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Life and death of a colliery. The condition and significance of former coal mining facilities in the transborder region of Saarland-Moselle

Śmierć i życie kopalni. Stan oraz znaczenie obiektów pogórniczych w transgranicznym regionie Saarland-Moselle

Abstract

The region of the Saar Basin in Germany and Moselle in France used to be one of the most important centres of coal mining. Spatial transformations of the region are related to the close-down of collieries and to the redevelopment of the former mining facilities. The research carried out by the Author in 2015 enabled an analysis of mines, taking into account the mode and scope of their redevelopment, as well as significance of these facilities. Several types of transformations have been distinguished – ranging from demolition of the former mining facilities to their adaptation for a new use. The analysis has given grounds for an evaluation of the observed processes, also in the aspect of the significance of the mines for revitalisation of the degraded areas. The conclusions primarily refer to the mining facilities in the Saarland-Moselle region, yet they may provide a reference point in the evaluation of transformations of similar European regions.

Keywords: coal mining, colliery, former mining facilities, revitalisation, cultural heritage

Streszczenie

Transgraniczny region Zagłębia Saary w Niemczech i Moselle we Francji to obszar dawnej eksploatacji węgla kamiennego. Przeobrażenia tego regionu mają związek z likwidacją kopalni oraz zagospodarowaniem obiektów pogórniczych. Autorskie badania terenowe, przeprowadzone w 2015 roku, pozwoliły na analizę reprezentatywnej części kopalni regionu Saarland-Moselle, z uwzględnieniem sposobu i zakresu ich przebudowy po zakończeniu eksploatacji oraz przestrzennego, użytkowego i krajobrazowego znaczenia tych elementów. Wyszczególniono podstawowe kierunki działań - od całkowitej likwidacji obiektów pogórniczych aż po ich adaptację dla nowych potrzeb. Dokonano oceny zaobserwowanych procesów i zjawisk, również pod kątem znaczenia kopalni dla rewitalizacji obszarów zdegradowanych oraz wykorzystania dziedzictwa pogórniczego w kreowaniu przestrzeni postindustrialnej. Sformułowane wnioski odnoszą się do obiektów w regionie Saarland-Moselle, ale mogą stanowić odniesienie do oceny przeobrażeń innych regionów górnictwa podziemnego w Europie, także w Polsce.

Słowa kluczowe: górnictwo węgla kamiennego, kopalnia węgla, obiekty pogórnicze, rewitalizacja, dziedzictwo kulturowe

1. Introduction. The Saarland-Moselle region as the area of underground coal mining industry transformation

A special place among all problems related to spatial revitalisation is occupied by the problems of transformations taking place in former industrial areas, including the sites of underground mining of raw materials. The significance and validity of these problems stem primarily from the transformation of the mining industry, observed in many European countries, which is reflected not only in economic and social processes, but also in initial changes in the space and in the functioning of traditional mining areas.

An example illustrating the problems accompanying contemporary transformations of areas with an underground mining industry, including a review of diverse approaches to the process of closing defunct collieries and to using the former mining facilities, is the trans-border region of the Saar Basin – located in the western part of Germany and the French region of Moselle – jointly constituting one of the biggest areas of underground coal mining in Europe. The area comprises several dozens of collieries located on both sides of the Saar River running along the French-German border, in the zone outlined by the network of towns: Saarlouis, Neunkirchen and Saarbrücken in Germany and Creutzwald, Stiring-Wendel and Folschviller in France (Fig. 1).

The history of coal mining in the Saar Basin and the Moselle region goes back to the 14th century, and the industrial scale mining of "black gold" began in these areas in the early 19th century. From that time on, the region was experiencing dynamic growth, playing a significant role in the post-war industrialisation process of the whole continent, based mainly on heavy industry, such as coal mining, coke production and their accompanying industries – steel metallurgy and conventional power generation. Until the mid-20th century, German and French coal mining industries were key economic sectors in both countries. Coal production in the Saarland-Moselle region reached its historic peak in the 50s of the last century [8][1]. However, since that time on, the amount of mined coal was continually diminishing until June 2012, when the last underground colliery in the Saar Basin was finally shut down.[2]

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[1] As may be found in statistical data, the German coal mining industry recorded its historic highest level of raw material extraction in the first decade after the end of the II world war and in the mid-50s of the last century, it reached 125 m tonnes a year. Over 150 underground collieries were functioning in the area of then Germany at that time, employing jointly almost 600 thousand miners.

