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High Temperature Effects on Global Heritage Stone Resources: A Systematic Review

Roberta Lobarinhas [1], Amélia Dionísio [2] and Gustavo Paneiro [2,*]

[1] CERENA, Técnico Lisboa, ULisboa, 1049-001 Lisbon, Portugal; robertalobarinhas@tecnico.ulisboa.pt
[2] DER/CERENA, Técnico Lisboa, ULisboa, 1049-001 Lisbon, Portugal; amelia.dionisio@tecnico.ulisboa.pt
* Correspondence: gustavo.paneiro@tecnico.ulisboa.pt

Abstract: Throughout history, natural stone has been a crucial building material due to its strength, durability, and aesthetic qualities. Today, it continues to be a valuable resource, representing both a cultural heritage asset and a significant economic material. However, the increasing frequency of heat waves and fires driven by climate change poses a growing threat to stone building materials. This paper reviews the scientific attention given to the effects of high temperatures on Global Heritage Stone Resources (GHSRs), an international classification designed to enhance the recognition and status of building stones. Through a systematic SCOPUS search with refined filtering criteria, the study aims to quantify the existing research on these heritage stones. The search applied the standardized lithotype terms from GHSR publications to ensure consistency, followed by the exclusion of irrelevant terms when identified. Additionally, a relevance filter was applied to restrict the number of articles per lithotype and ensure that only the most pertinent studies were considered. Key findings from the literature reveal that exposure to high temperatures (ranging from 200 °C to 900 °C) significantly affected the studied GHSRs, leading to thermal micro-fissuring, increased porosity, and changes in water absorption, which compromise the mechanical properties of the stones. Moreover, these conditions can result in irreversible chemical transformations, exacerbating the deterioration of cultural heritage assets. The study emphasizes the critical need for research to better understand how these stone materials behave when exposed to high temperatures. It also provides a relevant framework for future investigations aimed at predicting and mitigating the effects of external threats such as fires.

Keywords: global heritage stone resources; stone-built heritage; high temperature behavior; preservation

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1. Introduction

In a world where climate change is increasing the frequency of fires, understanding the resilience of natural stone to high temperatures is both a scientific and global concern. This issue is closely related to its historical application and its cultural heritage value. Throughout history, stone has been used for various urban infrastructure needs, including road construction [1], facade cladding, ashlar or masonry walls [2], and for decorative purposes and sculptural endeavors [3]. Natural stone is essential for preserving and integrating architectural heritage, and its continued use in modern applications highlights its inherent sustainability, even amidst the prevalence of concrete in contemporary construction [1].

As a building material, natural stone is considered one of the Earth's most sustainable mineral resources [2]. It offers greater durability than alternative materials while consuming less energy and producing fewer toxic by-products [3]. Global production of natural stone is increasing due to ongoing research. Understanding its behavior under different conditions has gained attention in recent decades for its performance in civil engineering and architecture [4–7].

As the world prioritizes sustainable development, studying stone materials is crucial for addressing both immediate challenges and the long-term goals outlined in the Sustainable Development Goals (SDGs) [8]. This framework underscores the importance of natural resources like stone in fostering economic prosperity, environmental protection, and climate resilience. Understanding how stone materials perform under high temperatures can enhance structural integrity, promote the design of fire-resistant buildings, and improve safety regulations, thereby safeguarding human lives and minimizing economic losses.

Climate change projections suggest an increase of future fire risk. Rising global temperatures are directly linked to hotter and drier environments and increased severity and frequency of fire events [1,9]. Additionally, high temperatures are associated with fire events in buildings, often related to electrical issues.

Studying the impact of fire on stone materials can contribute to reducing this risk. Incorporating fire-resilient strategies into infrastructure planning enhances overall resilience, aligning with SDG Goal 9, which focuses on building resilient infrastructure and fostering innovation. Additionally, understanding stone behavior under high temperatures is vital for the preservation and restoration of cultural heritage sites, ensuring their longevity for future generations.

Integrating stone that performs well under high temperatures into urban infrastructure can improve disaster risk reduction efforts and protect urban populations, aligning with SDG Goal 11 and 13. Goal 11 focuses on protecting cultural and natural heritage, while Goal 13 addresses the impacts of climate change, focusing on combating climate change and its effects.

Given the non-renewable nature of stone and its substantial cultural, social, and economic value [10,11], it is crucial to ensure its protection through informed material choices and effective preservation techniques. Scientific research on stone materials is essential for preserving heritage against the effects of time, physical forces, and environmental conditions. Heritage stones are found in architectural structures worldwide, representing various historical periods and styles [12].

Despite the recognized importance of Global Heritage Stone Resources (GHSR) and given their key role of natural stone in heritage, it is imperative to understand their behavior under extreme conditions, especially in the context of increasing climate change impacts. This comprehensive review aims to evaluate the attention given by the scientific community to the challenges posed by high temperatures on GHSR.

By highlighting existing research, this paper identifies critical challenges where further study is needed to ensure the preservation and resilience of these important materials, thereby improving predictions and mitigation strategies for potential damage from events such as fires.

Given the critical importance of GHSR, no comprehensive approach has yet been applied to assess the extent of research focused on their response to high temperatures. This paper seeks to fill this gap by providing a detailed review of the current state of knowledge and highlighting the need for additional research.

2. Global Heritage Stone Resources

The concept of GHSR was initially introduced by the International Association of Engineering Geology and the Environment (IAEG), specifically through Commission 10 - Building Stones and Ornamental Rocks (C-10), in late 2007. The concept underwent thorough discussion by the Executive Committee of IAEG throughout 2008, culminating in its formal deliberation during a meeting held in Madrid in September of that year. Furthermore, the proposal for GHSR was introduced at the 33rd International Geological Congress in Oslo in August 2008 [13], and it garnered attention in the primary forum of the International Union for the Geological Sciences (IUGS), where it received support from the IUGS [3].

For a lithotype to attain recognition as a GHSR, it must satisfy precise criteria, including: (i) a history of significant and prolonged use (30 years or 50 years have been recommended), (ii) widespread geographic utilization (international use highlights a material's historical importance, but regional appreciation should also be valued), (iii) involvement in significant projects (considering the candidate's role in human projects now recognized as having major heritage significance), (iv) cultural significance and recognition (artistic and architectural masterpieces, heritage construction, as well as utilitarian applications), (v) quarrying and availability (continuing availability of a GHSR allows both the repair of heritage construction and encourages the building of future stone heritage, as well as promotes the sustainability of stone use), and (vi) potential socio-economic and environmental benefits [14,15].

The designation of GHSR does not discourage ongoing quarrying activities for these stones; rather, it advocates for their sustainable use, ensuring availability for heritage structure repairs, future stone heritage construction, and overall sustainable stone utilization. Moreover, it fosters the exploration of new materials for contemporary projects, which may potentially earn GHSR recognition in the future [3]. Preserving historical quarries that have supplied stones for architectural heritage remains of paramount importance. Neglecting proper stone selection or employing incompatible mortars during restoration efforts can result in structural and financial repercussions, jeopardizing aesthetic integrity [14].

Additionally, the GHSR stimulates scientific research and encourages international cooperation in the study and utilization of natural stone resources. The associated papers with this classification play a crucial role by serving as opportunities for further investigation and documentation of heritage stones on a global scale [12].

As of the latest update in April 2023, the scope of this classification encompasses 32 lithotypes. Figure 1 presents the number of GHRS, considering the information obtained by IAEG. Analysis of this figure offers clear insight into the prominence of limestones among ornamental lithologies within the GHSR classification. Limestones correspond to 34.4% of all lithologies, which highlights their substantial importance. Marbles follow closely (15.6%), with granites (6.2%), and sandstones (6.2%) also featuring prominently in the GHSR classification.

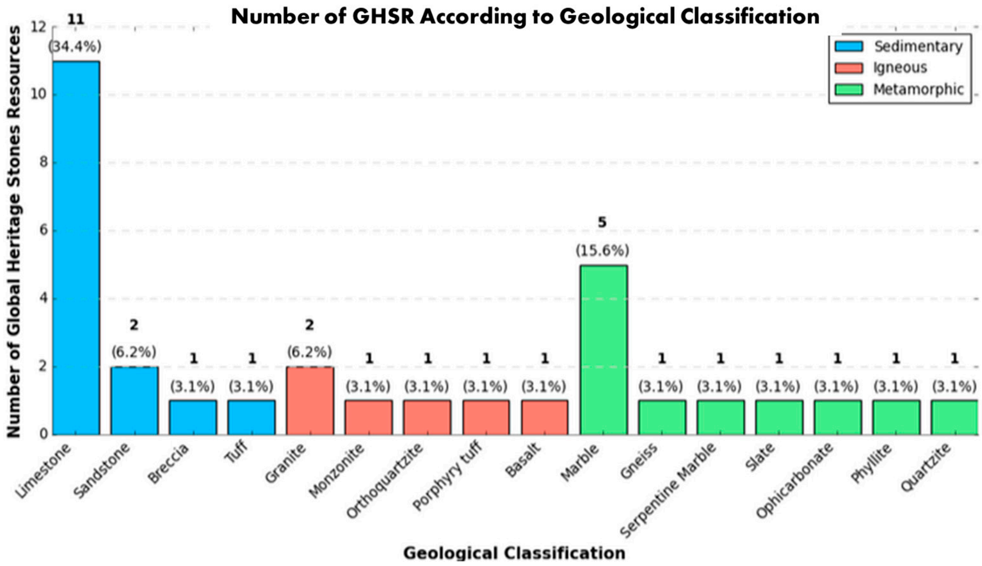


Figure 1. Frequency distribution of Global Heritage Stone Resources according to geological classification.

Analyzing the continental distribution of GHSR reveals a significant concentration in Europe, where 71.9% of lithotypes are found, as depicted in Figure 2. This graphical representation emphasizes the extensive scope of this study and highlights Europe's predominant role, likely due to historical factors that facilitated the construction of numerous stone monuments in the region.

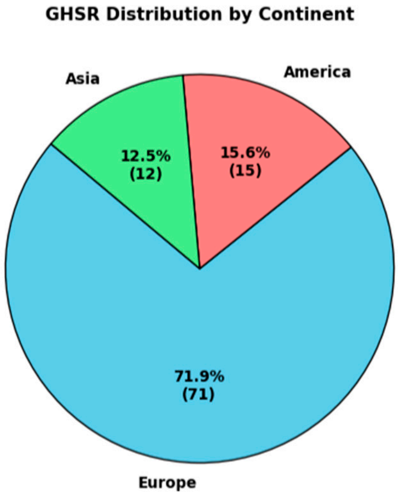


Figure 2. Worldwide distribution of Global Heritage Stone Resources.

The Americas account for 15.6% and Asia for 12.5% of the total lithotypes, demonstrating a substantial presence of GHSR beyond Europe. These findings suggest that Europe's prominence in GHSR may be influenced its long-standing architectural heritage and construction practices.

By contrast, the lower percentages observed in the Americas and Asia could be attributed to regional differences in geological composition, construction traditions, and historical contexts. Overall, the 32 lithologies represent 17 distinct countries. Understanding these regional dynamics is crucial for developing tailored conservation strategies and promoting sustainable management practices for GHSR globally.

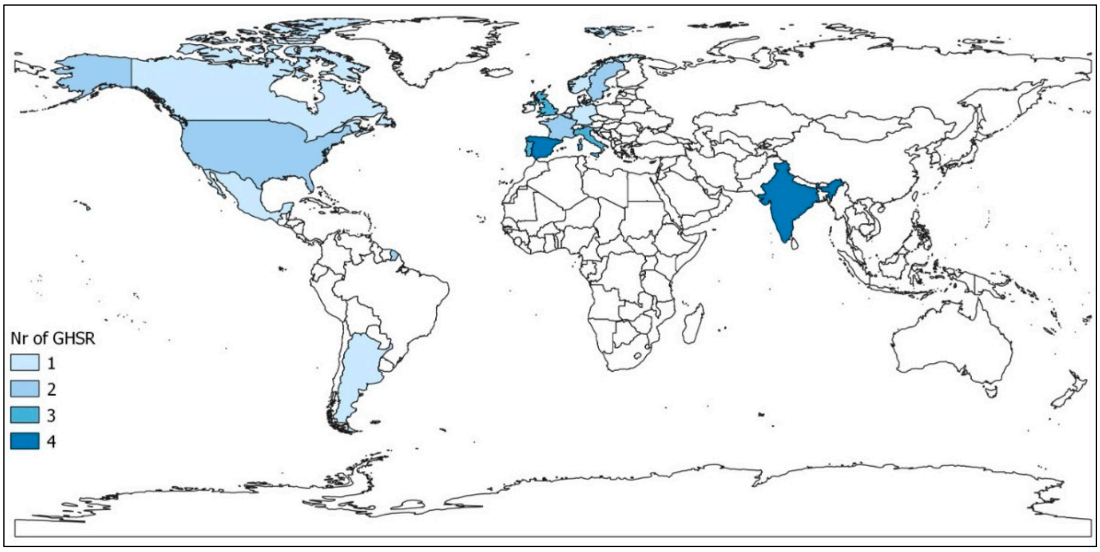
This context highlights the importance of international collaboration and research initiatives. As of the latest update in April 2023, Africa and Oceania remain the only continents without any classified GHSR.

Figure 3 features photos of two architectural heritage buildings that use *Lioz Limestone* This lithotype is included in the GHSR list and falls under both the limestone classification and the Europe group, as it originates from Portugal.

(**a**) (**b**)

Figure 3. Global Heritage Stone Resource *Lioz Limestone* applications on heritage architectural buildings (Portugal): (**a**) Belém Tower; (**b**) Jerónimos Monastery.

In Figure 4a, the geographical distribution of all GHSRs worldwide up to April 2023 is depicted. In Figure 4b, a closer view of Europe is provided, showing that it hosts 72% of the GHSR. This view is overlaid with a layer highlighting burned areas from 2000 to 2023. This overview underscores the susceptibility of these valuable materials to fire incidents, highlighting that areas previously affected by such phenomena remain at risk of future occurrences. Given the significance of these stones for *global* heritage and the challenges posed by high temperatures, it is imperative to conduct thorough studies to anticipate and understand their behavior when confronted with such challenges.



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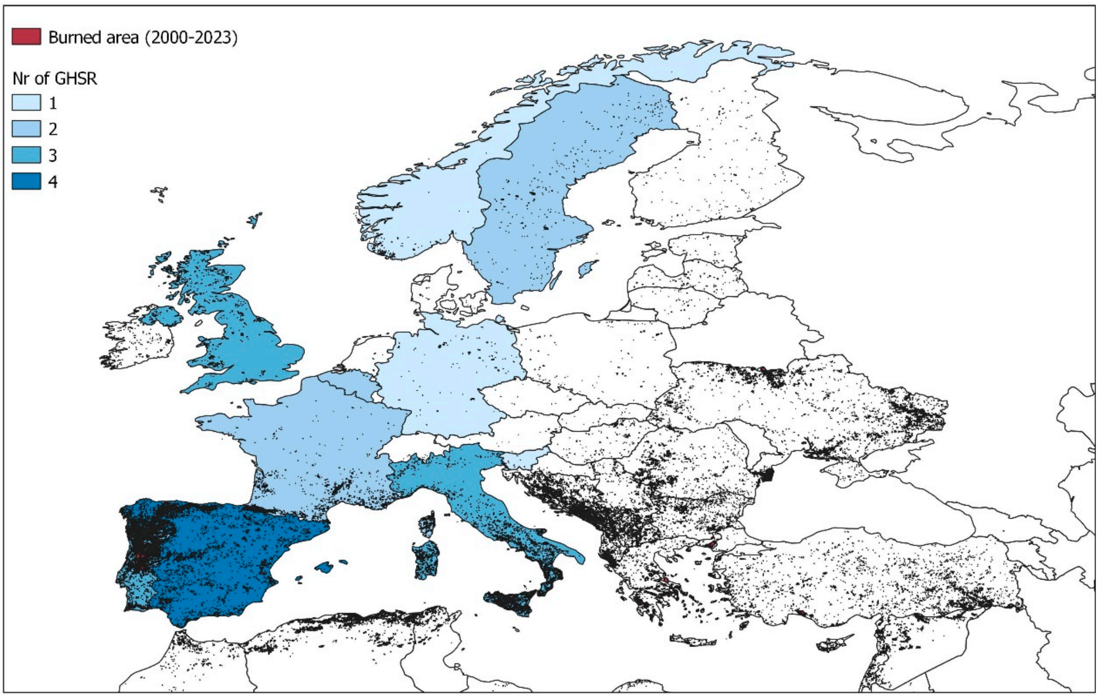


(**b**)

Figure 4. Global Heritage Stone Resource world distribution and (**a**) burned areas of European countries from 2000 to 2023 (**b**). Data sources: World countries layer—OpenDataSource (2023); Fire layers—EFFIS (2023).

3. Methods

3.1. Selection of Database

The initial bibliographic filtering process began by searching for relevant articles related to each lithotype using the specific terms found in the GHSR publication, including the lithotype name and its geological identification (Figure 5). This method was chosen since certain lithologies are often studied under different names; however, considering all possible variations would be impractical. Therefore, standardized classification terms were used, as these are the most recognized designations. The variability in the designations, a longstanding issue within the scientific community, underscores the need for standardizing lithology nomenclature to improve the accuracy of research assessments. The search for each recognized lithology was conducted using a query structure as the following example: for Bath limestone, the query was TS = (bath) AND TS = (limestone). This search was applied to keywords, titles, and abstracts of papers indexed by SCOPUS, without any restrictions on publication year to ensure that the search was comprehensive. The initial search returned over 20,000 papers across all 32 lithologies under study.

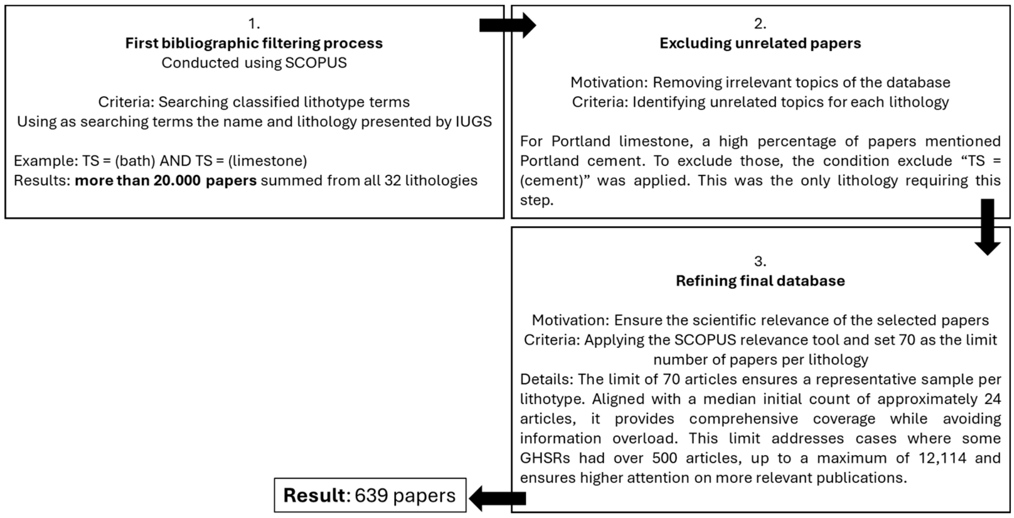


Figure 5. Flowchart illustrating the selection process for the analyzed papers.

