

Striped Flint and the Krzemionki Opatowskie Mine, Poland. The Beginnings

Danuta Piotrowska

State Archaeological Museum in Warsaw, Długa 52 – Arsenał, 00-241 Warsaw, Poland
e-mail: d.piotrowska.007@gmail.com

Abstract: The interest in striped flint from the Vistula River basin in prehistoric times is associated with articles published by Georg Wilke and Gustaf Kossinna. The works of these German prehistorians turned the attention of Stefan Krukowski to this raw material. In July 1922, Jan Samsonowicz, a geologist from Warsaw, discovered a Neolithic flint mine in the village of Krzemionki, at the time in Opatów district (central Poland). The first excavations of the mine were carried out by Józef Żurowski in 1925. In 1928 the State Archaeological Museum in Warsaw (PMA) was formed, the main archaeological institution in Poland. On the part of the Museum, its curator S. Krukowski took on the job of creating the Krzemionki reserve. He was supported by Roman Jakimowicz, the director of PMA. In the spring of 1928 Krukowski began excavations of the Neolithic mine shafts in Krzemionki. The first period of excavations was summed up in his work: *Krzemionki Opatowskie* (Krukowski 1939). The book played an important role in the development of the archaeology of prehistoric flint mining in Poland.

Keywords: striped flint, Krzemionki Opatowskie, flint mine, Neolithic, Gustaf Kossinna, Georg Wilke, Stefan Krukowski

The interest in striped flint as a raw material used to produce axe-heads in the Neolithic Age arose among German prehistorians during, or just previous to, the Great War of 1914–1918 (Kossinna 1917, 1918; Wilke 1917).¹ They most probably noticed the characteristic axes of striped flint which accompanied globular amphoras in cist graves. We can be certain that the distribution of striped flint axe-heads was one of the problems interesting Gustaf Kossinna (1858–1931) when he was visiting the museums of western and eastern Prussia and the neighbouring lands of Poland in 1915 (Kossinna 1917). At this time, striped flint also interested another German prehistorian and G. Kossinna's collaborator – Georg Wilke (1859–1938).

The publication of articles by G. Kossinna and G. Wilke inspired Stefan Krukowski (1890–1982) to turn his attention to flint and the beginnings of flint mining in prehistoric Poland (Schild 1997–1998: 347–348; Lech 1999: 39–41, 2013: 14; Lech and Piotrowska 2009: 209–213; Piotrowska 2014). Krukowski (1922: 56), when undertaking his own studies in this field, referred to Kossinna's earlier achievements 'regarding striped axes'.

The beginnings of interest in striped flint in archaeological studies

From what we know, striped flint made its debut in archaeological literature in the ninth volume of *Mannus* for the year 1917, which appeared in 1919, and in which Wilke published an article devoted to the origins of

¹ Some of the arguments in this article have been more broadly presented recently in another work (Piotrowska 2014), and are therefore only touched upon here.

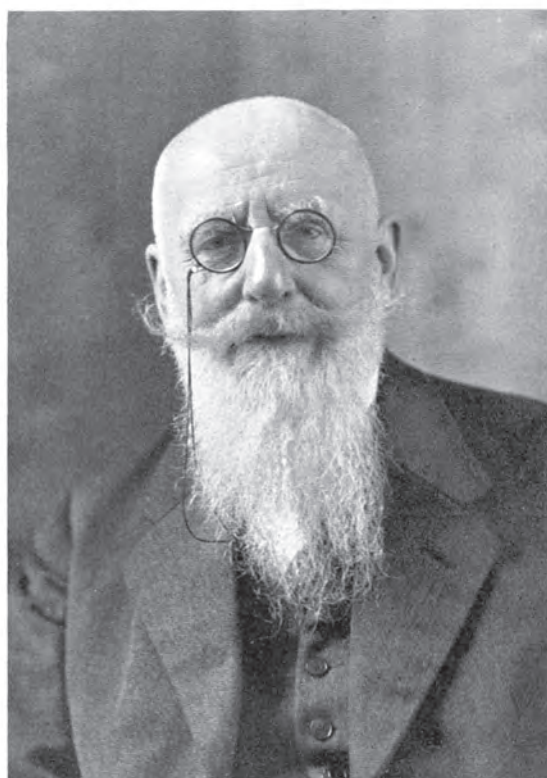


Fig. 1. Georg Wilke (1859–1938). German prehistorian, a medical doctor by profession. After Ritter (1939).