[2] The main reason of coal mining industry liquidation in Germany was the systematically decreasing profitability of coal extraction, as the industry was unable to compete with the considerably cheaper stock imported from abroad, among others from Russia, Columbia, the USA, Canada and Poland [9]. Contrary to popular belief, German collieries were not shut down due to pro-environmental policy of the government and, which follows, the desire to limit the amount of energy generated in conventional power plants [4]. Admittedly, the share of renewable energy in the total energy production in Germany is continuously growing, but at the same time, by the decision of the federal government, Germany is going to withdraw completely from nuclear power generation by 2022 [6]. In such situation, the demand for coal used for energy production in modern conventional power plants has been stable in recent years and amounts to approximately 60 m tonnes per year, the significantly major part of which is imported. Coal mining in Germany will definitely cease to exist in 2018, when the domestic mining industry will no longer receive subsidies. The last two active underground collieries – in Bottrop in the Ruhr Basin area and in Ibbenbueren (North Rhine-Westphalia) – will have

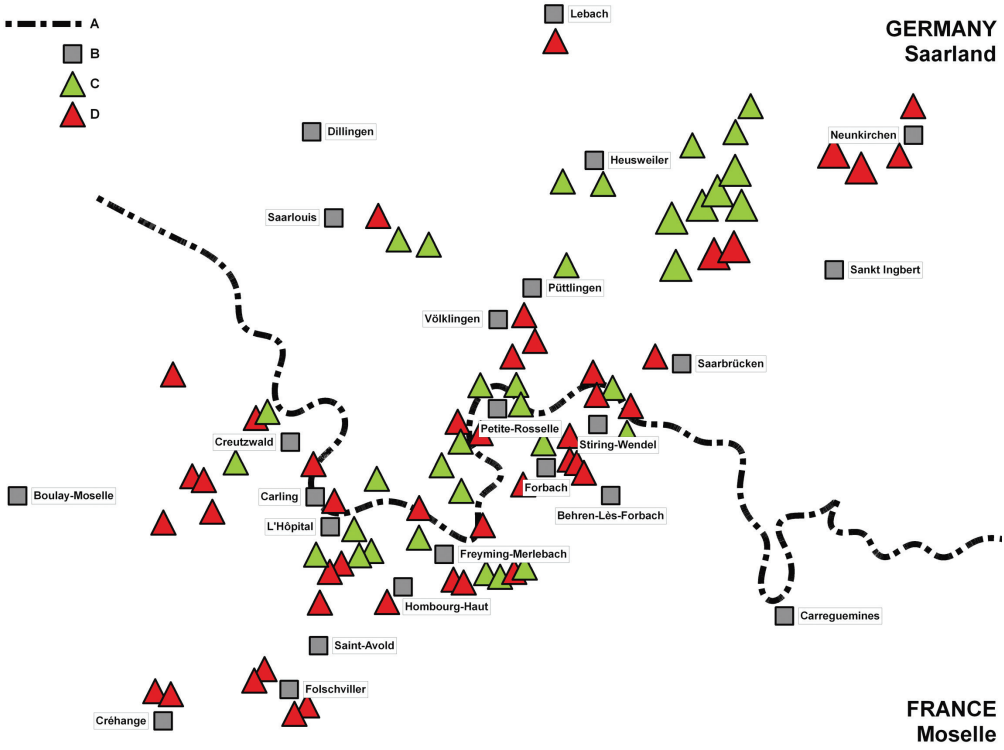

Fig. 1. Location of defunct coalmine shafts in the Saarland-Moselle region in Germany and France (graphics by the author based on the permanent exhibition in the museum of mining at the site of former *Wendel* colliery in Petite-Rosselle): A – German-French border; B – major towns; C – locations of mining shafts included in the field research; D – locations of the remaining mining shafts (preserved and non-preserved)

The ongoing transformation of the former mining region of Saarland-Moselle and its related spatial phenomena and problems have inspired the author to undertake research work comprising field research carried out in July and August 2015 at over thirty sites of coal extraction (listed in Fig. 1). The selected locations reflect the distribution of mining infrastructure, i.e. complexes of shaft headframes and their accompanying facilities of industrial, administrative and economic function related to the operation of a dozen or so separate collieries. Taking into account the stage of liquidation of individual collieries at the time of the research as well as the degree of preservation and the scope of use of the former mining facilities, the studied objects may be classified into two basic groups:

been closed by that time [8]. The situation of coal mining in France used to be the same as in Germany, the only difference being that the process of coal mining industry liquidation took place a little earlier and was stretched over a longer period of time. In France, environment protection was indeed a strong argument for shutting down underground collieries extracting coal. It is worth noting that both in Germany and in France, the process of coal mining industry liquidation is accompanied by comprehensive government programmes alleviating the social effects of definitive closure of all underground collieries in the Saarland-Moselle region.

a) collieries, which have been definitely closed, now in various degrees of preservation and used as former industrial facilities;
b) collieries currently in the process of being shut down, undergoing spatial and functional transformations.

With reference to the classification outlined above, the aim of the field research was to identify certain properties and phenomena that are important for the space and functioning of the former mining region of Saarland-Moselle in the face of the ongoing or completed process of liquidating defunct collieries. The following issues were the focus of the research work:

- spatial effects of liquidating the defunct underground collieries, with emphasis placed on the degree of preservation of the infrastructure characteristic of underground mining;
- the potential of the preserved mining facilities to be used for other purposes, with special attention paid to using defunct collieries for the function of services;
- landscape, scenic and compositional role of former mining facilities, including shaft headframes and dumping grounds;
- relation between the direction in which the colliery liquidation proceeded as well as the preservation and display of specific culture-related values connected with mining in the region.

