THE *HOMO ERECTUS* SITE OF TRINIL: PAST, PRESENT AND FUTURE OF A HISTORIC PLACE

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Abstrak. Trinil: Masa lalu, Sekarang dan Masa Depan Sebuah Situs Bersejarah. Dusun Trinil menjadi terkenal dengan ditemukannya *Pithecanthropus erectus*, sekarang *Homo erectus*, oleh Dubois pada tahun 1891. Setelah ekskavasi Dubois, pada tahun 1907 sebuah ekspedisi besar-besaran dipimpin oleh E. Selenka berlangsung di lokasi yang sama. Selain fosil-fosil sisa manusia, puluhan ribu fosil vertebrata lain dan moluska ditemukan dalam ekskavasi Dubois dan Selenka antara tahun 1891 dan 1907. Koleksi ini sekarang disimpan di Naturalis di Leiden (Belanda) dan di Museum für Naturkunde di Berlin (Jerman). Studi yang berlangsung saat ini terhadap koleksi-koleksi itu mendorong perlunya penelitian baru di lapangan. Tujuannya selain untuk mengetahui potensi situs juga untuk menjawab pertanyaan-pertanyaan yang muncul dalam studi koleksi. Parit penggalian Dubois dan ekspedisi Selenka dikontekstualisasikan dalam peta geografi modern berdasarkan data historis, bahan fotografi yang masih ada, dan peninjauan lapangan 2014/2015. Potensi untuk menemukan tinggalan pada '*Hauptknochenschicht*' (HK) cukup besar di tepi kiri sungai Solo, di selatan penggalian Dubois yang asli, termasuk di tepi kiri disebelah timur lokasi yang digali. Pertanyaan yang masih tersisa, antara lain menyangkut stratigrafi situs, umur fauna Trinil dan *Homo erectus*, dan homogenitas himpunan HK, diharapkan dapat terjawab melalui penelitian baru yang akan dilaksanakan di situs ini.

Kata Kunci: Trinil, Arkeologi, Paleoantropologi, Dubois, Selenka

Abstract. *Trinil became famous through the discovery of Pithecanthropus erectus, now Homo erectus, by Dubois in 1891. After Dubois' excavations it was the expedition led by E. Selenka in 1907 performing large scale fieldwork at the location. Apart from the hominin remains, thousands of other vertebrate and molluscan fossils were excavated by both Dubois and Selenka between 1891 and 1908. These collections are currently housed at Naturalis in Leiden (The Netherlands) and the Museum für Naturkunde in Berlin (Germany). Ongoing studies of these collections have raised questions that warrant new fieldwork. This study aimed to establish the site's present potential to solve extant research questions. The excavation trenches of Dubois and the Selenka expedition were contextualized within a modern geographical map, based on historical data, extant photographic material and a 2014/2015 field trip. The potential to reach the find bearing Hauptknochenschicht (HK) is high at the left bank of the Solo river, south of Dubois' original excavations. Also the left bank directly east of the former excavation pits has a good potential. Still remaining questions concerning the site stratigraphy, the age of the Trinil fauna, including the Homo erectus finds, and the homogeneity of the HK assemblage, might be resolved by new fieldwork.*

Keywords*: Trinil, Archaeology, Paleoanthropology, Dubois, Selenka*

1. Introduction

1.1 General Introduction and Aim

The discovery of the remains of a hominin that later became known as *Pithecantropus erectus* by Eugène Dubois in Trinil on the island Java (Indonesia) (Fig.1) in 1891/1892, was a milestone in the study of human evolution. During the excavations along the Solo river in

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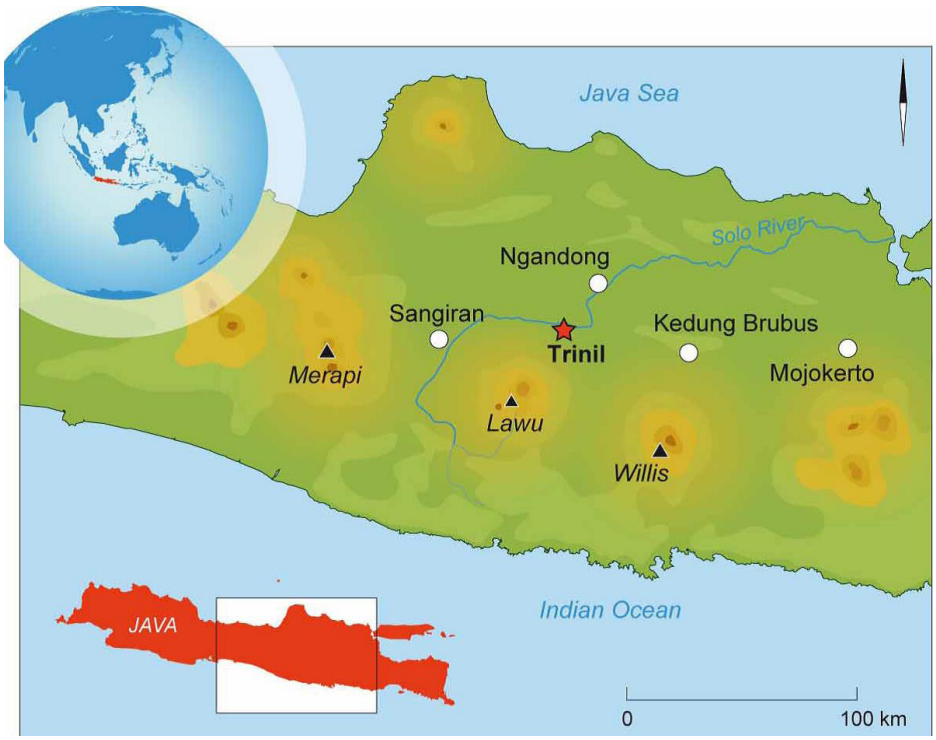


Figure 1. The location of Trinil and other early hominin sites at Java, Indonesia (Source: Joordens et al. 2015)

addition to the hominin remains an enormous amount of Pleistocene vertebrate faunal remains and molluscs were unearthed, associated with the hominin fossils.

