a direct or intense contact between Urartu and Northern Iran"
- Discusses findings in several graves and supplies pictures of swords (but "from the market") and daggers, including a double-disc pommel type
- Most interesting, however, is that Piller declares bi-metallic swords in North Iran around 1000 BC as so common, that they could serve as "Leitfossil":
  "Swords of this type can have a bronze or iron blade of considerable length with a cast-on bronze hilt. Bi-metallic objects such as this have been designated as “Leitfossil” of the Iron Age II (10th to 9th centuries BC)[4]."
  The reference is to Pigott's paper right below, and *it is not correct* . The word "Leitfossil" or anything similar does not appear in Pigott's paper.

Now a few quotes from Piller's paper that relate to our subject here:

- *Page 60*
  One of the main results of Haerinck's article is the identification of a later re-use of some Iron Age I stone cist graves during the Iron Age III period. This conclusion was mainly based on his examination of the burial goods from Grave 14 at Tomadjan and a reevaluation of the well documented Japanese excavations at Ghalekuti2. The occurrence of a bronze fibula in Grave 36 at Marlik3 was also ascribed to a re-use of this late 2nd millennium stone tomb during the Iron Age III. Other authors were heavily influenced by Haerinck's ideas. For example, Löw proposed a similar re-use for quite a few graves at Marlik and classified the material from this site into two chronological periods: Iron Age I (end of the 2nd millennium BC) and Iron Age II/III (early 1st millennium BC)4. In fact, a detailed analysis of the necropolis of Marlik has proven that the vast majority of the finds very probably belong to the closing centuries of the second millennium BC. There are virtually no objects that can be securely dated to the period after ca. 1000 BC5.
  This relates directly to the paper of Haerlink (above) and essentially make a strong case about precise dating: *Forget it*. Well, it's not quite that bad but goes rather far to support my outrageous dictum No. 2 right at the beginning of this topic.
- There is an interesting paragraph about "cotton reel pommel" swords, which I give here.

Erb-Satullo, Nathaniel L.: **The Innovation and Adaption of Iron in the Ancient Near East**; **2019**;
Journal of Archaeological Research; Published oin .line 21. Feb. 2019

- A very recent and very readable review of early iron in all aspects. Covers all of the Near East and considers the South Caucasus area in detail.
  A considerable part of the paper deals with all the, shall we say: "problems" of older papers, be it the dating, the assumptions made (e.g. about "carburizations and hardening"), or the contexts used. This goes a long way to strengthen my outrageous dictum on the "home" page of this topic
  The paper contains a few maps but unfortunately no pictures. Here is the:
- **Abstract**
  This review synthesizes field research, textual analysis, and archaeometric data to evaluate different explanations for the spread of iron in the ancient Near East. Current evidence supports an Anatolian origin for extractive iron metallurgy on a limited scale sometime in the early 2nd millennium BC. However, the first major expansion of iron, both in Anatolia and across the wider Near East, occurred in the late second and early first millennium BC. Explanations that place iron adoption within its broader social context are favored over those that consider material or geological properties in isolation. A recurring theme is the importance of comparative analysis, both geographically and between the iron and bronze economies, to explore how social, political, and economic conditions affected adoption patterns.
- While the paper provides for good reading it does not help in getting more information about our "Leitfossilien" swords.

Ümit **Güder**, Marie-Henriette **Gates** and Ünsal **Yalçýn**: **Early Iron from Kinet Höyük, Turkey: Analysis of Objects and Evidence for Smithing 2017**
Metalla Nr. 23.2 / 2017, 51–65