2. The current situation of underground collieries in the Saarland-Moselle region

The main objective of liquidating collieries, in which industrial extraction of natural stock, including coal, has ceased, is to neutralise the negative effects of their operation as well as to prevent the emergence of such effects in the future. In the technical sense, liquidation of underground collieries includes securing the underground post-excavation spaces, which is aimed at limiting the influence of the colliery on its surrounding areas above ground. The final stage of liquidation is filling up the shafts, or at least sealing off the shaft openings above ground. The process is, as a rule, irreversible, so it may be assumed that a colliery liquidation usually entails permanent and total loss of the underground workings in spite of the fact that there are a number of options of how these spaces could be adapted and reused, also for commercial purposes.

The liquidation mode presented above is typical of the great majority of shutdown procedures applied to collieries in the Saarland-Moselle region. Of all the researched cases, only the German colliery *Velsen* located in the area of Grossrosseln has made a fragment of its former underground workings available for mass tourism (Fig. 2).

Given the complete liquidation of underground workings in almost all collieries in the Saarland-Moselle region, the analysis of the current condition and significance of these facilities must automatically be restricted to an evaluation of mining components located above ground – individual buildings, complexes of buildings, engineering facilities and undeveloped areas in the past connected with the operations of the colliery.

Fig. 2. Entrance to the underground tourist route created in a part of the former underground workings of the now defunct colliery *Velsen* in the vicinity of the German town of Grossrosseln (photo by P. Langer, 2015)

2.1. Collieries in the Saarland-Moselle region after completion of the liquidation process

Liquidation of a great majority of collieries in the Saarland-Moselle region has already been completed. Nonetheless, they differ considerably from one another in respect of the degree of preservation and their current functional, spatial and scenic significance.

In extreme cases, the liquidation has led to complete demolition and clearance of aboveground mining infrastructure, including the structures of shaft headframes. At present, the only reminder that such collieries or parts thereof – in the form of scattered clusters of shafts – ever existed are information boards presenting a short outline of the colliery history, old photos and basic technical data of the facility. Such is the situation of, among others, the *Südschacht* shaft headframe in the *Saar* colliery close to the German town of Heusweiler, or the *Josefschacht* headframe in Altenkessel located near Völklingen. Some of the closed mining shafts are marked out in the space by installations mounted above ground in order to degas the closed underground workings, such as in the case of twin shafts *Neuhaus 1* and *Neuhouse 2* as well as the *Lauterbach* shaft located just off the German-French border (Fig. 3). The cases presented above constitute a minority. Most often, some of the aboveground mining infrastructure is preserved, including the now totally useless shaft headframes. It makes economic sense as it reduces the cost of colliery liquidation, even if the former mining facilities are not going to be adapted for new functions.

A large group among the closed collieries in the Saarland-Moselle region are facilities with a partly preserved aboveground infrastructure, which has remained unused since the liquidation process completion. Development complexes, in the past servicing the mining shaft, are usually fenced away and frequently screened by high greenery; access to them is difficult or there is no access at all. In numerous cases, locations of defunct shafts are highlighted by their still

Fig. 3. An installation for degassing liquidated coal workings – the only element marking the former location of mining shaft *Lauterbach* on the border between Saarland and the Moselle district (photo by P. Langer, 2015)

existing headframes, which constitute characteristic dominant elements of the view. Remnants of liquidated collieries – in the form of abandoned and useless mining facilities – may be found both in Saarland, e.g. *Elm* shaft, *Erkershöhe* shaft in the vicinity of Friedrichstahl, *Itzenplitz* shafts near Schiffweiler or remnants of *Landsweiler-Reden* colliery (Fig. 4), and on the French side of the border: shafts in Stiring-Wendel, *Saint-Charles 1* shaft between Grossrosseln and Petite-Rosselle, *Troise* shaft in L'Hôpital and others (Fig. 5).

Fig. 4. Headframes and disused facilities of *Itzenplitz* shafts in the Saar Basin (photo by P. Langer, 2015)

Fig. 5. Useless remnants of a colliery in Stiring-Wendel in the French district of Moselle (photo by P. Langer, 2015)

A separate category of facilities falling within the scope of this research are collieries, which, following the completion of the liquidation process, have undergone functional adaptation of the preserved former mining facilities. This category may be divided into two subgroups. The first one comprises shaft headframe complexes, which are used in a way that has no connection to their original function. It refers primarily to large-scale buildings used by local companies for purposes related to their business operations. The following complexes of former shaft facilities are used in this way: *Neuschacht*, the collieries in Holz, Hirtel and Putlingen in the Saarland area, and in the French part of the region – *inter alia* the *Saint-Charles 2* shaft facilities in Petite-Rosselle and the shutdown colliery *Ste-Fontaine* in Freyming-Merlebach (Fig. 6).

Fig. 6. The area and buildings of the shut down colliery in Holz (Saarland, Germany) used by a local building company to purposes totally unconnected with the former function of the preserved facilities (photo by P. Langer, 2015)

In some cases, like e.g. in German Dilsburg, the former colliery sites have become the cores of modern industrial zones, where the preserved headframes play the role of compositional dominants testifying to the mining past of the region, yet they are not incorporated into the functional programme of the new areas, nor have they been turned into a tourist attraction.