The whole paleontological collection and the many sediment samples, descriptions and pictures taken by Dubois eventually found their way to Leiden (The Netherlands) where they are preserved as the Dubois Collection in the Naturalis Biodiversity Center. After Dubois finished his excavations at Trinil in 1900, the fieldwork at Trinil and the search for more human fossils was continued by Lenore Selenka at the same location, from 1906-1908 (Selenka and Blanckenhorn 1911). Although the Selenka expedition did not result in new hominin remains, it yielded important contextual data through its systematic and multidisciplinary approach and its detailed reporting of the fieldwork in an excellently edited volume (Selenka and Blanckenhorn 1911). The vertebrate and mollusc fossils collected by the Selenka expedition are curated in the Museum für Naturkunde in Berlin (Germany). A series of smaller-scale fieldwork interventions at and around the site was carried out in the decades following the Selenka expedition, though thus far hardly any information has been published on those activities. In 1976 and 1977 new geological observations were made regarding the setting of the find bearing levels, predominantly on the basis of coring studies, by an Indonesian-Japanese team (Soeradi et al. 1985). No further paleoanthropological fieldwork in Trinil has been published since the Selenka expedition, though. Nowadays at the right bank of the Solo river, close to the excavation sites of Dubois and Selenka, a museum can be found and the small monument placed by Dubois in 1894, shortly before he left to the Netherlands in 1895, indicating the location of his famous *Pithecanthropus erectus* (Fig. 2).

The archives of Dubois and his collections have been extensively studied, resulting in many scientific publications on the faunal remains and their paleoenvironmental setting (Hooijer 1958; Hooijer and Kurten 1984; Vos 2004; Vos and Aziz 1989; Vos and Sondaar 1982), as well as in monographs on Dubois' 'life history', the context of his research and the importance of his collections (Albers and Vos 2010; Shipman

Figure 1. The Dubois monument near the Trinil Site in June 2014 (Source: Alink)

2001; Theunissen 1989). The Dubois collection is still the subject of a variety of ongoing research, e.g. through the application of a variety of dating methods, various analyses of faunal remains, including stable isotope and CT-studies, as well as attention to the non-vertebrate fauna, contributing to our knowledge of *Homo erectus* and the paleoenvironmental setting of this species on Java (Joordens et al. 2009, 2015; Ruff et al. 2015; Vos 2004).

The age and origin of the hominin fossils and the fauna layer, the *Hauptknochenschicht* (HK layer), in Trinil is still a matter of discussion. Soeradi et al. (1985:53) for example assume that the HK layer is comparable with the 'Grenzbank' of the Sangiran area, which is dated between 0.9 and 0.7 Ma (Widianto and Simanjuntak 2009: 60), an estimate which is widely followed in the existing literature (Joordens et al. 2009: 657). However, recent dating work of sediments preserved in the Dubois collection suggest that the age of the deposition of the HK layer might be considerably younger, around 0.5 Ma (Joordens et al. 2015: 230). This obviously does not imply that all of the fossils encased in the HK matrix are of the same age as the sediments, as some of these fossils may be (significantly) older, an issue that needs to be solved by future dating studies. Joordens et al. (2015) however have provided good evidence that the mollusc fauna recovered from the HK layer does date to around 0.5 Ma, i.e. to the middle part of the Middle Pleistocene.

Recent work on the Dubois collection has shown that *Homo erectus* around half a million years ago collected freshwater mussels for consumption, used their shells for tool production and –most spectacularly– as a substrate for a geometric engraving (Joordens et al. 2015: 229, 230). The discovery of this simple engraving on a shell has significantly boosted the interest in the Trinil site and pointed to its potential for future research. The ongoing studies have also shown that many questions are still open and that new fieldwork is needed to clarify most of these. These questions include the exact mode of genesis of the HK layer, needed to understand the depositional context of the existing collections and the relative homogeneity of the assemblages retrieved by Dubois and Selenka. We not only need fine-grained data on the site formation processes, but also fresh sediment samples to construct a detailed geochronology of Trinil. Questions also remain regarding the

paleoenvironmental and paleoclimatological conditions during deposition of the hominin-bearing *Hauptknochenschicht* and the overlying layers at Trinil.

A collaboration between Arkenas and Leiden University to begin with new small-scale fieldwork in the Trinil area has recently started. In preparation of that fieldwork, a systematic survey of the history of research at the site was made by the first author, in the context of his MA in Archaeology research. The primary aim of the survey was to locate the trenches of the Dubois and Selenka teams in the extant landscape, and secondly to assess the present archaeological-paleoanthropological potential of the site. Historical data, photographic material and field trips in 2014 and 2015 to the location formed the core material for this study.

1.2 Excavations by Dubois

Dubois' excavations in Trinil took place on the left and right bank of the river Solo in the

