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NEW RESULTS ON THE SETTLEMENT STRUCTURE OF THE FÜZESABONY-ÖREGDOMB BRONZE AGE TELL

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Kivonat A füzesabonyi kultúra névadó települése Füzesabony-Öregdomb, Tompa Ferenc 1931–1937-es feltárásai révén vált ismertté. A több évig tartó, rövid periódusokban végzett ásatásokon a két és fél méter vastagságú bronzkori rétegekből a telleknél megszokott hatalmas mennyiségű leletanyag mellett számos, a település belső szerkezetére utaló telepjelenség került a felszínre. Az akkor szokásos ásónyomonkénti ásatási módszer miatt azonban a telep szerkezetére, időrendi helyzetére vonatkozó következtetések csak részben szolgálhattak hiteles információkkal. 40 évvel később, 1976-ban került sor Stanczik Ilona vezetésével egy leletmentő-hitelesítő ásatásra. Ez a rétegről rétegre történő hiteles feltárás tette lehetővé Füzesabony-Öregdomb tell telep újraértékelését. Mindez legutóbb roncsolásmentes kutatásokkal (terepbejárás, légifotó, magnetométeres felmérés), valamint a régi és új dokumentációk térinformatikai feldolgozásával egészült ki, így a telep külső-belső szerkezetének ismerete pontosabbá válhatott. Az új 14C-es adatok némileg módosították a tell életének időtartamát is.

Kulcsszavak füzesabony-öregdombi ásatások (1931–1937, 1976), füzesabonyi kultúra, tell település, településszerkezet, új eredmények, kronológia

Keywords excavations in Füzesabony-Öregdomb (1931–1937, 1976), Füzesabony culture, multi-layered settlement, internal and external settlement structure, new results, chronology

Introduction

The first excavations of the Bronze Age tell in Füzesabony began nearly 90 years ago in the 1930's under the supervision of Ferenc Tompa. The excavations were carried out in short seasons between 1931 and 1937. During his researchbeside a large amount of ceramic finds-numerous settlement features (above all houses with wooden floors, circular economic buildings, hearths and ovens of different types) were found (Tompa 1936, 90-97) and the results revealed the internal structure of the settlement. A more detailed study and a re-evaluation of the tell and its material began only a great deal later, as rescue excavations in 1976 led by Ilona Stanczik were carried out (Stanczik 1987). The precise excavation and documentation methods and the finds, that were kept separated layer by layer contributed to a better understanding of the first excavation data and descriptions (Kovács 1989-1990; Szathmári 1990; Szathmári 1992; Szathmári 2009; Vörös 2011;

Horváth 2016; Szathmári 2017). The traditional archaeological records regarding the internal and external settlement layouts of the tell were modified due to recent investigations by using modern technology (geomagnetic survey, GIS based analysis of old documentation and aerial photographs).

The site of Füzesabony-Öregdomb (Nagyhalom)

Füzesabony is located in the South-eastern part of Heves county, South of the border between the Northern Mountain Range and the Great Plain. The plain area is bordered by the Laskó river to the West and by the Eger river to the East (Fig. 1). The geomorphological features of the area had been already formed by the beginning of the Bronze Age.

The surface is covered by thick Late Pleistocene loess and the streams from the Bükk Mountain Range had little transformation effect. The landscape is characterized by flood-free plains and slightly curved surfaces. The proximity of rivers, woodlands and gallery forests provided favourable living conditions in the Bronze Age. The originally oval shaped Öregdomb (Old Hill, formerly known as Nagyhalom = Great Mound) lies at the South-western edge of the village Füzesabony, where the Laskó with its strong bends bypasses the site at north-northeast (Fig. 2). Recent landscape is a result of serious water management works in the early 1930's, when the stream was channelled through a ditch crossing and cutting the tell's core. The old riverbed is still visible NE of the site, that is still used as a drainage (Fig. 3). In the last decades the mound was shrinking in size, its surroundings were built in making further research almost impossible.

The first excavations between 1931–1937

The excavations of Tompa between 1931-1937 were carried out in the central part and on the south-western edge of the tell (Fig. 4). This was clearly observed, since the stratigraphy of the trenches were getting smaller and the number of documented features decreased. Excavations were conducted in one- or in two-week periods each year, and an area of $1,900 \text{ m}^2$ were uncovered, which is almost half of the estimated $4,000 \text{ m}^2$ of

the original extent.