A different way of putting defunct Saarland-Moselle collieries back to use is their functional adaptation for public services, which is accompanied by rebuilding and spatial restructuring guided by intentional use of former mining facilities highlighting them as components of the region's specific cultural heritage. Such mode of transforming shutdown collieries is described by the author as their revitalisation.

Analysing the process of former collieries revitalisation, both on the French and on the German side of the border, we cannot fail to notice how much attention is paid to preserving the authentic character of these facilities, which manifests itself, among others, by keeping their original form and layout, conservation, as the facilities are not always in good technical condition, preserving the old furnishings, materials and colour schemes, while at the same time introducing new components – remaining in clear contrast with the traditional form of the former colliery buildings (Fig. 7).

Fig. 7. Colliery *Wendel* in Petite-Rosselle in the French district of Moselle, after revitalisation playing the role of an interactive museum of mining (Musée La Mine – Carreau Wendel and Musée Les Mineurs Wendel) housed both in the original mining facilities and in contemporary pavilions built within the framework of the revitalisation process. The areas of the former colliery are used as open-air stage for mass cultural and entertainment events as well as an open-air exhibition of mining machines and devices (photo by P. Langer, 2015)

The research done in the Saarland-Moselle region has demonstrated that revitalisation of defunct collieries refers not only to the built development located at the mining shafts, but also – in equal measure – to the open areas surrounding these shafts. An example to illustrate the above is the *Schiffweiler-Reden* colliery in the Saar Basin, where the revitalisation project comprised creating a park whose main axis is the natural, though partly arranged, watercourse flowing under the main headframe of the colliery adapted for a museum and an exhibition area – *Das ERBE* (Fig. 8). The recreation and leisure areas of the revitalised colliery also incorporate the colliery's external dumping ground, the top of which has been turned into an extensive area destined for mass events, complete with a stage, gastronomic infrastructure and viewing terraces over the vast panorama of the Basin. The revitalisation activities at the dumping grounds are part of the programme aiming at turning this area into a multifunctional park-garden (*Reden-Haldengarten*) exhibiting the natural and cultural assets, which are specific for the land related to coal mining. An interesting example of modern redevelopment of former mining facilities in the Saarland-Moselle region is the site of the former colliery in Saarbrücken-Burbach. The area surrounding the now defunct shaft complex has been transformed into a modern technological park with works of architecture and public spaces designed and executed to high technological and aesthetic standards. Admittedly, the preserved mining facilities are not incorporated into the functional programme of the park, yet they constitute a key element in shaping its composition and visual connections. The shaft steel headframe as well as two ventilation exhaust vents of the former underground workings make interesting features in the spatial structure of the former industrial part of Saarbrücken – the second largest city in the Saar Basin (Fig. 9).

Fig. 8. Open areas of the revitalised colliery in Schiffweiler (Saarland, Germany) arranged as a contemporary park with a natural watercourse and an artificial water canal along the main compositional axis of the site (photo by P. Langer, 2015)

Fig. 9. The site of a former colliery in Saarbrücken-Burbach (Saar Basin, Germany) now transformed into a technology park. Besides new buildings, an important component of the new urban development are former mining facilities, including air exhaust vents ventilating the underground coal workings (photo by P. Langer, 2015)

2.2. Collieries in the Saarland-Moselle region currently undergoing the liquidation process

The collieries discussed so far are facilities for which the liquidation process has already been completed. Therefore, it is possible to undertake a preliminary analysis of the effects that this process has produced. However, there are still mining companies in the Saarland-

Moselle region, which are currently going through the process of liquidation and are subject to intensive functional and spatial transformations. One of such collieries is *Göttelborn*, located a few kilometres to the west of Heusweiler (Fig. 10).

Fig. 10. Fragment of the aboveground infrastructure of *Göttelborn* colliery (the Saar Basin, Germany) now undergoing intensive spatial and functional transformation (photo by P. Langer, 2015)

Movements in the area of the main shaft of the colliery and, in particular, the working hoist in the headframe reveal that works related to sealing off the coal workings are still continued underground. Meanwhile, a part of the preserved aboveground infrastructure has been transformed into modern commercial facilities.

New buildings, although blended into the former excavation infrastructure, stand out because of their architectural form and applied materials. Generally accessible spaces, gradually incorporated into the system of public areas, are characterised by carefully designed details of the urban plan referring to the now defunct industrial plant. An interesting component of the *Göttelborn* colliery's new development is the educational trail linking the main complex of buildings with the dumping ground, which features a viewing platform offering views over the whole development complex of the shaft and extensive panoramas of the region, at the same time allowing for observation of the mining works carried out within the dumping site itself (Fig. 11).

Another example of a facility, which is undergoing the process of liquidation, is the *Saar* colliery, whose shaft complexes (already partially inactivated) are located in the vicinity of the region's capital – Saarlouis. The colliery, where the liquidation works are still continuing, maintains its mining function, but its accompanying dumping grounds are being gradually regenerated and made accessible to new users. The crown of the dumping site is a perfect viewing point offering an extensive panorama of the Saar valley and the industrial sites located therein (Fig. 12). The flattened top of the hill is a convenient starting point for air

sports lovers, and the slopes perform the function of public green areas in which camping is permitted. The southern slopes of the dumping grounds have also been used as the site of experimental vineyards, which apparently yield excellent fruit due to the soil, which is rich in carbon compounds.