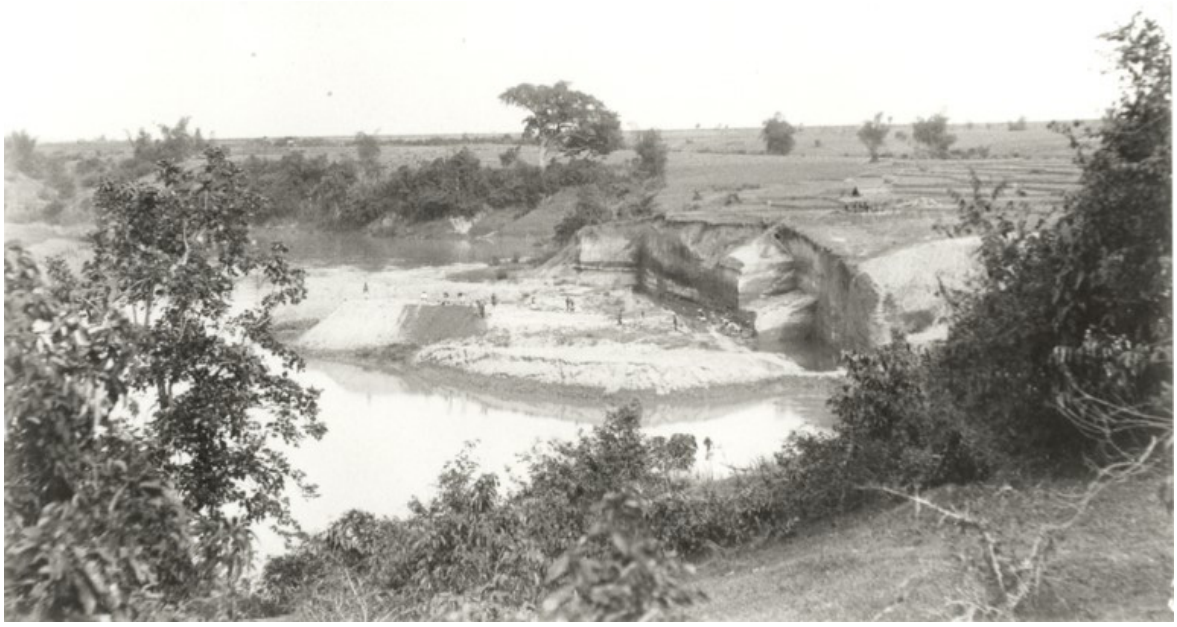


Figure 3. The Trinil Site in 1900, with a view on the left bank (Source: De Vos and Aziz 1989: 411)

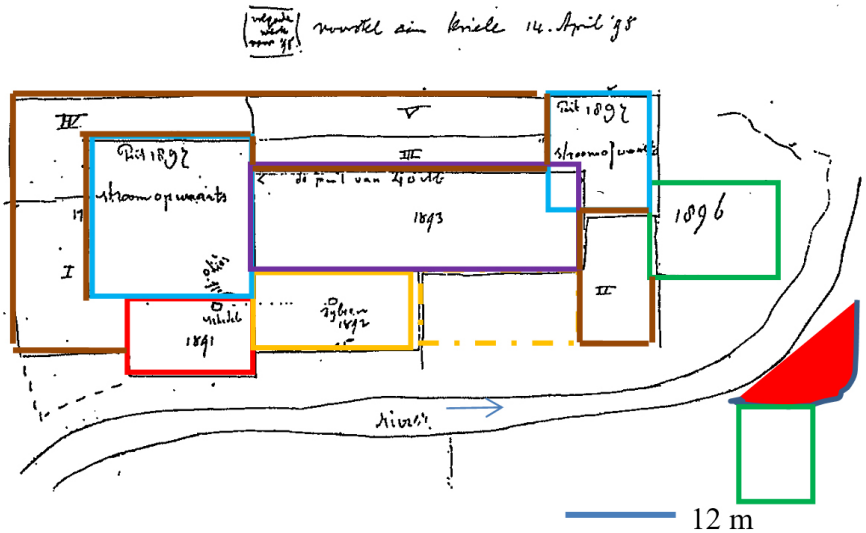


Figure 4. The trenches excavated by the Dubois team up till 1899: Red: 1891, Yellow: 1892, Purple: 1893, Green: 1896, Blue: 1897, Brown: 1899. Original sketch, without colours, was prepared by Kriele and taken from De Vos and Aziz (1989: 410)

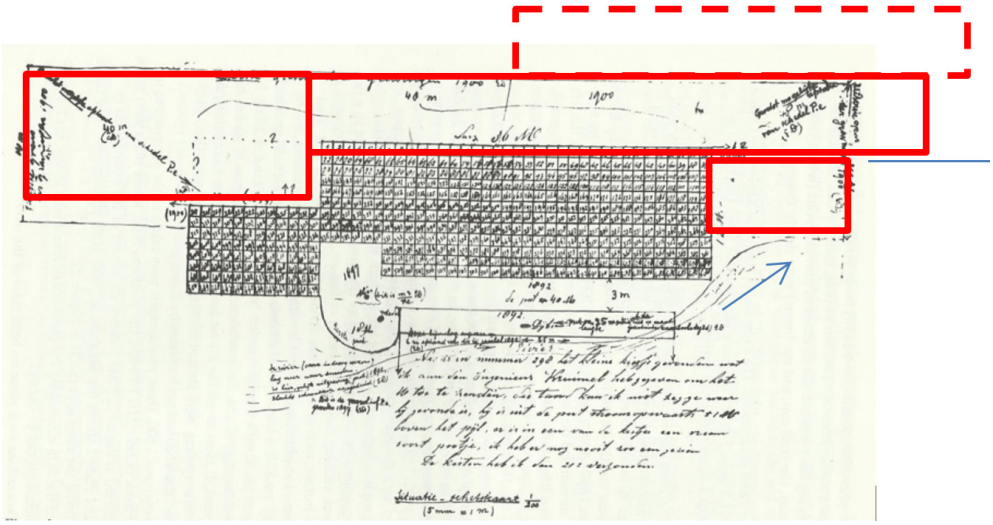


Figure 5. The excavated trenches in 1900, in red. Original sketch, without colour, was prepared by Kriele and taken from De Vos and Aziz (1989: 415). The dotted red line was not present in the original sketch

Figure 6. The famous skull cap of *Pithecanthropus erectus* (left) (Source: De Vos 2004: 271); a left femur and left upper second molar (right)(Source: Dubois 1894: Tafel II)

period 1891-1900 (Fig. 3). The total excavated area amounted to 2317 m^2 for the left bank and to 106 m^2 for the right bank. The excavated trenches in each year are roughly indicated in Figure 4 and 5. Already in September 1891 the find of a right upper third hominin molar (assigned by Dubois to *Pithecanthropus erectus*, nowadays classified as *Homo erectus*), was made, and a month later, at a distance of about 1 m, the spectacular find of a hominin skullcap (Fig. 6). In August 1892, again a hominin femur was found about 12 m downstream of the skull, and in the same month also a left upper second molar (Fig. 6). In 1900, the last year, a very large area was excavated, measuring 75 by 6 meters, directly east of the trenches of 1899 (Fig. 5). In this large pit four incomplete hominin femora were found.

