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ИНСТИТУТ АРХЕОЛОГИИ И ЭТНОГРАФИИ
СИБИРСКОГО ОТДЕЛЕНИЯ РОССИЙСКОЙ АКАДЕМИИ НАУК

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ЕВРАЗИЙСКОЕ ОТДЕЛЕНИЕ

МИНИСТЕРСТВО ОБРАЗОВАНИЯ И НАУКИ РОССИЙСКОЙ ФЕДЕРАЦИИ
НОВОСИБИРСКИЙ ГОСУДАРСТВЕННЫЙ УНИВЕРСИТЕТ

МУЛЬТИДИСЦИПЛИНАРНЫЕ МЕТОДЫ В АРХЕОЛОГИИ: НОВЕЙШИЕ ИТОГИ И ПЕРСПЕКТИВЫ

Материалы международного симпозиума «Мультидисциплинарные методы в археологии: новейшие итоги и перспективы» (22–26 июня 2015 г., г. Новосибирск)

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MULTIDISCIPLINARY APPROACH TO ARCHAEOLOGY: RECENT ACHIEVEMENTS AND PROSPECTS

Proceedings of the International Symposium "Multidisciplinary Approach to Archaeology: Recent achievements and prospects" (June 22 – 26, 2015, Novosibirsk)

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Professor *S. Hansen*

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MULTIDISZIPLINÄRE METHODEN IN DER ARCHÄOLOGIE: AKTUELLE ERGEBNISSE UND ZUKUNFTSPERSPEKTIVEN

Materialien des Internationalen Symposium ”Multidisziplinäre Methoden in der Archäologie: Aktuelle Ergebnisse und Zukunftsperspektiven“ (von 22. bis 26. Juni 2015, Nowosibirsk)

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THE BASEL-GASFABRIK RESEARCH PROJECT: ADDRESSING COMPLEX TOPICS BY AN INTEGRATIVE APPROACH*

The la Tène period) site of Basel-Gasfabrik has been under investigation for more than a century. During that time, the unfortified settlement with its two cemeteries has yielded huge amounts of everyday and exceptional objects and features. Beginning in the mid-1970s, samples were systematically collected for scientific analyses during ongoing excavations, thus producing ideal preconditions for interdisciplinary research. In 2011–2014, the international research project "Approaching the living via the dead: human remains from the Late La Tène site Basel-Gasfabrik and their cultural-historical interpretations" addressed the multifarious ways in which the Iron Age community handled their deceased. The intense collaboration involved researchers from the Archäologische Bodenforschung Basel-Stadt and the universities of Basel (CH), Mainz, and Freiburg i.Br. (D) and spanned eight disciplines: archeology, archeoanthropology, archeobotany, archeozoology, geoarcheology, biogeochemistry, molecular genetics, and statistics. Research topics and theoretical frameworks were developed jointly as well as procedures to combine the disciplinary results in multistage processes in order to generate integrative syntheses of novel insights. The challenges and specific research potentials of the integrative approach may serve as a positive example for future interdisciplinary research projects.

Keywords: *late Iron Age, interdisciplinary collaboration, project design, integrative synthesis, case study.*

*The project Approaching the living via the dead: human remains from the Late La Tène site Basel-Gasfabrik and their cultural-historical interpretations was funded by the Swiss National Research Foundation, the Freiwillige Akademische Gesellschaft (FAG) Basel, and the Archäologische Bodenforschung Kanton Basel-Stadt, Switzerland.