Fig. 11. View from the platform located at the end of the educational trail created in the area of the *Göttelborn* colliery on the slopes of the dumping site, a water reservoir and the local power plant set against the panorama of the region (photo by P. Langer, 2015)

Fig. 12. View over the Saar valley and the city of Saarlouis – the capital of the Saar Basin – from the top of the dumping site heaped up at one of the shaft complexes of the Saar colliery, now in liquidation (photo by P. Langer, 2015)

3. Evaluation of the contemporary condition and significance of collieries in the Saarland-Moselle region. Discussion of the research results

The examination carried out by the Author has unveiled a certain image of the collieries covered by his field research. It may be noticed that the present condition and contemporary significance of the analysed facilities differ considerably. All the collieries have ceased their industrial mining operations; however, some of them still continue underground works within the closedown process. The research enables a general assessment of the liquidation outcomes as well as the spatial, functional and scenic significance of the collieries in which the liquidation process has been completed. When it comes to the facilities, which are still undergoing liquidation, we may only monitor the tendencies in their transformation, but the final results of the ongoing metamorphosis remain unknown.

Table 1.

Stage of the liquidation process and the present mode of using the colliery		Examined feature				Sample facilities (names of collieries or towns/cities in which collieries are located (G) – facilities located in the area of Germany, Saarland (F) – facilities located in the area of France, Moselle
		Degree of mining infrastructure preservation	**Functional significance of defunct collieries**	**Landscape-related role of former mining facilities**	**Influence of the liquidation on the culture-related value of former industrial facilities**	
Liquidated collieries and complexes of shafts	Completely dismantled and cleared	unpreserved	no functional significance	no landscape-related significance	immediate loss of culture-related assets	Südschacht, Josefschacht, Neuhaus 1 i 2, Lauterbach (G)
	Left unused	partly preserved, subject to ongoing technical degradation	no functional significance	limited landscape-related and compositional role of the preserved former mining facilities	gradually progressing degradation of culture-related assets	Elm, Erkershöhe, Itzenplitz, Landsweiler-Reden (G) Stiring-Wendel, Saint-Charles 1, Troise (F)
	Adapted to a function with no connection to coal mining	preserved, maintained in satisfactory technical condition	commercial function with no connection to the mining function	considerable landscape-related significance and important compositional and scenic role of the preserved former mining facilities	maintaining former industrial units as part of cultural heritage without showcasing the preserved assets (static role)	Neuschacht, Holz, Hirtel, Putlingen, Dilsburg (G) Saint-Charles 2, Ste-Fontaine (F)

Liquidated collieries and complexes of shafts	Revitalised	preserved, renovated and technically modernised	comprehensively redeveloped for public utility purposes closely related to the mining function	considerable landscape-related significance and important compositional and scenic role of the preserved former mining facilities	maintaining former industrial facilities as part of cultural heritage and showcasing the preserved assets (dynamic role)	Schiffweiler-Reden, Saarbrücken-Burbach (G) Wendel (F)
Collieries undergoing the liquidation process		preserved, subject to successive renovation and technical modernisation	gradually adapted for commercial functions, using the specific assets of the space	considerable landscape-related significance and important compositional and scenic role of the preserved former mining facilities	maintaining former industrial facilities as part of cultural heritage and showcasing the preserved assets (dynamic role)	Göttelborn, Saar-Saarlouis (G)

As has been demonstrated in the article, the post-industrial transformations of the examined collieries often head in completely different directions, which instantly affects the current condition and role of these facilities as former mining units. The above problem may be viewed in several related aspects, relevant to the present and the future of the Saarland-Moselle region as a trans-border post-industrial space.

The results of the field research carried out by the Author in the trans-border region of Saarland-Moselle have been collected and synthetically presented in the table below (Table 1).

3.1. Degree of mining infrastructure preservation

Analysis of the degree in which the mining infrastructure has been preserved is a key component in the evaluation of the results of liquidating defunct collieries. As has been mentioned before, the evaluation basically refers to the facilities situated above ground, since liquidation of the coal mining companies has (with one exception) entailed permanent blocking and sealing off of underground workings, with no option of making these spaces accessible for any purposes.

Liquidation of numerous collieries means comprehensive and complete demolition and clearance of the aboveground mining infrastructure. Such cases may be described as an intentional and irreversible physical destruction of collieries. However, a significant part of the liquidated coal mining enterprises has survived in their physical form, preserving, to various extents, their aboveground facilities. This group comprises both collieries whose complexes of headframes are not used and the ones that have been adapted to new functions – related to coal mining or not. Where the defunct colliery has not been redeveloped, leaving the former mining facilities without giving them a new function, contributes to their progressing technical degradation and, in consequence, to inevitable destruction. Hence, it may be assumed that the ultimate result of refraining from any action with reference to the former coal mining facilities is similar to the one of their complete liquidation and, in the long-term perspective, entails total removal of the disused infrastructure. Evidence supporting the above thesis may be found in the remnants of the defunct collieries, where the abandoned shaft headframes have soon fallen into disrepair, which – in all probability – cancels any chances of modernisation and further use of these facilities.