- Not concerned with the Leitfossilien swords we are after but giving a very good and modern introduction into the development of iron technology.
- Iron workshops (i.e. smithies) were found and investigated. Some evidence was obtained that the basic way of working with the metal did not change much in centuries.
  Very interesting for me is that the authors are critical of the prevailing myth in archaeological circles that the smiths somehow "carburized" the iron to get steel. They emphasize - possible for the fist time in an archaeological papers - that steel was part of a bloom, that smiths could recognize this, and that the major technology in smithing might have been folding / faggotting and piling (as I have claimed all this time)
- Some interesting quotes:
- It is likely that the thousands of iron objects discovered by excavations in western Iran at Hasanlu, including 700 arrow-points, 500 spear-points and 70 swords, were produced by *blacksmiths travelling with the troops of Assurnasirpal II* (883-859 BC) during the Assyrians' first military campaign into that region.
  In all periods, the presence of medium- and high-carbon steel structures in most of these items shows that these Iron Age blacksmiths *were skilled in choosing the right materials*for producing tools
  The current study supports the consensus on Iron Age metallurgy in the eastern Mediterranean and Near East that carburizing was *realized during the smelting*..
  The research conducted here demonstrates that Kinet's metal workers *appreciated the heterogeneous nature of their materials* and achieved success with it by adapting thermo-mechanical treatments. *They knew to select the medium- and high-carbon steel*, which is harder than pure iron, for improved tool production.
  The slag inclusions, which were broken and deformed during the forging stage, could either have originated from the smelting operation, or were introduced into the body during *folding or welding operations*. Due
  The sampled iron objects from Kinet all date to the Iron Age, but *span a 500-year range* from the earliest example, KT7955 (Early Iron Age Period 12, 12th - 11th century BC) to the latest one, KT8548 (Late Iron Age, Period 7, 7th century BC). Although the number of analyzed objects is limited, *the changes detected among*

them were minor from a metallurgical point of view. In all periods, the presence of medium- and high-carbon steel structures in most of these items shows that these Iron Age blacksmiths *were skilled in choosing the right materials for producing tools*. Moreover, the consistency in procedures for applying heat during the manufacturing process indicates the deliberate transfer of metallurgical knowledge over many generations

McConchie, Matasha
Archaeology at the Northeastern Frontiers, V
Iron Technology and Iron Making Communities at the First Millennium BC
Ancient Neat Eastern Studies, Peter, Louvre - Paris - Dubai, 2004

- The rather substantial book is more or less identical to the Ph.D. thesis of Dr. McConchie, it seems. It is a pity that I was not aware of this source before 2021. It is also a pity that Dr. McConchie obviously did not continue to research the topic; I couldn't find more papers of her.
  Why is all that a pity? Because McConchie's work is simply the best treatise about the subject that I have come across so far. It essentially consists of two parts:

  1. A thorough review of the literature to the topic plus a presentations of what the author thinks might have happened during the transition period from bronze to iron. This includes an in-depth analysis of of what is involved in making and working with iron and steel
  2. A detailed metallurgical analysis of many (small) iron objects with outstandingly good pictures and data.

- I like this treatise very much because it agrees in many points with my point of view. Seriously now: McConchie (correctly, in my view) stresses that it wasn't the possible large hardness of (quenched) steel that triggered the transition to iron, mentions techniques like faggotting as important, and pushes the view that the smiths of old could assess the quality of the iron they obtained as to its suitability for some intended purpose. Much to her credit, in going through the literature, she doesn't just enumerate what A,B,C thought about the topic but reviews and compares results critically, pointing out inconsistencies and outdated views.
- Moreover, her background in Material Science is quite sound. She doesn't just use the big buzz-words like pearlite, martensite, quenching etc. but understands their meaning in detail, something, to put it politely, I cannot attest to many writers with a background in archaeology. She also does not fall into the old and cherished trap of "carburization" as the main technology of of smiths.
  And so on. Read for yourself by buying the book.
- Alas! For our very specific task here the treatise is not overly helpful since it does not consider swords directly. Nevertheless, some of her experimental results, if studied carefully and in detail (something I haven't done yet) may have some bearing on the questions I ask in these modules. We shall see.