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ИССЛЕДОВАТЕЛЬСКИЙ ПРОЕКТ «БАЗЕЛЬ – ГАЗОВЫЙ ЗАВОД»: РЕШЕНИЕ КОМПЛЕКСНЫХ ЗАДАЧ С ПОМОЩЬЮ ИНТЕГРАЦИОННОГО ПОДХОДА

Памятник позднего железного века (эпоха Латена) Базель – Газовый завод исследуется уже более ста лет. За это время раскопки неукрепленного поселения с двумя могильниками принесли огромное количество как рядовых, так и исключительных находок. Начиная с середины 1970-х гг., образцы систематически собирались для научного анализа в ходе ведущихся раскопок, таким образом создавая идеальные предпосылки для последующих междисциплинарных исследований. В 2011–2014 гг. международный научно-исследовательский проект «Постигая живое через мертвое: человеческие останки из позднелатенского памятника Базель – Газовый завод и их историко-культурная интерпретация» был нацелен на рассмотрение многообразных способов обращения с усопшими, бытовавших в сообществе железного века. Активное сотрудничество объединило исследователей из Бюро археологического почвоведения г. Базеля и университетов Базеля (Швейцария), Майнца и Фрайбурга (Германия) и охватило восемь научных дисциплин: археологию, антропологию, археоботанику, археозоологию, геоархеологию, биогеохимию, молекулярную генетику и статистику. Совместно были выработаны темы исследования и теоретические обоснования, а также соответствующие процедуры, нацеленные на объединение результатов отдельных дисциплин в многоступенчатом процессе создания новых идей путем интеграционного синтеза. Задачи и конкретный исследовательский потенциал данного интегративного подхода могут служить положительным примером для будущих междисциплинарных научных проектов.

Ключевые слова: *поздний железный век, междисциплинарное сотрудничество, концепция проекта, интегративный синтез, пример исследования.*

Basel-Gasfabrik: a proto urban center in the Upper Rhine region

The la Tène period site of Basel-Gasfabrik (ca. 150–80 BC) was an important center of trade and production in the Upper Rhine region. The open settlement on the left bank of the river covered an area of about 150,000 m^2, three quarters of which have been excavated in over a hundred years of archeological investigations. Inside the

settlement, houses, crafts zones (pottery, smithy, glass and coin production), pits for a range of purposes (storage cellars, grain silos etc.) as well as animal pens and garden plots were arranged along a grid pattern and allowed for the reconstruction of various domestic and economic units. All in all, the site represents the region's first proto urban center, drawing upon an extensive hinterland and being incorporated in trade networks extending as far as the Mediterranean (Blöck et al., 2014; Alltagskultur…, 2011).

Beyond the world of the living, the site provides insights into a world of the dead no less complex. To the north of the settlement, two synchronous cemeteries held over 200 inhumation and cremation burials*. Inside the settlement, complete skeletons of almost 30 individuals were found in pits and wells, while fetuses and newborns were recovered from diverse settlement features (Fig. 1). More striking still are the numerous isolated human bones mixed in with the settlement material in every conceivable context, such as settlement pits, occupation layers and leveling debris, with a certain proportion bearing traces of carnivore gnawing, cut marks or other post- or perimortem manipulations (Pichler et al., 2013, Rissanen et al., 2013).

A wealth of data from a century of exploration

In more than a century of archeological excavations, huge numbers of finds have been documented at Basel-Gasfabrik: over 700,000 objects, from ceramic and iron tools to imports from the Mediterranean area as well as 1,600,000 animal bones. The records on the complex multi phase features, the more than 500 pits and the graves excavated according to modern archeological standards fill 65 m of shelf space and include 67,000 photos and 46,000 drawings. Furthermore, from the early 1980s onward, samples for scientific analyses were collected on site and geoarcheological, archeozoological, and archeobotanical studies conducted on a regular basis (Jud, 2008; Rentzel, 1995; Stopp, 1999; Schaer, Stopp, 2005). Sampling of human skeletal remains for stable isotope and a(ncient)DNA studies commenced soon after the turn of the millennium and the prerequisites were thus established for yet another class of bioarcheometric analyses (Pichler, 2012). The rare and fortunate fact that both the settlement and the cemeteries are known and the presence of highly complex features in combination with the comprehensive archeological and archeometric data amassed make Basel-Gasfabrik an ideal site for interdisciplinary research.