The situation of shaft facilities, which, following the process of colliery liquidation, have been adapted to new purposes, is different. When it comes to facilities whose new function bears no relation to their original use, the technical condition of the redeveloped infrastructure is maintained at a stable and satisfactory level – according to the needs of the new users of the preserved facilities. It refers primarily to large-scale former mining buildings, usually adapted to the storage function, much less frequently to shaft headframes, which – due to their specific character and form, are difficult to adapt to any other function than the one related to mining. As it is referred to revitalised collieries – comprehensive projects of redeveloping the former coal mining facilities and areas stipulate extensive use of the preserved infrastructure, mostly for public utility purposes. The observations made in the Saarland-Moselle region clearly indicate that revitalisation of defunct collieries comprises partial restructuring of former shaft facilities, renovation and modernisation of mining infrastructure components,

including interiors of buildings, while at the same time introducing new buildings and other components of development in the open area. A characteristic feature of the reconstruction process in the revitalised areas is conservation of the original technical condition of the existing development and the pursuit to preserve their original character and décor.

Evaluation of the degree of mining infrastructure preservation in collieries currently undergoing the process of liquidation is a complex issue. Since the liquidation process requires that certain underground works still need to be done, the necessary part of the colliery infrastructure must be maintained in the condition allowing its safe use for the purposes of continuing the liquidation works. It also refers to shaft headframes, which – at the stage of the colliery liquidation – must enable communication and transportation in selected shafts. At the same time, the collieries undergoing liquidation no longer continue their mining operations, which makes a greater part of the preserved mining infrastructure useless. The analysis of the liquidated collieries in the Saarland-Moselle region gives ground for formulating the conclusion that facilities permanently barred from the mining function tend to find new users, who – through modernisation and adaptation – greatly improve the technical standard of these facilities, also by using modern materials and building technologies.

3.2. Functional significance of defunct collieries

Before we begin to discuss the present functional significance of former mining facilities in the Saarland-Moselle region, it must be emphasised that underground coal workings have been partly redeveloped for the purpose of creating a generally accessible tourist trail only in one liquidated colliery. In all the remaining cases, the evaluation of the present use of the preserved mining infrastructure refers solely to the objects situated above ground.

It is impossible to talk about any functional significance of former mining facilities with reference to the collieries, which have been completely liquidated. Degassing installations, which have their vents above the surface of the ground, are obviously important for safety considerations, yet they do not play any other role. Areas cleared of the shaft facilities usually remain unused as wasteland or are incorporated into extensive farming acreages. Occasionally, locations of the old shafts are marked by information boards, which may point out to a certain tourist significance, yet they are not linked by any trails or a theme path, and their accessibility is restricted.

A large group of facilities among the examined ones are shaft facilities, which have at least partly survived the liquidation procedure and still remain in the space of the former collieries, but they have not been adapted to any new functions. The author has no knowledge as to the reasons of this situation, yet it may be assumed that they are of economic and/or technical nature. What is more important for the present analysis are the results of the observed process, because, as has already been mentioned, permanent disuse of the preserved mining facilities contributes considerably to their technical degradation.

The functional significance of defunct collieries redeveloped after completion of the liquidation process to perform new roles must be evaluated entirely differently. The most frequent trend in functional adaptation of former mining areas and facilities in the Saarland-Moselle region is to put them to some commercial use unconnected with their original function, mostly by local

businesses, which adapt and use the preserved facilities according to their needs. Former mining infrastructure, especially large-scale buildings as well as their accompanying open areas, usually perform some commercial function – storage, warehousing or workshop, less frequently – they are used for trading or other services.

In the case of revitalised collieries, an important indicator of the revitalisation process is the reconstruction and the ultimate intended use of the defunct former industrial facilities and areas for public utility purposes – in close relation to the original function of these objects. The main trends in the functional adaptation of such collieries are: museums, culture, art, education, science and entertainment, completed with subsidiary forms of commercial activity, such as retail, gastronomic services etc. It is worth noting that revitalisation as one of the methods to utilise defunct collieries usually entails using their surrounding open areas, stipulating, among others, attractive forms of utilising the dumping grounds situated in the vicinity of former mining shafts.

Analysis of the present functional significance of collieries currently in the process of liquidation demonstrates that they are "hybrid" structures when it comes to their function. On the one hand, the mining company performing the liquidation works remains an industrial unit, and on the other – since there is no coal extraction going on at the colliery, its premises feature a lot of aboveground infrastructure, which no longer performs any function. Observations made *in situ* lead to the conclusion that the period of inutility of these facilities has been relatively short, and the process of their functional transformation is progressing smoothly, limiting the transition stage between the mining operations and the functional adaptation for new needs. As the liquidation process progresses, subsequent parts of the liquidated shaft facilities are successively given over to new users, for – among others – headquarters of external companies, which use the specific former industrial space to raise their prestige. Unusual scenery, highlighted by the shape of the shaft headframes – characteristic for underground mining industry, is an environment readily chosen to locate conference and training facilities, business centres, fairs and exhibitions.