Jens Nieling
Die Einführung der Eisentechnologie in Südkauhasien und Ostanatolien während der Spätbronze- und Frilheisenzeit
Dissertation zur Erlangung des Akademischen Grades Dok-or der Philosophie der Fakultät für Kulturwissenschafän der Eberhard-Karls-Universität Tübingen.
Aarhus: AarhusUP zoo9. Q S. zahlr. Abb. 3 Taf. (BlackSea Studies. o.)

- The "German" counterpart of *Matasha McConchie's* work (see above). Contains some good parts but is too long and unstructured.
  It does not include any of our sword types and thus is of limited value here-
  The book obtained several reviews, all rather negative. Below is an excerpt from the review of Prof. Dirk Paul Mielke; Institut für Altorientalistik, FU Berlin, that says it all:
- "Insgesamt werden in dem Werk vieleDinge und Aspekte behandelt und diskutiert, doch ergeben sich daraus wiederum Ansprüche, die vielfach nicht erfüllt werden können. Der Text schwankt von dem eigentlichen Thema des Buches, der "Einführung der Eisentechnologie in Südkaukasien und Ostanatolien während der Spätbronze- und Früheisenzeit" und einem alle frühen Eisenfunden bzw. die gesamte frühe Eisenmetallurgie der Alten Welt umfassenden Ansatz. Der Autor hätte sich auf sein selbst formuliertes Ziel beschrän-ken sollen.
  "Es ist somit das Anliegen der vorliegen-den Arbeit, unbekanntes Material einer kombinierten arcäologisch archäometrischen Untersuchung zuzufihren.". Bei einer Konzentration auf die grundlegende Fragestellung wäre vielleicht eine solide Arbeit herausgekommen, wie sie das ungefähr zeitgleich entstandene Werk von *Matasha McConchie* über frühe Eisenfunde us Ostanatolien darstellt. Das hier grob skizzierte negative Gesamtbild, das ohne Zweifel viele Einzelergebnisse es Autors unterschlägt, wird zsätzlich von einer auffällig hohen Anzahl unterschiedlichster redaktioneller Fehler bestätigt. Für eine Veröffentlichung hätte zumindest eine diesbezügliche formale Überarbeitung des Werkes erfolgen müssen. Was nachhaltig von der Arbeit bleiben wird, ist wohl nur der analvtische Teil, der zwei-felsohne einen wichtigen Forschungsbeitrag darstellt. Vor allem international wird das Buch auf Grund der strukturellen Probleme aber kaum eine Rezeption erfahren

- Well, yes, there is some truth in this judgement (and in the many pages written on top of the short passage given above, not to mention at least two other negative reviews). However, I feel that this criticism is overly harsh. Yes, Jens Nieling writes in a style that is not compatible with the usual dry and boring lingo of academia, and he is on occasion openly critical of established viewpoints by his superiors, i.e. professors.
  I did get some useful information from his opus and that's why I have a link to it here.
  What I don't like is that the manuscript is protected, i.e. you can't copy parts of the text and that is why I'm not quoting anything here.

Hasanlu

Pigott , V. C. (**1989**). **The emergence of iron use at Hasanlu** Expedition 31(2–3): 67–79.(Penn State University Museum publications)

Detailed review of the "The Appearance of Iron Working in Southwestern Asia" and transition from bronze to iron, why and where it happened. Many pictures including maps
Discusses lack of evidence for smelting and why Hasanlui might be important: "Excavation has yielded some 700 arrow points, 500 spearpoints, and 70 swords. Tools follow weaponry in quantity, with some 90 sickle blades and 90 small knives. Personal ornaments include some 14 0 pins, 40 bracelets, 15 rings, and 115 decorative studs and bosses. With the addition of various other categories of artifacts, there is a total of over 2000 iron objects"

- Discusses in detail bi-metallic artifacts and their making: "Bimetallic artifacts, which use two rather different metals to complement each other, may be the best representation of innovative technological craftsmanship. Such pieces are of particular interest technologically, since they are characteristic of transitional metal industries."
  Supplies some metallurical and composition analysis.
- Perhaps most important: Supposes *Assyrian origin* of Hasanlu iron objects or at least raw iron in Hasanlu IVb. Provides a picture of a large flat-iron panel for a quiver with embossed decoration. Essentially links iron technology to Assyrians.