1.3 Excavations by Selenka

Selenka's team started excavations in 1906. First a trench was made 60 m south of the Dubois monument, on the right bank of the Solo river, where the bone (HK) layer was not found. In another trench, also on the right bank, but north of the Dubois monument, called Grube I, the HK layer was found with fossils i.e. of *Cervus*, *Bos* and *Stegodon* (Fig. 7, 8). At the left bank, about 50 m south of Dubois' excavations, a third trench went below the lowest river water level, and also yielded some faunal remains. Also on the left bank, but a few hundred meter north of Dubois' excavations a fourth trench

Figure 7. Grube I, photo showing the systematic excavations in this pit (Source: Selenka and Blanckenhorn 1911: Tafel III)

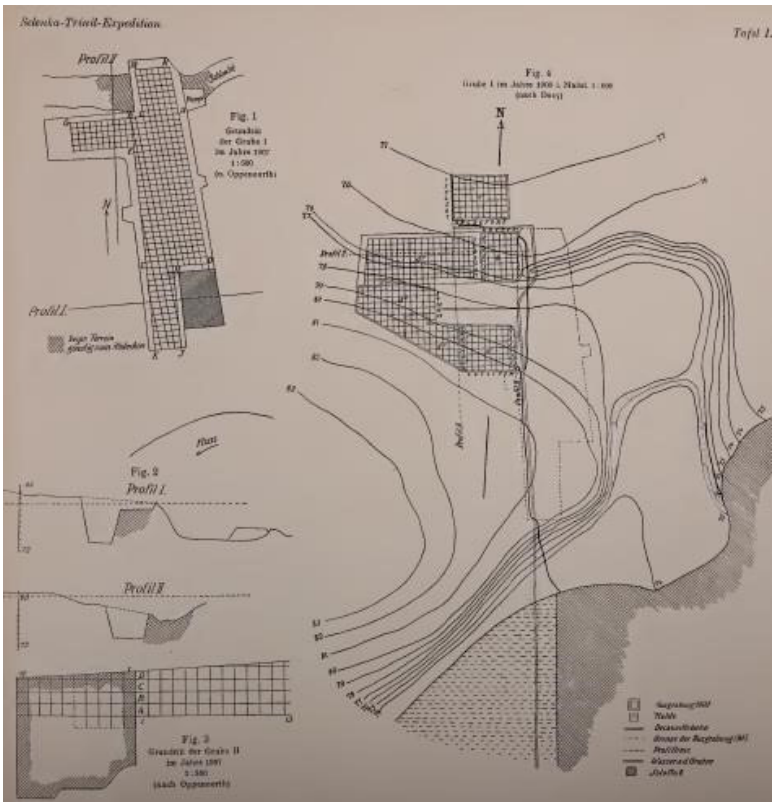


Figure 8. Detailed drawings of Grube I and Grube II (Source: Selenka and Blanckenhorn 1911: Tafel II)

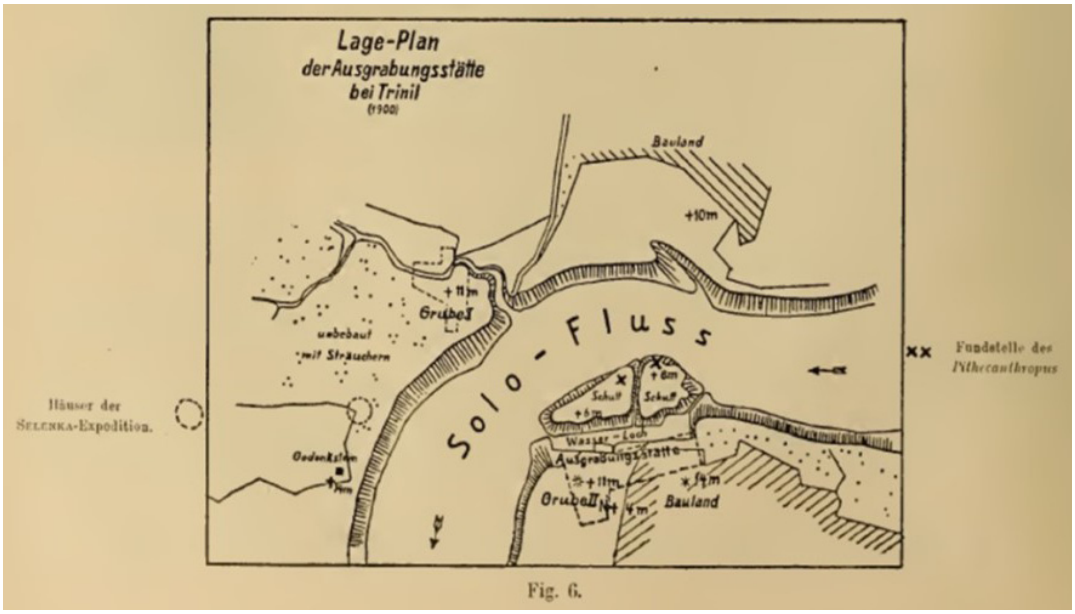


Figure 9. Map of Trinil Site showing Dubois' excavations and the location of Grube I and II, by Selenka and Blanckenhorn (1911: XII)

Figure 10. Excavation of Grube II on left bank. The arrows S and F indicate the approximate locations where skull (S) and femur (F) of *Pithecanthropus* were found by Dubois (Source: Selenka and Blanckenhorn 1911: Tafel 1, fig. 2; arrows added by author)

was made, uncovering a bone layer of 0.35 m in thickness (Oppenoorth 1911: XXX).

In 1907, while excavations continued in Grube I, a trench was dug at the left bank at the same place as Dubois' excavations, but further inland, called Grube II (Fig. 8, 10). Also here the HK layer was found. Furthermore a trench was made about 1 km north of Grube II on the left bank near 'Batu Gadja', and another trench about 3 km north of Trinil near the village Saka (Carthaus 1911: XXXIX). In 1908 the excavations largely concentrated on Grube I. In this pit the western limit of the horizontal distribution of the HK layer was found. By means of coring it was concluded that north and south of Grube I the HK layer was not present anymore (Selenka & Blanckenhorn 1911: XLI). A rough situation map for Grube I and II is given by Selenka and Blanckenhorn (1911) in Figure 9.

