THE VALUE OF THE SYMBOLIC IDENTITY OF THE INDUSTRIAL HERITAGE:
between knowledge, recovery and enhancement of the mills of Val d’Agri

A. Guida1*, V.D. Porcari2*, A. Lanzolla3*
1Università degli Studi della Basilicata - Dipartimento delle Culture Europee e del Mediterraneo (DiCEM) – Matera, Italia – antonella.guida@unibas.it
2Università degli Studi della Basilicata - Dipartimento delle Culture Europee e del Mediterraneo (DiCEM) – Matera, Italia – vito.porcari@unibas.it
3Università degli Studi della Basilicata - Dipartimento delle Culture Europee e del Mediterraneo (DiCEM) – Matera, Italia – alessandro.lanzolla@unibas.it

ABSTRACT
Industrial Heritage (I.H) consists of the remains of industrial culture that are of historical, technological, social, architectural or scientific value. These remains consist of buildings and machinery, workshops, mills and factories, mines and sites for processing and refining, warehouses and shops, places where energy is generated, transmitted and used for transport and all its infrastructure, as well as places used for social activities related to the sector such as housing, religious worship or education. (1)

Of importance is the initiation of a process of heritagization of I.H., as the set of practices in the course of which this legacy of memories and identity of a community is officially recognised. The theme of the research focuses on the industrial heritage of the Italian territory, in particular of the Basilicata region, a southern region, and takes into consideration the proto-industrial period, the period from the second half of the seventeenth century to the second half of the nineteenth century, understood as the form of organisation of the industrial system that preceded industrialisation at the end of the nineteenth century. In particular, it focuses on the social and economic importance of the mills in the Val d’Agri, hypothesising the functional recovery of water mills through re-use, transforming them into small hydroelectric power stations and museums of their former selves, through a multidisciplinary study with analyses on specific themes ranging from the anthropological to the hydraulic field.

INTRODUCTION
After more than thirty years of investigation, I.H. still constitutes a rich field of research, ranging from the historical documentary and architectural value to the economic value of industrial sites that have left the production cycle, together with all the relationships established with the urban context and society.

Italy is rich in workplaces, and in the south in particular the agri-food industry prevails, consisting of a series of productive activities linked to the processing of agricultural products. In fact, between the 18th and the first half of the 20th century, the milling industry was a source of economic development and favoured the construction of mills, soup pasta factories and bread ovens. It represented a particular need of rural communities to transform wheat into flour for their own use and for third parties; this period saw the transition from the use of proto-industrial milling structures such as hydraulic mills and centimoles, the former powered by watercourses, the latter by animal power, to industrial ones with the introduction of modern production cycles and plants consisting of rolling mills with cylinders or driven by mechanical power.

With the invention of the steam engine, which marked the beginning of the first industrial revolution, there was a need to build larger and larger buildings to house the various machines. (2) New industrial structures began to be built and in urban areas the mills fell into disuse, while in some rural areas their function was changed to housing or warehouses. (3)
STATE OF THE ART

Basilicata, formerly Lucania, is a region in southern Italy, bordering on Campania, Puglia and Calabria. The region, which is divided into two provinces, Potenza and Matera, has ancient origins, since the first archaeological finds, which affirm the presence of man, date back to the Lower Palaeolithic period, while the first signs of industrialisation occurred between the mid-1700s and the early 1800s, through small craft activities that produced tools and foodstuffs. There were more than 900 milling structures, most of them operated by hydraulic power. (4)

In the Potentino and Lagonegrese areas there was a considerable development of the textile industry, especially through the processing of linen. Around 1876, there were no real industries, but there was a diffusion of home textile manufacturing, while the food industries, i.e. small family-run factories such as mills, oil mills and pasta factories, had a different fate, as they were of great importance to the economy of the region.

The mill corresponds to the prototype of the modern factory, it is part of the pre-industrial architecture and is associated with any sphere requiring the use of machines to process raw materials.

They used water as a source of energy to drive the production process, which could not be transported very far, and this is why all the material remains from the age before the application of the steam engine are found near and along rivers, and the structure of the mills varied according to the territory, using local materials and almost blending in with the environment in which they lived, something that would not happen later with the construction of factories.