Making use of a huge potential – the integrative Basel-Gasfabrik research project

The site's potential was first exploited from 2011–2014 during a large international project investigating the cultural and social context of the multifarious handling of the dead reflected in the archeological record. The project team comprised 14 researchers representing 8 disciplines: archeology, archeoanthropology, archeobotany, archeozoology, geoarcheology, biogeochemistry, molecular genetics and statistics, involving five research institutions in two nations. From the outset, it was clear that the number and diversity of disciplines, the array of materials analyzed as well as the different disciplinary terminologies, methods and approaches involved would present challenges both in purposefully combining the separate lines of research and in the synthesis of the generated data. At the same time, the situation also provided a unique potential for gaining in-depth information beyond the disciplinary results, especially since most of the researchers involved already had a vast experience in interdisciplinary collaboration. The research was therefore to be designed so as to exploit the multiple potentials given to the best possible degree.

Organizing research in a multi researcher, multi discipline project

In the past, archeological research projects involving scientific analyses were often planed along solely archeological research trajectories, the collaborating scientists being requested to provide data gained by specific analytical procedures and with feasibility estimates constituting their main contribution during the planning phase prior to project commencement. The results generated

*The precise dating of the two cemeteries is in the focus of an ongoing PhD thesis (Rissanen, forthcoming).