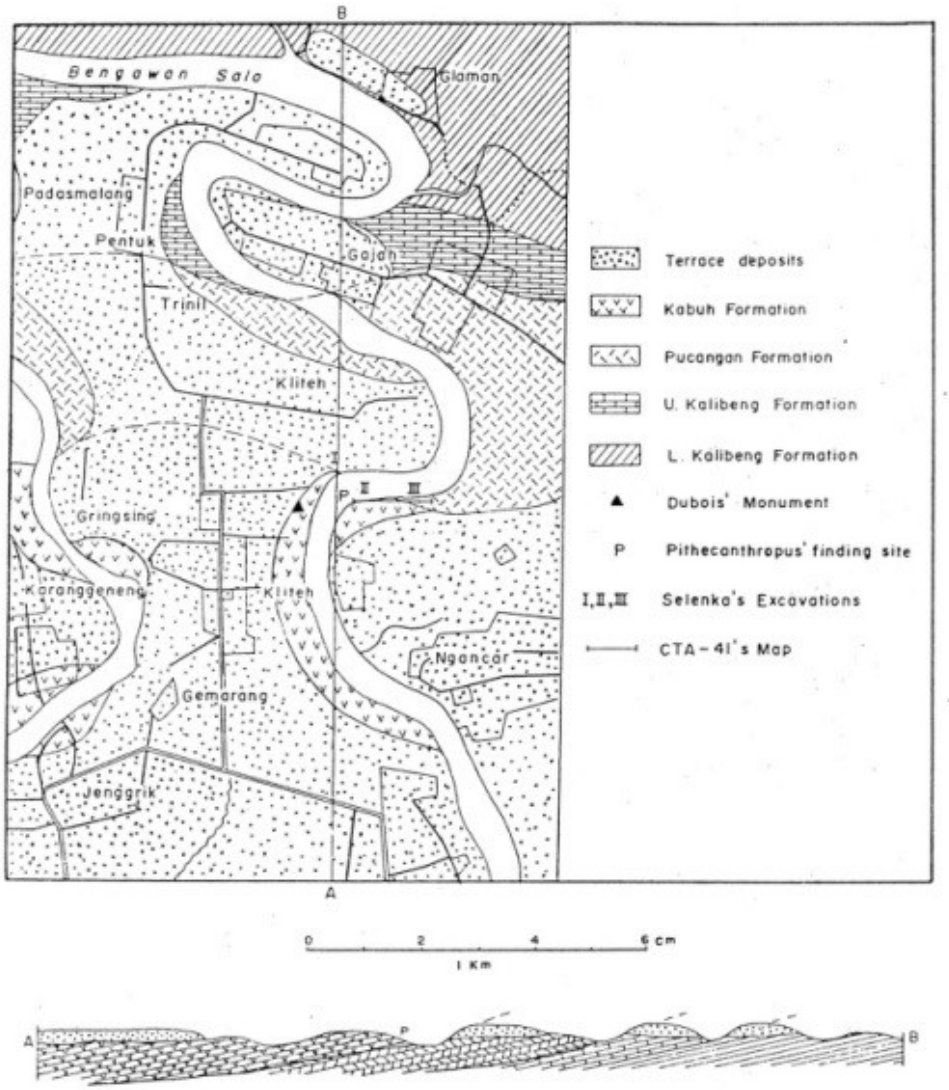


Figure 11. Geological map of the Trinil area (Source: Soeradi et al. 1985: 50)

1.4 Geological Observations by Soeradi et al.

In 1976 and 1977 the Geological Survey of Indonesia in collaboration with Quaternary scientists of Japan conducted a field survey in the Trinil area (Soeradi et al. 1985). Figure 11 shows that directly at the excavation sites of Dubois and Selenka the boundary between the so-called Kabuh and Pucangan layer, where the HK layer may be expected, is present near the surface. At the find spot of the *Pithecanthropus erectus* it was confirmed that the hominin fossils were unearthed from the gravel bed located at the base of the Kabuh Formation (Soeradi et al. 1985: 50). At the Trinil site itself, detailed columnar sections were taken directly east of the Dubois excavations on the left bank. In several sections it was shown that the HK layer is still present.

Soeradi et al. (1985: 53) made the following observations. 'At Trinil the Pucangan and Kabuh Formation crop out. The lower limit of the Pucangan Formation cannot be observed. It starts with clayey facies which consists of bluish grey silty clay, lahar or andesitic volcanic breccia with fragments ranging up to boulder size, and a silt facies which is composed of sandy siltstone. Upon the Pucangan Formation lies the Kabuh Formation which starts with gravel. In this lower gravel bed, which corresponds with Dubois' *Hauptknochenschicht*, many mammalian fossils

can be found. Upon this gravel bed, alternating clayey and sandy facies can be observed, the latter containing cross lamination'. Soeradi et al. concluded furthermore that the fossil-bearing bed of the Trinil area, a conglomerate with components of andesite and limestone fragments, has a similar appearance as the fossil-bearing bed, called 'Grenzbank', of the basal part of the Kabuh (Bapang) Formation in the Sangiran area (Vos & Aziz 1989: 419).

2. Methods

2.1 Georeferencing of the Excavation Pits

In preparation for new fieldwork at the site, it is important to locate the trenches of the Dubois and Selenka teams in the extant landscape. For georeferencing the excavation trenches of Dubois and Selenka on a present map, the Google map of 2014 of the Trinil area was used (Fig. 12). Georeferencing was based on: 1) numerical data retrieved from the literature and excavation reports such as trench dimensions, the distance between the Dubois monument and the Pithecantropus site, the width of the river bed and of cross sections, 2) sketches made by Dubois and his assistants Kriele and de Winter, and by Selenka and co-workers, 3) photographs taken by Dubois and Selenka, 4) later (including very recent, 2014/2015) pictures of the excavation area, 5) structures visible on the Google map, and 6) observations made at the location during recent (June 2014, July 2015) site visits. With these data the exact size and position of the trenches of Dubois and Selenka could be superimposed on a recent map of the area.

2.2 Archaeological-Paleoanthropological Potential Assessment

The archaeological-paleoanthropological potential of the Trinil site can to some degree be translated in terms of the chances of finding the equivalent of what Dubois called the *Hauptknochenschicht* or main bone layer (HK layer) at Trinil, where he encountered it buried beneath more than 10 meters of sediments of younger age. Getting access to those sediments is a first step to obtain fresh field data for contextualising the rich collections of Dubois (stored at Leiden) and Selenka (stored at Berlin), in order to answer key questions about the homogeneity and the age(s) of their constituents, including the hominin remains. Assessing the probable distribution of the *Hauptknochenschicht* on a geographical map is a necessary first step, which can only be made in a coarse-grained way, due to the lack of precise point-provenanced data and the few geological cores that have been sunk in the area. In this study, this assessment was based on information regarding the locations of excavations by the Dubois and Selenka teams and the coring studies of the Selenka team and of Soeradi and co-workers.