All in all, 32 trenches were opened with the sizes of 5×10 , 5×15 , 10×10 and 10×20 meters. The trenches were closely connected to each other with a slightly deviation to North-South or West-East orientation (Fig. 5). As finds also indicate, the top layer (the youngest settlement inhabitation) of the site was thicker and less destroyed, than during the rescue excavations of 1976.

In the central parts of the tell Tompa reached the paleosol at 240–260 cm, but he didn't excavate to that level in all of the trenches. We know from Tompa's handwritten excavation diary and notes, that he was digging in spits (Fig. 6).

Today it is widely known that this method can not be used to excavate multilayer settlements: spits ignore settlement layers and features, which makes it difficult, or even impossible to establish the exact chronology of finds.

The very same problem was faced during the conventional processing of the finds. Probably as a result of the old excavation methods, Tompa could only observe three settlement layers based on, what he believed were three destruction horizons. Based on some Early Iron Age skeleton burials at the northern edge of the settlement led Tompa to an incorrect dating of the tell settlement to the Late Bronze Age (Tompa 1938: 90–91).



Figure 1. Heves county and location of Füzesabony



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Figure 2. The tell on the 2nd military survey (1806–1869)



Figure 3. Areal photo of the tell in 2010 (picture taken by Zoltán Czajlik)



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Figure 4. Geodetic survey of the tell (1931)



Figure 5. Trenches excavated by F. Tompa 1931-1937 (after I. Szathmári 2017)



Figure 6. The handwritten diary of F. Tompa (1937)

The rescue excavation of 1976

In 1976 modern excavation methods were used to identify settlement layers and features in order to re-evaluate the old excavation finds and the chronology of the tell. However, it can not be ignored that, by that time two-third of the settlement was already destroyed and only an area of 100 m^2 could be explored.

It was a one-month rescue excavation led by Ilona Stanczik and with the participation of István Bóna and Ildikó Szathmári. Next to the crest of dam a 5×10 meter trench (Trench I) was set up. Northeast of that a 51 meters long profile cut was opened. At the South-East end of the cut a 13 meters long trench (Trench II) was cleared and in the bottom layer the earliest settlement features were documented (Fig. 7). During the excavations the approximate locations of Tompa's trenches could be identified. The edges were destroyed by the years and due to danger of further collapse the new trenches could not be fitted directly to the old ones. The results of 1976 improved our knowledge about the settlement of Füzesabony. We clearly identified 5 settlement layers with a thickness of 240-250 cm (Fig. 8) (Stanczik 1978: Abb. 2). The tell was founded and inhabited by the people of the Füzesabony culture. They used the village for a relatively longer period renewing the houses on the same spot (Stanczik 1978; Szathmári 1990, 1992). The fall of the settlement can be dated to the Koszider period (Szathmári 2011).

Previous conclusions about the external structures of the Füzesabony tell

Both in the 1930's and in 1976 archaeological research was carried out only on the central part of the tell. Nevertheless, during the Tompa-excavations even the surroundings of the tell were investigated. Unfortunately, there is no record of a ditch in Tompa's diary, nor in his 1936 published summary of the state of prehistoric research in Hungary (Tompa 1936: 90–97).

The first finds were registered by the local notary Árpád Magnin, who informed the Hungarian National Museum in the early 1930's. He attached to his letter a sketch about a small ditch NE of the tell, on the other side of the Laskó river (HNM Repository Inv. No. 345. 1930) (Fig. 9).

No further information about the ditch is known, Tompa himself didn't mention it. Later, Amália Mozsolics surveyed the tell in 1961 and reported traces of a fortification (HNM Repository Inv. No. VIII.172. 1961).

Most probably she observed the old riverbed of the Laskó and misinterpreted it as part of an entrenchment. The ditch as shown on Á. Magnin's map—if it really existed—must have been within the city's residential area, which is today the centre of the modern settlement. Although no geological coring was carried out in the surroundings of the tell in 1976, field surveys and surface collections did not indicate any fortification.

Also the existence of an external settlement was uncertain until recently. Tompa concentrated his research primary at the core of the mound.