Christopher P. **Thornton** and Vincent C. Pigott (2012) **Blade-type Weaponry of Hasanlu Period IV**, University of Pennsylvania Press.

- The key paper for my purpose here - as far as Hasanlu is concerned. Why? Here is a quote: "Hasanlu provides one of the largest stratigraphically controlled corpuses of proto-historic weaponry from the Iron Age of Southwest Asia. .... "681 arrowheads, 420 spearheads, 22 swords, 28 daggers, and 21 shortswords could be identified" "
  The paper contains a wealth of information and many details - read it yourself.
- Alas! None of the swords found matches our "Leitfossilien" and all finds are badly corroded. Moreover, even so we know very precisely from what time the findings come (the violent destruction close to 800 BC)., we do not necessarily know if a sword is from Hasanlu and belonged to the defenders of the city or if it was the sword of one of the unknown (probably Uraturian) invaders.
  In addition, the authors make a convincing case that one of the swords was actually a much older "heirloom" of probably Hittite origin.
- There are interesting finds, however: Swords with hilts that look very much likes the ones on all those Assyrian reliefs (but are around 100 years older. Here are pictures.
- All in all, Hasanlu doesn't help us much in our quest here. The authors know why: "The biggest problem in trying to assign weapon types to specific regions is the lack of published material from Early Iron Age sites in Southwest Asia."
  That is a critical remark addressed at their dear archaeologist colleagues from the relevant countries.

Saruq al-Hadid

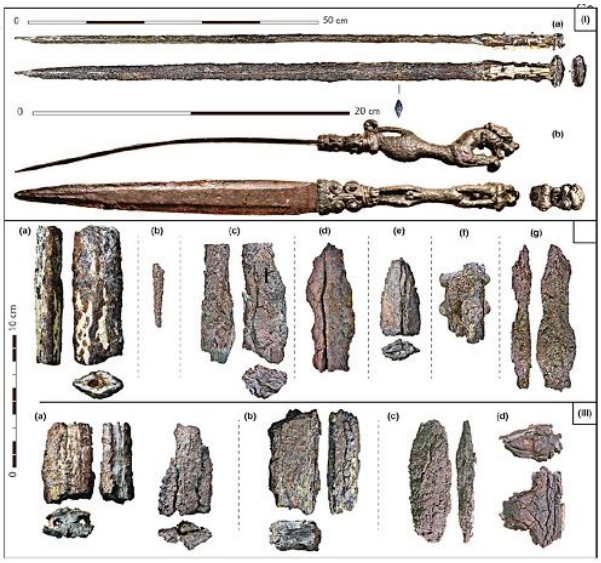
I focus here on the papers with **Ivan Stepanov** and **Lloyd Weeks** from the Australian university of New England as first authors. They present not only interesting results but demonstrate what modern analytics can do

I. Stepanov, L. Weeks and 6 others (**2017**) **Archaeometallurgy of corroded iron artifacts: A case study form Saruq al-Hadid, U:A:E**: Poster to some conference.

- Many color pictures give a good impression of the finds. Some analytics is demonstrated and first suggestions for faggoting / piling are made.
  Here is the link

Lloyd Weeks (**2017**) Charlotte Cable, Kristina Franke, Claire Newton, Steven Karacic, James Roberts, Ivan Stepanov, Hélène David-Cuny, David Price, Rashad Mohammed Bukhash, Mansour Boraik Radwan, Hassan Zein, (2017) **Recent archaeological research at Saruq al-Hadid, Dubai, UAE**. Arabian Archaeology and Epigraphy, Volume 28, Issue 1 May 2017 Pages 31–60, Wiley Online Library,

Detailed information to Saruq al-Hadid and what was found there. Specific information about dating and "biological" artifacts. Some doubts about Saruq al-Hadid as a production site of metals are voiced.
You find chapters about copper, bronze, gold, silver and lead artifacts and in particular about ferrous artifacts.
There you find this enticing picture:



Representative types of ferrous remains from Dubai Municipality and SHARP excavations at Saruq al-Hadid. I. Complete objects: a. double-edged long sword with hilt and blade of iron; b. double-edged bimetallic bronze iron dagger with hilt of bronze and blade of iron. II. Fragments: a. double-edged fragment; b. small rod; c. single-edged/asymmetrical double-edged fragment; d. double-edged fragment, curved; e. tip of double-edged blade; f. hilt of sword/knife; g. leaf-shaped fragment. III. Ingots: a. semi-finished fragments; b. fragments of basic shapes; c. components for manufacture of swords: 1. complete double-edged piece; 2. complete pommel of hilt (illustrations by Hélène David-Cuny and Ivan Stepanov)

Link to a large scale version of the swords

Ivan **Stepanov**, Lloyd **Weeks**, Kristina Franke, Charlotte Cable, Bruno Overlaet, Peter Magee, Marc Händel, Yaaqoub Yousif Al Aali, Mansour Boraik Radwan & Hassan Zein (**2018**): **Methodologies for the investigation of corroded iron objects: examples from prehistoric sites in South-eastern Arabia and Western Iran**, STAR: Science & Technology of Archaeological Research,

The paper shows in great detail what you can find out by analyzing completely corroded ferrous pieces and how it is done.
The abstract says it all:

ABSTRACT

Ancient iron objects from early Iron Age archaeological sites are almost always severely corroded, which can severely limit the possibilities for their archaeometallurgical analysis. In this paper, a range of corroded iron objects from different sites and regions of the ancient Near East are investigated with the purpose of developing an integrated scientific approach to the investigation of such materials, outlining the capabilities and major technical limitations of currently available techniques. Specific objectives of the research include: (1) Assessing the state of degradation of ancient ferrous objects in respect to the portion of remnant carburized areas preserved; (2) Identifying metallographic structures and evaluating the carbon content from the observation of remnant carburized areas; (3) Developing an understanding of the representativeness of remnant carburized areas in corroded ferrous samples; and (4) Exploring the validity and technical constraints of SEM-EDS analyses of slag inclusions in corroded iron artefacts for the determination of provenance.

Ivan S**tepanov**, Lloyd **Weeks**, Filomena Salvemini, Yaaqoub Al Ali, Mansour Boraik Radwan, Hassan Zein, Peter Grave (**2019**) **Early Iron Age ferrous artefacts from southeastern Arabia: investigating fabrication techniques using neutron tomography, optical microscopy, and SEM-EDS** Archaeological and Anthropological Sciences (2019) 11:2971–2988

Neutron tomography demands a specialized source of neutrons, i.e. a running nuclear reactor. Plus some rather sophisticated (and expensive) hardware. It's not fore everybody.
Here is the abstract with my highlighting:

Abstract
The study presents a new approach for the investigation of ancient ferrous artefacts, by combining non-invasive and invasive techniques: *neutron tomography*, optical microscopy, and SEM-EDS, as applied to the objects from Saruq al-Hadid, U.A.E. It is revealed that despite the severe degradation of the objects, neutron tomography allows the detection of various features associated with the mechanisms of degradation and working (manufacturing, re-processing) of the ferrous artefacts including (1) different corrosion products and their specific distribution patterns; (2) surface dents from the use of hammers; and (3) various structural heterogeneities such as mineralised pierced holes, incised patterns, and *ex-welding lines*. The ex-welding lines present in every artefact have a major significance because they can be conveniently used for the investigation of the manufacturing techniques of the objects. The complementary invasive investigation via optical microscopy (OM) and SEM-EDS is used to relate the carburization patterns of the objects to their welding techniques, which are then associated with the patterns of variability of slag inclusion composition. The integrated data provide insight into the socio-technological aspects underlying the choices in the manufacturing of the Saruq al-Hadid objects, and broader aspects of early Iron Age iron-working in the ancient Near East.