3. Results and Discussion

3.1 Georeferencing the Excavation Trenches of Dubois and Selenka

The white spots in the river bed visible in Figure 12 are sediment deposits that arise above the water level of the river Solo, increasing in size at lower water levels. Some of these spots can unambiguously be associated with the excavation activities of the Dubois and Selenka teams. The most probable positions of the excavation trenches of Dubois and Selenka on the left and right bank of the Solo river are given in Figure 13. Some structures remaining from the early excavations of Dubois on the left bank (1891-1893) are still visible in the present. The one coinciding with a sediment spot indicated in Figure 12 with an arrow, enables to locate the find spots of the skull cap and femur rather accurately. Grube I and of Grube II, as accurately presented in figure 8, were drawn on scale in Figure 13. Although Grube I exactly corresponds with the size given in Figure 9, Grube II differs much from what is presented in this Figure.

Neither in figures nor in text can any indication be found about the extension of Grube

Figure 12. Google map of the Trinil Site (June 2014). The arrow indicates the probable find spot of the *Pithecanthropus erectus* by Dubois, based on reconstruction of the excavation area (see Figure 13)

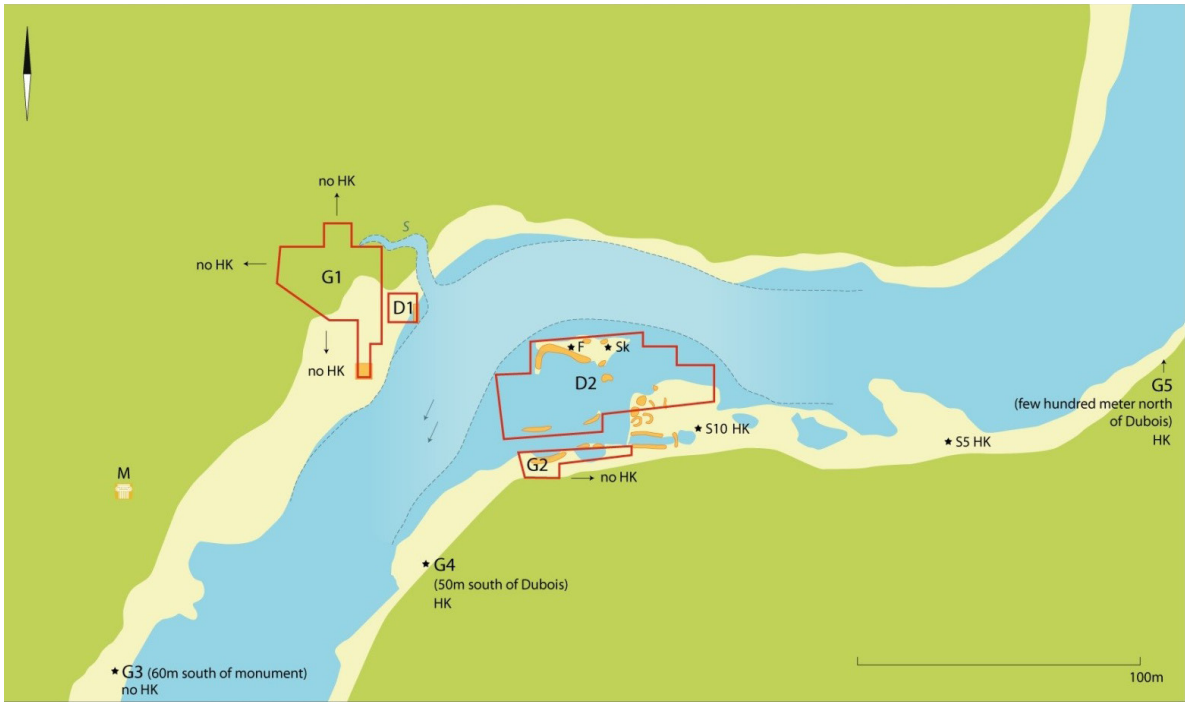


Figure 13. The excavations by Dubois (D1,2) and Selenka (G1,2) placed on a recent Google image of the Trinil Site. Green: higher river banks. white: sediment layers in the river bed (see Google map), light blue, between dotted lines: former river bed, brown: visible structures during the site visit in June 2014, possibly belonging to excavations of Dubois and Selenka. D1, D2- excavation pits of Dubois, G1 - Grube I, G2 - Grube II, G3, G4, G5 – other excavation locations of Selenka, HK- *Hauptknochenschicht*, M- Monument of Dubois, S- Schlucht, S5, 10 - coring of Soeradi (Design: Joanne Porck)