the Celts, Germans and Illyrians (Fig. 1). The last map illustrating the article is about the spreading of striped flint. Wilke's map shows 29 places where the raw material termed striped flint occurs. In his comments

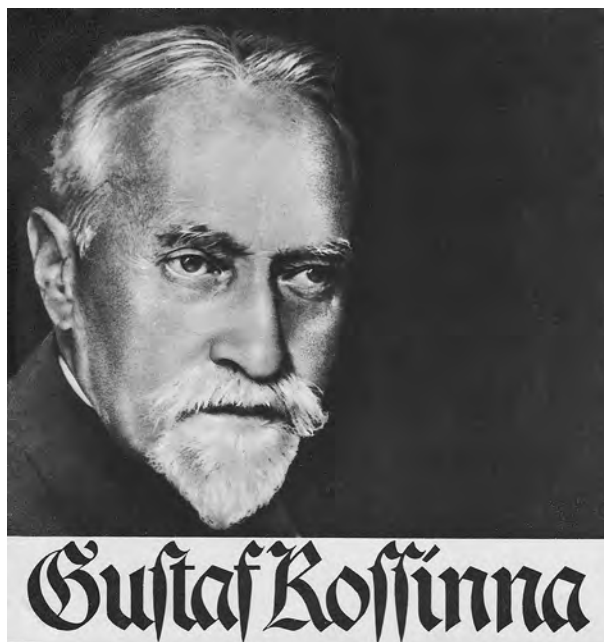


Fig. 2. Gustaf Kossinna (1858–1931), professor at the University of Berlin, was one of the first archaeologists to study the distribution of striped flint axes. After R. Stampfuss (1935).

Wilke (1917: 39; Lech and Piotrowska 2009: Fig. 4) refers to the view expressed by Kossinna that artefacts made of striped flint come from ‘Galicia’ – the name given to the southern area of Poland, incorporated at the time into the Austrian Empire.

Mannus, in the same volume, published an extensive article by Kossinna (Fig. 2), which is still cited today because of its rather untypical, for an archaeological work, title: *Meine Reise nach West- und Ostpreussen und meine Berufung zu Generalfeldmarschall v. Hindenburg im August 1915*. In the article, Kossinna (1917: 143) notes that axes of striped flint come from ‘eastern Galicia’ – ‘from the vicinity of Lemberg’.

Kossinna also discusses Wilke’s map (mentioned above) showing the spread of striped flint axes and published in the same volume of *Mannus*. His commentary indicates that he was thoroughly acquainted with the archaeological collections in Cracow and Lvov (Polish *Lwów*, Ukrainian *Lviv*, German *Lemberg*) and that he distinguished between striped flint and Volhynian flint.

Kossinna’s (1917: 144) deliberations on the subject of striped flint give some idea of his extensive research travels and contacts, which comprised not only all of Poland but also Lithuania, western Ukraine and Bohemia. He visited a number of museums, among them those in Warsaw, Cracow and Lvov, and carried

out meticulous searches in literature on the subject. His research skills and methodology, and knowledge of archaeological materials must command respect. Among other things, he produced an extensive list of finds of striped flint, together with place of occurrence (Kossinna 1918). His analysis of the latter served as a method of determining the spread of Neolithic Nordic peoples or ‘Indo-Germans’ (Kossinna 1917: 144–145). According to Kossinna (1917: 149–150), axe-heads of striped flint were for ‘northern Indo-Germans’ the main product used for barter in exchange for highly prized amber.

In the next volume of *Mannus* Kossinna published an article in which he supplemented the list of striped flint finds. He also included his own map showing occurrence of striped flint artefacts, mainly axe-heads, a map much better in every way than the one produced by Wilke (Kossinna 1918: Plate IV; Lech and Piotrowska 2009: fig. 5). On it he noted possible places from which the striped flint had originated, however none of them turned out to be correct.