Figure 6 presents the frequency of papers filtered from the first process, allowing for an analysis of the intensity of research for each stone. The results show significant disparities in the attention given to different stones in the literature.

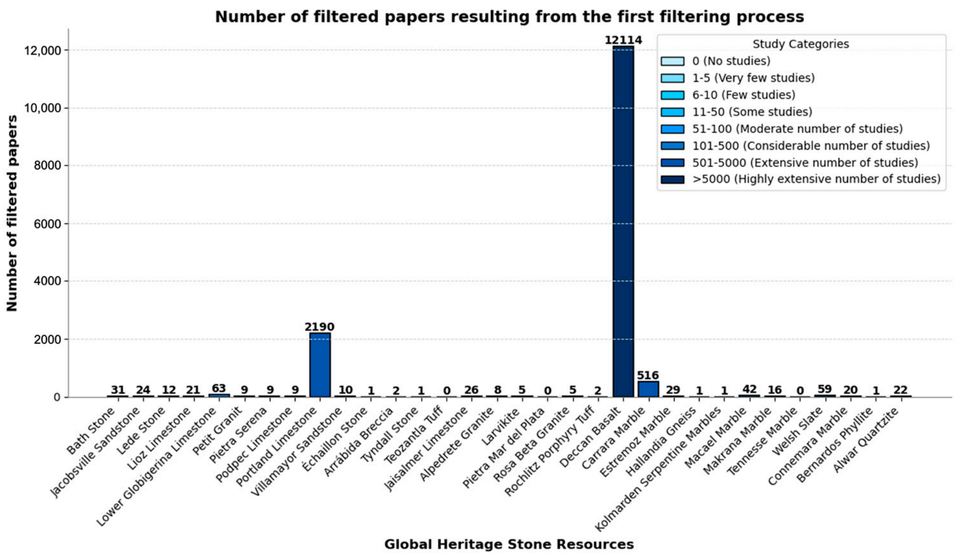


Figure 6. Number of papers resulting from the first filtering process.

For instance, several stones, such as *Teozantla Tuff*, *Pietra Mar del Plata*, and *Tennessee Marble* have no associated studies, revealing potential areas for future research.

Other stones, such as *Échaillon Stone*, *Tyndall Stone*, *Hallandia Gneiss*, *Kolmarden Serpentine Marbles*, *Rochlitz Porphyry Tuff*, and *Arrábida Breccia* have received limited research attention, with fewer than five studies each.

In the category of lithotypes with five to ten studies, we find *Larvikite* and *Rosa Beta Granite* (five studies each), *Alpedrete Granite*, *Petit Granit*, *Pietra Serena*, and *Podpec Limestone* (nine studies each), and *Villamayor Sandstone* (10 studies). Despite having received slightly more attention than those in the "very few studies category", these stones are still relatively under-researched.

Lithotypes with a moderate number of studies (ranging from 10 to 50 studies) include *Lede Stone* (12 studies), *Makrana Marble* (16 studies), and *Connemara Marble* (20 studies). *Lioz Limestone*, *Alwar Quartzite*, and *Jacobsville Sandstone* also fall into this category, with 21, 22, and 24 studies, respectively. Other examples include *Jaisalmer Limestone* (26 studies), *Estremoz Marble* (29 studies), *Bath Stone* (31 studies), and *Macael Marble* (42 studies). Although these stones have been relatively well-researched, there remains ample opportunity for further investigation.

A small group of stones has been the subject of more extensive research, with between fifty and one hundred studies. Notable examples include *Welsh Slate* (59 studies), and *Lower Globigerina Limestone* (63 studies). These stones have attracted a moderate level of academic attention, likely due to their historical or architectural significance.

Carrara Marble stands out with an impressive 516 studies dedicated to it, highlighting its prominence and widespread use in sculpture and construction. This substantial body of research underscores its historical and artistic importance.

Interestingly, no stone falls within the range of 500–1000 studies, revealing a gap between moderately researched stones and those extensively studied. The most extensively researched stones, with more than 5000 studies each, are *Deccan Basalt* and *Portland Limestone*. *Deccan Basalt*, with 12,114 studies, and *Portland Limestone*, with 2190 studies, are the most researched stones in this dataset, reflecting their geological significance and widespread use. It is important to note that using English search terms may exclude some research published in the native languages of the GHSRs' geographical regions.

In conclusion, the distribution of research across these stones is highly uneven. While stones like *Deccan Basalt* and *Portland Limestone* have been extensively studied, many others, particularly those with fewer than ten studies, remain largely unexplored. This disparity highlights significant opportunities for future research, especially for stones that received little to no attention. Investigating the factors behind these imbalances could provide insights into what drives research interest in different stone types.

To address this imbalance and ensure the focus remained on the relevant material, a second filtering process was applied. This step involved excluding papers not directly related to the lithotype. For instance, the initial search for *Portland Limestone* yielded 2190 papers, many of which were related to Portland cement rather than the GHSR itself. By applying the exclusion criterion TS = (cement), the number of papers was significantly reduced to 122. This exclusion step was applied specifically to *Portland Limestone* due to the high prevalence of cement-related articles.

After this refinement, the final step aimed to ensure the scientific relevance of the selected papers. The SCOPUS relevance tool, which ranks papers based on keyword frequency and position, was employed. To maintain a balance between thoroughness and practicality, a cap of 70 papers per lithotype was established. This limit was based on the median initial count of around 24 articles per lithotype, ensuring a representative sample while excluding less relevant papers. This was particularly important for lithotypes like *Deccan Basalt* and *Carrara Marble*, which initially returned 12,114 and 516 articles, respectively.

The total number of papers considered for each lithotype, after this meticulous process, is detailed in Figure 6. The disparities in the number of articles can be attributed to factors such as historical context, worldwide recognition, the type of applied built heritage, and the year of inclusion in the GHSR list. Stones that have been classified for longer periods tend to receive more academic attention.

This structured methodology ensures a comprehensive and focused review of the most pertinent research for each lithotype. No restrictions were placed on SCOPUS categories, recognizing that stone intersects with various scientific fields besides geology.

3.2. Database Analyses Criteria

Through this method and a systematic analysis of the articles obtained from the SCOPUS search, the goal was to assess the scope of scientific research on stone resources and interpret quantitative findings, particularly regarding the effects of high temperatures on GHSR stones.

Data analysis began with Microsoft Excel for initial organization and preprocessing. Subsequently, Python was used for advanced statistical analysis and visualization, enabling a detailed examination of relationships within the dataset. This integrated approach allowed a comprehensive and in-depth exploration of the data.

In an initial assessment, it was considered important to analyze whether the paper referred to different denominations of the lithology, to determine if a significant number of studies might have been excluded from the analyses due to the use of different names.

After that, it was decided to explore whether any references were made to composition, with the goal of determining the extent to which the lithology's composition instigated interest in the scientific community. Similarly, it was considered important to examine if physical and/or mechanical properties were specified. Comparing these two aspects provides valuable insights into the primary lithological characteristics of GHSR as a geological material. Additionally, it was essential to determine whether the analyzed papers included information on the behavior of these materials at high temperatures.

For Other Nomenclatures: The goal was to determine whether the lithotype is commonly referred to by alternative names, as it can complicate the identification of all relevant scientific publications. Variations in terminology may arise from different commercial names or from distinct facies of the lithotype, each of which may be associated with different properties and behaviors.

For Composition: The aim was to determine the level of attention given by the scientific community to the significance of mineralogical, petrographic, and chemical composition of the lithotypes, as they play a crucial role in understanding the behavior of stone materials.

For Physical and/or Mechanical Properties: The purpose was to investigate the extent of research conducted regarding physical and mechanical properties, as it is essential to understand how stone materials can be affected when exposed to various hazards. This is a very inclusive category, encompassing a wide range of properties with the goal of achieving a positive outcome in the research conducted on the studied lithologies.

For High Temperatures: The goal was to obtain an overview of the extent of investigation being conducted on the effects of high temperatures on stone materials, given its importance in this study. The minimum temperature considered was 120 °C, since 100 °C is usually the limit temperature that studies consider for freeze-thaw tests [16,17], and it was intended to extend that temperature 20 °C to exclude this specific test. Other studies, such as [18], consider 100 °C as the temperature for drying stone samples before conducting further tests if it does not affect their previous properties. This consideration also supported the choice made in this methodology.

Information regarding the papers that fit the criteria is presented in Appendix A. In Table 1 the inclusion criteria are listed. Each article was considered for inclusion in the specific category only if it contained information that met the predefined criteria to have an overview of the studied subjects.

Table 1. Identified information and topics in the four different categories analyzed.

Categories	Identified Information for Selection/Topic Detected for Selection
Other nomenclatures	References to other facies of the same lithotype Different commercial names for the same lithotype data
Composition	Mineralogic and petrographic composition Chemical composition
Physical and/or Mechanical Properties	Properties that characterize the stone as a material, some examples found: porosity, capillarity, structure properties, color measurements, gloss.
High Temperatures	Exposition of stone to temperatures above 120 °C data

4. Results

The applied methodology resulted in a Main Table (Appendix A, Table 1) presenting information on each lithotype, including lithology, place of origin, year of entrance into the GHSR catalog, and the reference paper leading to its classification.

Figure 7 displays the total number of topic entries for the papers that met the specific GHSR criteria. It is important to note that the same paper can be counted multiple times if it addresses more than one topic, meaning the overall number reflects the count of entries across topics, not the total number of individual papers analyzed. *Carrara Marble* (70), *Macael Marble* (60), and *Portland Limestone* (53) stand out among the lithotypes. In the case of *Carrara Marble* and of *Portland Limestone* this outcome is related to the two stones having scored the maximum number of reviewed papers (70). For that reason, it is considered that lithology status also plays a significant role in the scientific attention given to the natural stone, since *Macael* is a worldwide recognized marble that has been appreciated since the Neolithic period (3400–3000 years B.C.) and is still applied in prominent international buildings [19]. Examples like *Deccan Basalt*, *Lower Globigerina*, and *Welsh Slate* also support that theory. *Deccan Basalt* was also one of the lithotypes with 70 reviewed papers, but it is not among the most rated lithotypes, with 25 papers. Observation during the literature review supports that the explanation that a large number of the papers filtered for *Deccan Basalt* referred to other facies associated with the lava flows from which this lithology originates. A similar situation occurred for *Lower Globigerina Limestone* and *Welsh Slate*: For the first example, many studies emerged regarding the stratigraphic series relating to the limestone's occurrence, and for the second case, a large number of the selected papers fell into the scientific fields of Arts and Humanities, as well as Social Sciences.

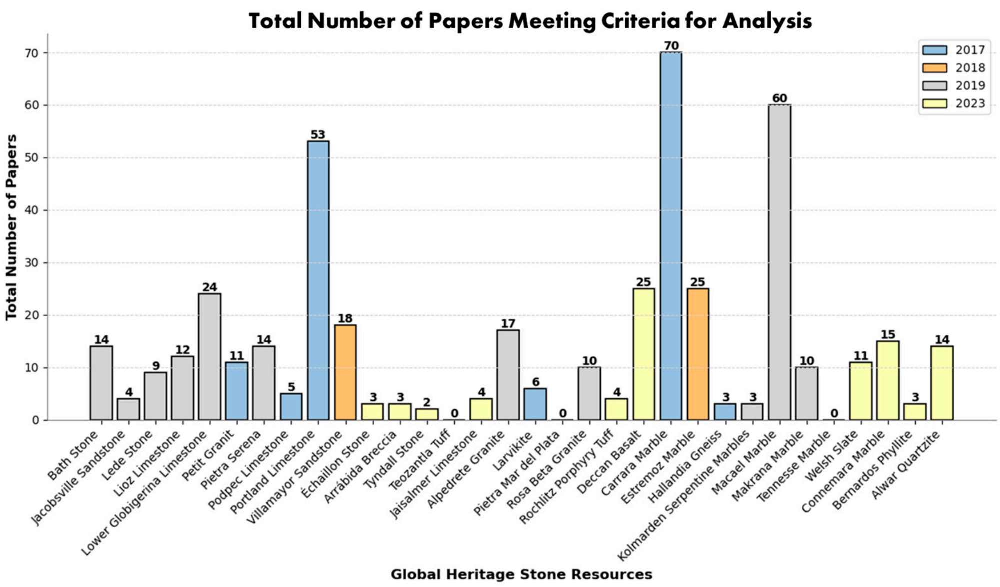


Figure 7. Total number of papers meeting criteria for analysis for each GHSR (total nr = 639).

As previously noted in this study, the longer a lithology has been classified, the more likely it is to attract increased attention from researchers. For this reason, the year of entrance was also considered for inclusion in Figure 7. The results of this assessment are reflected in Figure 8, where it is evident that the years with the majority of entrances 2019 and 2017. However, upon analyzing the data for the total number of lithologies per year, it becomes apparent that the average decreases in the most recent years (Figure 9), corroborating this theory. Nonetheless, it is important to note that many of the lithotypes had been studied prior to the establishment of its Global Heritage Stone Resource status.

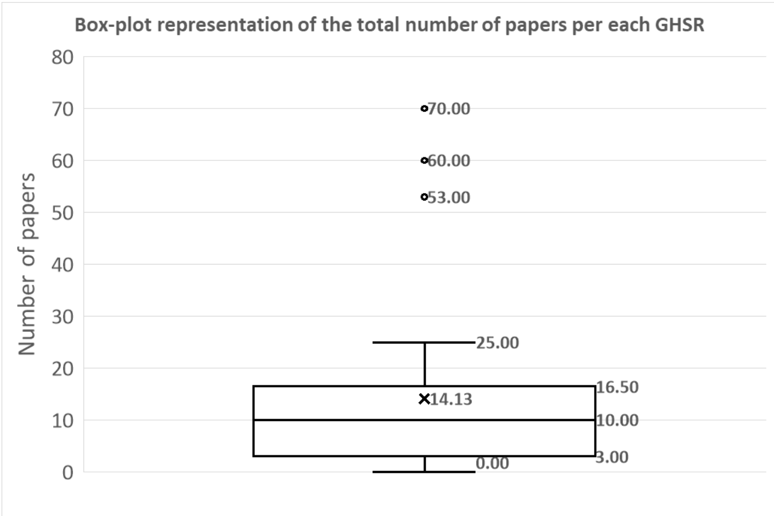


Figure 8. Box plot representing the total number of papers identified for each GHSR.

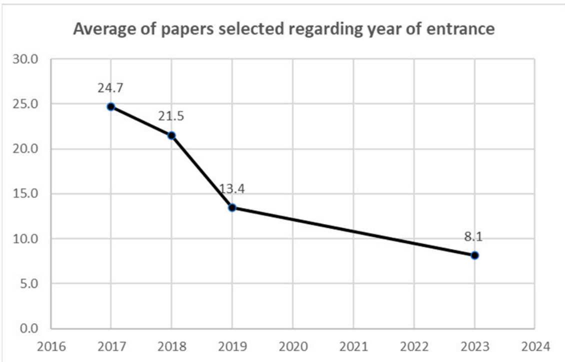
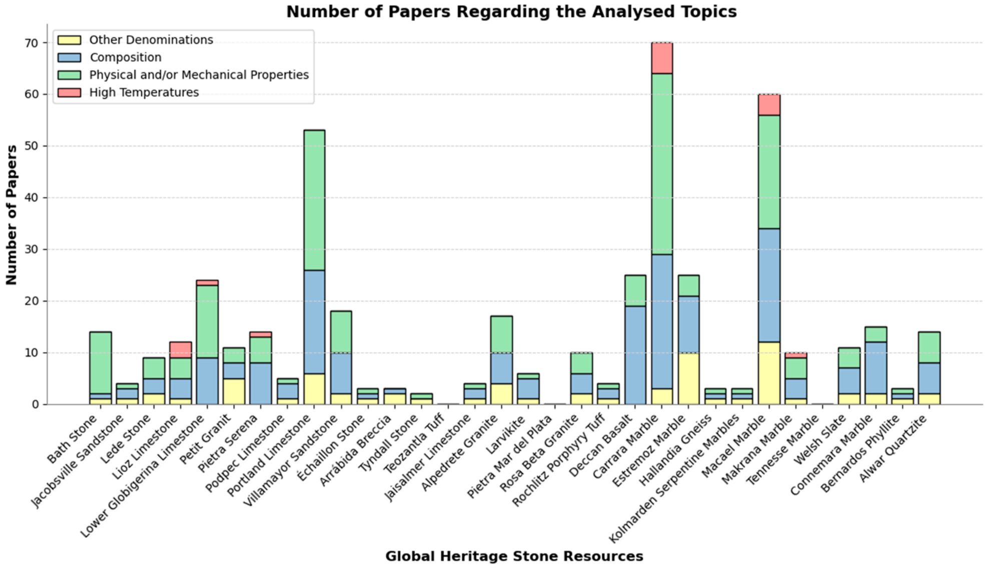


Figure 9. Number of papers selected per GHSR by year of entrance.

Figure 10a presents the results detailing the number of papers associated with each individual topic. The results reveal that 67 papers (14.3%) mentioned alternative names for the analyzed GHSR (Figure 11). This suggests that the potential for additional scientific research not captured by this methodology is higher for lithotypes with multiple denominations.



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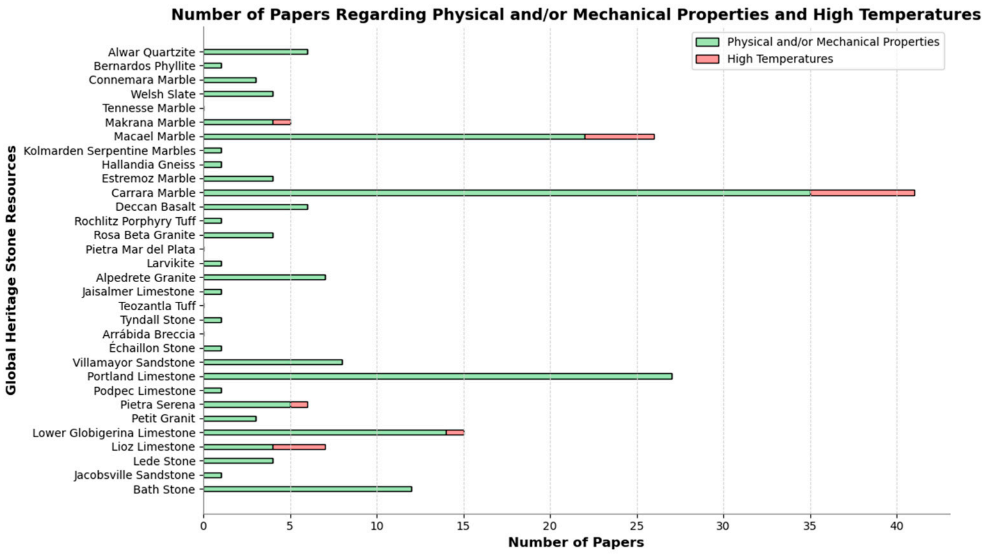

(**b**)

Figure 10. Number of papers per analyzed topic: (**a**) Overview of all four topics; (**b**) Focus on topics Physical and/or Mechanical Properties and High Temperatures per GHSR.