3.3. Landscape-related role of former mining facilities

Another important role of former collieries, irrespective of their technical condition and present functional significance, is their landscape-related function, especially the role that these facilities play in different visual relations and in shaping the urban composition of towns in the Saarland-Moselle region.

Visual and compositional significance of former mining facilities in the landscape depends on the degree of their preservation and the mode of use. For obvious reasons, the shaft facilities of defunct collieries that have been completely cleared are absent from the region's landscape. Even if locations of these facilities are marked by information boards or installations serving the purpose of degassing the cut-off underground workings, the sites are not displayed in any way and are only visible from a close distance.

Collieries, which have preserved their aboveground infrastructure, at least in part, in the greatest majority of cases composed of large-scale and high-rise buildings, play a significantly larger role in the landscape of the region. It may be observed, on the basis of the performed field analysis, that facilities, which have not been subject to functional adaptation, are less

clearly defined in space – mostly because of the impervious screen of high greenery, which – over time – overgrows and hides the preserved, though unused, remains of the colliery.

Shaft infrastructure redeveloped for new functions is more clearly visible in the landscape and it plays a significant compositional and visual role, regardless of whether the adaptation is in any way related to its original function. It stems mainly from the fact that the buildings are maintained in a good technical condition and the areas around the facilities tend to be kept clear of high greenery or they feature a restricted amount of high trees, which promotes visual exposure of former shafts and ensures their good visibility, even from large distances. A particularly important landscape-related function is performed by steel structures of shaft headframes in vivid colours and fairly varied shapes and heights, towering over the remaining shaft infrastructure. The structures are not only characteristic compositional dominants, but also orientation points in the area. Collieries currently in liquidation, which still operate as mining companies, while at the same time undergoing dynamic transformation, also have high visual and compositional significance. Both in the case of such facilities and in the case of revitalised collieries, the traditional mining landscape has become the basic component of building the visual appeal of the space, also serving marketing purposes.

An important feature of the revitalised collieries as well as the facilities now at the stage of liquidation is highlighting the landscape-related role of redeveloped dumping grounds. These features are clearly different from natural topographic forms of terrain and from dumping grounds transformed into wooded areas. Moreover, dumping grounds made accessible to the public are convenient viewing points offering wide and distant panoramas.

3.4. Influence of colliery liquidation on the culture-related value of former industrial facilities

The links between the Saarland-Moselle region and the mining industry are strongly accentuated and treated as an important factor of its contemporary appeal created on the basis of the cultural heritage of the industry represented by coal mining and its accompanying sectors, including steel metallurgy[3] and conventional power generation industry. At the time of the region's functional transformation, the problem of putting this specific heritage to adequate use acquires a special importance in the context of developing such functions as tourism and recreation. Another important issue is the need to preserve the local identity, rooted in mining, now becoming a thing of the past. For this reason, evaluation of the influence of the liquidation of collieries on their culture-related value is an important part of this research.

Liquidation of a colliery resulting in complete disassembly and clearance of the aboveground mining infrastructure is equivalent to losing the culture-related value of the removed components. As has been mentioned earlier, locations of former shafts marked by information boards are not incorporated into the regional tourist infrastructure of cycling, hiking or horse riding trails. Similarly, the closed mining shafts equipped with installations degassing underground workings

[3] One of the most important components of Saarland-Moselle cultural heritage is the former steelworks in Völklingen (Weltkulturerbe Völklinger Hütte) – legally protected and entered on the UNESCO World Heritage List. The facility is now a centre of culture, science and art and, at the same time, a modern museum of steel metallurgy.

are of negligible significance, though the facilities may seem interesting from the culture-related point of view, since they illustrate the method of securing sealed off workings as one of the stages of land regeneration following termination of coal extraction in an underground colliery.

In defunct collieries with partly preserved but unused shaft infrastructure, prolonged disuse of former mining facilities brings about their degradation and subsequently their complete ruin, thus leading to the loss of culture-related value. The final effect of this liquidation mode for the culture-related aspect is then similar to the one when the infrastructure is completely cleared off, the only difference being that it is slightly postponed.

Collieries, which have prolonged their existence beyond the moment of coal mining termination by functional adaptation to new purposes, are of special significance for cultural heritage. With reference to facilities used in a way that is unrelated to their original industrial function, we may talk about their *static* cultural role. They contribute to the region's material stock that has some culture-related relevance, yet the specific character of the preserved assets is not emphasised. The colliery infrastructure is used and maintained in a relatively good technical condition, but the mining past of these facilities is largely irrelevant. Therefore, the culture-related value of these facilities is not a factor determining their use.

The situation of revitalised collieries is entirely different. In all examined cases, the culture-related value of the facilities subjected to revitalisation was the main reason for their redevelopment for the purposes of public utility functions closely related to the mining history and tradition. The revitalisation process may be seen as striving to maintain a variety of culture-related elements, but also as intentionally showcasing the existing assets, which, on the one hand, ensures effective protection of the mining heritage and, on the other, clearly improves the quality of the space and attracts new users. Thus, thanks to revitalisation, defunct collieries acquire a totally new culture-related significance, playing the *dynamic* role in this aspect, based on the preserved material and non-material assets.