In 1976, however, opportunity was given by chance to do some archaeological work in the neighbourhood of the tell. 300 meters to the S-SE of the tell, in the area called Cigánytelep a thick humus layer was removed because of roadconstruction works. The archaeological settlement features, that were documented here were dated to a younger prehistoric period and were not part of the tell.

In 2017—focusing on the reconstruction of the settlement layout and its surroundings archaeological surface collection and geomagnetic survey were completed. Due to densely inhabited areas around the tell, only limited investigation was possible. Preliminary to these field-surveys it can be said, that the largest number of finds belonging to the Middle Bronze Age Füzesabony culture were collected at the S and SW edge of the tell settlement. If there was any external settlement (most probably there was, see other Füzesabony settlement field survey data: Kienlin et al. 2018), then it must be located here.



Figure 7. Areal photo of 1976 combined with the drawing of geodetic survey (1976)



Figure 8. Section of the profile in Trench II (excavation year 1976)



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Figure 9. Sketch of the surroundings of the tell (Á. Magnin 1930)

Cemeteries belonging to the tell of Füzesabony: Pusztaszikszó and Kettőshalom

At least three cemeteries with few graves can be connected to the tell (Fig. 10). The first cemetery with a small number of skeleton graves was mentioned by F. Tompa in 1936. During the excavation of the tell, near the road leading to Mezőtárkány several skeleton graves in contracted position were found (Tompa 1936, 97). Based on the descriptions and the grave goods we assume that it was one of the cemeteries used by the inhabitants of the tell. The second cemetery was discovered to the SW of the tell in a distance of *ca*. 1,200 meters. At the site Kettőshalom János Győző Szabó excavated 24 graves (Szathmári 1997). The third cemetery lies in a greater distance, *ca*. 3 kilometres to the NW of the tell in Pusztaszikszó. Here, Frigyes Kőszegi documented 30 graves (Kőszegi 1968). According to the the rigorous burial practices of the Füzesabony culture, the bodies were buried in both cemeteries similarly, in contracted position. Beside skeleton graves cremation also occurred: one grave in Kettőshalom and several graves in Pusztaszikszó. As far as we know from the publications, the two cemeteries were not used simultaneously: in Kettőshalom the first settlers of the tell were buried in rich equipped graves (Fig. 11a). The burials in Pusztaszikszó belong to the later inhabitants of the tell, see also radiocarbon dates from Füzesabony-Pusztaszikszó: Kiss et al. in press (Fig. 11b). Unfortunately, nothing is known about the graves in Mezőtárkány and the finds probably got lost.



Figure 10. Location of the cemeteries around the tell



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Figure 11. a: Graves of the cemetery in Füzesabony-Kettőshalom (after I. Szathmári 1997); b: Graves of the cemetery in Pusztaszikszó (after F. Kőszegi 1968)



Figure 12. Drawing of the settlement layer III (1976)

Earlier conclusions related to the internal structure of the Füzesabony settlement regarding both excavation results (1931–37 and 1976)

The excavations between the years 1931-37 uncovered a large area and delivered a great deal of information about settlement structures, the size and building technology of the houses and about their interiors. In the 1930's digging in spits were generally used thus making the identification of different layers and the exact chronology of the finds difficult. Nevertheless, at times F. Tompa made very accurate notes and sketches about settlement structures, surfaces and parts of houses. The oldest settlement laver revealed two sizes of houses: a smaller and a larger one. According to the drawings it seemed, that the two types were used contemporary. During the excavations in 1976 only parts of (three) houses were uncovered therefore their exact size could not be specified. More information is available about the relation of the buildings. The space between the buildings, with other words the streets of 2–2.5 m width could be observed, too. According to Tompa's drawings, the structure of the settlement was more diverse and less regular. The building technology of houses regarding both the internal and external structures was best recognised on layer III of the 1976 excavations. Both the new and the old excavations revealed mainly earthen floors inside the houses, but in some cases floors were covered by wooden planks as well (Fig. 12–13).