One sentence in the conclusions is tantalizing:
"*Folding* and welding (FW), recognized from the presence of a concentric structure in a longitudinal section (Fig. 7(a), (b)), is the most common fabrication technique." That is about the first time that folding (I.e. faggoting) is mentioned in the context of very ealy forging techniques. It supports the conclusions we have reached in the "Luristan project".
Here is Fig. 7:

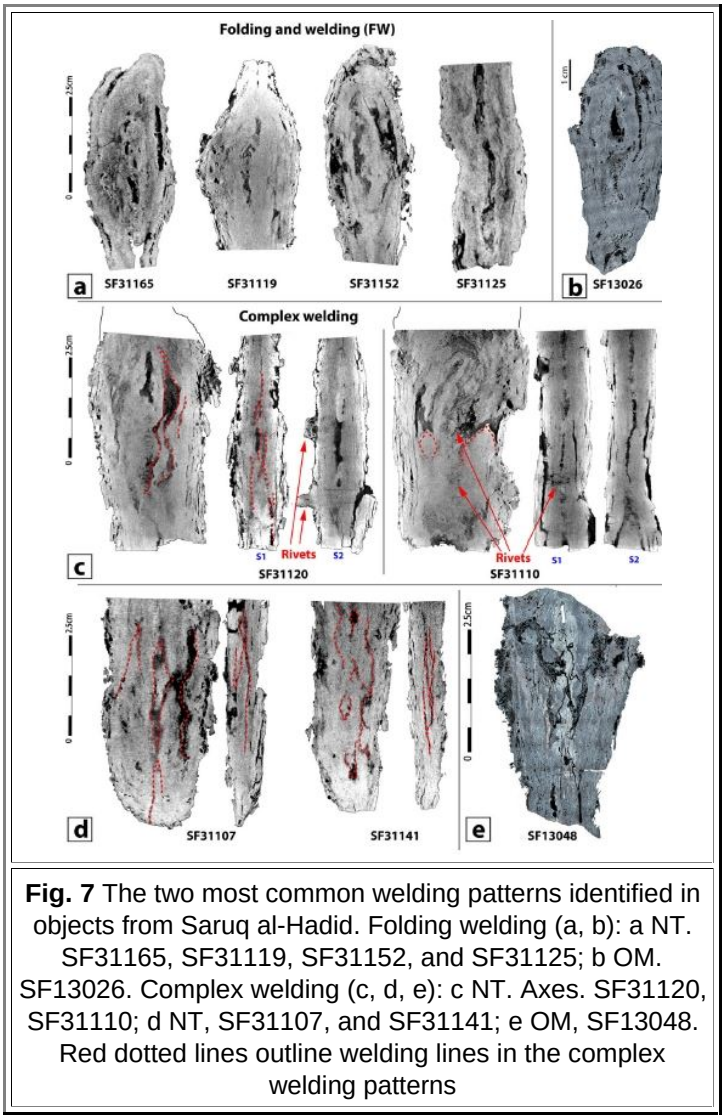


Fig. 7 The two most common welding patterns identified in objects from Saruq al-Hadid. Folding welding (a, b): a NT. SF31165, SF31119, SF31152, and SF31125; b OM. SF13026. Complex welding (c, d, e): c NT. Axes. SF31120, SF31110; d NT, SF31107, and SF31141; e OM, SF13048. Red dotted lines outline welding lines in the complex welding patterns

Well, yes: Neutron tomography pictreus look a lot lkike X-ray pictures but don't forget: X-rays could not easily penetrate the thick samples and we have a complete three-dimensional image; the prints show only some specific cuts.
And yes, you need to know how to look at pictures like that to be able to "see" what they contain. 5 years or so of intensive studies will get you there.