Figure 10b illustrates the proportion of studies focusing on overall properties compared to those addressing high temperature effects. Out of 32 lithotypes, only six have been studied in relation to high temperatures. This indicates that research on high-temperature behavior is less prevalent compared to general studies. This data underscores the need for more focused research on the high-temperature properties of these culturally significant lithotypes.

Among the selected papers on fire studies, a broad temperature range is observed, from 200 °C to 900 °C (Figure 12). The most frequently studied temperatures are 200 °C, 250 °C, 300 °C, 400 °C, and 600 °C. This selection is justified by the need to evaluate stone behavior at temperatures relevant to high-enthalpy geothermal applications (from room temperature to 250 °C) [20]. Other studies focus on temperature ranges such as 300 °C, 400 °C, and 600 °C to simulate fire scenarios and assess the performance of stones in heritage applications.

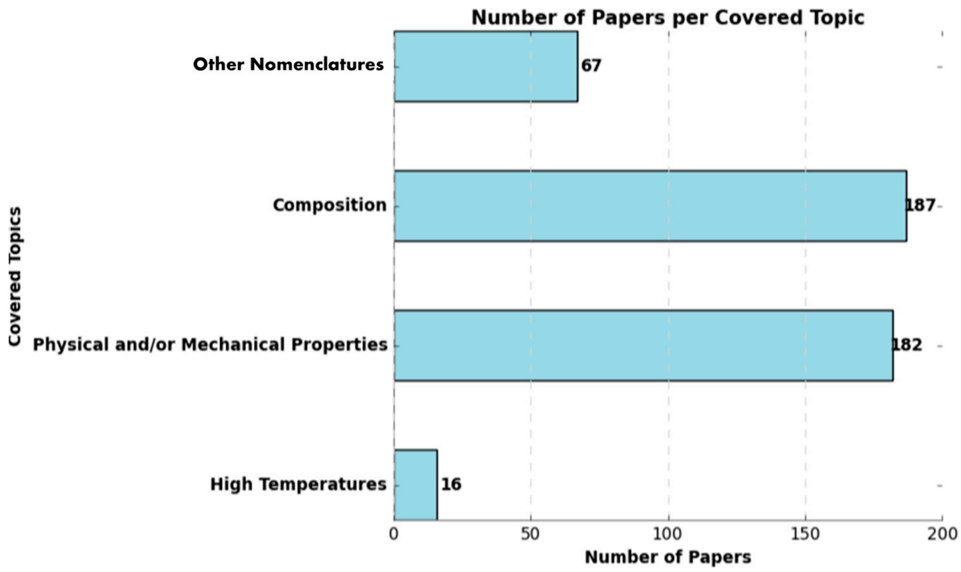

Figure 11. Total number of papers on each topic.

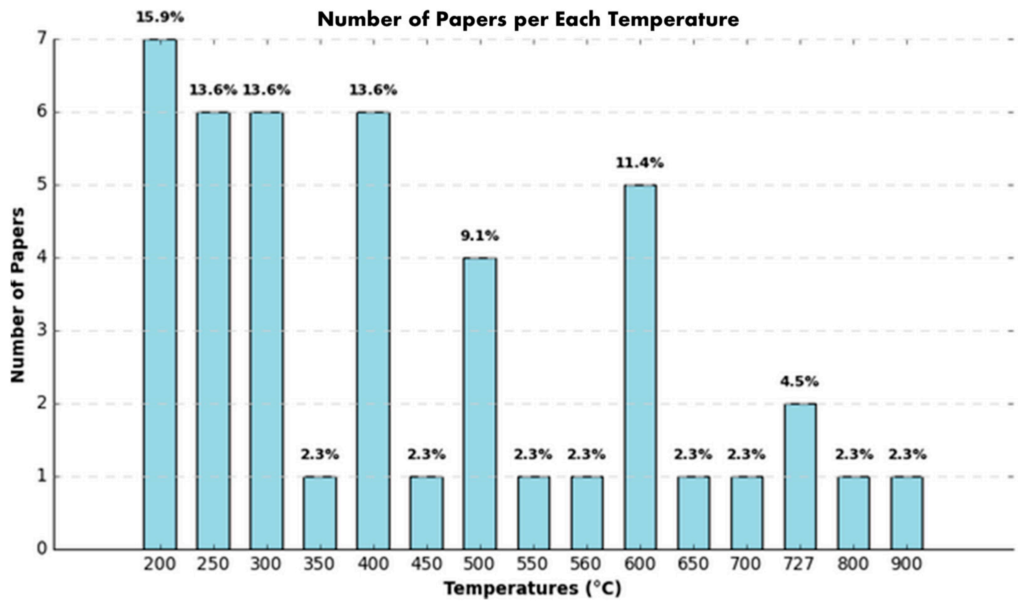

Figure 12. Distribution of papers based on temperature range.

The geometry of the studied samples is also an important factor when comparing results. Figure 13 shows that the predominant geometry chosen by researchers is cylindrical (62.5%), followed by cubic (18.75%) and parallelepiped (6.65%), and other geometries (18.75%). The studies categorized under "Other" encompass those involving disk morphology and a U-shaped notch. These morphologies were grouped under "Other" to facilitate the conduct of specific tests.

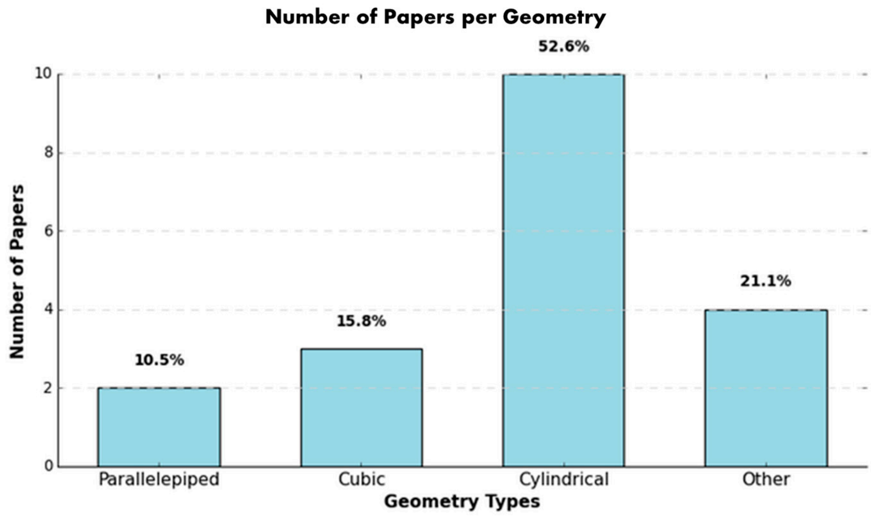

Figure 13. Graph illustrating the number of papers per analyzed geometry.

In addition to geometry, the heating rate, and the duration of sample exposure to the heat source play a crucial role in determining the results. Since the scope of this study intends to call attention to the threat fire poses to cultural heritage and to the need to understand the behavior of the stone, it is important to state that these laboratorial parameters should try to mimic natural conditions as closely as possible. While some of the studies filtered in this research focus on geothermal applications [20–24], which typically involve a slower heating rate and longer exposure times, it is important to note that real fire scenarios often entail rapid heating rates. Additionally, the duration of exposure can be unpredictable and depends on available extinguishing methods and combustible material. However, in the context of cultural heritage preservation, exposure times are anticipated to be shorter due to the valued nature of these resources and the implementation of efficient protective measures.

Some of the filtered studies describe different methods of exposure to the heating source. Some immediately expose the samples to the chosen temperature, while others control the heating rate, ranging from 0.05 °C/min to 9.6 °C/min (Figure 14). Regarding the duration of exposure, intervals of 1 h, 24 h, and 48 h (at least) were reported in some of the papers, suggesting a tendency towards either short or long periods of time (Figure 15).

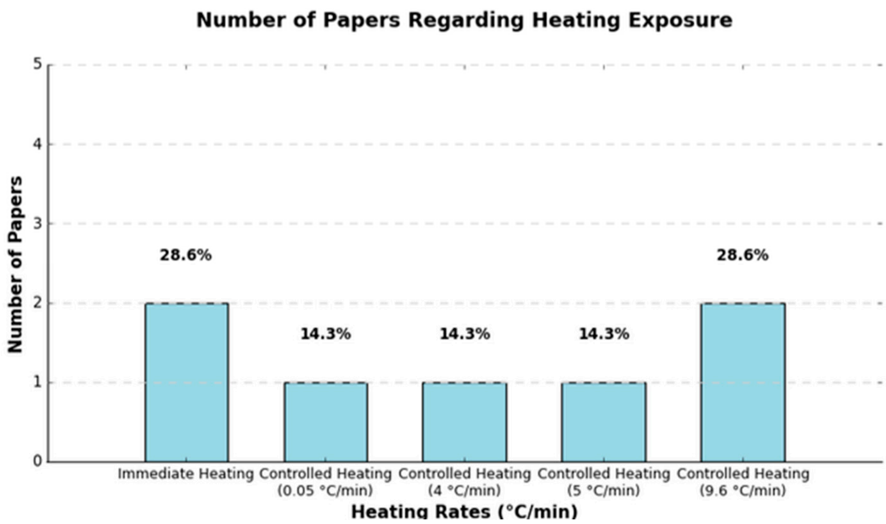

Figure 14. Graph illustrating the number of papers by heating exposure.

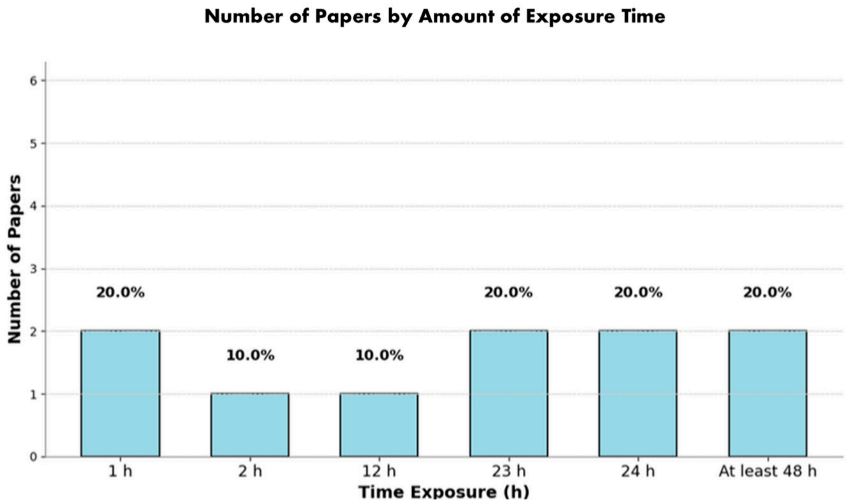

Figure 15. Graph illustrating the number of papers by amount of exposure time.

In all previously mentioned papers, the study samples were heated in a laboratory setting using heating equipment usually referred to as a muffle or oven. However, none of them explored case studies following real fire scenarios, despite some authors having previously focused on these types of assessments [25–30]. This type of evaluation can be more complex, as the natural heating process involves variations regarding temperature penetration and velocity spread throughout the stone material, making it challenging to assess mineralogical, physical, and mechanical properties. Additionally, sample assessment can be challenging since preventing damage to the applied heritage should be a priority. This aspect can contribute to the preference for laboratory evaluation where this is not a concern and the heating process can be controlled.

The findings from the analyzed laboratory-filtered studies highlight that the assessment of Physical-Mechanical properties tends to exceed the Minerochemical ones, except for *Makrana Marble*. This data suggests that studies prioritize assessing the performance of natural stones when exposed to high temperatures and are interested in assessing how the stone behaves as an architectural and building material. However, it is also important to understand the minerochemical changes that occur, since they are intrinsically related to the overall behavior. Another significant aspect highlighted in Figure 16 is that all lithotypes have some properties analyzed in both categories, which can be highly useful for correlating these properties and understanding their associations.

Within Minerochemical properties, Scanning Electron Microscopy (SEM) and Polarizing Microscopy are the most popular assessments, which may be due to the importance of understanding with a high definition the mineralogic and structural changes on a smaller scale, since one of the most damaging aspects resulting from high temperatures influences are fissures and fractures that lead to higher scale cracks and deformation [26,28,31–36].

Within the Physical-Mechanical group, the assessment of open porosity and water absorption stands out. These properties are deemed valuable for understanding the extent of impact on a stone's internal structure [7]. Open porosity provides critical insights into the increase of voids in the natural stone, while water absorption indicates the influence of variations on water-stone interaction.

Analyzing the filtered studies regarding the effects of high temperatures on GHSR reveals a consistent finding: Temperature has a significant impact on stone materials. Both Mineralogical and Physical-Mechanical properties are reported to be affected by temperature variations.

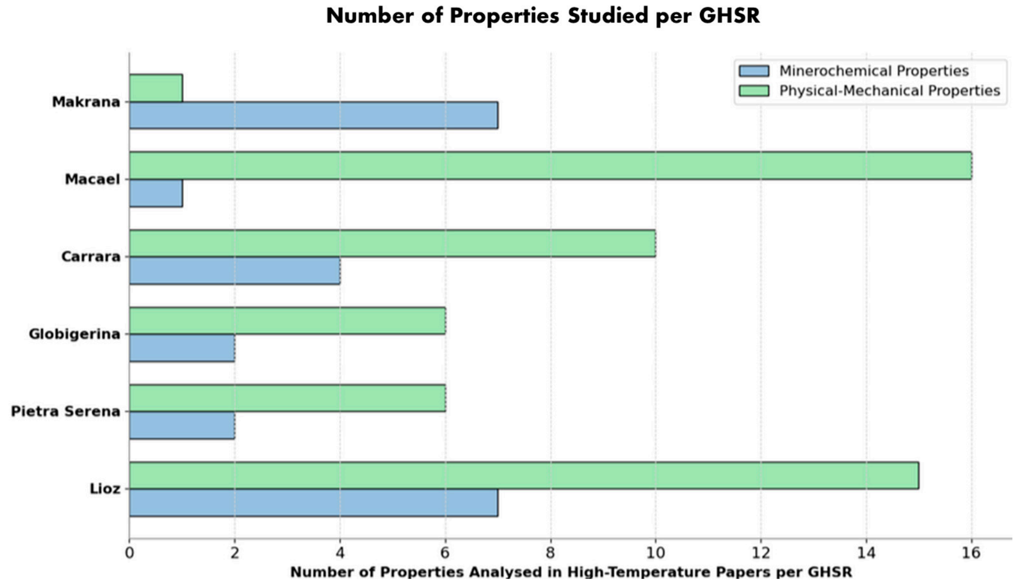

Figure 16. Number of properties studied per Global Heritage Stone Resource.

Similar to findings of the previous study [7], other research has reported changes in the stone's microstructure. For example, intense thermal micro-fissuring has been identified using techniques such as ultrasonic tomography and Field Emission Scanning Electron Microscopy (FESEM) [24]. Another study reported increases in open porosity and water absorption following heating, which the authors attributed to the anisotropic thermal deformation caused by micro-cracks and grain decohesion [37]. Stating initial average values of capillarity absorption shifted from 1.35 g m^{-2} $s^{-1}/^{2}$ to 39.88 g m^{-2} $s^{-1}/^{2}$, representing a percentual increase of 4504%. Open porosity average values shifted from 0.895% to 3.73%.

In some cases, the increase in anisotropy occurs due to thermal expansion of calcite grains [38,39]. Specially, limited slip and twinning occur at 400 °C, limited recrystallization at 500 °C, widespread recrystallization at 600–700 °C, and grain growth becomes prominent at 800–900 °C [40,41].

In addition to changes in anisotropy, chemical changes also take place, for example, marble exposed to temperatures between 500 and 700 °C resulted in the formation of calcium and magnesium oxides confirmed by thermodynamic analysis [7]. Conversely, limestone decomposes to calcium oxide at temperatures between 800 and 1000 °C [38]. *Pietra Serena sandstone* exhibited an increase in compressive (+12%) and tensile strength (+10%), possibly due to chemical-physical transformations undergone by secondary mineralogical fractions (clay minerals) at high temperatures [42]. *Globigerina limestone*, on the other hand, showed a decrease in compressive strength (−14%) and tensile strength (−14.5%) [42]. These chemical changes can manifest as volume increase, reduced bearing capacity, increased mass loss rate, and structural damage. All of the above can ultimately result in distinct behaviors like change in P-wave velocity. In study [37], more than 50% of specimens showed a significant reduction. Processes of vaporization and escape of adhered water, bound water, and structural water are also observed at elevated temperatures [37].

Fracture toughness, for instance, exhibited varying trends with temperature [43,44]. In [43], fracture toughness of the studied *Kimachi sandstone* increased slightly by 11% at lower temperatures (20–100 °C), then decreased gradually by 18% between 100 °C and 500 °C. Above 500 °C, a sharp decline of 44% was observed, with 500–600 °C identified as a critical threshold for a significant drop, primarily due to increased fragmentation and complex fracturing mechanisms such as intergranular and thermal cracking. In study [44], a limestone from Saudi Arabia was considered. The study compared limestone samples taken from deep within a petroleum reservoir to outcrop samples from the same geological formation collected at the surface. It was found that at 116 °C, the fracture toughness increased moderately, with a 24% rise in both reservoir and outcrop specimens.

In a different study, [22], porous samples (*Moleano limestone* and *Floresta sandstone*), exhibited an initial increase in tensile strength of approximately 6%, up to a critical temperature of 150 °C, followed by a slight decrease. These samples also showed continuous growth in fracture toughness until reaching a critical temperature. In contrast, non-porous samples, *Macael* and *Carrara marbles*, displayed a steady decrease in tensile strength, with a notable reduction of about 40% in fracture toughness after heating, demonstrating further declines after a heating-cooling cycle [21].

In particular, the study [24] on *Makrana marble* indicated that compressive and tensile strength decreased dramatically, with reductions ranging from 57.56% to 70.01% as temperatures increased from 25 °C to 700 °C. Correspondingly, petrophysical values, elastic parameters, and mechanical properties of the same marble exhibited a significant reduction at high temperatures, indicating intense thermal micro-fissuring

Fracture toughness was considered a key parameter characterizing the residual strength of rocks under temperature influences [21]. Areas more affected by high temperatures, such as those directly exposed to heat, exhibited lower P-wave velocity and more intense fissuration, whereas more protected areas showed thermal etch pits structures [37].

The studies collectively emphasize the significant impact of high temperatures on natural stone, affecting microstructure, porosity, and mechanical properties [20,21,37,45–47]. Considering lithotype-specific characteristics is crucial when assessing thermal decay and deciding on remediation measures, like consolidant application. Heating was found to be an effective method for inducing artificial weathering in stone samples, facilitating consolidant testing. However, adjustments to heating procedures and complementary methods are necessary based on lithotype microstructural characteristics [42]. In [45], 3D ultrasonic tomography allowed visualization of the depth reached by this consolidant, proven to be a useful technique for assessing not only heat damage but also the consolidation efficiency of consolidants. Ethyl silicate consolidant showed better performance than nanolime in a study performed using *Lioz Limestone* samples. The average restoration percentage for the P-wave velocity across the three specimens was 55%. The consolidants studied in [37] were able to reduce capillarity absorption coefficient by 75.5% when comparing treated samples with samples heated at 600 °C and a decrease of open porosity of 10.9%. However, authors highlight that the effectiveness of weathered substrates remains an area that needs further research and focus from the scientific community. Throughout the analysis of the filtered papers, in addition to the previously mentioned high temperature studies, other studies focusing on external factors that influence stone properties were also identified. These include the effects of feral pigeon excrement [48], salt crystallization [49–53], and interactions with acid rain [54,55] on certain classified GHSR.