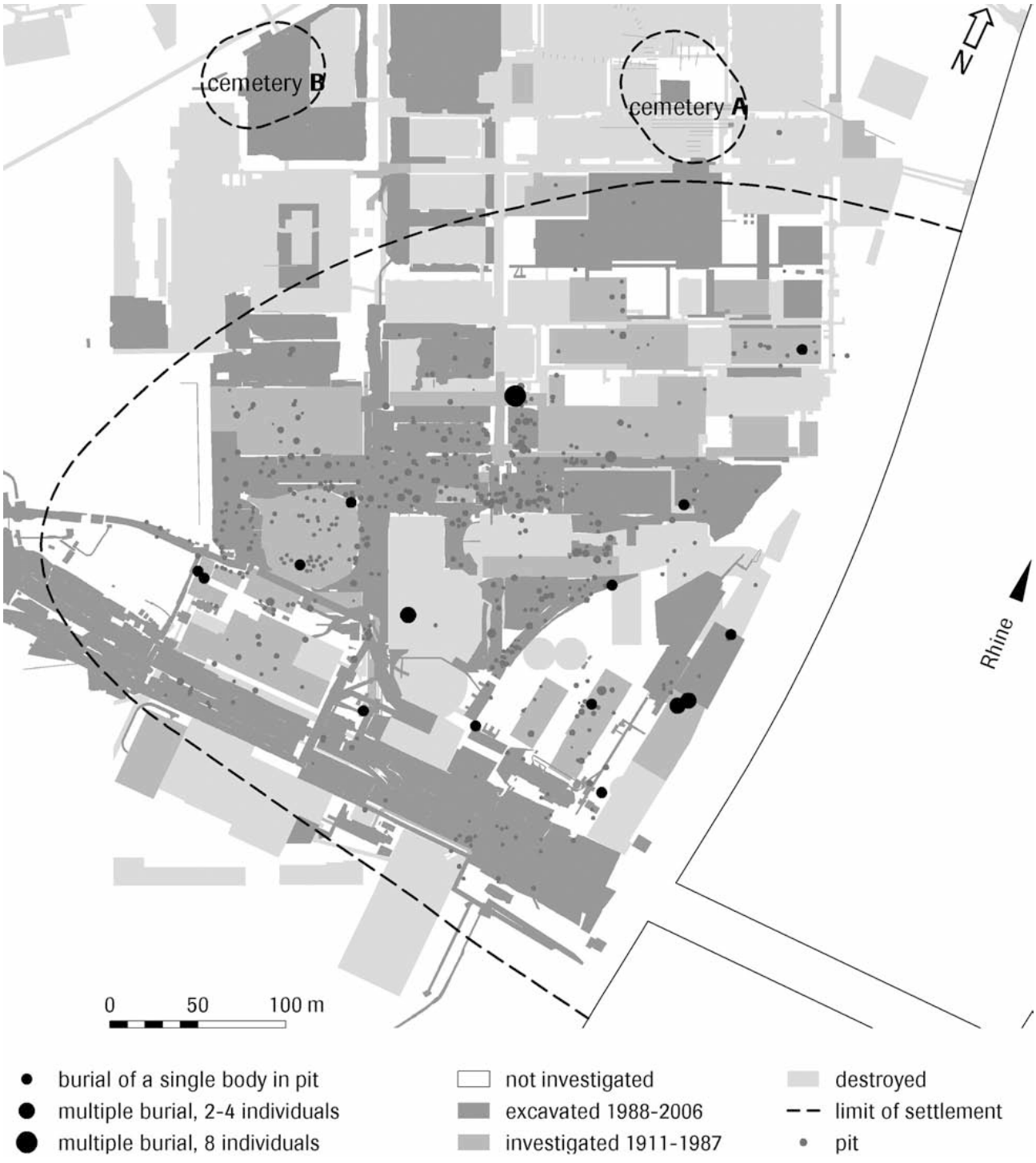

Fig. 1. Plan of the late La Tène period site of Basel-Gasfabrik, Switzerland. The unfortified settlement on the left bank of the Rhine river had two cemeteries, A and B. Different shades of grey mark investigated and destroyed areas; dots denote the location of pits (illustration: Peter von Holzen, ABBS).

in such projects were frequently novel, providing informative answers for the specific questions investigated. They seldom, however, utilized the potential of the disciplines involved in such a way as to initiate further innovative research even in the course of ongoing projects and to bring a comprehensive, "outside" view to bear on the issues under investigation. In the Basel-Gasfabrik project on the other hand, the interdisciplinary* research design was to be developed jointly by all collaborators from the very beginning, including discipline spanning topics and aims, shared theoretical frameworks, the establishment of routines of data exchange and procedures for ensuring a continual interpretative process and integrative** data synthesis. This was realized in several meetings of all members of the research team, during which a detailed research plan was gradually developed, discussed and finally mutually decided (Fig. 2).

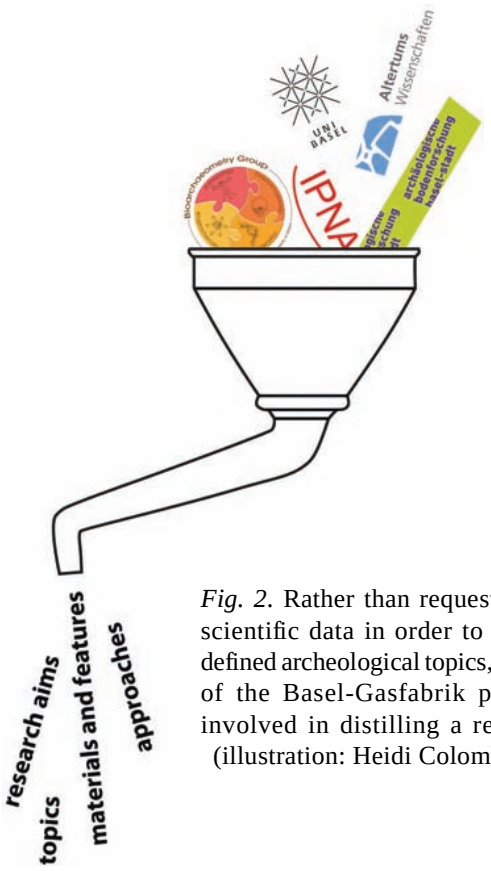

Fig. 2. Rather than requesting specific scientific data in order to answer predefined archeological topics, all members of the Basel-Gasfabrik project were involved in distilling a research plan (illustration: Heidi Colombi, ABBS).