With the construction of railway networks, industrial structures were no longer built near watercourses or other sources of natural energy, but near train tracks so that raw materials could be transported economically and quickly. (5)

In Basilicata, there were both vertical and horizontal wheel mills; both were fed by a penstock known as a tower or arubah, which, depending on the hydrographic characteristics, could reach heights ranging from 4 to 14m. (6)

The horizontal wheel mill is the simplest and most economical mill, since it did not require continuous maintenance; it consisted of a vertical shaft with a horizontally positioned wheel at the end. (7) (Figure1)

The flow rate of the watercourses in this area was not constant, which meant that it could not guarantee annual activity. This problem was solved by the construction of the tower system, which made it possible to collect a large quantity of water in a large funnel-shaped cistern that fed the horizontal wheel mills.

Horizontal-wheel mills were used until the beginning of the 20th century in Basilicata, the main reason for their abandonment being the milling tax, which provoked a strong reaction from the population. This was probably one of the reasons why the mills closed and deteriorated, since the tax was introduced at a time that was already difficult for the Mezzogiorno, due to the events linked to post-unification banditry and repression activities, and was characterised by a crisis that was not only economic and productive but also political and institutional.

In Basilicata in September 1869, riots had already broken out and there were 997 active and licensed mills, 467 closed, of which 112 were licensed.
Narrowing the territorial field of study, the research investigates the small industrial buildings in the Agri Valley, which is located in the south-western part of Basilicata and takes its name from the river that flows through it. The economy of this area was mainly based on agriculture and the demand for grinding cereals was high, in fact there is the greatest presence of hydraulic mills.

OBJECTIVES
The main objective of the research is to define a methodological approach to knowledge, recovery and valorisation of the I.H. of Basilicata, through the rural structures present in the territory. The period in which interest in industrial archaeology in Basilicata developed concerns the 1980s, when the then archaeological superintendent of Basilicata supported experimental interventions on industrial artefacts. The aim was to protect and safeguard the industrial heritage of Basilicata. In 1990 there was the publication of a catalogue concerning the results of a census carried out by the Archaeological Superintendency at the Maratea Operations Centre. (8) The diffusion over the territory and the absolute lack of documentary sources make it essential to activate a coherent process of knowledge and valorisation, through a work of cataloguing and data acquisition of the Lucanian I.H.

In addition, recovery and valorisation certainly passes by resuming and revising the law issued by Basilicata, which was one of the first Italian regions to issue a law (Law 30 November 2017, no. 31) on the valorisation of the industrial archaeology heritage. The purpose of this law is to enhance the industrial archaeology heritage present in Basilicata, recognising it as a historical testimony of work and culture. The aim of the law was to initiate industrial tourism so that people could discover the places housing these structures.

METHODOLOGY
Acquisition and cataloguing is the propaedeutic phase in a process of re-use and valorisation, which makes it possible to define the problems, characteristics and potential of each phase, which derive from a synergic and multidisciplinary action of competences from different specialist areas for the management of the interventions.

The next phase is the drafting of a documentary collection, the management of all the data acquired, so as to ensure the collection of information on collective memory, cultural traditions, structural characteristics, the production process, the study of individual components such as wheels, millstones, hopper etc, the creation of an abacus of typological comparison of the same. The above-mentioned research focuses on two pilot case studies, on which the cataloguing methodology is applied, which are the mill and the gualchiera owned by the Romano family, located at the foot of the municipality of San Martino d’Agri, in Val d’Agri, along the Trigella stream, a stream that rises on Mount Raparello, crosses a large part of the municipal territory, and flows into the Agri river. San Martino d’Agri (figure 2) is a small village located in the south-western part of Basilicata, inside the Alta Val d’Agri. The village is very compact, standing on a hill 682 m above sea level, in an area with a high seismic and hydrogeological risk, as from a geological point of view the territory is characterised by outcropping calcarenites, dark-grey limestones and debris.
The entire built-up area of San Martino d'Agri lies in the middle basin of the Agri river and is characterised by two tributaries of the Agri: the Trigella stream and the Tufolo ditch. These two watercourses, especially in the past and before their regimentation, have been of considerable importance for the geomorphological evolution and stability of the slopes underneath them. (figure 3)

The building is named after its owners. The structure consisted of two rooms: the mill and the oat house. Today, all that remains of these rooms are the two towers that powered two different water wheels, the vertical wheel of the gualchiera and the horizontal wheel of the mill; the rest are just ruins. In the mill room there is a stone millstone with a diameter of 162 cm (figure 4).