The analysis of the influence of colliery liquidation on the sphere of culture is particularly interesting with reference to enterprises still carrying on liquidation works. It would seem that the culture-related role of such collieries must be limited. Meanwhile, the research has clearly demonstrated the tendency to smoothly incorporate the infrastructure undergoing liquidation into the cultural heritage stock of the region. Their unique value rests in the fact that they offer unrestricted access to facilities that are still at the stage of liquidation, thus providing a chance to directly observe actual mining works, e.g. forming dumping grounds, which would be very difficult, if not entirely impossible, in normal circumstances. Thus, it is not only rich history, but also the present mining activities that are integrally connected to culture, and the colliery itself may be compared to a venue staging an unusual spectacle.

4. Summary and conclusions

The trans-border former mining region comprising the Saar Basin in Germany and the Moselle region in France is undoubtedly a region of intensive changes taking place in close relation with liquidation of coal mining as a traditional sector of the industry, present in this

area for several centuries. The ongoing transformation of the region has – once and for all – put an end to the existence of numerous collieries located on both sides of the German-French border. Referring back to the title of this article, it could be said that all these facilities have been *faced with death*, both in the material and culture-related dimension, yet their fates in the post-industrial era are not always the same.

The field research carried out by the Author has demonstrated that the defunct collieries are by no means uniform in character – they differ in many things: the current stage of the liquidation process and the most important characteristics: the condition of the aboveground mining infrastructure, the scope of its use and the type of functional adaptation, landscape-related, scenic and compositional role as well as the significance for the region's cultural heritage.

It has been found in the course of the research that many of the liquidated collieries have been totally annihilated, in other words – they *died*. Some have survived, but have fallen into disuse and are now slowly *coming to the end of their lives*; others have *been born again* acquiring an entirely new function. However, the key question that must be taken into account in the considerations on the *life and death* of former collieries is the rationale and the real possibility of preserving mining facilities permanently excluded from industrial operation. The decisions on a complete liquidation or further transformations of the closed-down collieries were certainly taken after a careful scrutiny in which numerous arguments were taken into consideration. The prevailing ones, it would seem, were the economic factors – redeveloping a closed-down colliery generates enormous cost. The research results show that numerous collieries in the Saarland-Moselle region have undergone effective rebuilding and functional adaptation following termination of their mining activities, which proves that prolonging the life of such facilities is at times feasible. In the cases of defunct shaft infrastructure now used in the function that is not related to their mining past, redeveloping the former industrial facilities must have made sense from the economic perspective, both for the enterprise managing the preserved infrastructure of the colliery and for the new tenants, who use them for the purposes of their business activity. In the case of revitalised collieries, the economic factor may be of secondary importance. The implemented revitalisation programmes and projects stipulate functional adaptation of the former mining facilities mainly for public utility purposes, with commercial activity viewed as supplementary. In such a situation, the overall economic balance of the facility may be negative and the current functioning of the revitalised colliery may require financial support. Yet, it is their unquestionable culture-related value that determines the feasibility of keeping such collieries alive. Moreover, facilities subjected to revitalisation are characterised by a significant compositional and visual role in the landscape and they are attractive from the point of view of utility, especially in the context of the ongoing functional transformation of the region aiming at developing tourism, science, culture, high technology industry and business.

The above observation leads to the conclusion that revitalisation of a colliery is the best way of prolonging its life into the post-industrial stage, or – more precisely – of its rebirth in an entirely new role, at the same time safeguarding full protection of former mining facilities as an important part of the specific cultural heritage. Revitalisation of all, very numerous, collieries in the region would be impossible for obvious reasons. Factors determining the fates of collieries

destined for liquidation remain outside the scope of this research. However, it is understood that the following factors – among others – must be taken into account when considering the option of revitalisation: the condition of the former industrial infrastructure and its diversity, technical possibilities of adaptation, the size of the area for revitalisation as well as its accessibility, spatial and transportation connections with its surroundings, especially with large cities of the region.

Defunct collieries, which – for a variety of reasons – are not intended for revitalisation, may escape death by functional adaptation for purposes unrelated to their original mining operations. The Author's research shows that such transformation does not entail an attractive form of use, but it supports the landscape-related function of former mining facilities and prolongs their relative protection, at least as long as the colliery is still used.

The mining history, identity and cultural continuity of the Saarland-Moselle region would be best emphasised, it seems, by creating a culture theme trail connecting all the former locations of collieries – both those that have been preserved and those that have completely wiped out from the surface. Such a project may contribute to strengthening of the tourist appeal of the region; it may also help to showcase these former mining facilities, which are only accessible with difficulty and are thus marginalised.

All the considerations presented in this article refer directly to a specific area, i.e. the trans-border region of Saarland-Moselle. The research results are, however, a good starting point for evaluating similar phenomena and processes going on in other places related to underground coal mining. They may also be true for Polish mining areas, *inter alia* for Upper Silesia, Zagłębie Dąbrowskie (Dąbrowa Basin) or the Lower Silesia Coal Basin, where transformation of mining as a traditional industrial sector has already commenced or will be initiated in the near future.

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