This course of action was crucial as it was realized from the outset that none of the eight participating disciplines was able to address the core problematic by themselves, namely to reconstruct the parallel and multifarious ways dead bodies were treated at the a Tène period site of Basel-Gasfabrik. Further aims centered on assessing the living conditions, diet, economy, land use, mobility and identity of the former population on the basis of the site's human skeletal remains in their specific contexts.

Prior to the commencement of the project, the principal investigators signed an agreement defining sampling strategies, procedures of data collection and warehousing, routines of internal communication and knowledge transfer as well as guiding principles concerning the communication of project results in oral and written form and the authorship of research papers. The complexity of the project also made it indispensable that two of the participants held the roles of administrative and scientific project coordinators respectively in addition to their scientific tasks in order to ensure a rigid adherence to the research plan, to maintain inter researcher communication on specific subjects and to coordinate the stepwise progress in the multiple disciplinary analyses being carried out along separate but converging lines.

Structuring the research process: intra project knowledge production and exchange

The central topics as well as the nature and extent of the samples to be analyzed being defined, research work in the project commenced along established and predefined disciplinary routines, with the scientific project coordinator ensuring timely realization of specific intermediate or final disciplinary results. At intervals, these results were discussed in meetings either of the complete research team or subgroups thereof set up to investigate specific topics involving two or more disciplines and researchers (Fig. 3). Such

*"Interdisciplinary research is a mode of research by teams or individuals that integrates information, data, techniques, tools, perspectives, concepts, and/or theories from two or more disciplines or bodies of specialized knowledge to advance fundamental understanding or to solve problems whose solutions are beyond the scope of a single discipline or area of research practice" (Committee…, 2005).

**Integrative Archaeology denotes the Basel research profile in which data and approaches from the sciences and the humanities are inextricably linked in order to produce new insights to past communities integrated in an overall view.

subgroups investigated topics like the pre- and post-sedimentary history and taphonomy of the sediments and artifacts used to fill two large exemplary pits in the settlement (geoarcheology, archeology, archeozoology, archeobotany, archeoanthropology), the diet and health status of individuals from various archeological contexts (biogeochemistry, archeoanthropology, archeozoology, archeobotany, archeology) or the identification of depositions among the randomly distributed infillings of the exemplary pits (statistics, archeology, archeozoology, archeobotany). Discussions in such meetings were both intense and productive, with the exchange resulting in a timely communication of disciplinary findings to all the collaborators. They also sparked new insights as well as suggesting new lines of inquiry to be followed with respect to the specific topics, thus initiating yet another round of investigations, ensuing discussions and integrative synthesis (Fig. 4). Equal participation in the overall progress achieved was also fostered by the use of a common, restricted access workspace on a university webserver. All documents, reports, publications, presentations etc. pertaining to the project were uploaded directly and were thereby open for all project members.

As new knowledge and ideas were being generated, lead roles frequently shifted between the disciplines involved, necessitating flexible approaches and deepening the understanding both of the different disciplinary methodologies and of the research topic under investigation among all members of the project. This process was intensified by daylong workshops during which the results of individual researchers or of sub-groups were presented, the overall progress was discussed and the next steps in the research process were defined.

About halfway through the project, a two-day workshop was held with specifically selected international experts. Seven presentations by project members and four by invited speakers served as a basis to debate specific and overall hypotheses and approaches as well as preliminary results and for placing these in their respective frameworks. In a whole day dedicated solely to discussions, invaluable feedback and suggestions were gained. These advanced the further progress of the scientific work, which afterwards proceeded along even more focused and rigorous lines.

Fig. 3. The thought grinder: disciplinary results are combined in an integrative synthesis (illustration: Heidi Colombi, ABBS).