Ivan **Stepanov**, Lloyd **Weeks**, Kristina Franke, Thomas Rodemann, Filomena Salvemini, Charlotte Cable, Yaaqoub Al Alid, Mansour Boraik Radwan, Hassan Zeind, Peter Grave (**2019**) **Scrapping ritual: Iron Age metal recycling at the site of Saruq al-Hadid (U.A.E.)** Journal of Archaeological Science 101 (2019) 72–88

- A quoter from the a**bstract** says it all:
  "The main analytical focus is the investigation of corrosion layers preserving traces of hot oxidation and forging of metallic iron, along with re-heating of previously formed rust layers. The collected evidence suggests that the numerous iron artefacts ritually deposited at the site in the early Iron Age were subsequently retrieved and re-forged into semiproducts as a part of larger scheme of recycling operations, in which Saruq al-Hadid was a first node"
  Once more an impressive piece of advanced analytics

Ivan S. **Stepanov,**, Lloyd **Weeks**, Kristina A. Franke, Bruno Overlaet, Olivier Alard, Charlotte M. Cable, Yaaqoub Yousif Al Aali, Mansour Boraik, Hassan Zein, Peter Grave (**2020**) **The provenance of early Iron Age ferrous remains from southeastern Arabia** Journal ofArchaeologicalScience120 (2020) 105192

- Complex analytics once more. One of the results is spectacular for us. Somewhat simplified it says:
  The Luristan 2 swords (mostly found as corroded pieces) were not made in Sarq al-Hadid but 1000 km north-east, i.e. in *in Luristan*
- That is amazing for 2 reasons:

1. It is now possible to deduce the provenance with respect to the original location of some ferrous artifacts. That makes some of the "unprovenanced" ferrous artifacts from the antiquities trade far more valuable for research.
2. The old Luristanis exported their type 2 swords over a large distance. Well - why not? But why did they keep their type 1 mask swords for themselves, just as they did with all their wonderful "Master if Animal" bronzes?

Marlik and Toul-E Talish

Vahdari, Ali A., (**2ß007**). **Marlik and Toul-E Talish: A Dating Problem** Iranica Antiqua, vol. XLII, 2007,

- Unfortunately my pdf. version dose not allow to copy parts of text; I need to resort to pictures.

MARLIK AND TOUL-E TALISH: A DATING PROBLEM

BY

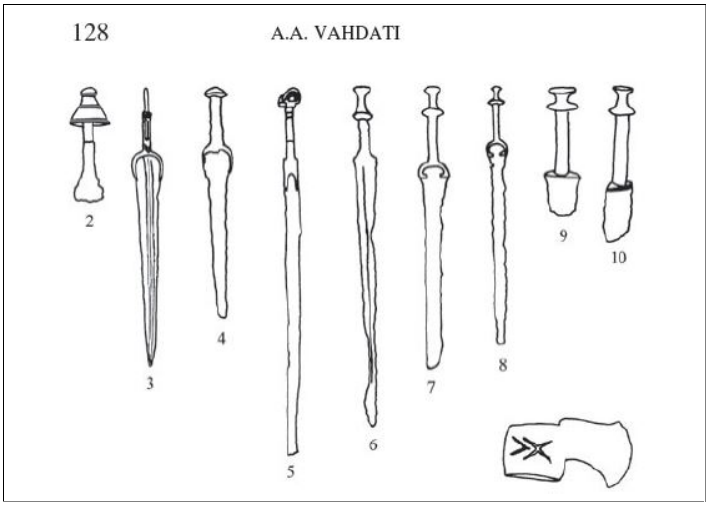
Ali A.VAHDATI

(Cultural Heritage, Handicraft and Tourism Organization of North Khorassan Province, Iran)

Abstract: As a result of recent activities of Iranian expeditions in Talish, to the southwest of the Caspian Sea, several graveyards with remarkable Iron Age material has been excavated. Among these, perhaps the most interesting is Toul cemetery that produced material similar to some tombs at Marlik. Based on these similarities and on the presence of a bronze bracelet with an Urartian inscription in Toul cemetery, the excavator of the site concluded that both cemeteries are contemporary, belonging entirely to the 8th-7th centuries B.C. and that they are highly influenced by Urartian art. In this article I propose that the majority of finds from Toul cemetery belong to ca. the 10th-9th centuries B.C. The presence of a few Iron III/IV depositions should be considered as a result of the occurrence of later burials in the cemetery. It is further suggested that the inscribed bracelet of Toul neither is a precise chronological indicator nor an indication of Urartian influence over the art of the Caspian region.