Due to their content, both of the articles by Kossinna are interesting and important to a historian of archaeology as well as a researcher of striped flint (Piotrowska 2014: 24–28). The copies of *Mannus* stored today in the State Archaeological Museum in Warsaw have notes and underlinings certainly made by Stefan Krukowski, probably shortly after the two volumes reached Warsaw (Piotrowska 2014: 29).

Kossinna, Wilke, Krukowski and striped flint

In 1918 Gustaf Kossinna was celebrating his sixtieth birthday (Kossinna 1919/1920) being a well-known and highly regarded scholar not only in Germany but in much of Europe. Stefan Krukowski was twenty-eight at the time (Fig. 3). Though an experienced researcher, he was still on the threshold of his career, having returned to Warsaw after several years in Russia. He hoped to devote his life to prehistoric archaeology (Piotrowska 1992, 2006: 194–210, 2014: 28–30) and towards the end of August 1918 began some excavations in the Ciemna Cave in Ojców, commissioned by the Anthropology Institute of the Warsaw Scientific Society. The beginnings were promising, bringing the discovery of an unknown industry from the Middle Palaeolithic, later to be called the Ojców industry by Krukowski. At the beginning of September 1919 work was resumed at the site but on November 4th a tragic accident occurred. One of the hired labourers was killed when a wall of the cutting slid into the deep trench in which he was digging. The man left behind a widow and five children. The accident practically put an end to Krukowski’s cave excavations (Piotrowska 2006: 201–207 and 221; Kozłowski 2007: 65–75).



Fig. 3. Stefan Krukowski (1890–1982). The Polish prehistorian who excavated the Neolithic mine at Krzemionki in Opatów dist. From the collection of the Central Archives of Modern Records in Warsaw.

Kossinna's article on striped flint appeared with some delay in 1919 and probably quickly reached Warsaw. The subject matter suggested to Krukowski a new direction in his research, unconnected with cave excavations. The flint described by the German archaeologist was sufficiently well known to Krukowski, so that on the margin of Kossinna's (1917: 143) article he noted the local regional name – 'salceson', in English 'brawn' (Piotrowska 2014: 29). The fact that two esteemed German archaeologists had written on the subject suggested that the topic was important and worth further study. At the same time Krukowski must have realized that Kossinna was in error as to where the flint came from and that he had also mistakenly joined under a common name two different raw materials – striped flint from the north east fringe of the Holy Cross (Świętokrzyskie) Mountains and flint from the east, now known as Volhynian.

Analyzing Krukowski's articles (1920, 1922), we can suppose that the earlier German articles in *Mannus* made him realize the cognitive potential of the topic formulated as 'the beginnings of mining, transport and trade' in Poland's prehistory and were one of the

motivations for preparing a research programme to study the occurrence and prehistoric exploitation of flint raw materials from the Vistula River basin (Balcer 1992; Borkowski 1992; Lech 1992; Zalewski 1992).

These were the circumstances leading up to the initiation in 1919 of systematic studies of flint raw materials and their exploitation in prehistoric times. This particular year was specified by Krukowski himself in the preface to his book *Krzemionki Opatowskie* where he wrote: 'Research into flint mining and knapping only appeared in Poland in 1919' (Krukowski 1939: VI; Lech 1992: 139–141, 1999: 39–41). The programme introduced by Stefan Krukowski in 1919 rested on extensive field studies. Information about Kossinna's recent visit in Warsaw, about his talks with Polish researchers Marian Wawrzeniecki (1863–1943) and probably Jan Samsonowicz (1888–1959), as well as his interest in striped flint, must have reached Krukowski shortly after his return from Russia at the beginning of summer in 1918 (Wójcik 1994). The arrival in Warsaw of a renowned scholar from the University in Berlin was a significant event for Warsaw archaeologists and researchers in related disciplines. The publication of articles in two volumes of *Mannus*, in which Kossinna had drawn on the results of his travels to various places in Poland, including his recent stay in Warsaw, was most probably one of the incentives for Krukowski to formulate his programme of research into flint raw materials used in Poland in prehistoric times and into the beginnings of mining, transport and trade from the final Palaeolithic to the beginnings of the Bronze Age (Krukowski 1920, 1922).