Although feral pigeon excrement can significantly damage natural stone, particularly limestone, due to its acidic nature [48,56], it is the only external factor that is not in a way related to climate change. Salt crystallization on natural stone is related to climate change, as it is influenced by humidity conditions as well as temperature variations [57]. These settings can promote stone decay, particularly in the presence of specific salts such as halite, nitratine, niter, and mirabilite [58]. One of the key factors contributing to the significance of this aspect in the context of stone heritage decay is the potential for minimal quantities of salts to induce substantial changes, particularly in the case of daily fluctuations in climate and periods of severe drought [59]. Climate change has also been shown to influence the acidity of rainfall [60,61], since the elevated atmospheric CO_2 levels associated with climate change contribute to higher concentrations of carbonic acid in the water system [54].

These studies are crucial to the characterization of heritage stones, as they evaluate how materials respond to extreme external factors. Their significance stems from their ability to reveal irreversible damage analogous to that caused by high temperatures. Consequently, such assessments should be incorporated into the comprehensive understanding of each lithology due to the valuable insights they offer.

5. Conclusions

The Global Heritage Stone Resource classification is a key initiative for natural stones used in heritage applications, enhancing their protection and social recognition. This recognition often correlates with a rise in scientific interest from the academic community. Additionally, it is important to note that multiple designations for certain lithologies can significantly hinder the assessment of the overall scientific output related to applications, enhancing their protection and social recognition. This recognition often correlates with a rise in scientific interest from the academic community. Additionally, it is important to note that multiple designations for certain lithologies can significantly hinder the assessment of the overall scientific output related to these materials in literature reviews.

Compared to the study of general properties, the issue of high temperatures remains relatively underexplored, despite its significant impact, particularly for European countries, which account for 72% of the total GHSR.

Studies evaluating the impact of high temperatures on GHSR reveal significant disparities in methodologies. This variability makes it challenging to compare the behavior of different lithologies, a situation that is anticipated due to the lack of established standards for guiding and assessing changes caused by high-temperature exposure.

Studies analyzing the impact of high temperatures on GHSR often focus on sound lithologies. However, it is important to note that lithologies subjected to the effects of fire may exhibit additional damage, especially given their application in heritage contexts and extensive historical background. Consequently, a variation between laboratory results and real-world scenarios is anticipated [62]. Also, these studies do not assess how the material will behave over time [31]. This variability arises from the inherent susceptibility of these materials to diverse factors over time, emphasizing the complex interaction and different degrees of these influences on the lithology. Adding to that fact it is important not to forget the impact of intrinsic initial properties, like the influence of textures and porosity in the behavior of stone at different temperatures that will lead to different outcomes regarding high temperatures behavior [63]. The mineralogy will also have a significant impact, with some authors documenting changes in the mineralogical composition or even the destruction of clay minerals [28,30,32,64–67]. It is also important to highlight that studying the impact of high temperatures on heritage stones contributes directly to the Sustainable Development Goals of the 2030 Agenda, particularly those focused on environmental conservation and heritage preservation. This research addresses the urgent need to combat climate change by offering valuable insights into the vulnerability of heritage stone resources. Such understanding fosters a more sustainable and resilient approach to preserving these materials, safeguarding cultural heritage, and advancing global efforts toward a more sustainable and climate-resilient future.

In conclusion, the thorough analysis of studies on the effects of high temperatures on GHSR reveals the intricate relationship between temperature, microstructure, and mechanical properties. Grasping these interactions is essential for maintaining the integrity of stone materials and ensuring their effective preservation.

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Appendix A

Table 1. Compilation of the main information assessed regarding each GHSR.

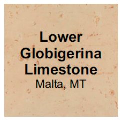
	Name and Visual Aspect	Lithology	Place of Origin	Year of Entrance	Reference for Application	Total nr of Papers Found	Search Words	Other Nomen-clatures	Composition	Physical and/or Mechanical Properties	High Temperatures
Sedimentary stones		Limestone	Bath, United Kingdom	July 2019	Marker, 2015	**31**	Bath stone + Limestone	**1** [68]	**1** [69]	**12** [48,49,54,68–76]	**0**
		Sandstone	Michigan, USA	January 2019	Rose et al. 2017	**24**	Jacobsville + Sandstone	**1** [77]	**2** [78,79]	**1** [77]	**0**
		Sandy Limestone	Brussels, Belgium	January 2019	De Kock et al. 2015	**9**	Lede Stone + Limestone	**2** [80,81]	**3** [80,81]	**4** [81–83]	**0**
		Limestone	Lisbon, Portugal	July 2019	Silva, 2019	**21**	Lioz + Limestone	**1** [84]	**4** [85–88]	**4** [45,84,85,89]	**3** [37,45,90]
		Limestone	Malta	January 2019	Cassar et al. 2017	**63**	Globigerina + Limestone	**0**	**9** [91–99]	**14** [50,51,91,92,94–103]	**1** [42]
		Limestone	Namur, Belgium	December 2017	Pereira et al. 2015	**9**	Petit Granit + Limestone	**5** [104–108]	**3** [104,105,109]	**3** [105,107,109]	**0**
		Sandy lime-stone/Sandstone	Florence, Italy	July 2019	Fratini et al. 20115	**9**	Pietra Serena + Limestone	**0**	**8** [42,110–116]	**5** [42,110,112,113,117]	**1** [2]

Table 1. *Cont.*

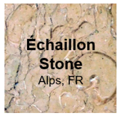
	Name and Visual Aspect	Lithology	Place of Origin	Year of Entrance	Reference for Application	Total nr of Papers Found	Search Words	Other Nomenclatures	Composition	Physical and/or Mechanical Properties	High Temperatures
		Limestone	Podpeč, Slovenia	December 2017	Kramar et al. 2015	**9**	Podpeč + Limestone	1 [118]	**3** [118–120]	**1** [118]	**0**
		Limestone	Portland, United Kingdom	December 2017	Hughes et al. 2013	**2190**	Portland + Limestone	**6** [52,121–125]	**20** [55,121–124,126–140]	**27** [52,55,122,124–127,129,130,132–149]	**0**
		Sandstone	Salamanca, Spain	February 2018	Garcia-Talegon et al. 2015	**10**	Villamayor + Sandstone	**2** [150,151]	**8** [151–158]	**8** [150–152,154,156–159]	**0**
		Limestone	Alps, France	April 2023	Dumont, 2020	**1**	Echaillon Stone + Limestone	**1** [160]	**1** [160]	**1** [160]	**0**
		Breccia	Arrábida, Portugal	April 2023		**2**	Arrábida + Breccia	**2** [161,162]	**1** [162]	**0**	**0**
		Dolomitic limestone	Manitoba, Canada	April 2023		**1**	Tyndall Stone + Limestone	**1** [163]	**0**	**1** [163]	**0**
Igneous stones	(not found)	Tuff	Mexico	April 2023		**0**	Teozantla + Tuff	-	-	-	-
		Limestone	Jaisalmer, India	April 2023	[3]	**26**	Jaisalmer + Limestone	**1** [164]	**2** [164,165]	**1** [164]	**0**
		Granite	Alpedrete Province, Madrid, Spain	July 2019	Freire-Lista et al. 2015	**8**	Alpedrete + Granite	**4** [166–172]	**6** [53,166–170]	**7** [53,166–171]	**0**

Table 1. *Cont.*

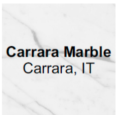
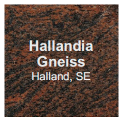
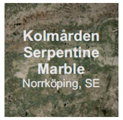
	Name and Visual Aspect	Lithology	Place of Origin	Year of Entrance	Reference for Application	Total nr of Papers Found	Search Words	Other Nomen-clatures	Composition	Physical and/or Mechanical Properties	High Temperatures
		Monzonite	Larvik, Norway	December 2017	Heldal et al. 2015	**5**	Larvikite + Monzonite	**1** [172]	**4** [172–175]	**1** [172]	**0**
		Orthoquartzite	Mar del Plata, Argentina	January 2019	Cravero et al.2015	**0**	Piedra Mar del Plata +	-	-	-	-
		Granite	Italy	July 2019	Careddu et al. 2015	**5**	Rosa Beta + Granite	**2** [176,177]	**4** [176,178–180]	**4** [176,178–180]	**0**
		Porphyry tuff	Rochlitz, Germany	April 2023	[181]	**2**	Rochlitz + Porphyry Tuff	**1** [181]	**2** [181,182]	**1** [181]	**0**
		Deccan	Deccan, India	April 2023		**12,114**	Deccan + Basalt	**0**	**19** [183–201]	**6** [183,184,191,202–204]	**0**
Metamorphic stones		Marble	Tuscany, Italy	December 2017	Primavori, 2015	**560**	Carrara + Marble	**3** [39,91,205]	**26** [38,91,206–228]	**35** [38,39,212–220,222–239]	**6** [38,39,209, 219,223,240]
		Marble	Estremoz, Portugal	February 2018	Lopes & Martins, 2015	**29**	Estremoz + Marble	**10** [241–250]	**11** [241–251]	**4** [242–244,249]	**0**
		Gneiss	Getinge, Sweden	December 2017	Schouenborg et al. 2015	**1**	Hallandia + Gneiss	**1** [252]	**1** [252]	**1** [252]	**0**

Table 1. *Cont.*

	Serpentine Marble	Kolmarden, Sweden	January 2019	Wikstrom & Pereira, 2015	**1**	Kolmarden Serpentine + Marble	**1** [253]	**1** [253]	**1** [253]	**0**
	Marble	Almeria, Spain	July 2019	Navarro et al. 2015	**42**	Macael + Marble	**12** [19,248,254–263]	**22** [16,19–21,248,254–256,258–262,264–272]	**22** [16,19,20,45,47,255–262,265–267,270–275]	**4** [20,21,45,273]
	Marble	Makrana, India	July 2019	Garg et al. 2019	**16**	Makrana + Marble	**1** [276]	**4** [24,276–278]	**4** [24,276,279,280]	**1** [24]
	Marble	Tennessee, USA	July 2019	Byerly & Knowles, 2017	**0**	Tennesse + Marble	-	-	-	-
	Slate	Wales, United Kingdom	January 2019	Hughes et al. 2016	**59**	Welsh + Slate	**2** [281,282]	**5** [281,283–286]	**4** [281,284–286]	**0**
	Sillimanite-grade ophicarbonate	Connemara, Ireland	April 2023	[287]	**20**	Connemara + Marble	**2** [282,288]	**10** [56,288–295]	**3** [289,289,292]	**0**
	Phyllite	Bernardos, Spain	April 2023	[296]	**1**	Bernardos + Phyllite	**1** [297]	**1** [297]	**1** [297]	**0**
	Quartzite	Delhi, India	April 2023	[298]	**22**	Alwar + Quartzite	**2** [298,299]	**6** [298,300–304]	**6** [298,299,301,302,305,306]	**0**

References

1. Sims, I. Natural stone: Sustaining the future of the world's oldest construction material. *Proc. Inst. Civil Eng.-Civil Eng.* **2015**, *166*, 149–157. [CrossRef]
2. Cooper, B.J. Sustainable Development: An Opportunity for Dimension Stone. *Roc Maquina* **2004**, *54*, 12–17.
3. Cooper, B.J. Toward establishing a "Global Heritage Stone Resource" designation. *Episodes* **2010**, *33*, 38–43. [CrossRef] [PubMed]
4. Adorni, E.; Venturelli, G. Mortars and Stones of the Damascus Citadel (Syria). *Int. J. Archit. Herit.* **2010**, *4*, 337–350. [CrossRef]
5. Pinho, F.F.S.; Lúcio, V.J.G. Rubble Stone Masonry Walls in Portugal: Material Properties, Carbonation Depth and Mechanical Characterization. *Int. J. Archit. Herit.* **2017**, *11*, 685–702. [CrossRef]
6. Winkler, E. *Stone in Architecture: Properties, Durability*, 3rd ed.; Springer: Berlin, Germany, 1997.
7. Martinho, E.; Dionísio, A. Assessment Techniques for Studying the Effects of Fire on Stone Materials: A Literature Review. *Int. J. Archit. Herit.* **2018**, *14*, 275–299. [CrossRef]
8. United Nations. Transforming Our World: The 2030 Agenda for Sustainable Development. Available online: https://sustainabledevelopment.un.org/post2015/transformingourworld (accessed on 1 March 2023).
9. Jain, P.; Castellanos-Acuna, D.; Coogan, S.C.P.; Abatzoglou, J.T.; Flannigan, M.D. Observed Increases in Extreme Fire Weather Driven by Atmospheric Humidity and Temperature. *Nat. Clim. Chang.* **2022**, *12*, 63–70. [CrossRef]
10. Ross, S.M. Saving Heritage Is Key to Sustainable Development. *Herit. Can. Spring* **2006**, 24–28. Available online: https://archive.nationaltrustcanada.ca (accessed on 18 March 2023).
11. Carter, B.; Grimwade, G. Balancing Use and Preservation in Cultural Heritage Management. *Int. J. Herit. Stud.* **1997**, *3*, 45–53. [CrossRef]
12. Hannibal, J.T.; Kramar, S.; Cooper, B.J. Worldwide Examples of Global Heritage Stones: An Introduction. *Geol. Soc. Spec. Publ.* **2020**, *486*, 1–6. [CrossRef]
13. Cooper, B.J. Recognition of a "World Heritage Stone Resource": A Proposal. In Proceedings of the Global Stone Congress 2008, Carrara, Italy, 1–3 October 2008.
14. Pereira, D. The Value of Global Heritage Stone Resource Designation in Enhancing and Recovering Our Legacy and Culture. *Episodes* **2015**, *38*, 197–202.
15. Cooper, B.J.; Marker, B.R.; Thomas, I.A. Towards International Designation of a Heritage Dimension Stone. *Geol. Soc. Spec. Publ.* **2013**, *391*, 233–240. [CrossRef]
16. Rodríguez Gordillo, J.; Sáez Pérez, M.P. Performance of Spanish White Macael Marble Exposed to Narrow- and Medium-Range Temperature Cycling. *Mater. Construcc.* **2010**, *60*, 127–141. [CrossRef]
17. Costa, M.M.; Falcão, P.; Paneiro, G. Finishing Surface Influence on Stone Thermal Behaviour. In Proceedings of the International Multidisciplinary Scientific GeoConference: SGEM; Sofia Vol. 2,: Surveying Geology & Mining Ecology Management (SGEM), Albena, Bulgaria, 17–26 June 2014; 2014; pp. 377–384.
18. Andriani, G.F.; Germinario, L. Thermal Decay of Carbonate Dimension Stones: Fabric, Physical and Mechanical Changes. Environ. *Earth Sci.* **2014**, *73*, 8057–8069. [CrossRef]
19. Navarro, R.; Pereira, D.; Cruz, A.S.; Carrillo, G. The Significance of "White Macael" Marble Since Ancient Times: Characteristics of a Candidate as Global Heritage Stone Resource. *Geoheritage* **2019**, *11*, 113–123. [CrossRef]
20. Justo, J.; Lagüera, A.; Castro, J.; Miranda, M.; Sagaseta, C. Influence of Temperature on the Tensile Strength of a Limestone and a Marble. In Proceedings of the 17th European Conference on Soil Mechanics and Geotechnical Engineering (ECSMGE 2019), Reykjavik, Iceland, 1–6 September 2019.
21. Justo, J.; Castro, J.; Cicero, S.; Sánchez-Carro, M.A. Influence of Temperature on the Fracture Toughness of Several Rocks. In Proceedings of the 17th European Conference on Soil Mechanics and Geotechnical Engineering (ECSMGE 2019), Reykjavik, Iceland, 1–6 September 2019.
22. Justo, J.; Castro, J. Mechanical Properties of Four Rocks at Different Temperatures and Fracture Assessment Using the Strain Energy Density Criterion. *Geomech. Energy Environ.* **2021**, *25*, 100212. [CrossRef]
23. Justo, J.; Castro, J.; Cicero, S.; Sánchez-Carro, M.A.; Husillos, R. Notch Effect on the Fracture of Several Rocks: Application of the Theory of Critical Distances. *Theor. Appl. Fract. Mech.* **2017**, *90*, 251–258. [CrossRef]
24. Gautam, P.K.; Jha, M.K.; Verma, A.K.; Singh, T.N. Experimental Study of Thermal Damage under Compression and Tension of Makrana Marble. *J. Therm. Anal. Calorim.* **2020**, *139*, 609–627. [CrossRef]
25. Dionísio, A.; Martinho, E.; Pozo-António, J.S.; Sequeira Braga, M.A.; Mendes, M. Evaluation of Combined Effects of Real-Fire and Natural Environment in a Building Granite. *Constr. Build. Mater.* **2021**, *277*, 122327. [CrossRef]
26. Dionísio, A. Stone Decay Induced by Fire on Historic Buildings: The Case of the Cloister of Lisbon Cathedral (Portugal). *Geol. Soc. Lond. Spec. Publ.* **2007**, *271*, 87–98. [CrossRef]
27. Pozo-Antonio, J.S.; Sanmartín, P.; Serrano, M.; De la Rosa, J.M.; Miller, A.Z.; Sanjurjo-Sánchez, J. Impact of Wildfire on Granite Outcrops in Archaeological Sites Surrounded by Different Types of Vegetation. *Sci. Total Environ.* **2020**, *747*, 141143. [CrossRef] [PubMed]
28. Chakrabarti, B.; Yates, T.; Lewry, A. Effect of Fire Damage on Natural Stonework in Buildings. *Constr. Build. Mater.* **1996**, *10*, 539–544. [CrossRef]
29. Gillhuber, S.; Lehrberger, G.; Göske, J. Fire Damage of Trachyte: Investigations of the Teplá Monastery Building Stones. *Geol. Soc. Lond. Spec. Publ.* **2010**, *333*, 73–79. [CrossRef]