Within the tell – whether it had an external settlement part or not – traces of production and crafting activities were documented. Moulds and bronze artefacts, mainly pins indicate, that bronze melting and production was located in the centre of the tell (Fig. 14) (Szathmári 2017). Also, large amount of bone and antler tools, finished or partially finished artefacts suggest the existence of (a) workshop(s) around and in trenches XV–XVI and XXV (Vörös 2011, 665). Additionally, the building of the IVth settlement layer of the 1976 excavations with multiple hearths was probably not an ordinary house for dwelling



Figure 13. Drawing of the settlement layer IV (1976)



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Figure 14. Bronze moulds (marked by circles) and concentration of bronze finds (marked by X-s) (1931-1937)

GIS based processing of the field documentations

The unfortunate death of Ferenc Tompa in WWII (and the war itself) hindered the processing of the enormous amount of finds and the detailed publication of the excavation results (Patay 1993, 93). It was because of the accurate drawings and descriptions both in the diary and on the original field drawings that made a reconstruction and a reevaluation possible (Szathmári 1990). In consequence of rapid technological developments of the last decades, geographic information sciences found their way into archaeological science. Considering digitalised geospatial data and the use of mapping applications have become a must within documentation of archaeological features, excavations etc. Moreover, technological improvements enabled us also to digitize old excavation documentations like profile and plan drawings. In addition, free access to old military maps and areal photography provides us with new possibilities to reconstruct and interpret. In the following we shall present shortly the reconstruction process based on the old and new excavation data and the new results on settlement layout and structures.

As seen before, F. Tompa—and his co-worker at the excavations István Méri—made accurate plan drawings on mm-paper in a scale of 1:20. There are two sets of plan drawings that slightly differ: one set is cut in smaller pieces (more or less to the size of the trench) and were made probably during excavation on the site (Fig. 15). These drawings contain a great deal of important information, notes on features, their depths and even short descriptions. The other set is a clean copy that was made some time (no exact date is known) after the excavation season was finished (Fig. 16).

The clean copies of the originals were used to prepare drawings for publishing, but just a few were issued (Tompa 1936, Abb. 8).

All three settlement layers assumed by F. Tompa were documented with the very same method, more or less with the same accuracy. Some of the information (e.g. legend of symbols and layers or the Iron Age graves, see Kemenczei 2003) can only be found on the originals, some on the copies or on both of them. Therefore all three kind of drawings (the original, the clean copy and the published plan drawing) were scanned and used to georeferencing each trench. In this way large distortions were eliminated and at the same time all available information could be applied (Fig. 17–18).



Figure 15. Original plan drawing of trench VI by Tompa

During the excavation in 1976 more accurate documentation methods were used, and a great accent was put on the making of the plan views and the profiles. During excavation on site exact drawings with a scale of 1:20 were made and neatly coloured. Regrettably, traditional colour pencils were used and during the years the lighter colours had been fainted, thus making the identification of different archaeological structures difficult.



Figure 16. Clean copy of the original drawing (trench VI)

The original drawings were used-as in case of the old excavations-to produce copies: handmade ink copies on transparent paper and coloured copies for publishing purposes. Unfortunately, no legend or description is available to the different features. Moreover, in the course of preparing the Bronzezeit 1992 catalogue, some of the original drawings (and even their transparent copies) went lost. Therefore, all three kind of raster images were used to create digital plans for different layers. During the GIS processing of both, the old and the new excavation plans the same colour coding was used for similar features, thus making the identified settlement layers comparable. It was also important to understand the difference in the number of main settlement layers defined by both excavations (Tompa identified three, whereas in 1976 at least five layers were observed).



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Figure 17. Georeferencing the original drawings of Tompa (settlement layer I)



Figure 18. Digitised image of the same layer

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Figure 19. Areal photo taken on 7.9.1976. Institute of Geodesy, Cartography and Remote Sensing. (picture id. 1976-215/2998).

By the processing of the profile drawings with CAD our basic intention was to reconstruct as much as possible about the tell's stratigraphy, settlement layers, horizontal dimensions of features (e.g. houses) and any assigned characteristics. As seen in case of the plan drawings, profiles were also documented both on and off site. During excavations 1:20 drawings were made, later 1:50 clean copies. The drawings were meticulously made, although the lack of a complete legend for the different lavers complicated their interpretation. Initially, the profiles were digitalised in 2D space and subsequently rotated and placed in 3D space based on the block system of the excavations. The majority of the profiles were consecutive, which enabled the fitting of common points in elevation. The elevation placement of two free-standing profiles was approximated.