The discovery of a Neolithic flint mine in Krzemionki Opatowskie

The crowning moment in the first phase of research into flint raw materials used in prehistoric Poland and the places where they were exploited was the discovery on 19 July 1922 by Jan Samsonowicz (Fig. 4) of a well preserved Neolithic mine (Samsonowicz 1923; see Lech 1999: 39; Bąbel 2014: 60, 2015: 28–31).

The mine discovered by Samsonowicz was situated in the grounds of the recently formed colony and then village of Krzemionki, at the time in the district of Opatów (Fig. 5). The village stood on ground where forest had previously grown and been cut down in the years 1911–1914, and part of the mining field was still covered by trees. To distinguish between the village of Krzemionki and the newly discovered site, Krukowski called it Krzemionki Opatowskie. Parts of the ancient mining field were very well preserved (Fig. 6), but others were badly damaged by small limestone quarries exploited by local peasants. Many such quarries were dug in the interwar period (Fig. 7).



Fig. 4. Jan Samsonowicz (1888–1959), the geologist working with S. Krukowski who discovered the Neolithic mine at Krzemionki. In a photograph from 1917–1920. From the collection of the State Archaeological Museum in Warsaw.



Fig. 5. Kolonia Krzemionki, formerly in Opatów dist. View onto part of the prehistoric mining field discovered in 1922. Photograph taken in the first years following the discovery. From the collection of the State Archaeological Museum in Warsaw.



Fig. 6. Krzemionki, formerly in Opatów dist. A well-preserved fragment of the prehistoric mining field. Two men are standing on a small mound – the remnants of a circular spoil heap surrounding a hollow where a large shaft used to be. Photograph taken by T. Rekwirowicz from Ostrowiec Świętokrzyski in 1930. From the collection of the State Archaeological Museum in Warsaw.



Fig. 7. Krzemionki, formerly in Opatów dist. Part of the prehistoric mining field west of B. Janicki's farmstead; devastation caused by 'limestone diggers' from Krzemionki. From the collection of the State Archaeological Museum in Warsaw.

The first archaeological excavations of the mine were carried out in September 1925, from the 3rd to the 17th of the month, by Dr Józef Żurowski (1892–1936), a Neolithic archaeologist and conservator of prehistoric monuments for Cracow voivodeship. They were financed by the Ostrowiec Świętokrzyski branch of the Polish Tourist Association and made possible the first description of the mine (Radwan 1926: 69). Żurowski counted over 500 shaft hollows (Piotrowska 2014: 37). He excavated two shafts to the west of B. Janicki's house and removed the debris from 20 metres of galleries. The intention was to secure and carry out conservation work of these features (Krukowski 1939: 118; Bąbel 1975: 165, 2015: 29–30). Żurowski also examined several



Fig. 8. Józef Żurowski (1892–1936). The Polish prehistorian who excavated the Neolithic mine at Krzemionki in Opatów dist. From the collection of the State Archaeological Museum in Warsaw.

other shafts which were accessible from the peasant quarries and cleared about sixty metres of galleries, where he came across the bottom parts of several other features. The work provided the first more reliable information about the mine, both on the surface and underground. Żurowski (Fig. 8) determined that the shafts were on average five to six meters deep and that the galleries were 50 to 70 cm high and 1.5 m wide. Basing on Żurowski's excavations, Mieczysław Radwan (1889–1968) published the first summing up of what was known about the mine (Radwan 1926). The Krzemionki Opatowskie mine was dated to the end of the Neolithic and beginning of the Bronze Age, according to the 'short chronology of European prehistory' to about four thousand years ago (Krukowski 1932a: 53, 1932b: 58; see Childe 1925: 171–243, 1932; Renfrew 1976: 15–52; Trigger 2007: 227–228).