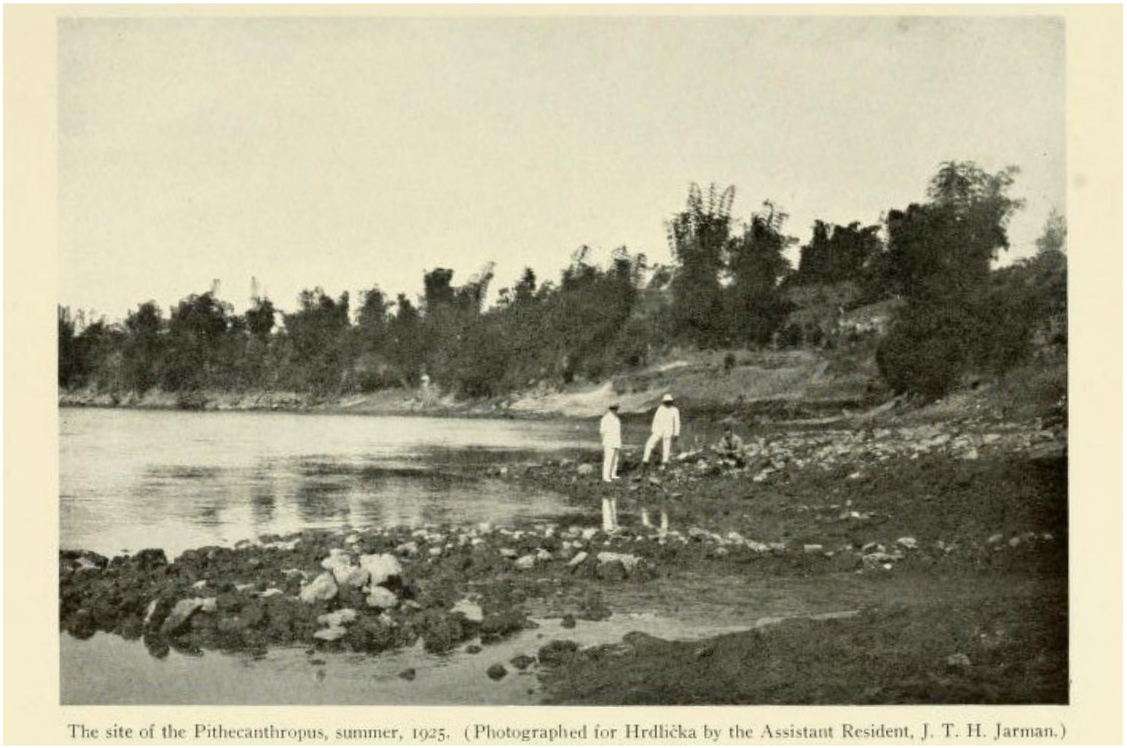
II in 1908. Dozy (Selenka and Blanckenhorn 1911: XLI) describes that in Grube II in a unpublished profile the HK layer completely disappears, and that it was therefore useless to extend the excavations further to the east. Extension of the excavation further to the south was not possible because the team did not get access to this private property. It is probable that the size of Grube II as presented by Selenka and Blanckenhorn in Figure 9 reflects the original planned excavation of Grube II.

3.2 Trinil Site, The Present Situation

As far as known the observations made by the Indonesian-Japanese team in 1976 (Soeradi et al. 1985) constitute the most recent geological data about the Trinil area collected in the field that have been published. During the site visit in June 2014 some probable remains of structures of the excavation trenches of Dubois and Selenka were visible, schematically shown in Figure 14. The fact that the structures are still there is due to the hard cemented-like character of the sediments, consisting of conglomerated volcanic material. In Figure 15 some pictures are given taken in July 2015, when the water level was lower than in June 2014. However the water level of the Solo was not as low as in 1925 (Fig. 16), when much more remains of the excavation area were visible. Although the lowest water levels nowadays are reached during the months of July, August and September, according to Mr. Catur

Figure 14. Composite figure indicating the location of some visible structures related to the excavations of Dubois and Selenka in June 2014. See also figure 15,16 (Source: Alink 2014, design: Joanne Porck)

Figure 15. Two pictures of the Trinil Site during a low water level phase in July 2015, showing structures of the excavations of Dubois and Selenka and probably the location of the 'Wasser Loch' (arrow, see also Fig. 9) (Source: Alink 2015)



The site of the Pithecanthropus, summer, 1925. (Photographed for Hrdlička by the Assistant Resident, J. T. H. Jarman.)

Figure 16. Trinil excavation site in 1925 (Source: Hrdlička 1930: Plate 3)

Hari Gumono, interpreter of the Trinil museum, they will probably never again reach the low level of 1925: water levels of the Solo have risen due to the construction of the Wonogiri Dam in 1981, in connection with a flood control plan of the Bengawan Solo river basin. Nevertheless, remains of the late 19th and early 20th century excavation pits are occasionally still visible. Exactly how all the changes in water levels, natural ones and those caused by dam construction, have influenced the remnants of these excavations is thus far completely unknown.

3.3 The Archaeological-Paleoanthropological Potential of the Trinil Site

The potential distribution of the *Hauptknochenschicht* on the left and right bank, directly adjacent to the excavation pits, is given in Figure 17. A low potential is expected for the right river bank south of Grube I of Selenka, as coring studies demonstrated the absence of the HK layer south of this Grube I (G1), which was also the case in a pit 60 m south of the Dubois monument (G3) (Selenka and Blanckenhorn 1911). The geological map produced by Soeradi