Possible location and direction of the excavation trenches

The biggest challenge during the whole reconstruction process was the right placement of the old trenches. Already in 1931 there was a geodetic survey carried out on and around the mound. This sketch was then used to record the outlines of the trenches by F. Tompa. Elevation and extent of the tell is perfectly visible on this map, however any other geographical features that would enable the georeferencing of the sketch were lacking. As a consequence, even the exact direction of the trenches was difficult to specify. therefore historical maps (1st and 2nd military surveys), cadastral maps, archive excavation photos and accessible aerial photos were used. Although the georeferencing of both the cadastral maps and the geodetic survey of the mound could be carried out, we must accept the fact that even by using all available data, the image we create is still "just" a reconstruction. Nevertheless, the direction of the trenches could be modified, and as a matter of fact we are quite sure, that the plots marked on the cadastral maps were used as guiding lines for the direction of the excavation trenches. Finding

the right axis of the trenches showed us, that – in opposite to previous presumptions – they were not set exactly N-S, but leaning slightly more to the NW.

The location and direction of the new excavation trenches of 1976 were less problematic, since during the excavation precise geodetic survey was conducted in the surroundings of the site, on an area of about 3 hectares. Luckily

enough, during our research in the aerial photo archive of the Hungarian Geographic Institute we found a picture (Fig. 19) taken just couple of months after the excavation was finished (September 1976). On this image the opened (and still not refilled) excavation Trench I is clearly visible. The georeferencing of the aerial photo with the drawings made an exact location of the trenches possible.



Figure 20. Combined image of the old and new excavation trenches (possible location, 3rd settlement layer)

With a good deal of experimentation in placing, rotating both excavation areas a combined plan view of the surfaces can be presented. However, it must be emphasised, that it is still just a possibility. We are more confident about the direction of the old trench than about its precise geographic location. Nevertheless, the two areas could be fitted to each other by a possible error of just couple of meters (Fig. 20).

New results of the field research and geomagnetic survey

In this context, we had the opportunity to conduct geophysical prospection and surface collection on and off site. The main goal using magnetometry on

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the tell was to identify-as far as possible-the edges of the settlement on both side of the Laskó. On the eastern bank of the river (the location of the 1976 excavations), the building activities of the dam probably destroyed most of the upper layers. The geophysical prospection made very intense anomalies visible, which will be evaluated and discussed later. Most parts of the tell-and therefore Tompa's excavation trenches-can be located mainly on the western side of the river, disturbed edges and anthropogenic activities are still recognisable. The most western parts, the sloping and thinning outcrops of the tell are probably destroyed or covered within the fenced gardens of the properties. The area today is mainly used for gardening and housing activities, thus making any geophysical prospection impossible.

At the same time systematic surface collection was carried out around the tell, which aimed to locate possible external settlements. The area marked for investigation was limited, since large parts of the surrounding areas are covered either by buildings or by vegetation. Even so, the preliminary result of the surface collection revealed finds of several archaeological periods, with quite a few Middle Bronze Age ceramic finds in SW direction of the tell (Fig. 21). Of course, investigations are necessary further for establishing a connection and a chronological link between the sites, but even the small amount of information we gained through new field surveys confirms the existence and the possible location of a satellite site.



Figure 21. Results of the geophysical survey and the field survey (2017)

Chronology

During the past decades, there were various, sometimes contradicting views expressed about the age and internal chronology of the Füzesabony tell settlement. The leader of the first excavations, F. Tompa stated in his publication, summarising Hungarian prehistoric research, published during the years of the excavations the following about the Füzesabony settlement: "...drei durchgehend zu verfolgende Wohnschichten [lassen sich] ausscheiden (...). Hinsichtlich des Fundmaterials zeigen sich aber in den Niveaus keinerlei Abweichungen; der ganze Fundkomplex ist von oben bis unten völlig einheitlich und das in den unteren Schichten gefundene Material kommt gleichartig auch in den oberen vor." (Tompa 1936, 91). The dating was based on much younger Early Iron Age skeleton graves dug in the settlement layers, thus extended the life of the tell settlement till Late Bronze Age.