Surveys have shown that the wall structure consists of single-body masonry with internal and external walls made of squared and hewn ashlars of dark-grey limestone, calcarenite and sandstone, held together by layers of different thicknesses of lime mortar. The material appears to be local, and even though no quarry concession has been found, it would appear to have been recovered from the area surrounding the mill. The masonry varies in thickness from 50 to 100 cm.

The structure has no foundations and is leaning against the rocky bank, which in the gualchiera forms the western wall of the room. The intermediate floors have not been surveyed due to the presence of vegetation and the roof has a wooden pitch with terracotta tiles, internally collapsed. (figure 5).

Originally, it is assumed that the gualchiera and the mill consisted of two towers that activated, thanks to the force of the water, two different wheels: the horizontal wheel, belonging to the mill, which allowed, with the movement of the millstones, the production of flour; and the vertical wheel, belonging to the gualchiera, which allowed, through the movement of the large wooden hammers, the fulling of the wool (figure 6).
The two towers were fed by a canal, which diverted the course of the Trigella stream to bring the right amount of water to the two towers. The water passed through the tower of the ointment factory thanks to a vertical conduit, which tapers from top to bottom, the upper part having a diameter of 54 cm and the lower part 20 cm. The vertical wheel was connected to the mill by means of a wooden element called a 'shaft'. In the mill, the (horizontal) water wheel was driven by the force of the water passing through the conduit inside the tower. This (inclined) conduit tapers from top to bottom; at the top there is an opening with a diameter of 80 cm, while at the foot of the tower there is an opening with a diameter of 34 cm.

The water, after activating the two wheels, returned to the inside of the stream thanks to two drainage channels, one for each tower; the traces of the two channels are still visible in spite of the vast vegetation present on the site.

The awareness of a detailed and in-depth knowledge of this minor industrial heritage leads to the need to apply a systematic methodology so that these memories are not permanently erased.
The research work tackles these issues through valorisation and functional re-use, converting the gualchiera into a micro hydroelectric power station (figure 7), hypothesising the replacement of the vertical wheel with a turbine by carrying out research and studies in the field of hydraulics, aiming at the self-sustenance of the factories and possible new eco-sustainable structures built in wood and rice straw, with the aim of stimulating tourism in the Lucanian H.I. (figure 8) A possible design approach of this type leads to the development of a proposal for "museum" reuse but integrated with new functions and strategies of valorisation and recovery.

CONCLUSIONS

Today there is a need to recover industrial structures in a state of decay, abandonment and sometimes reduced to ruins, both for social reasons, since they represent a part of the history of our society, and economic reasons, becoming places of interest, and finally also from the point of view of environmental sustainability.

Awareness of the value of the region's H.I. now requires a necessary "revelation" of the identity aspect for the future transmission of a heritage of memory and history, which must assume a priority role in the planning of local development strategies.

As a result, Basilicata is not equipped with a methodological and systematised knowledge of these places of work and socio-economic memory of the territory, which need such reconnaissance knowledge in order to aim for the protection and enhancement of realities recognised as being of such importance at national and European level, in addition to the strengthening and implementation of Law no. 31 of 30 November 2017 on protection and enhancement.

The recovery, reconversion and subsequent management of disused I.H. is a vector of a twofold theme: the first, material is linked to the structural and functional recovery of the assets, while the second is of a social, tourist and cultural nature, linked to the value that these architectures have for history. The innovative character of this research is therefore the synthesis of these two themes in the structure of a "continuous laboratory" on the territory capable of implementing constant monitoring of this heritage.