30. Hajpál, M. Changes in Sandstones of Historical Monuments Exposed to Fire or High Temperature. *Fire Technol.* **2002**, *38*, 373–382. [CrossRef]
31. Gomez-Heras, M.; McCabe, S.; Smith, B.J.; Fort, R. Impacts of Fire on Stone-Built Heritage: An Overview. *J. Archit. Conserv.* **2009**, *15*, 47–58. [CrossRef]
32. Franzen, C.; Krause, D.; Siedel, H.; Ullrich, B. Temperature Impact on Cotta Sandstone. ResearchGate 2012. Available online: https://www.researchgate.net/publication/257304809_Impact_of_temperature_on_Cotta_sandstone (accessed on 11 April 2023).
33. Sanjurjo-Sánchez, J.; Gomez-Heras, M.; Fort, R. Dating Fires and Estimating the Temperature Attained on Stone Surfaces: The Case of Ciudad de Vascos (Spain). *Microchem. J.* **2016**, *127*, 247–255. [CrossRef]
34. McCabe, S.; Smith, B.J.; Warke, P.A. Exploitation of Inherited Weakness in Fire-Damaged Building Sandstone: The "Fatiguing" of "Shocked" Stone. *Eng. Geol.* **2010**, *115*, 217–225. [CrossRef]
35. Heidari, M.; Torabi-Kaveh, M.; Mohseni, H. Artificial Weathering Assessment of Persepolis Stone Due to Heating to Elucidate the Effects of the Burning of Persepolis. *Bull. Eng. Geol. Environ.* **2016**, *75*, 979–992. [CrossRef]
36. Koca, M.Y.; Ozden, G.; Yavuz, A.B.; Kincal, C.; Onargan, T.; Kucuk, K. Changes in the Engineering Properties of Marble in Fire-Exposed Columns. *Int. J. Rock Mech. Min. Sci.* **2006**, *43*, 520–530. [CrossRef]
37. Martinho, E.; Mendes, M.; Dionísio, A. 3D Imaging of P-Waves Velocity as a Tool for Evaluation of Heat-Induced Limestone Decay. *Constr. Build. Mater.* **2017**, *135*, 119–128. [CrossRef]
38. Lu, C.; Jackson, I. Seismic-Frequency Laboratory Measurements of Shear Mode Viscoelasticity in Crustal Rocks I: Competition between Cracking and Plastic Flow in Thermally Cycled Carrara Marble. *Phys. Earth Planet. Inter.* **1996**, *94*, 105–119. [CrossRef]
39. Ruf, M.; Steeb, H. Effects of Thermal Treatment on Acoustic Waves in Carrara Marble. *Int. J. Rock Mech. Min. Sci.* **2022**, *159*, 105205. [CrossRef]
40. Casey, M.; Rutter, E.H.; Schmid, S.M.; Siddans, A.W.B.; Whalley, J.S. Texture Development in Experimentally Deformed Calcite Rocks. In Proceedings of the Annual Meeting of the Geological Society of America, Toronto, ON, Canada, 23–26 October 1978.
41. Hacker, B.R.; Christie, J.M. High-Pressure Deformation of Calcite Marble and Its Transformation to Aragonite under Non-Hydrostatic Conditions. *J. Struct. Geol.* **1993**, *15*, 1207–1222. [CrossRef]
42. Franzoni, E.; Sassoni, E.; Scherer, G.W.; Naidu, S. Artificial Weathering of Stone by Heating. *J. Cult. Herit.* **2013**, *14*, 69–76. [CrossRef]
43. Feng, G.; Kang, Y.; Meng, T.; Hu, Y.Q.; Li, X.H. The Influence of Temperature on Mode I Fracture Toughness and Fracture Characteristics of Sandstone. *Rock Mech. Rock Eng.* **2017**, *50*, 2007–2019. [CrossRef]
44. Al-Shayea, N. Comparing Reservoir and Outcrop Specimens for Mixed Mode I-II Fracture Toughness of a Limestone Rock Formation at Various Conditions. *Rock Mech. Rock Eng.* **2002**, *35*, 271–297. [CrossRef]
45. Justo, J.; Castro, J.; Cicero, S. Notch Effect and Fracture Load Predictions of Rock Beams at Different Temperatures Using the Theory of Critical Distances. *Int. J. Rock Mech. Min. Sci.* **2020**, *125*, 104161. [CrossRef]
46. Justo, J.; Castro, J. Application of the TCD for the Fracture Prediction of Rocks with U-Shaped Notches at Different Temperatures. In *Rock Mechanics for Natural Resources and Infrastructure Development- Proceedings of the 14th International Congress on Rock Mechanics and Rock Engineering, ISRM 2019*; CRC Press: Boca Raton, FL, USA, 2020; pp. 1242–1249.
47. Martinho, E.; Dionísio, A.; Mendes, M. Simulation of a Portuguese Limestone Masonry Structure Submitted to Fire: 3D Ultrasonic Tomography Approach. *Int. J. Conserv. Sci.* **2017**, *8*, 565–580.
48. Channon, D. Feral Pigeon Excrement on Heritage Stonework. 2004. Available online: https://www.researchgate.net/publication/277304552_Feral_pigeon_excrement_on_heritage_stonework (accessed on 9 April 2023).
49. Viles, H.A.; Goudie, A.S. Rapid Salt Weathering in the Coastal Namib Desert: Implications for Landscape Development. *Geomorphology* **2007**, *85*, 49–62. [CrossRef]
50. Roussel, E.; Vautier, F.; Voldoire, O.; André, M.-F.; Cassar, J.; Fronteau, G.; Phalip, B.; Thomachot-Schneider, C.; Toumazet, J.-P. Quantifying 450 Years of Limestone Weathering Induced by Salt Crystallization on Fortifications in Malta and Gozo. *Geomorphology* **2021**, *378*, 107614. [CrossRef]
51. Graziani, G.; Sassoni, E.; Scherer, G.W.; Franzoni, E. Phosphate-Based Treatments for Consolidation of Salt-Bearing Globigerina Limestone. *IOP Conf. Ser. Mater. Sci. Eng.* **2018**, *364*, 012082. [CrossRef]
52. Wilhelm, K.; Viles, H.; Burke, Ò. The Influence of Salt on Handheld Electrical Moisture Meters: Can They Be Used to Detect Salt Problems in Porous Stone? *Int. J. Archit. Herit.* **2016**, *10*, 735–748. [CrossRef]
53. López-Arce, P.; Varas-Muriel, M.J.; Fernández-Revuelta, B.; Álvarez de Buergo, M.; Fort, R.; Pérez-Soba, C. Artificial Weathering of Spanish Granites Subjected to Salt Crystallization Tests: Surface Roughness Quantification. *Catena* **2010**, *83*, 170–185. [CrossRef]
54. Thornbush, M.J.; Viles, H.A. Simulation of the Dissolution of Weathered versus Unweathered Limestone in Carbonic Acid Solutions of Varying Strength. Earth Surf. *Process. Landf.* **2007**, *32*, 841–852. [CrossRef]
55. Compton, R.G.; Walker, C.T.; Unwin, P.R.; House, W.A. Dissolution Kinetics of Carrera Marble, Portland Stone and Several Limestones in Acid Waters. *J. Chem. Soc. Faraday Trans.* **1990**, *86*, 849–854. [CrossRef]
56. Giunchi, D.; Baldaccini, N.E.; Sbragia, G.; Soldatini, C. Feral Pigeons: Problems, Dynamics and Control Methods. In *Encyclopedia of Pest Management*; Taylor & Francis: Abingdon, UK, 2012; pp. 1–4.
57. Viles, H.A.; Taylor, M.P.; Yates, T.J.S.; Massey, S.W. Soiling and Decay of N.M.E.P. Limestone Tablets. *Sci. Total Environ.* **2002**, *292*, 215–229. [CrossRef]

58. Laue, S. Salt Weathering of Porous Structures Related to Climate Changes/Klimaabhängige Salzverwitterung Poröser Strukturen. *Restor. Build. Monum.* **2005**, *11*, 381–390. [CrossRef]
59. Godts, S.; Hayen, R.; De Clercq, H. Investigating Salt Decay of Stone Materials Related to the Environment: A Case Study in the St. James Church in Liège, Belgium. *Stud. Conserv.* **2017**, *62*, 329–342. [CrossRef]
60. Davies, T.D.; Kelly, P.M.; Brimblecombe, P.; Farmer, G.; Barthelmie, R.J.; Davies, T.D. Acidity of Scottish Rainfall Influenced by Climatic Change. *Nature* **1986**, *322*, 359–361. [CrossRef]
61. White, J.; Wagner, W.; Beal, C. *Global Climate Change Linkages: Acid Rain, Air Quality, and Stratospheric Ozone*; Springer Science & Business Media: Berlin/Heidelberg, Germany, 1989.
62. Přikryl, R. Durability Assessment of Natural Stone. *Q. J. Eng. Geol. Hydrogeol.* **2013**, *46*, 377–390. [CrossRef]
63. Gomez-Heras, M.; Alvarez de Buergo, M.; Varas-Muriel, M.J.; Fort, R.; Hajpál, M.; Török, Á. Evolution of Porosity in Hungarian Building Stones after Simulated Burning. In *Heritage Weathering and Conservation HWC-2006*; Taylor & Francis: Rotterdam, The Netherlands, 2006; pp. 513–519.
64. Hajpál, M.; Török, Á. Mineralogical and Colour Changes of Quartz Sandstones by Heat. *Environ. Geol.* **2004**, *46*, 311–322. [CrossRef]
65. Gómez-Heras, M.; Gomez-Villalba, L.S.; Fort, R. Cambios de Fase en Litoarenitas Calcáreas con la Temperatura: Implicaciones para el Deterioro Causado por Incendios. *Macla* **2010**, *13*, 101–102.
66. Dionísio, A.; Sequeira Braga, M.A.; Waerenborgh, J.C. Clay Minerals and Iron Oxides-Oxyhydroxides as Fingerprints of Firing Effects in a Limestone Monument. *Appl. Clay Sci.* **2009**, *42*, 629–638. [CrossRef]
67. Sippel, J.; Siegesmund, S.; Weiss, T.; Nitsch, K.H.; Korzen, M. Decay of Natural Stones Caused by Fire Damage. *Geol. Soc. Lond. Spec. Publ.* **2007**, *271*, 139–151. [CrossRef]
68. Allen, G.C.; El-Turki, A.; Hallam, K.R.; McLaughlin, D.; Stacey, M. Role of NO_2 and SO_2 in Degradation of Limestone. *Br. Corros. J.* **2000**, *35*, 35–38. [CrossRef]
69. Marker, B.R. Bath Stone and Purbeck Stone: A Comparison in Terms of Criteria for Global Heritage Stone Resource Designation. *Episodes* **2015**, *38*, 118–123. [CrossRef]
70. Viles, H.A.; Gorbushina, A.A. Soiling and Microbial Colonisation on Urban Roadside Limestone: A Three Year Study in Oxford, England. *Build. Environ.* **2003**, *38*, 1217–1224. [CrossRef]
71. Pesce, G.L.; Morgan, D.; Odgers, D.; Henry, A.; Allen, M.; Ball, R.J. Consolidation of Weathered Limestone Using Nanolime. *Proc. Inst. Civ. Eng. Constr. Mater.* **2013**, *166*, 213–228. [CrossRef]
72. Thornbush, M.; Viles, H. Changing Patterns of Soiling and Microbial Growth on Building Stone in Oxford, England after Implementation of a Major Traffic Scheme. *Sci. Total Environ.* **2006**, *367*, 203–211. [CrossRef]
73. Laycock, E.A.; Spence, K.; Jefferson, D.P.; Hetherington, S.; Martin, B.; Wood, C. Testing the Durability of Limestone for Cathedral Façade Restoration. *Environ. Geol.* **2008**, *56*, 521–528. [CrossRef]
74. Elliott, G.M.; Brown, E.T. Yield of a Soft, High Porosity Rock. *Geotechnique* **1985**, *35*, 413–423. [CrossRef]
75. Nuño, M.; Pesce, G.L.; Bowen, C.R.; Xenophontos, P.; Ball, R.J. Environmental Performance of Nano-Structured $Ca(OH)_2/TiO_2$ Photocatalytic Coatings for Buildings. *Build. Environ.* **2015**, *92*, 734–742. [CrossRef]
76. Forrest, M. Secure heritage. *Mater. World* **2007**, *15*, 39–40.
77. Sherman, H.M.; Gierke, J.S.; Anderson, C.P. Controls on Spatial Variability of Uranium in Sandstone Aquifers. *Ground Water Monit. Remediat.* **2007**, *27*, 106–118. [CrossRef]
78. Kerfoot, W.C.; Hobmeier, M.M.; Green, S.A.; Yousef, F.; Brooks, C.N.; Shuchman, R.; Sayers, M.; Lin, L.; Luong, P.; Hayter, E.; et al. Coastal Ecosystem Investigations with LiDAR (Light Detection and Ranging) and Bottom Reflectance: Lake Superior Reef Threatened by Migrating Tailings. *Remote Sens.* **2019**, *11*, 1076. [CrossRef]
79. Mitchell, R.L.; Sheldon, N.D. Sedimentary Provenance and Weathering Processes in the 1.1Ga Midcontinental Rift of the Keweenaw Peninsula, Michigan, USA. *Precambrian Res.* **2016**, *275*, 225–240. [CrossRef]
80. De Kock, T.; Turmel, A.; Fronteau, G.; Cnudde, V. Rock Fabric Heterogeneity and Its Influence on the Petrophysical Properties of a Building Limestone: Lede Stone (Belgium) as an Example. *Eng. Geol.* **2017**, *216*, 31–41. [CrossRef]
81. Dewanckele, J.; Boone, M.A.; De Kock, T.; De Boever, W.; Brabant, L.; Boone, M.N.; Fronteau, G.; Dils, J.; Van Hoorebeke, L.; Jacobs, P.; et al. Holistic Approach of Pre-Existing Flaws on the Decay of Two Limestones. *Sci. Total Environ.* **2013**, *447*, 403–414. [CrossRef]
82. De Kock, T.; Van Stappen, J.; Fronteau, G.; Boone, M.; De Boever, W.; Dagrain, F.; Silversmit, G.; Vincze, L.; Cnudde, V. Laminar Gypsum Crust on Lede Stone: Microspatial Characterization and Laboratory Acid Weathering. *Talanta* **2017**, *162*, 193–202. [CrossRef]
83. Schröer, L.; De Kock, T.; Cnudde, V.; Boon, N. Differential Colonization of Microbial Communities Inhabiting Lede Stone in the Urban and Rural Environment. *Sci. Total Environ.* **2020**, *733*, 139339. [CrossRef]
84. Mozer, A.G.S.; Castro, N.F.; Mansur, K.L.; Ribeiro, R.C.C. Mapping Lioz Limestone in Monuments at Rio de Janeiro, Brazil. *Geoheritage* **2022**, *14*, 30. [CrossRef]
85. Da Conceição Ribeiro, R.C.; Marques Ferreira de Figueiredo, P.; Silva Barbutti, D. Multi-Analytical Investigation of Stains on Dimension Stones in Master Valentim's Fountain, Brazil. *Minerals* **2018**, *8*, 465. [CrossRef]
86. Miller, A.; Dionísio, A.; Macedo, M.F. Primary Bioreceptivity: A Comparative Study of Different Portuguese Lithotypes. *Int. Biodeterior. Biodegrad.* **2006**, *57*, 136–142. [CrossRef]

87. Polck, M.A.R.; Siqueira, L.M.P.; Barreto, A.M. An Urban Geotourism Route in the City of Recife (PE), Based on Fossiliferous Stones. *Anu. Inst. Geociênc.* **2020**, *43*, 425–435. [CrossRef]
88. Silva, Z.C.G. Lioz—A Royal Stone in Portugal and a Monumental Stone in Colonial Brazil. *Geoheritage* **2019**, *11*, 165–175. [CrossRef]
89. Pozo-Antonio, J.S.; López, L.; Dionísio, A.; Rivas, T. A Study on the Suitability of Mechanical Soft-Abrasive Blasting Methods to Extract Graffiti Paints on Ornamental Stones. *Coatings* **2018**, *8*, 335. [CrossRef]
90. Pozo-Antonio, J.S.; Otero, J.; Alonso, P.; Mas i Barberà, X. Nanolime- and Nanosilica-Based Consolidants Applied on Heated Granite and Limestone: Effectiveness and Durability. *Constr. Build. Mater.* **2019**, *201*, 852–870. [CrossRef]
91. Eichert, D.; Vergès-Belmin, V.E.; Kahn, O. Electronic Paramagnetic Resonance as a Tool for Studying the Blackening of Carrara Marble Due to Irradiation by a Q-Switched YAG Laser. *J. Cult. Herit.* **2000**, *1*, S1296–S2074. [CrossRef]
92. Bianco, L. Geochemistry, Mineralogy and Textural Properties of the Lower Globigerina Limestone Used in the Built Heritage. *Minerals* **2021**, *11*, 740. [CrossRef]
93. Bianco, L. Petrological, Mineralogical and Geochemical Characteristics of the Globigerina Limestone Outcropping at Fomm Ir-Ri¯ H¯, Malta. C. R. *Acad. Bulg. Sci.* **2020**, *73*, 985–991. [CrossRef]
94. Briffa, S.M.; Vella, D.A. The Behaviour of As-Applied and Artificially Weathered Silica–Epoxy Consolidants on a Typical Mediterranean Porous Limestone: A Comparison with TEOS. *Herit. Sci.* **2019**, *7*, 70. [CrossRef]
95. Cataldo, A.; De Benedetto, E.; Cannazza, G.; D'Amico, S.; Farrugia, L.; Mifsud, G.; Dimech, E.; Sammut, C.V.; Persico, R.; Leucci, G.; et al. TDR-Based Water Content Estimation on Globigerina Limestone through Permittivity Measurements. In Proceedings of the 3rd IMEKO International Conference on Metrology for Archaeology and Cultural Heritage, MetroArchaeo, Lecce, Italy; 2017; pp. 528–533.
96. Andreotti, S.; Franzoni, E.; Ruiz-Agudo, E.; Scherer, G.W.; Fabbri, P.; Sassoni, E.; Rodriguez-Navarro, C. New Polymer-Based Treatments for the Prevention of Damage by Salt Crystallization in Stone. *Mater. Struct./Materiaux Constr.* **2019**, *52*, 1309. [CrossRef]
97. Cataldo, A.; De Benedetto, E.; Cannazza, G.; D'Amico, S.; Farrugia, L.; Mifsud, G.; Dimech, E.; Sammut, C.V.; Persico, R.; Leucci, G.; et al. Dielectric Permittivity Diagnostics as a Tool for Cultural Heritage Preservation: Application on Degradable Globigerina Limestone. *Measurement* **2018**, *123*, 270–274. [CrossRef]
98. Bianco, L. Petrological Characteristics of Blue Lenticular Patches Occurring in the Lower Globigerina Building Limestone of Malta. *Rev. Rom. Mater.* **2018**, *48*, 115–120.
99. Cassar, J.; Torpiano, A.; Zammit, T.; Micallef, A. Proposal for the Nomination of Lower Globigerina Limestone of the Maltese Islands as a "Global Heritage Stone Resource". *Episodes* **2017**, *40*, 221–231. [CrossRef]
100. Grøntoft, T.; Cassar, J.A. An Assessment of the Contribution of Air Pollution to the Weathering of Limestone Heritage in Malta. *Environ. Earth Sci.* **2020**, *79*, 310. [CrossRef]
101. Dreyfuss, T. Artificially Induced Calcium Oxalate on Limestone in Urban Environments—New Findings. *J. Cult. Herit.* **2020**, *42*, 56–63. [CrossRef]
102. Camilleri, D.H. Malta's Heritage in Stone: From Temple Builders to Eurocodes 6/8. *Masonry Int.* **2019**, *31*, 49–65.
103. Cabello-Briones, C.; Viles, H.A. Evaluating the Effects of Open Shelters on Limestone Deterioration at Archaeological Sites in Different Climatic Locations. *Int. J. Archit. Herit.* **2017**, *11*, 816–828. [CrossRef]
104. Hibo, D. The "Petit Granit" from the Meuse Valley and Soignies Basin Mines: A Sedimentological Examination and Comparison. *Bull. Soc. Belge Geol.* **1993**, *102*, 359–378.
105. Pereira, D.; Tourneur, F.; Bernáldez, L.; Blázquez, A.G. Petit Granit: A Belgian Limestone Used in Heritage, Construction and Sculpture. *Episodes* **2015**, *38*, 85–90. [CrossRef] [PubMed]
106. Groessens, E. The Origin and Evolution of the Expression "Petit Granit". *Bull. Soc. Belge Geol.* **1993**, *102*, 271–276.
107. Netels, V.; Doyen, L. Geoelectrical and Electromagnetic Mapping of a Faulted and Karstified Limestone Deposit under a Thick Tertiary Overburden. *Bull. Soc. Belge Geol.* **1997**, *105*, 15–28.
108. Pereira, D.; Perez-Castro, P. Art Museums: A Good Context for Outreach Activities on Natural Stones and Heritage. *Geoheritage* **2019**, *11*, 125–132. [CrossRef]
109. Dubois, C.; Quinif, Y.; Baele, J.-M.; Dagrain, F.; Deceuster, J.; Kaufmann, O. The Evolution of the Mineralogical and Petrophysical Properties of a Weathered Limestone in Southern Belgium. *Geol. Belg.* **2014**, *17*, 1–8.
110. Coli, M.; Livi, E.; Pandeli, E.; Tanini, C. Pietra Serena Mining in Fiesole. Part II: Geological Situation. *J. Min. Sci.* **2003**, *39*, 56–63. [CrossRef]
111. Clausi, M.; Magnani, L.L.; Occhipinti, R.; Riccardi, M.P.; Zema, M.; Tarantino, S.C. Interaction of Metakaolin-Based Geopolymers with Natural and Artificial Stones and Implications on Their Use in Cultural Heritage. *Int. J. Conserv. Sci.* **2016**, *7*, 871–884.
112. Santo, A.P.; Centauro, I.; Pecchioni, E. Walking Through Florence to Discover the Stone-Built Cultural Heritage. In *International Conference Florence Heri-Tech: The Future of Heritage Science and Technologies*; Springer International Publishing: Cham, Switzerland, 2022.
113. Sorace, S. Long-Term Tensile and Bending Strength of Natural Building Stones. *Mater. Struct./Materiaux Constr.* **1996**, *29*, 426–435. [CrossRef]
114. Coli, M.; Ciuffreda, A.L.; Donigaglia, T.; Tanganelli, M. The Building Stones of Prato's Cathedral and Bell Tower, Italy. *Appl. Sci.* **2022**, *12*, 10132. [CrossRef]