- Well. Once more it looks like good scientific digging does not automatically supply a trustworthy provenance with respect to age. One more illustrating to my claim here. There are plenty of others but the point has been made.

The paper also describes the findings of the Iranian archaeologist M: R: Kahlatbari at Toul-E Talish. Eight tombs were found in Toul but the reporting of the finds is jumbled and leaves much to desire. Tomb 1, the major tomb, was of the Dolmen type and 16 m long, 2 m wide. Eight bi-metal swords and one full iron sword were found; and bi-metalic is referred to as the most common type. of weapon found. These bi-metalic weapons came up and were dated to the 8th - 7th century BC. Vahdati, however, questions Kahlatbari's dating and dates these bi-metal sword (Especially No 3 with the "ear" pommel) in the 10th - 9th century BC.



Weapons found in tomb 1 in Toul
Drawings by Vahdati; for details read text

What we learn is bi-metal weapons were often found in the general area but that there are hardly any pictures. There are reasons to suppose that they are quite old, 10th - 9th century BC.

Piller, Christian Konrad,(**2008**) **Untersuchungen zur relativen Chronologie der Nekropole von Marlik**
Dissertation an der Fakultät für Kulturwissenschaften der Ludwig-Maximilians-Universität München

- Lots of details from an excavation in the Marlik region. However, none of the swords of interest here appear.
- The dissertation is of huge interest for another reason: It gives very interesting details about the "illegal" diggings in Iran, which - surprise! - were not all that illegal after all!
  Here are some relevant quotes.

Bi-Metal Swords

Hisashi NOJIMA, Yui ARIMATSU, Masahiro FUJII, Susumu MURATA, Hakuhiro ICHIKAWA, Shohei FUJII, Naoto MORIMOTO, **2020, "Bronze-Hilted Iron Swords from Western Asia at the Department of Archaeology, Hiroshima University"**
Accessible in the Net; no clear reference.

- The authors demonstrate that the swords bought by the Research Centre of the Hiroshima University, Faculty of Letters, in Iran during the 1970s as shown above are actually *pastiches*. The hilt contains an iron core and that has caused some excitement in (Japanese) scientific circles and beyond.
- The authors use many polite words in rather circumstantial writing, so nobody looses his or her face more than required. They leave no doubt, however, that there is no such thing as a "*bronze swords with an iron core*". There are only pastiches that must be counted as fakes even so the two parts are real antiques.
- The paper provided an interesting map (here it is with some additional information):

Simpson and La Niece, **2010**, "**New light on old swords from Iran**"
British Museum Technical Research Bulletin (4) (p.95-101)
Archetype Publications, London, 2010

- The British Museum debunks two swords (one a "*cotton-reel pommel*" sword) to be a pastiches; a bronze blade crafted onto a bronze hilt with iron core. Here are pictures
- "Both of the swords from the British Museum collection examined here date to the beginning of the first millennium bc. The first belongs to a type of sword with a prominent cotton-reel pommel but where the original iron blade has been replaced by a bronze blade originally belonging to a different type of weapon"..

Wever, Gaylew, , **1969**, "**A Persian Puzzle: A Bronze Sword from Teheran**"
Expedition (Penn State University Museum Journal),. , Fall 1969, p.24 - 27

- Possibly the first paper recognizing a pastiche.
  The sword is shown today in the home pages of the Museum. It is mentioned that it is a pastiche

The PennState pastiche

- Wever calls their sword a "technological and ethetical monstrosity" and expresses his hope that students of the Near-Eastern archaeology would recognize those pastiches for what they are.
  Well, he was overly optimistic, it appears