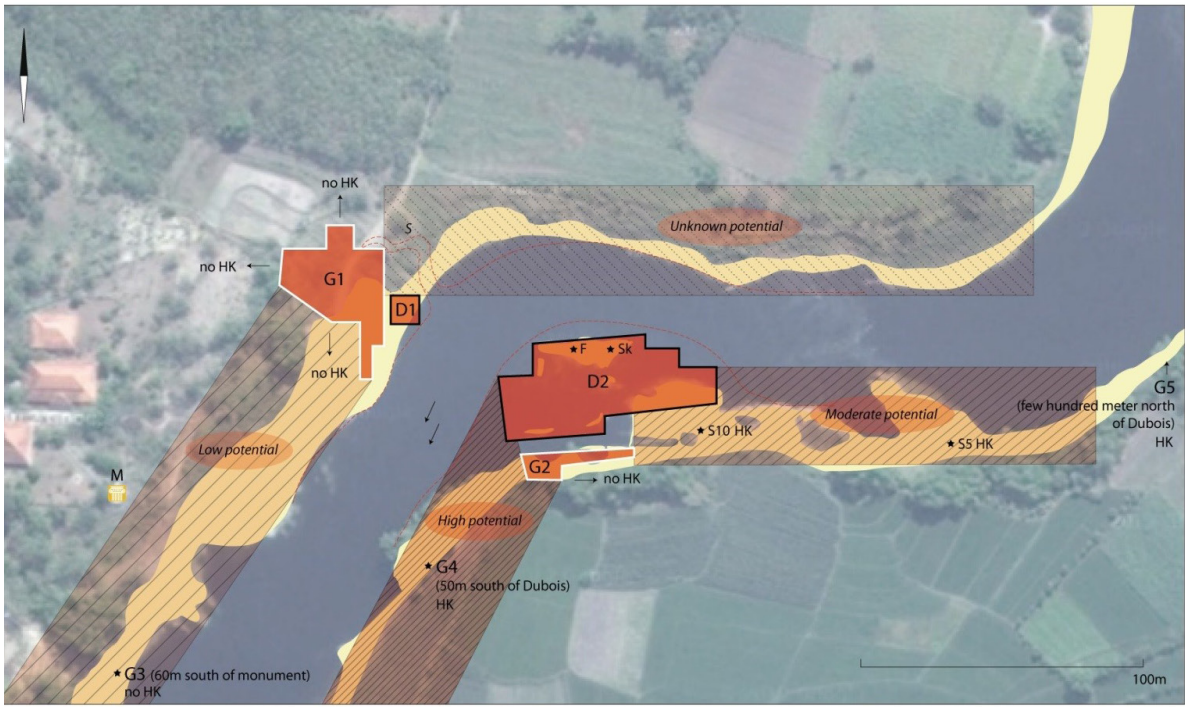


Figure 17. Potential map of the area adjacent to the Trinil Site for finding the HK layer based on excavations by Dubois (D1,2) and Selenka (G1-5), and coring of Soeradi (S5,10). G1-Grube I, G2-Grube II, G3-excavation on right bank 50 south of monument Dubois (M), G4-excavation on left bank south of excavation of Dubois (D2), G5-excavation on left bank few hundred meters north of Dubois, HK-*Hauptknochenschicht*. (Design: Joanne Porck)

et al. (1985) (Fig. 11) shows that on the right bank the Kabuh layer is cropping out and might be too thick to reach the HK layer here. A high potential is inferred for the left bank, south of Dubois (D2) and Selenka's (G2) excavations. This is based on the fact that 50 m south of these pits the Selenka team was still able to find the HK layer (G4). Although Figure 11 shows that the Kabuh layer is cropping out at the left bank at that spot, this layer is apparently here not so thick as on the right bank. The right bank directly east of Grube I has an unknown potential, as no results of excavations or coring studies are available. For the left bank east of the Dubois' excavation pits (D2) based on Soeradi's studies (Soeradi et al. 1985: 52), a moderate potential is suggested. Although Selenka indicates that east of the south extension of pit G2 the HK layer is disappearing, probably due to cropping out of the Pucangan Formation, this does not mean that more north at the height of Dubois' excavation pits this is the case too. In Figure 11, east of the Dubois excavation site, cropping out of the Pucangan Formation is indicated. However in an excavation pit on the left bank, "a few hundred meter north" of Dubois' sites, the Selenka team still identified the presence of the HK layer (G5), although on the geographical map also here outcropping of the Pucangan Formation is mentioned.

As mentioned above (3.2) there are still structures of the excavation trenches of Dubois and Selenka visible at the Trinil site. These structures are most pronounced during periods of low water level of the Solo river, i.e. during the months July, August and September. On the basis of the observations presented here one can conclude that the chances of getting access to the *Hauptknochenschicht* at present day Trinil are excellent. Hence new fieldwork to answer the questions raised in the introduction to this paper is both feasible and warranted.

4. Conclusion

The main goal of this study was to assess the potential of the Trinil site for new

fieldwork aimed at resolving a series of questions regarding the site and its finds, as outlined in the general introduction to the paper. These included questions related to the formation of the sediments that contained the finds, dating of the recovered hominin fossils and the biotic and abiotic environment of early hominins at Trinil. In order to achieve this, existing (mainly published) excavation data produced by the teams of Dubois and Selenka were summarized, excavation size and locations were recorded, and areas georeferenced on a recent map of the area. All structures visible during the 2014 and 2015 site visits fit well with the estimated excavation areas of the Dubois and Selenka teams. We wish to stress that the resulting map (Fig. 13) is a hypothesis, which needs to be tested by additional studies at the Trinil location, such as remote sensing (air photographing), high-resolution recording of the geographical coordinates of the remnant structures and by a coring campaign to trace the actual distribution of the *Hauptknochenschicht*.

We suggest that the left bank of the Solo south of the Dubois and Selenka excavations is the most promising area to restart small-scale fieldwork at the site, more than a century after the Selenka team ended its large-scale excavations there. The goals of such fieldwork could include creating fresh exposures of the *Hauptknochenschicht* and its overlying sediments, as well as mapping the distribution of the HK layer through a variety of methods, including an augering campaign. Having good access to sections through the Trinil Pleistocene deposits for dedicated sampling would enable us to retrieve new data on the mode of genesis of the HK layer, crucial to understand the depositional context of the existing collections. This could shed some light on the old debate about the relative homogeneity of the assemblages retrieved by Dubois and Selenka, recently rekindled by Ruff et al. (2015). (They suggest that it is very likely that Trinil Femur I derives from a much more recent time period than the skull cap, while the incomplete Femora II–V, recovered in Dubois 1900 excavations, may represent H. erectus.). Apart from fine-grained data on the sedimentation processes at Trinil, we also need fresh sediment samples to construct a detailed geochronology of the sequences there, as well as to reconstruct paleoenvironmental conditions during deposition of the hominin-bearing *Hauptknochenschicht* and the overlying layers at Trinil. Depending on the outcome of such exploratory small-scale fieldwork, new excavations may be warranted, addressing for instance whether, besides artefacts made on shell (Joordens et al. 2015), lithic artefacts were used by *Homo erectus* at Trinil. Thus far no such artefacts have been identified, neither by Dubois nor by members of the Selenka team, though. Carthaus (1911) stated that some faunal remains displayed possible traces of anthropogenic modification (no unambiguous traces though, as shown by a first overview of the Berlin material). Bartstra (1982) suggested that small and crude flakes, not recognized as artefacts by the excavators, could have belonged to the toolkit of the *Homo erectus* in Trinil.

The final conclusion of this paper is that a) there exists a good potential to retrieve and access the HK layer at the Trinil site adjacent to the excavation pits of Dubois and Selenka, especially at the left bank of the Solo river, and b) there are still remnants of the excavations of Dubois and Selenka visible which may be worthwhile to protect. New fieldwork at the site looks very promising and should be encouraged. Important to mention is that recently a memorandum of understanding between The National Research Centre of Archaeology in Jakarta (Arkenas) and the Faculty of Archaeology of Leiden University to restart archaeological and geological studies in Trinil has been signed. This fieldwork was started in August 2016.

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