115. Sassoni, E.; Franzoni, E.; Pigino, B.; Scherer, G.W.; Naidu, S. Consolidation of Calcareous and Siliceous Sandstones by Hydroxyapatite: Comparison with a TEOS-Based Consolidant. *J. Cult. Herit.* **2013**, *14*, S103–S108. [CrossRef]
116. Fratini, F.; Cantisani, E.; Pecchioni, E.; Pandeli, E.; Vettori, S. Pietra Alberese: Building Material and Stone for Lime in the Florentine Territory (Tuscany, Italy). *Heritage* **2020**, *3*, 1520–1538. [CrossRef]
117. Bargossi, G.M.; Gamberini, F.; Gasparotto, G.; Grillini, G.C.; Marocchi, M. Dimension and Ornamental Stones from the Tosco-Romagnolo and Bolognese Apennine. *Period. Miner.* **2004**, *73*, 171–195.
118. Kramar, S.; Bedjanič, M.; Mirtič, B.; Mladenović, A.; Rožič, B.; Skaberne, D.; Gutman, M.; Zupančič, N.; Cooper, B. Podpeč Limestone: A Heritage Stone from Slovenia. *Geoheritage* **2015**, *7*, 33–41. [CrossRef]
119. Rožič, B.; Gale, L.; Brajković, R.; Popit, T.; Žvab Rožič, P. Lower Jurassic Succession at the Site of Potential Roman Quarry Staje near Ig (Central Slovenia). *Geologija* **2018**, *61*, 49–71. [CrossRef]
120. Gale, L. Lower Jurassic Foraminiferal Biostratigraphy of Podpeč Limestone (External Dinarides, Slovenia). *Geologia* **2014**, *57*, 119–146. [CrossRef]
121. Marinelli, A.; Stewart, M.R. Comparative Experimental Study of the Mechanical and Fracture Properties of Portland Limestone and Corsehill Sandstone. *Frat. Integrità Strutt.* **2019**, *13*, 438–450. [CrossRef]
122. Hughes, T.; Lott, G.K.; Poultney, M.J.; Cooper, B.J. Portland Stone: A Nomination for "Global Heritage Stone Resource" from the United Kingdom. *Episodes* **2013**, *36*, 221–226. [CrossRef]
123. Falcon-Lang, H. The Isle of Portland, Dorset, England. *Geol. Today* **2011**, *27*, 34–38. [CrossRef]
124. Butler-Warke, A.; Warke, M.R. Foundation Stone of Empire: The Role of Portland Stone in 'Heritage', Commemoration, and Identity. *Trans. Inst. Br. Geogr.* **2021**, *46*, 958–972. [CrossRef]
125. Eklund, J.A.; Zhang, H.; Viles, H.A.; Curteis, T. Using Handheld Moisture Meters on Limestone: Factors Affecting Performance and Guidelines for Best Practice. *Int. J. Archit. Herit.* **2013**, *7*, 207–224. [CrossRef]
126. Dubelaar, C.W.; Engering, S.; Van Hees, R.P.J.; Koch, R.; Lorenz, H.-G. Lithofacies and Petrophysical Properties of Portland Base Bed and Portland Whit Bed Limestone as Related to Durability. *Heron* **2003**, *48*, 221–229.
127. Kirkitsos, P.; Sikiotis, D. Deterioration of Pentelic Marble, Portland Limestone, and Baumberger Sandstone in Laboratory Exposures to Gaseous Nitric Acid. *Atmos. Environ.* **1995**, *29*, 77–86. [CrossRef]
128. Kirkitsos, P.; Sikiotis, D. Deterioration of Pentelic Marble, Portland Limestone, and Baumberger Sandstone in Laboratory Exposures to NO_2: A Comparison with Exposures to Gaseous HNO_3. *Atmos. Environ.* **1996**, *30*, 941–950. [CrossRef]
129. Allison, R.J. A Non-Destructive Method of Determining Rock Strength. *Earth Surf. Process. Landf.* **1988**, *13*, 729–736. [CrossRef]
130. Searle, D.E.; Mitchell, D.J. The Effect of Coal and Diesel Particulates on the Weathering Loss of Portland Limestone in an Urban Environment. *Sci. Total Environ.* **2006**, *370*, 207–223. [CrossRef]
131. Viles, H.A. The Early Stages of Building Stone Decay in an Urban Environment. *Atmos. Environ. Part A Gen. Top.* **1990**, *24*, 229–232. [CrossRef]
132. Cabello Briones, C.; Viles, H. An Assessment of the Role of an Open Shelter in Reducing Soiling and Microbial Growth on the Archaeological Site of the Bishop's Palace, Witney, England. *Conserv. Manag. Archaeol. Sites* **2018**, *20*, 2–17. [CrossRef]
133. Allison, R.J.; Kimber, O.G. Modelling Failure Mechanisms to Explain Rock Slope Change along the Isle of Purbeck Coast, UK. *Earth Surf. Process. Landf.* **1998**, *23*, 731–750. [CrossRef]
134. Bijeljic, B.; Mostaghimi, P.; Blunt, M.J. Signature of Non-Fickian Solute Transport in Complex Heterogeneous Porous Media. *Phys. Rev. Lett.* **2011**, *107*, 204502. [CrossRef]
135. Cooper, T.P.; O'Brien, P.F.; Jeffrey, D.W. Rates of Deterioration of Portland Limestone in an Urban Environment. *Stud. Conserv.* **1992**, *37*, 228–238. [CrossRef]
136. Alyafei, N.; Blunt, M.J. The Effect of Wettability on Capillary Trapping in Carbonates. *Adv. Water Resour.* **2016**, *90*, 36–50. [CrossRef]
137. Perry, S.H.; Duffy, A.P. The Short-Term Effects of Mortar Joints on Salt Movement in Stone. *Atmos. Environ.* **1997**, *31*, 1297–1305. [CrossRef]
138. Hutchinson, A.J.; Johnson, J.B.; Thompson, G.E.; Wood, G.C.; Sage, P.W.; Cooke, M.J. The Role of Fly-Ash Particulate Material and Oxide Catalysts in Stone Degradation. *Atmos. Environ. Part A Gen. Top.* **1992**, *26*, 2795–2803. [CrossRef]
139. Roots, O. ICP Materials: Long-Term Studies at the Lahemaa Monitoring Station, Estonia. *Proc. Est. Acad. Sci.* **2015**, *64*, 43–52. [CrossRef]
140. Carmona-Quiroga, P.M.; Martínez-Ramírez, S.; Viles, H.A. Efficiency and Durability of a Self-Cleaning Coating on Concrete and Stones under Both Natural and Artificial Ageing Trials. *Appl. Surf. Sci.* **2018**, *433*, 312–320. [CrossRef]
141. Johnson, J.B.; Montgomery, M.; Thompson, G.E.; Wood, G.C.; Sage, P.W.; Cooke, M.J. The Influence of Combustion-Derived Pollutants on Limestone Deterioration: 2. The Wet Deposition of Pollutant Species. *Corros. Sci.* **1996**, *38*, 267–278. [CrossRef]
142. Wilhelm, K.; Viles, H.; Burke, O.; Mayaud, J. Surface Hardness as a Proxy for Weathering Behaviour of Limestone Heritage: A Case Study on Dated Headstones on the Isle of Portland, UK. Environ. *Earth Sci.* **2016**, *75*, 931. [CrossRef]
143. Hennah, S.J.; Astin, T.R.; Sothcott, J.; McCann, C. Relationships between Rock Heterogeneity, Attenuation, and Velocity Dispersion at Ultrasonic and Sonic Frequencies. In Proceedings of the SEG International Exposition and Annual Meeting, Dallas, DX, USA, 26–31 October 2003.

144. Cabello Briones, C. Effects of Open Shelters on Limestone Decay: The Case Study of the Bishop's Palace Archaeological Site in Witney (England). In *Science, Technology and Cultural Heritage—Proceedings of the 2nd International Congress on Science and Technology for the Conservation of Cultural Heritage*; CRC Press: Boca Raton, FL, USA, 2014; pp. 41–46.
145. Grossi, C.M.; Esbert, R.M.; Díaz-Pache, F. Decay and Durability of Building Stones in Urban Environments | Degradación y Durabilidad de Materiales Rocosos de Edificación en Ambientes Urbanos. *Mater. Construcc.* **1998**, *48*, 5–25. [CrossRef]
146. Daengprathum, N.; Onchang, R.; Nakhapakorn, K.; Robert, O.; Tipayarom, A.; Sturm, P.J. Estimation of Effects of Air Pollution on the Corrosion of Historical Buildings in Bangkok. *Environ. Nat. Resour. J.* **2022**, *20*, 505–514. [CrossRef]
147. Inkpen, R. Errors in Measuring the Percentage Dry Weight Change of Stone Tablets. *Earth Surf. Process. Landf.* **1995**, *20*, 783–793. [CrossRef]
148. Inkpen, R.; Viles, H.; Moses, C.; Baily, B. Modelling the Impact of Changing Atmospheric Pollution Levels on Limestone Erosion Rates in Central London, 1980–2010. *Atmos. Environ.* **2012**, *61*, 476–481. [CrossRef]
149. Roots, O.O.; Roose, A.; Eerme, K. Remote Sensing of Climate Change, Long-Term Monitoring of Air Pollution and Stone Material Corrosion in Estonia. *Int. J. Remote Sens.* **2011**, *32*, 9691–9705. [CrossRef]
150. García-Talegón, J.; Vicente, M.A.; Vicente-Tavera, S.; Molina-Ballesteros, E. Assessment of Chromatic Changes Due to Artificial Ageing and/or Conservation Treatments of Sandstones. *Color Res. Appl.* **1998**, *23*, 46–51. [CrossRef]
151. Ordaz, J.; Alonso, F.J. Características Del Sistema Poroso de La Arenisca de Villamayor (Salamanca). *Trab. Geol. Univ. Oviedo* **1983**, *13*, 83–92.
152. Martin Patino, M.T.; Madruga, F.; Saavedra, J. The Internal Structure of the Villamayor Sandstone as It Affects Its Use as a Construction Material. *Appl. Clay Sci.* **1993**, *8*, 61–77. [CrossRef]
153. Marcos Laso, B. Biodiversity and Lichenic Growth on Some Monuments in Salamanca City | Biodiversidad y Colonización Liquénica de Algunos Monumentos en La Ciudad de Salamanca (España). *Bot. Complut.* **2001**, 93–102.
154. Vielba Cuerpo, C.; Hernández Olivares, F. Tests to Characterize the Behaviour of Natural Stone in Contact with Water | Ensayos de Caracterización Del Comportamiento Frente Al Agua de La Piedra Natural. *Mater. Construcc.* **2002**, *52*, 43–54. [CrossRef]
155. Schleicher, N.; Hernández, C.R. Source Identification of Sulphate Forming Salts on Sandstones from Monuments in Salamanca, Spain—A Stable Isotope Approach. *Environ. Sci. Pollut. Res.* **2010**, *17*, 770–778. [CrossRef]
156. Grondona, I.; Monte, E.; Rives, V.; Vicente, M.A. Lichenized Association between Septonema Tormes sp. Nov., a Coccoid Cyanobacterium, and a Green Alga with an Unforeseen Biopreservation Effect of Villamayor Sandstone at "Casa Lis" of Salamanca, Spain. *Mycol. Res.* **1997**, *101*, 1489–1495. [CrossRef]
157. Arco, M.D.; Carballo, A.M.; Holgado, M.J.; Martín, C.; Rives, V. A Microporosity Study of Villamayor Sandstone (Salamanca, Spain). *Appl. Clay Sci.* **1987**, *2*, 375–383. [CrossRef]
158. Vicente, M.A.; Brufau, A. Weathering of the Villamayor Arkosic Sandstone Used in Buildings, under a Continental Semi-Arid Climate. *Appl. Clay Sci.* **1986**, *1*, 265–272. [CrossRef]
159. Saavedra, J.; Madruga, F.; Martin Patino, M.T. Classification of Villamayor Sandstone (Salamanca) from Technological Characteristics and Internal Structure | Clasificación de la Arenisca de Villamayor (Salamanca) por Sus Características Tecnológicas y Estructura Interna. *Bol. Geol. y Min.* **1993**, *104*, 655–663.
160. Dumont, T. Échaillon Stone from France: A Global Heritage Stone Resource Proposal. *Geol. Soc. Lond. Spec. Publ.* **2020**, *486*, 115–128. [CrossRef]
161. Kullberg, J.C.; Coelho, C.; Prego, A. Geological and Cultural Routes of the Arrábida Breccia: A Contribution to the Nomination of Arrábida for UNESCO's Mixed World Heritage List. In Proceedings of the STRATI 2013: First International Congress on Stratigraphy At the Cutting Edge of Stratigraphy, Lisbon, Portugal, 1–7 July 2013; Springer International Publishing: Berlin/Heidelberg, Germany, 2014.
162. Kullberg, J.C.; Prego, A. The Historical Importance and Architectonic Relevance of the "Extinct" Arrábida Breccia. *Geoheritage* **2019**, *11*, 87–111. [CrossRef]
163. Brisbin, W.C.; Young, G.; Young, J. Geology of the Parliament Buildings 5: Geology of the Manitoba Legislative Building. *Geosci. Can.* **2005**, *32*, 177–193.
164. Kaur, G.; Kaur, P.; Ahuja, A.; Singh, A.; Saini, J.; Agarwal, P.; Bhargava, O.N.; Pandit, M.; Goswami, R.G.; Acharya, K.; et al. Jaisalmer Golden Limestone: A Heritage Stone Resource from the Desert of Western India. *Geoheritage* **2020**, *12*, 53. [CrossRef]
165. Sen, P.; Ghosh, J.; Prabhulingaiah, G.; Sekhar, D.M.R. Internal Morphology of SMS Grade Limestone Samples. *Trans. Inst. Min. Metall. Sect. C Miner. Process. Extr. Metall.* **2006**, *115*, 127–131. [CrossRef]
166. Freire-Lista, D.M.; Fort, R. Exfoliation Microcracks in Building Granite. Implications for Anisotropy. *Eng. Geol.* **2017**, *220*, 85–93. [CrossRef]
167. Freire-Lista, D.M.; Fort, R.; Varas-Muriel, M.J. Thermal Stress-Induced Microcracking in Building Granite. *Eng. Geol.* **2016**, *206*, 83–93. [CrossRef]
168. Freire-Lista, D.M.; Fort, R. Heritage Stone 4. The Piedra Berroqueña Region: Candidacy for Global Heritage Stone Province Status. *Geosci. Can.* **2016**, *43*, 43–52. [CrossRef]
169. Freire-Lista, D.M.; Fort, R.; Varas-Muriel, M.J. Alpedrete Granite (Spain): A Nomination for the "Global Heritage Stone Resource" Designation. *Episodes* **2015**, *38*, 106–113. [CrossRef] [PubMed]