The shafts uncovered by Żurowski in 1925 were destroyed shortly after excavations by the owners of the allotments, who found them a useful source of lime (Radwan 1926: 71; Piotrowska 2014: 38–39; Bąbel 2015: 29–30). Limestone was exploited in Krzemionki by local peasants as a means of augmenting their incomes as the small farms were not profitable. The quarrying was done on fallow land which happened to be the

best preserved fragments of the prehistoric mining field. No wonder that the damage done by digging for limestone was considerable (Krukowski 1939: 108–109, 113–114 and 118–119; Bąbel 1975: 150–153, 2015: 16–17; Borkowski 1992: 226–228; Piotrowska 2014: 39–40). Luckily, the Neolithic mining field in Krzemionki covers a very large area and part of the well-preserved fragments could be saved by being designated a nature reserve. A characteristic feature of the ancient landscape surrounding the mine were karst funnels which retained rain water. In the Neolithic Age they were the only source of water for miners. It was near such funnels that the remains of Neolithic camp sites were discovered (Krukowski 1939: 68, 76–77, 79–83 and 108; Bąbel 2014: 84–85, 2015: 129–130).

When Krukowski began to implement his programme of research into flint raw materials and the location of prehistoric exploitation points, formulated in 1919, he was employed as an assistant in the Anthropology Institute of the Warsaw Scientific Society. In June 1920 he took the post of conservator of prehistoric monuments in the State Group of Conservators of Prehistoric Remains (PGKZP), which provided him with greater possibilities of protecting and investigating monuments of prehistoric mining (Stolpiak 1984: 53–61; Abramowicz 1991: 114–115; Więckowska 1992: 32; Piotrowska 2014: 37–39).

PGKZP was a short-lived institution and in 1928 its responsibilities and seat were taken over by the State Archaeological Museum in Warsaw (PMA), established on the 22 March 1928. The State Archaeological Museum was the largest and most important archaeological institution in interwar Poland with a wide range of functions and powers but modest staff. Stefan Krukowski worked in Krzemionki as conservator and then curator, initially on behalf of PGKZP and then PMA (Piotrowska 2003: 14–20). For dr Roman Jakimowicz (1889–1951), director of the Museum and previously secretary and head of PGKZP (Fig. 9), the forming of a reserve in Krzemionki and its protection, as well as excavations of the Krzemionki Opatowskie site were a matter of prime importance. Stefan Krukowski specialized in Palaeolithic archaeology and had therefore not intended to concern himself with Krzemionki, nevertheless he agreed to devote a large part of his time to protection and excavations of the Neolithic mine. Thus, owing to the exertions and will of both men, in the spring of 1928, Krukowski could begin the systematic archaeological work at Krzemionki Opatowskie (Krukowski 1932: 53), though working conditions were extremely difficult (Borkowski 1992: 227–228).

The State Archaeological Museum was created towards the end of a short period of improving economic



Fig. 9. Roman Jakimowicz (1889–1951), the first director of the State Archaeological Museum in Warsaw. From the Central Archives of Modern Records in Warsaw.

conditions in the years 1926–1929. The situation of the newly formed institution was not easy from the start and in the next year came the Great Depression, preceded in Poland by a harsh winter, with temperatures falling in places to minus 35–40 degrees (Brzoza 2001: 157–159 and 171–177). In spite of difficult conditions, in autumn of 1929 Krukowski excavated three shafts situated in the fields of Magonie village. One of the more interesting finds made in the subterranean part of these features were some schematic drawings done in charcoal (Krukowski 1939: 55–58 and 119; Bąbel 1975: 165 and 170–171, 2014: 82–83, 2015: 117–124; Piotrowska 2014: 45 and 47). In the following years Krukowski excavated three shafts in Krzemionki (Bąbel 1975: 170–171, 2015: 30–31). The work was on a larger scale. The shafts were secured, as were the underground workings of several other shafts that could be accessed when exploitation of limestone was discontinued.

Final remarks

As a result of efforts on the part of the State Archaeological Museum, the shafts excavated by Krukowski could be appropriately secured and, though some of them

suffered damage during the World War II, today they are included in Krzemionki Opatowskie tourist route open to visitors. The first period of excavation work in the mine was summed up in a monograph of the site, which appeared just before the outbreak of World War II (Krukowski 1939). The book played an important role in advancing the archaeology of prehistoric flint mining in Poland, though much of the edition burned during the siege of Warsaw in September 1939. The discovery of the mine in Krzemionki, followed by discoveries of many other mines in the Vistula basin in later years meant that from 1922 prehistoric flint mining became an important field of study in Polish archaeology (see Lech ed. 1995; Borkowski ed. 2000; Piotrowska *et al.*, eds 2014).

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