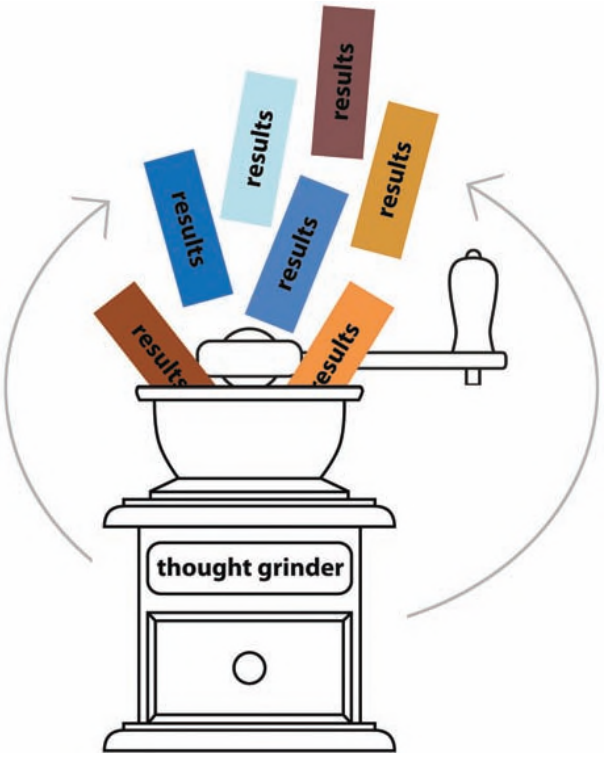

Fig. 4. The thought grinder, stage 2: insights and ideas generated in the integrative synthesis initiate yet another round of inter-/disciplinary investigations and subsequent synthesis (illustration: Heidi Colombi, ABBS).

Challenges and potentials of an integrative approach

The parallel lines of research followed throughout the project as well as the integration of multifarious disciplinary and interdisciplinary results in a routine of regular exchange among the participating scientists presented both challenges and potentials. Challenges emerged on various levels:

– project management was more demanding

– workpower and money had to be allotted for the administrative and scientific project coordination

– each participant needed to acquire a basic knowledge of all the disciplines involved

– discrepancies in knowledge and methodologies had to be addressed constructively

– a "culture" of discussion and knowledge exchange had to be developed

– everybody was continuously called upon to achieve a synthesis of the multifarious data and results

The points addressed are essential for a successful collaboration in any interdisciplinary project (Brown, Deletic, Wong, 2015), and even more so if an integrative approach is chosen as the inherent principle of research. On the plus side, such an approach equally presents a number of key potentials. These include:

– a better understanding of the complex, multifactorial processes underlying the observed phenomena

– neither the materials on which analyses are based nor the process of knowledge construction need be disrupted or fragmented

– the scientific data is thoroughly contextualized culturally

– a deepened reflection and better error control is ensured by diverse "outside views" provided by members from within the project itself, e.g. by the statistician

– research results of higher quality and greater diversity are obtained

– a research process is instigated which produces results in excess of disciplinary findings

So in spite of the challenges involved, the integrative approach emerged as being highly productive in generating results both on the disciplinary and interdisciplinary levels.

Integrative archeology – assessing the outcome

From the outset, an interdisciplinary project scheme seemed the only feasible manner in which to address the complex topics presented by the Basel-Gasfabrik site. It was clear that the chosen approach would present challenges on different levels and at different stages of the scientific process; these challenges were, however, actively addressed and resolved. In this, the professional attitudes of all project members played a major role. The research team as a group acquired an understanding of the other disciplines and the dynamics involved in a continuous integrative synthesis of interdisciplinary results. Yet another supporting factor was the dynamic research process intrinsic to the integrative approach as it rapidly became manifest that the potentials far outweighed the challenges encountered. As anticipated, the close collaboration within the team provided insights into the Iron Age community investigated which could not have been achieved by disciplinary analyses*. In addition, a number of unanticipated and often surprising new data was generated, resulting in the investigation of entirely new topics. The whole research process proved highly productive and might serve as a blueprint for future interdisciplinary collaborations.

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