170. Sanz, M.; Oujja, M.; Ascaso, C.; Pérez-Ortega, S.; Souza-Egipsy, V.; Fort, R.; de los Ríos, A.; Wierzchos, J.; Cañamares, M.V.; Castillejo, M. Influence of Wavelength on the Laser Removal of Lichens Colonizing Heritage Stone. *Appl. Surf. Sci.* **2017**, *399*, 758–768. [CrossRef]
171. Fort, R.; de Buergo, M.A.; Perez-Monserrat, E.M.; Gomez-Heras, M.; Jose Varas-Muriel, M.; Freire, D.M. Evolution in the Use of Natural Building Stone in Madrid, Spain. *Q. J. Eng. Geol. Hydrogeol.* **2013**, *46*, 421–429. [CrossRef]
172. Heldal, T.; Meyer, G.B.; Dahl, R. Global Stone Heritage: Larvikite, Norway. *Geol. Soc. Lond. Spec. Publ.* **2015**, *407*, 21–34. [CrossRef]
173. Andersen, T. Crystallization History of a Permian Composite Monzonite-Alkali Syenite Pluton in the Sande Cauldron, Oslo Rift, Southern Norway. *Lithos* **1984**, *17*, 153–170. [CrossRef]
174. Ramberg, I.B. Braid Perthite in Nepheline Syenite Pegmatite, Langesundsfjorden, Oslo Region (Norway). *Lithos* **1972**, *5*, 281–306. [CrossRef]
175. Andersen, T.; Erambert, M.; Larsen, A.O.; Selbekk, R.S. Petrology of Nepheline Syenite Pegmatites in the Oslo Rift, Norway: Zirconium Silicate Mineral Assemblages as Indicators of Alkalinity and Volatile Fugacity in Mildly Agpaitic Magma. *J. Petrol.* **2010**, *51*, 2303–2325. [CrossRef]
176. Careddu, N.; Grillo, S. Rosa Beta Granite (Sardinian Pink Granite): A Heritage Stone of International Significance from Italy. *Geol. Soc. Lond. Spec. Publ.* **2015**, *407*, 155–172. [CrossRef]
177. Del Lama, E.A.; Costa, A.G. Global Heritage Stones in Brazil. *Geoheritage* **2022**, *14*, 25. [CrossRef]
178. Cuccuru, S.; Puccini, A. Petrographic, Physical–Mechanical and Radiological Characterisation of the Rosa Beta Granite (Corsica-Sardinia Batholith). In *Engineering Geology for Society and Territory-Volume 5: Urban Geology, Sustainable Planning and Landscape Exploitation*; Springer International Publishing: Berlin/Heidelberg, Germany, 2015.
179. Cuccuru, S.; Cherchi, G.P. The Bassacutena District: Quarrying Aspects and Physicomechanical Characterization of "Rosa Beta" Granite | Il Polo Estrattivo di Bassacutena: Aspetti Giacimentologici e Caratterizzazione Fisico-Meccanica del Granito "Rosa Beta". *Rend. Online Soc. Geol. Ital.* **2008**, *3*, 282–283.
180. Puccini, A.; Xhixha, G.; Cuccuru, S.; Oggiano, G.; Xhixha, M.K.; Mantovani, F.; Alvarez, C.R.; Casini, L. Radiological Characterization of Granitoid Outcrops and Dimension Stones of the Variscan Corsica-Sardinia Batholith. *Environ. Earth Sci.* **2014**, *71*, 393–405. [CrossRef]
181. Siedel, H.; Rust, M.; Goth, K.; Krüger, A.; Heidenfelder, W. Rochlitz Porphyry Tuff ("Rochlitzer Porphyrtuff"): A Candidate for "Global Heritage Stone Resource" Designation from Germany. *Episodes* **2019**, *42*, 81–91. [CrossRef]
182. Takahashi, Y. Some Topics in English Newsmagazines in 2019, with Special Reference to Mineral Resources, Building Stones, and a Revised Classification of Igneous Rocks. *Jpn. Mag. Mineral. Petrol. Sci.* **2020**, *48*, 133–141. [CrossRef]
183. Vedanti, N.; Malkoti, A.; Pandey, O.P.; Shrivastava, J.P. Ultrasonic P- and S-Wave Attenuation and Petrophysical Properties of Deccan Flood Basalts, India, as Revealed by Borehole Studies. *Pure Appl. Geophys.* **2018**, *175*, 2905–2930. [CrossRef]
184. Prasanna Lakshmi, K.J.; Senthil Kumar, P.; Vijayakumar, K.; Ravinder, S.; Seshunarayana, T.; Sen, M.K. Petrophysical Properties of the Deccan Basalts Exposed in the Western Ghats Escarpment Around Mahabaleshwar and Koyna, India. *J. Asian Earth Sci.* **2014**, *84*, 176–187. [CrossRef]
185. Das, A.; Krishnaswami, S. Barium in Deccan Basalt Rivers: Its Abundance, Relative Mobility and Flux. *Aquat. Geochem.* **2006**, *12*, 221–238. [CrossRef]
186. Sukheswala, R.N.; Poldervaart, A. Deccan Basalts of the Bombay Area, India. *Bull. Geol. Soc. Am.* **1958**, *69*, 1473–1494. [CrossRef]
187. Kulkarni, H.; Deolankar, S.B.; Lalwani, A.; Joseph, B.; Pawar, S. Hydrogeological Framework of the Deccan Basalt Groundwater Systems, West-Central India. *Hydrogeol. J.* **2000**, *8*, 368–378. [CrossRef]
188. Salil, M.S.; Shrivastava, J.P.; Pattanayak, S.K. Similarities in the Mineralogical and Geochemical Attributes of Detrital Clays of Maastrichtian Lameta Beds and Weathered Deccan Basalt, Central India. *Chem. Geol.* **1997**, *136*, 25–32. [CrossRef]
189. Chandrasekharam, D.; Vaselli, O.; Sheth, H.C.; Keshav, S. Petrogenetic Significance of Ferro-Enstatite Orthopyroxene in Basaltic Dikes from the Tapi Rift, Deccan Flood Basalt Province, India. *Earth Planet. Sci. Lett.* **2000**, *179*, 469–476. [CrossRef]
190. Kulkarni, Y.R.; Sangode, S.J.; Meshram, D.C.; Patil, S.K.; Dutt, Y. Mineral Magnetic Characterization of the Godavari River Sediments: Implications to Deccan Basalt Weathering. *J. Geol. Soc. India* **2014**, *83*, 376–384. [CrossRef]
191. Malik, A.; Chakraborty, T.; Rao, K.S.; Kumar, D.; Chandel, P.; Sharma, P. Dynamic Response of Deccan Trap Basalt under Hopkinson Bar Test. *Procedia Eng.* **2017**, *173*, 647–654. [CrossRef]
192. Kumar, A.; Shrivastava, J.P. Carbon Capture Induced Changes in Deccan Basalt: A Mass-Balance Approach. Greenh. *Gases Sci. Technol.* **2019**, *9*, 1158–1180. [CrossRef]
193. Bhattacharya, S.K.; Ma, G.S.-K.; Matsuhisa, Y. Oxygen Isotope Evidence for Crustal Contamination in Deccan Basalts. *Chem. Erde* **2013**, *73*, 105–112. [CrossRef]
194. Sano, T.; Fujii, T.; Deshmukh, S.S.; Fukuoka, T.; Aramaki, S. Differentiation Processes of Deccan Trap Basalts: Contribution from Geochemistry and Experimental Petrology. *J. Petrol.* **2001**, *42*, 2175–2195. [CrossRef]
195. Kumar, A.; Shrivastava, J.P. Thermodynamic Modelling and Experimental Validation of CO_2 Mineral Sequestration in Mandla Basalt of the Eastern Deccan Volcanic Province, India. *J. Geol. Soc. India* **2019**, *93*, 269–277. [CrossRef]
196. Santosh, M.; Hari, K.R.; Chatterjee, A.C. Fluid Inclusions in Deccan Basalt. In Proceedings of the Fluid Inclusions (India). *Fluid inclusions. Memoir-Geological Society of India.* **1988**, 11. Available online: https://www.geosocindia.org/GSI/product-category/memoirs (accessed on 20 September 2024).

197. Choubey, V.D. Long-Distance Correlation of Deccan Basalt Flows, Central India. *Bull. Geol. Soc. Am.* **1973**, *84*, 2785–2790. [CrossRef]
198. Das, A.; Krishnaswami, S. Elemental Geochemistry of River Sediments from the Deccan Traps, India: Implications to Sources of Elements and Their Mobility during Basalt-Water Interaction. *Chem. Geol.* **2007**, *242*, 232–254. [CrossRef]
199. Keays, R.R.; Lightfoot, P.C. Crustal Sulfur Is Required to Form Magmatic Ni-Cu Sulfide Deposits: Evidence from Chalcophile Element Signatures of Siberian and Deccan Trap Basalts. *Miner. Depos.* **2010**, *45*, 241–257. [CrossRef]
200. Sayyed, M.R.G.; Hundekari, S.M. Preliminary Comparison of Ancient Bole Beds and Modern Soils Developed Upon the Deccan Volcanic Basalts Around Pune (India): Potential for Palaeoenvironmental Reconstruction. *Quat. Int.* **2006**, *156–157*, 189–199. [CrossRef]
201. Mishra, S.; Misra, S.; Vyas, D.; Nikalje, D.; Warhade, A.; Roy, S. A 1251 m-Thick Deccan Flood Basalt Pile Recovered by Scientific Drilling in the Koyna Region, Western India. *J. Geol. Soc. India* **2017**, *90*, 788–794. [CrossRef]
202. Chaudhary, M.; Sharma, R.; Kapoor, D.; Sadiq, M. Formation Evaluation of Deccan (Basalt) Trap Basement of Kutch Offshore Basin, Gulf of Kutch, India. *J. Pet. Sci. Eng.* **2022**, *217*, 110854. [CrossRef]
203. Liu, D.; Agarwal, R.; Liu, F.; Yang, S.; Li, Y. Modeling and Assessment of CO_2 Geological Storage in the Eastern Deccan Basalt of India. *Environ. Sci. Pollut. Res.* **2022**, *29*, 85465–85481. [CrossRef] [PubMed]
204. Deolankar, S.B. The Deccan Basalts of Maharashtra, India—Their Potential as Aquifers. *Ground Water* **1980**, *18*, 188–195. [CrossRef]
205. Coli, M.; Criscuolo, A. The Carrara Marble: Geology, Geomechanics and Quarrying. *IOP Conf. Ser. Earth Environ. Sci.* **2021**, *833*, 203. [CrossRef]
206. Borla, O.; Lacidogna, G.; Carpinteri, A. X-ray Photoelectron Spectroscopy on Fracture Surfaces of Carrara Marble Specimens Crushed in Compression. In Proceedings of the 19th European Conference on Fracture: Fracture Mechanics for Durability, Reliability and Safety, ECF 2012, Kazan, Russia, 26–31 August 2012.
207. Carpinteri, A.; Lacidogna, G.; Borla, O. Alpha Particle Emissions from Carrara Marble Specimens Crushed in Compression and X-ray Photoelectron Spectroscopy of Correlated Nuclear Transmutations. In *Acoustic, Electromagnetic, Neutron Emissions from Fracture and Earthquakes*; Carpinteri, A., Lacidogna, G., Manuello, A., Eds.; Springer: Cham, Switzerland, 2015. [CrossRef]
208. Cheng, Y.; Wong, L.N.Y.; Maruvanchery, V. Transgranular Crack Nucleation in Carrara Marble of Brittle Failure. *Rock Mech. Rock Eng.* **2016**, *49*, 3069–3082. [CrossRef]
209. Bruijn, R.H.C.; Kunze, K.; Mainprice, D.; Burlini, L. Mechanical and Microstructural Development of Carrara Marble with Pre-Existing Strain Variation. *Tectonophysics* **2011**, *503*, 75–91. [CrossRef]
210. Kandula, N.; Cordonnier, B.; Boller, E.; Weiss, J.; Dysthe, D.K.; Renard, F. Dynamics of Microscale Precursors Durig Brittle Compressive Failure in Carrara Marble. *J. Geophys. Res. Solid Earth* **2019**, *124*, 6121–6139. [CrossRef]
211. Ree, J.-H.; Ando, J.-I.; Han, R.; Shimamoto, T. Coseismic Microstructures of Experimental Fault Zones in Carrara Marble. *J. Struct. Geol.* **2014**, *66*, 75–83. [CrossRef]
212. Vaselli, L.; Cortecci, G.; Tonarini, S.; Ottria, G.; Mussi, M. Conditions for Veining and Origin of Mineralizing Fluids in the Alpi Apuane (NW Tuscany, Italy): Evidence from Structural and Geochemical Analyses on Calcite Veins Hosted in Carrara Marbles. *J. Struct. Geol.* **2012**, *44*, 76–92. [CrossRef]
213. Giresse, P.; Bromblet, P.; de Barrau, C. Carrara Marble in the 11th Century Romanesque Works of Roussillon (Lintel of Saint-Genis-des-Fontaines, Lintel and Altar Table of Saint-André-de-Sorède, Eastern Pyrénées). Textural and Isotopic Analysis | Le Marbre de Carrare dans les Œuvres R. *ArcheoSciences* **2020**, *44*, 71–79. [CrossRef]
214. Cheng, Y.; Wong, L.N.Y.; Zou, C. Experimental Study on the Formation of Faults from En-Echelon Fractures in Carrara Marble. *Eng. Geol.* **2015**, *195*, 312–326. [CrossRef]
215. Luzin, V.; Dmitry, N.; Siegesmund, S. Temperature Induced Internal Stress in Carrara Marble. *Mater. Sci. Forum* **2014**, *777*, 148–154. [CrossRef]
216. Molli, G.; Cortecci, G.; Vaselli, L.; Ottria, G. Fault Zone Structure and Fluid-Rock Interaction of a High Angle Normal Fault in the Carrara Marble (NW Tuscany, Italy) | Caratteri Strutturali e Interazione Fluido-Roccia in Una Faglia Normale Ad Alto Angolo Nei Marmi di Carrara. *Rend. Online Soc. Geol. Ital.* **2009**, *5*, 142–143.
217. Aidun, J.B.; Gupta, Y.M. Shear Wave Measurements for Improved Characterization of Shock-Induced Phase Transformations in Carrara Marble. *Geophys. Res. Lett.* **1989**, *16*, 191–194. [CrossRef]
218. Tal, Y.; Evans, B.; Mok, U. Direct Observations of Damage During Unconfined Brittle Failure of Carrara Marble. *J. Geophys. Res. Solid Earth* **2016**, *121*, 1584–1609. [CrossRef]
219. Nardini, L.; Rybacki, E.; Döhmann, M.J.E.A.; Morales, L.F.G.; Brune, S.; Dresen, G. High-Temperature Shear Zone Formation in Carrara Marble: The Effect of Loading Conditions. *Tectonophysics* **2018**, *749*, 120–139. [CrossRef]
220. Doan, M.-L.; Billi, A. High Strain Rate Damage of Carrara Marble. *Geophys. Res. Lett.* **2011**, *38*, L19302. [CrossRef]
221. Bruni, S.; Cariati, F.; Bianchi, C.L.; Zanardini, E.; Sorlini, C. Spectroscopic Investigation of Red Stains Affecting the Carrara Marble Façade of the Certosa of Pavia. *Archaeometry* **1995**, *37*, 249–255. [CrossRef]
222. Schubnel, A.; Walker, E.; Thompson, B.D.; Fortin, J.; Guéguen, Y.; Young, R.P. Transient Creep, Aseismic Damage and Slow Failure in Carrara Marble Deformed Across the Brittle-Ductile Transition. *Geophys. Res. Lett.* **2006**, *33*, L17301. [CrossRef]
223. Covey-Crump, S.J. The Application of Hart's State Variable Description of Inelastic Deformation to Carrara Marble at $T < 450$ °C. *J. Geophys. Res.* **1994**, *99*, 19793–19808. [CrossRef]

224. Bonazza, A.; Sabbioni, C.; Messina, P.; Guaraldi, C.; De Nuntiis, P. Climate Change Impact: Mapping Thermal Stress on Carrara Marble in Europe. *Sci. Total Environ.* **2009**, *407*, 4506–4512. [CrossRef]
225. Wong, L.N.Y.; Xiong, Q. A Method for Multiscale Interpretation of Fracture Processes in Carrara Marble Specimen Containing a Single Flaw under Uniaxial Compression. *J. Geophys. Res. Solid Earth* **2018**, *123*, 6459–6490. [CrossRef]
226. Covey-Crump, S.J. The High Temperature Static Recovery and Recrystallization Behaviour of Cold-Worked Carrara Marble. *J. Struct. Geol.* **1997**, *19*, 225–241. [CrossRef]
227. Zou, C.; Cheng, Y.; Li, J. Strain Rate and Size Effects on the Brittleness Indexes of Carrara Marble. *Int. J. Rock Mech. Min. Sci.* **2021**, *146*, 104860. [CrossRef]
228. Wielgosz-Rondolino, D.; Antonelli, F.; Bojanowski, M.J.; Gładki, M.; Göncüoğlu, M.C.; Lazzarini, L. Improved Methodology for Identification of Göktepe White Marble and the Understanding of Its Use: A Comparison with Carrara Marble. *J. Archaeol. Sci.* **2020**, *113*, 105059. [CrossRef]
229. Zhang, Y.-H.; Zhou, Y.-S.; Yao, W.-M.; He, C.-R.; Dang, J.-X. Experimental Study on the Effect of Water on the Strength and Deformation Mechanism of Carrara Marble at High Temperature. *Dizhen Dizhi* **2017**, *39*, 54–66. [CrossRef]
230. Affuso, A.M.G.; Garzonio, C.A. Analysis of the Correlation Between Bending Phenomena and Physical-Mechanical and Petrographic Parameters of Carrara Marble Slabs. In Proceedings of the 10th ISRM Congress, Sandton, South Africa, 8–12 September 2003; pp. 1–6.
231. Coli, M.; Livi, E.; Baldi, M.; Coli, N. Studies for Rockburst Prediction in the Carrara Marble—II: Geostructural/Geomechanical Rivisitation and 2D FEM Modeling of a Large Underground Quarry. In Proceedings of the ISRM International Symposium—EUROCK 2012, Stockholm, Sweden, 28–30 May 2012.
232. Scheffzük, C.; Siegesmund, S.; Hoffmann, A.; Nikolayev, D.I. Texture and Residual Strain in Carrara Marbles Measured by TOF Neutron Diffraction. In Proceedings of the International Conference on Heritage, Weathering and Conservation, HWC, Madrid, Spain, 21–24 June 2006; pp. 547–553.
233. Song, J.; Zhou, Y.; Dang, J.; Yao, W. An Experimental Study on Pressure Solution Creep and Micro-Crack Healing of Carrara Marble. *Zhongguo Shiyou Daxue Xuebao (Ziran Kexue Ban)/J. China Univ. Pet. (Ed. Nat. Sci.)* **2017**, *41*, 52–60. [CrossRef]
234. Royer-Carfagni, G.; Salvatore, W. Localized Fatigue Damage of Carrara Marble. In Proceedings of the International Conference Damage Fracture Mechanics, Torino, Italy, 19 June 1998; pp. 65–76.
235. Chaye D'albissin, M.; Yokoyama, Y.; Massot, J.-C. Effect of Experimental Deformation on ESR Spectrum of Carrara Marble: Application to Tectonized Marbles | Effet d'une Déformation Expérimentale sur le Spectre de Résonance Paramagnétique Électronique (RPE) du Marbre de Carrare et Application aux Marbres T. *Comptes Rendus Acad. Sci. Sér. II Sci. Terre Planètes* **1994**, *318*, 405–410.
236. Zhang, G.; Song, M.; Li, J.; Shao, T.; Ji, S.; Wang, H. Microstructural Characteristics and Deformation Mechanism of Carrara Marble in Axial Compression Experiments. *Geotecton. Metallog.* **2018**, *42*, 786–797. [CrossRef]
237. Miller, J.T.; Einstein, H.H. Crack Coalescence Tests on Granite. In Proceedings of the 42nd U.S. Rock Mechanics—2nd U.S.-Canada Rock Mechanics Symposium, San Francisco, CA, USA, 29 June–2 July 2008.
238. Zou, C.; Wong, L.N.Y. Size and Geometry Effects on the Mechanical Properties of Carrara Marble Under Dynamic Loadings. *Rock Mech. Rock Eng.* **2016**, *49*, 1695–1708. [CrossRef]
239. Lissa, S.; Ruf, M.; Steeb, H.; Quintal, B. Effects of Crack Roughness on Attenuation Caused by Squirt Flow in Carrara Marble. In *SEG Technical Program Expanded Abstracts*; Society of Exploration Geophisicists: Houston, TX, USA, 2020; pp. 2439–2443.
240. De Raadt, W.S.; Burlini, L.; Kunze, K.; Spiers, C.J. Effect of Pre-Existing Crystallographic Preferred Orientation on the Rheology of Carrara Marble. *J. Struct. Geol.* **2014**, *68*, 44–57. [CrossRef]
241. Soutelo, S.G.; Garcia-M, A.G.; Bordas, H.G.; Savin, M.-C. Epigraphic and Archaeometric Study of the Roman Funerary Plaque of Cela (Mos, Pontevedra): New Approach to Its Interpretation | Estudio Epigráfico y Arqueométrico de la Placa Funeraria de Cela (Mos, Pontevedra): Nuevas Propuestas de Interpretación. *Estud. Quat.* **2019**, *20*, 71–84. [CrossRef]
242. Lopes, L.; Martins, R. Global Heritage Stone: Estremoz Marbles, Portugal. *Geol. Soc. Lond. Spec. Publ.* **2015**, *407*, 57–74. [CrossRef]
243. Lapuente Mercadal, P.; Savin, M.-C.; González Soutelo, S.; Gutiérrez Garcia-M, A.; Chapoulie, R.; Laborde Marqueze, A.; Pérez García, P.P. Marble Pieces in the Romanesque Portal of Glory of the Santiago de Compostela Cathedral. New Data through a Multi-Analytical Approach. *Int. J. Archit. Herit.* **2020**, *14*, 1239–1251. [CrossRef]
244. Menningen, J.; Siegesmund, S.; Lopes, L.; Martins, R.; Sousa, L. The Estremoz Marbles: An Updated Summary on the Geological, Mineralogical and Rock Physical Characteristics. *Environ. Earth Sci.* **2018**, *77*, 191. [CrossRef]
245. Moreira, N.; Pedro, J.; Santos, J.F.; Araújo, A.; Dias, R.; Ribeiro, S.; Romão, J.; Mirão, J. 87Sr/86Sr Applied to Age Discrimination of the Palaeozoic Carbonates of the Ossa-Morena Zone (SW Iberia Variscides). *Int. J. Earth Sci.* **2019**, *108*, 963–987. [CrossRef]
246. Moreira, N.; Pedro, J.; Lopes, L.; Carneiro, A.; Mourinha, N.; Araújo, A.; Santos, J.F. The Ossa-Morena Marbles Used in the Classical Antiquity: Review of Their Petrographic Features and Isotopic Data | Mármores da Zona de Ossa-Morena Utilizados na Antiguidade Clássica: Revisão das Características Petrográficas e Isotópicas. *Comun. Geol.* **2020**, *107*, 81–89.
247. Ochoa, C.F.; Galán, M.B.; García-Entero, V.; Álvarez, S.V. Cover of the Sarcophagus with the Cycle of Jonah Found in Carranque (Toledo) | Cubierta de Sarcófago con el Ciclo de Jonás Hallada en Carranque (Toledo). *Arch. Español Arqueol.* **2011**, *84*, 231–242. [CrossRef]