Several decades later I. Bóna compared the Füzesabony-Öregdomb settlement finds within the three phases of the Füzesabony culture (A-B-C) to the material found in the cemeteries of the same culture. The tell finds were paralleled to, partly, the finds of the Hernádkak B and Megyaszó A cemeteries (Füzesabony-B period), partly, the finds of the Megyaszó B, and the Gelej cemeteries, respectively (Füzesabony-C period) (Bóna 1975: 151). In a more recent study he further refined his statements and placed the foundation of the settlement to the B/C transitional period of the Füzesabony culture and claimed the length of the existence of the settlement till the end of the Middle Bronze Age, the 'Post-Füzesabony' times (Bóna 1992: 28). Tibor Kemenczei has dealt with the settlement first in connection with the study of material heritage of the surviving Füzesabony population. He selected, on the basis of typological criteria, some Late Füzesabony pottery from the old excavation material that in his opinion could originate only from the topmost layer of the settlement. He regarded these finds as representatives of the Koszider period and assigned them, accordingly, to LBA I. Later on, in course of the detailed analysis of the Gelej cemetery, he considered part of the Füzesabony finds contemporary with the material of the cemetery and dated them to the end of the Late Bronze Age (Kemenczei 1963: 171, 1. fig. 1-4, 6; Kemenczei 1979). The Pusztaszikszó cemetery was elaborated by F. Kőszegi; it was one of the cemeteries belonging to the Füzesabony tell settlement. When determining the internal chronology of the Füzesabony culture, the earliest habitation period of the Füzesabony settlement, Kőszegi assigned it to the classical phase of the Füzesabony culture and the rest to the Late Füzesabony period. The Pusztaszikszó cemetery itself was dated to the beginning of the Koszider period (Kőszegi 1968: 133-135; see also Kiss et al. in press, Fig. 4). T. Kovács has dealt with the chronology of the Füzesabony settlement, though only tangentially, in several studies. According to his observations made on the occasion of publishing some prominent finds from the settlement, the life of the settlement proper is basically parallel to the younger phase of the Füzesabony culture (Kovács 1984: 245; Kovács 1989-1990), but a certain part of the finds was already dated to the Koszider period (Kovács 1977: 60-61). On the basis of the finds of prevailingly uniform character, I. Stanczik, leader of the 1976 authenticating excavations did not see the presence of the Koszider period proved. She could assign the age of the settlement also to the last third of the Middle Bronze Age, the late period of the Füzesabony culture (Stanczik 1978). By now, after the processing of the whole material the abandonment of the tell can be dated to the phase immediately proceeding the Koszider period (Szathmári 2011).

Recently, the lifespan of the Füzesabony tell could be modified as a result of new radiocarbon dating (1940-1760 and 1730-1530 (95.4%) cal BC; see Table 1) on animal bone remains from the 1976 excavations. Accordingly, the data suggests that the foundation of tell must have happened somewhat earlier, already during the Füzesabony-B period by I. Bóna. Therefore, the earliest settlement features of the tell were contemporaneous with some of the early graves in the Megyaszó cemetery (Megyaszó A). Pit nr. 3. with the high chronological value (DeA-10120, 1939-1757 (95.4%) cal BC; Table 1) was dug from the uppermost layer of the tell cutting all 5 identified settlement layers and reached 80 cm into the paleosol. At the same time, it cannot be completely ignored, that Hungarian archaeology for a long time treated the founding of the tell as fact and connected it to the preceding Hatvanculture. By the preliminary study of the finds and documentation obtained on the excavation of the 1930-ies, Nándor Kalicz and later on István Bóna both arrived on the conclusion that similar to the

Table1. Radiocarbon dates for Füzesabony-Öregdomb Bronze Age site (from the excavation in 1976). The dates were calibrated using the OxCal v4.3 programme and the IntCal13 calibration curve (https://c14.arch.ox.ac.uk/ oxcal/OxCal.html)