248. Origlia, F.; Gliozzo, E.; Meccheri, M.; Spangenberg, J.E.; Memmi, I.T.; Papi, E. Mineralogical, Petrographic and Geochemical Characterisation of White and Coloured Iberian Marbles in the Context of the Provenancing of Some Artifacts from Thamusida (Kenitra, Morocco). *Eur. J. Miner.* **2011**, *23*, 857–869. [CrossRef]
249. Siegesmund, S.; Ruedrich, J.; Koch, A. Marble Bowing: Comparative Studies of Three Different Public Building Facades. *Environ. Geol.* **2008**, *56*, 473–494. [CrossRef]
250. Taelman, D.; Elburg, M.; Smet, I.; De Paepe, P.; Vanhaecke, F.; Vermeulen, F. White, Veined Marble from Roman Ammaia (Portugal): Provenance and Use. *Archaeometry* **2013**, *55*, 370–390. [CrossRef]
251. Taelman, D.; Elburg, M.; Smet, I.; De Paepe, P.; Lopes, L.; Vanhaecke, F.; Vermeulen, F. Roman Marble from Lusitania: Petrographic and Geochemical Characterisation. *J. Archaeol. Sci.* **2013**, *40*, 2227–2236. [CrossRef]
252. Schouenborg, B.; Andersson, J.; Göransson, M.; Inger, L. The Hallandia Gneiss, a Swedish Heritage Stone Resource. *Geol. Soc. Lond. Spec. Publ.* **2015**, *407*, 35–48. [CrossRef]
253. Wikström; Pereira, D. The Kolmården Serpentine Marble in Sweden: A Stone Found Both in Castles and People's Homes. *Geol. Soc. Lond. Spec. Publ.* **2015**, *407*, 49–56. [CrossRef]
254. Lapuente, P.; Rodà, I.; Gutiérrez Garcia-M, A.; Brilli, M. Addressing the Controversial Origin of the Marble Source Used in the Phoenician Anthropoid Sarcophagi of Gadir (Cadiz, Spain). *Archaeometry* **2021**, *63*, 467–480. [CrossRef]
255. Navarro, R.; Pereira, D.; Gimeno, A.; Del Barrio, S. Influence of Natural Carbonation Process in Serpentinites Used as Construction and Building Materials. *Constr. Build. Mater.* **2018**, *170*, 537–546. [CrossRef]
256. Navarro, R.; Cruz, A.S.; Arriaga, L.; Baltuille, J.M. Characterization of the Main Types of Marble Extracted in the Area of Macael (Almería, Southeastern Spain) and Its Historical Importance | Caracterización de los Principales Tipos de Mármol Extraídos en la Comarca de Macael (Almería, Sureste de España) y. *Bol. Geol. y Min.* **2017**, *128*, 345–361. [CrossRef]
257. Rey, J.; Martínez, J.; Vera, P.; Ruiz, N.; Cañadas, F.; Montiel, V. Ground-Penetrating Radar Method Used for the Characterisation of Ornamental Stone Quarries. *Constr. Build. Mater.* **2015**, *77*, 439–447. [CrossRef]
258. Navarro, R.; Pereira, D.; Gimeno, A.; Del Barrio, S. Characterization of the Natural Variability of Macael Serpentinite (Verde Macael) (Almería, South of Spain) for Their Appropriate Use in the Building Industry. In *Engineering Geology for Society and Territory-Volume 5: Urban Geology, Sustainable Planning and Landscape Exploitation*; Springer International Publishing: Berlin/Heidelberg, Germany, 2015.
259. Navarro, R.; Pereira, D.; Gimeno, A.; Del Barrio, S. Verde Macael: A Serpentinite Wrongly Referred to as a Marble. *Geosciences* **2013**, *3*, 102–113. [CrossRef]
260. Luque, A.; Ruiz-Agudo, E.; Cultrone, G.; Sebastián, E.; Siegesmund, S. Direct Observation of Microcrack Development in Marble Caused by Thermal Weathering. *Environ. Earth Sci.* **2011**, *62*, 1375–1386. [CrossRef]
261. Sáez-Pérez, M.P.; Rodríguez-Gordillo, J. Structural and Compositional Anisotropy in Macael Marble (Spain) by Ultrasonic, XRD and Optical Microscopy Methods. *Constr. Build. Mater.* **2009**, *23*, 2121–2126. [CrossRef]
262. Rodríguez-Gordillo, J.; Sáez-Pérez, M.P. Effects of Thermal Changes on Macael Marble: Experimental Study. *Constr. Build. Mater.* **2006**, *20*, 355–365. [CrossRef]
263. Mehiri, K.; Vieville, P.; Lipinski, P.; Tidu, A.; Tijeras, V. Initiation and Coalescence of Local Damages on Blanco de Macael Marble. In *Fracture of Nano and Engineering Materials and Structures—Proceedings of the 16th European Conference of Fracture, Alexandroupolis, Greece, 3–7 July 2006*; Springer: Dordrecht, The Netherlands, 2006; pp. 545–546.
264. Cámara, B.; De Buergo, M.Á.; Bethencourt, M.; Fernández-Montblanc, T.; La Russa, M.F.; Ricca, M.; Fort, R. Biodeterioration of Marble in an Underwater Environment. *Sci. Total Environ.* **2017**, *609*, 109–122. [CrossRef] [PubMed]
265. Martínez, J.; Montiel, V.; Rey, J.; Cañadas, F.; Vera, P. Utilization of Integrated Geophysical Techniques to Delineate the Extraction of Mining Bench of Ornamental Rocks (Marble). *Remote Sens.* **2017**, *9*, 1322. [CrossRef]
266. Burgos-Cara, A.; Ruiz-Agudo, E.; Rodríguez-Navarro, C. Effectiveness of Oxalic Acid Treatments for the Protection of Marble Surfaces. *Mater. Des.* **2017**, *115*, 82–92. [CrossRef]
267. Luque, A.; Cultrone, G.; Mosch, S.; Siegesmund, S.; Sebastián, E.; Leiss, B. Anisotropic Behaviour of White Macael Marble Used in the Alhambra of Granada (Spain): The Role of Thermohydric Expansion in Stone Durability. *Eng. Geol.* **2010**, *115*, 209–216. [CrossRef]
268. Tucci, P.; Marrese, G.; Polvorinos, A.; Azzaro, E. Italica (Seville, Spain): Use of Local Marble in Augustan Age. *Period. Miner.* **2010**, *79*, 113–129. [CrossRef]
269. Morbidelli, P.; Tucci, P.; Imperatori, C.; Polvorinos, A.; Preite Martinez, M.; Azzaro, E.; Hernandez, M.J. Roman Quarries of the Iberian Peninsula: "Anasol" and "Anasol"-Type. *Eur. J. Miner.* **2007**, *19*, 125–135. [CrossRef]
270. Benavente, D.; Martínez-Verdú, F.; Bernabeu, A.; Viqueira, V.; Fort, R.; García Del Cura, M.A.; Illueca, C.; Ordóñez, S. Influence of Surface Roughness on Color Changes in Building Stones. *Color Res. Appl.* **2003**, *28*, 343–351. [CrossRef]
271. Bello, M.A.; Martín, L.; Martín, A. Decay and Treatment of Macael White Marble. *Stud. Conserv.* **1992**, *37*, 193–200. [CrossRef]
272. Bello, M.A.; Martín, L.; Martín, A. Scanning Electron Microscopy to Establish the Marble Weathering Mechanism in the Alhambra of Granada (Spain). *Scanning Microsc.* **1991**, *5*, 645–652.
273. Justo, J.; Castro, J.; Miranda, M.; Gatica, D.; Cicero, S. The Theory of Critical Distances Applied to Fracture of Rocks with Circular Cavities. *Theor. Appl. Fract. Mech.* **2022**, *121*, 103530. [CrossRef]

274. Acampa, G.; Grasso, M. Integrated Evaluation Methods to HBIM for the Management of Cultural Heritage: The Case Study of the Colonnade of Patio de los Leones, Alhambra-Granada | Metodi di Valutazione Integrati all'HBIM per la Gestione del Patrimonio Storico: Il Caso del Colonnat. *Valori Valutazioni* **2021**, *29*, 133–153. [CrossRef]
275. Garcia-Guinea, J.; Crespo-Feo, E.; Correcher, V.; Iordanidis, A.; Charalampides, G.; Karamitou-Mentessidi, G. New Data on the Cathodoluminescence of White Marbles: Interpretation of Peaks and Relationships to Weathering. *Mediterr. Archaeol. Archaeom.* **2010**, *10*, 107–114.
276. Garg, S.; Kaur, P.; Pandit, M.; Fareeduddin Kaur, G.; Kamboj, A.; Thakur, S.N. Makrana Marble: A Popular Heritage Stone Resource from NW India. *Geoheritage* **2019**, *11*, 909–925. [CrossRef]
277. Pappu, A.; Chaturvedi, R.; Tyagi, P. Sustainable Approach Towards Utilizing Makrana Marble Waste for Making Water Resistant Green Composite Materials. *SN Appl. Sci.* **2020**, *2*, 347. [CrossRef]
278. Bhadra, B.K.; Gupta, A.K.; Sharma, J.R.; Choudhary, B.R. Mining Activity and Its Impact on the Environment: Study from Makrana Marble and Jodhpur Sandstone Mining Areas of Rajasthan. *J. Geol. Soc. India* **2007**, *70*, 557–570.
279. Dwivedi, R.D.; Singh, P.K.; Singh, T.N.; Singh, D.P. Compressive Strength and Tensile Strength of Rocks at Sub-Zero Temperature. *Indian J. Eng. Mater. Sci.* **1998**, *5*, 43–48.
280. Kaul, B.K.; Chattopadhyay, B.C. Effect of the Volume of the Specimen on the Flexural Strength of Makrana Marble. In Proceedings of the Symp on Rock Mech and Tunnelling Prob, Kurukshetra, Haryana, India, 17–18 December 1973; pp. 200–203.
281. Hughes, T.; Horak, J.; Lott, G.; Roberts, D. Cambrian Age Welsh Slate: A Global Heritage Stone Resource from the United Kingdom. *Episodes* **2016**, *39*, 45–51. [CrossRef]
282. Wyse Jackson, P.N.; Caulfield, L.; Feely, M.; Joyce, A.; Parkes, M.A. Connemara Marble, Co. Galway, Ireland: A Global Heritage Stone Resource Proposal. *Geol. Soc. Spec. Publ.* **2020**, *486*, 251–268. [CrossRef]
283. Attewell, P.B.; Taylor, R.K. A Microtextural Interpretation of a Welsh Slate. *Int. J. Rock Mech. Min. Sci.* **1969**, *6*, 423–438. [CrossRef]
284. Price, W.R.; Ronck, C.L. Quarrying for World Heritage Designation: Slate Tourism in North Wales. *Geoheritage* **2019**, *11*, 1839–1854. [CrossRef]
285. Girdler, R.W. Some Preliminary Measurements of Anisotropy of Magnetic Susceptibility of Rocks. *Geophys. J. R. Astron. Soc.* **1961**, *5*, 197–206. [CrossRef]
286. Fuller, M.D. Anisotropy of Susceptibility and the Natural Remanent Magnetization of Some Welsh Slates. *Nature* **1960**, *186*, 791–792. [CrossRef]
287. Rathore, J.S.; Henry, B. Comparison of Strain and Magnetic Fabrics in Dalradian Rocks from the Southwest Highlands of Scotland. *J. Struct. Geol.* **1982**, *4*, 373–384. [CrossRef]
288. Kollar, A.D.; Feely, M.; Joyce, A.; Fedosick, R.; Hughes, K.; Costanzo, A. Carnegie Institute Extension Connemara Marble: Cross-Atlantic Connections Between Western Ireland and Gilded Age Architecture in Pittsburgh, Pennsylvania. *Ann. Carnegie Mus.* **2020**, *86*, 207–253. [CrossRef]
289. Yardley, B.W.D.; Lloyd, G.E. An Application of Cathodoluminescence Microscopy to the Study of Textures and Reactions in High-Grade Marbles from Connemara, Ireland. *Geol. Mag.* **1989**, *126*, 333–337. [CrossRef]
290. Max, M.D. Connemara Marble and the Industry Based Upon It. In *Report Series—Geological Survey of Ireland, Dublin Ireland*; 1985; Available online: https://www.gsi.ie/en-ie/Pages/default.aspx (accessed on 20 September 2024).
291. Feely, M.; Wilton, D.H.; Costanzo, A.; Kollar, A.D.; Goudie, D.J.; Joyce, A. Mineral Liberation Analysis and Scanning Electron Microscopy of Connemara Marble: New Mineral Distribution Maps of an Iconic Irish Gem Material. *J. Gemmol.* **2019**, *36*, 456–466. [CrossRef]
292. McCaffrey, K.J.W.; Feely, M.; Hennessy, R.; Thompson, J. Visualization of Folding in Marble Outcrops, Connemara, Western Ireland: An Application of Virtual Outcrop Technology. *Geosphere* **2008**, *4*, 588–599. [CrossRef]
293. Leake, B.E.; Tanner, P.W.G.; Senior, A. The Composition and Origin of the Connemara Dolomitic Marbles and Ophicalcites, Ireland. *J. Petrol.* **1975**, *16*, 237–257. [CrossRef]
294. Cliff, R.A.; Yardley, B.W.D.; Bussy, F. U–Pb Isotopic Dating of Fluid Infiltration and Metasomatism During Dalradian Regional Metamorphism in Connemara, Western Ireland. *J. Metamorph. Geol.* **1993**, *11*, 185–191. [CrossRef]
295. Senior, A.; Leake, B.E. Regional Metasomatism and the Geochemistry of the Dalradian Metasediments of Connemara, Western Ireland. *J. Petrol.* **1978**, *19*, 585–625. [CrossRef]
296. Cárdenes, V.; López-Piñeiro, S.; Ruiz de Argandoña, V.G. The Relevance of the Green Phyllites of Lugo (Spain) in the Architectonical Heritage: An Exceptional Roofing Slate Resource. *Geoheritage* **2021**, *13*, 11. [CrossRef]
297. Cárdenes, V.; Rubio, A.; Ruiz de Argandoña, V.G. Roofing Slate from Bernardos, Spain: A Potential Candidate for Global Heritage Stone. *Episodes* **2021**, *44*, 3–9. [CrossRef]
298. Kaur, G.; Agarwal, P.; Garg, S.; Kaur, P.; Saini, J.; Singh, A. The Alwar Quartzite Built Architectural Heritage of North India: A Case for Global Heritage Stone Resource Designation. *Geoheritage* **2021**, *13*, 55. [CrossRef]
299. Mahajan, A.K.; Shukla, A.K.; Pandey, A.; Chauhan, M.; Chauhan, N.; Rai, N. Shear Wave Velocity Investigation for Ten Representative Sites of National Capital Territory, New Delhi, India. *Int. J. Geotech. Earthq. Eng.* **2011**, *2*, 29–43. [CrossRef]
300. Pathak, A.K.; Tripathi, S.; Maurya, A.K.; Das, P.; Ranjan, J.; Patel, A.K.; Misra, P.; Kumar, A. High Resolution Heliborne Magnetic, Radiometric, and Time Domain Electromagnetic Data Interpretation of Chomun-Alwar Tract of Alwar Sub-basin, North Delhi Fold Belt, Northern India as an Aid to Uranium Exploration. *Explor. Res. At. Miner.* **2020**, *28*, 24–35.

301. Muthamilselvan, A. Application of Supervised Classification and Crosta Technique for Lithological Discrimination in Parts of South Khetri Belt, Sikar District, Rajasthan. *J. Indian Soc. Remote Sens.* **2017**, *45*, 377–383. [CrossRef]
302. Kaur, P.; Zeh, A.; Chaudhri, N.; Gerdes, A.; Okrusch, M. Archaean to Palaeoproterozoic Crustal Evolution of the Aravalli Mountain Range, NW India, and Its Hinterland: The U-Pb and Hf Isotope Record of Detrital Zircon. *Precambrian Res.* **2011**, *187*, 155–164. [CrossRef]
303. Kaur, G.; Mehta, P.K. Geochemistry and Petrogenesis of Jasrapura Granitoid, North Khetri Copper Belt, Rajasthan: Evidence for Island Arc Magmatism. *J. Geol. Soc. India* **2007**, *69*, 319–330.
304. Powar, M.M.; Mathur, A.B. Geology and Geochemistry of Amphibolites from Ghataser Area, Mahendragarh District, Haryana. *Indian Miner.* **2004**, *58*, 27–34.
305. Verma, V.K. Ripple Marks in Alwar Quartzites East of Mera Ka Gurha near Udaipur, Rajasthan. *Proc. Indian Acad. Sci. Sect. A* **1964**, *59*, 313–317. [CrossRef]
306. Zaheeruddin; Khurshid, S. Aquifer Geometry and Hydrochemical Framework of the Shallow Alluvial Aquifers in the Western Part of the Yamuna River Basin, India. *Water Qual. Res. J. Can.* **2004**, *39*, 129–139. [CrossRef]