from remains of two houses	Level 4	ovis mandible sin. M2	1735–1632 (68.2%) 1756–1566 (95.4%)	3382 ± 33	DeA-10123	end of the Füzesabony B	4
from remains of two houses	Level 3	cattle mandible dext. dP3	1692–1621 (68.2%) 1746–1546 (95.4%)	3366 ± 34	DeA-10121	Füzesabony C	3
from remains of two houses	Level 2	horse upper P sin	1727–1630 (68.2%) 1746–1613 (95.4%)	3376 ± 30	DeA-10118	Füzesabony C	2
from the feature which start from Level 1 and end in Level 2	Pit 1	dog caninus dext. skull	756–542 (68.2%) 773–488 (95.4%)	2481 ± 28	DeA-10122	Füzesabony C	1 (mixed with later material)
from the feature which start from the Level 1, pass through the Levels 2-4, get into the ancient humus 80 cm deep	Pit 3	cattle mandible sin. M3	1912–1776 (68.2%) 1939–1757 (95.4%)	3527 ± 31	DeA-10120	Füzesabony B and C	1 (mixed with earlier material)
from the uppermost level of the settlement, with pits, without buildings, disturbed surface	Level 1	dog mandible sin. M1	1684–1562 (68.2%) 1731–1530 (95.4%)	3339 ± 32	DeA-10119	Füzesabony C	Ļ
CONTEXT	FEATURE No.	SAMPLE MATERIAL	CAL BC	BP DATE	LAB. NO.	RELATIVE CHRONOLOGY BASED ON THE POTTERY (AFTER BÓNA 1975, 151)	PHASE AT SITE

site Ároktő-Dongóhalom (Kalicz 1968, 118; P. Fischl 2006), on the Füzesabony tell one should suppose the existence of an older settlement layer

of the Late Hatvan culture (Kalicz 1968: 47, 119-120; Bóna 1975: 147). The basis for this idea was partly the form of the large houses excavated in the lowermost layers of the Füzesabony tell, corresponding to those of Late Hatvan culture houses and, partly the frequent occurrence of shards with textile pattern. This pottery style, however, was found among authentic conditions during the 1976 rescue excavation in the top layers of the settlement as well, thus their role ceased as cultural indicator. Opposite to his former opinion, in 1984 I. Bóna already rejected a Hatvan culture antecedent for the Füzesabony settlement on the site proper (Bóna 1984: 156). Also, the excavations of 1976 disproved the existence of the Hatvan culture at the site (Stanczik 1978: 100: Szathmári 2011: 486).

The abandonment of the tell is—even with the latest ¹⁴C data—uncertain, but it can be dated before the Koszider period, or maybe to a transitional phase signalising the Koszider-period. The uppermost layers of the tell were thicker and most probably less disturbed during the research of 1931–1937. Presumably, ceramic types suggesting a younger dating (than finds from layer I of 1976) must be connected to these, by the time of the excavation in 1976 already devastated layers (DeA-10119, 1731-1530 (95.4%) cal BC; Table 1). From the top layers of F. Tompa's excavation some bronze pins with hollow head are known, which represent a new technology in bronze production and thus indicate the youngest settlement layers. The youngest ¹⁴C data from pit nr 1. (excavation year 1976) might be connected to the Iron Age graves, that were also present on the tell's northern part (DeA-10122, 773-488 (95.4%) cal BC; Table 1).

Conclusions

The eponymous site of the Füzesabony culture has been known and studied for more than 90 years. Scientific excavations were carried out in the 1930-ies and in 1976, revealing a large amount of finds and the internal structure of the settlement. The unfortunate and too early death of both F. Tompa and I. Stanczik postponed the evaluation of finds by many decades. During the processing of the excavation materials by I. Szathmári, great deal of new information was secured, regarding mainly the chronology and the inner structure of the settlement. The results of that investigations are used as the basis for new, modern approaches and digital processing: the GIS based analysis of the documentations and areal photography made the exact location of the excavation trenches possible, while magnetic survey and surface collections proved the existence of at least one satellite settlement. New radiocarbon data was accessible, which modified slightly the absolute chronology of the tell, too.

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The fieldwork and the data processing was done by Gábor Serlegi and Bence Vágvölgyi. During the prospection a five chanell Sensys magnetometer was used with GPS orientation and real time correction. The raw data of the prospection was filtered with different methods during the post processing for further analysis.

The systematic field survey was made using Garmin GPSMap 62 handheld GPS devices. Survey tracks were oriented in parallel north-south lines with 25 meter intervals between them. Each collected find was marked with an individual point.

Radiocarbon dates for Füzesabony-Öregdomb Bronze Age site were provided by Hertelendi Laboratory of Environmental Studies, Hungarian Academy of Sciences ATOMKI, Debrecen. Calibration was made by Gabriella Kulcsár using the OxCal v4.3 programme and the IntCal13 calibration curve (https://c14.arch.ox.ac.uk/oxcal/ OxCal.html).

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