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PALEONTOLOGY FOR CHILDREN IN GUADALAJARA MUSEUMS

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Abstract: Two examples of museums specializing in paleontology in Western Mexico are presented. This study reviews the actions carried out between January 2023 and February 2024 to strengthen the museum-infancia-science links. Exploratory research based on bibliography and field work was carried out to comparatively study the activities offered such as courses, workshops and guided tours for visitors in both museums. The participation of children as a target audience is observed. The results are presented in tabulated form. The premise is that paleontology is preserved and conserved for future generations.

Keywords: Paleontology, De Catarina Mammoth, Gonfoterio Del Lago, Museum Education, Museum of Paleontology.

INTRODUCTION

In this article, two museums specialized in paleontology in Western Mexico are presented in a comparative manner, looking for the museum-infancia-science links, for this purpose the activities offered in a period of 14 months were studied, the premise is that in paleontology is preserved and preserved for the next generations.

In order to establish the common link between the two museums that were analyzed for this study, it is necessary to give the reader background on the legacy of Federico Adolfo Solórzano Barreto, who was born in Guadalajara Jalisco Mexico on September 27, 1922 and died on May 23, 2015, his biography is included in the *Historical and Biographical Encyclopedia* of the University of Guadalajara. He was trained as a pharmacobiological chemist at his alma mater and was a professor there for 55 years. In 1973 he joined the National Institute of Anthropology and History (INAH), where he worked as a full time researcher in Paleontology and History. He also served as curator of the then Regional

Museum of the State of Jalisco, today Regional Museum of Guadalajara (MRG), of which he was also deputy director and then director from 1980 to 1983. He worked at this institution until his retirement in 2010. His passion for science led him to study archeology, geology, physics, history, philosophy, anthropology and paleontology. He collected fossils in Jalisco Mexico: in the Lake Chapala basin, the Zacoalco de Torres basin, Juchitlán and Tecolotlán. During several decades of work, he formed a fossil collection with more than two hundred large pieces and more than five hundred boxes with thousands of fragments. This collection has been part of the collection of the Museum of Paleontology of Guadalajara (MPG) since February 14, 2000.

As a professor at El Colegio de Jalisco, Peregrina pointed out in his narrative *In Memoriam* that Engineer Solorzano in life received awards, recognitions and distinctions (Peregrina, 2016) highlights the importance for Engineer Solorzano that scholars share his findings. Ingeniero Solórzano's contribution to the research and collection of fossils in Jalisco is invaluable. He was named emeritus professor of the University of Guadalajara on May 8, 1996. He received an honorary doctorate from the same University on March 6, 2003. The Museum of Paleontology of Guadalajara is named after him. On October 26, 2004, a bronze monument with his figure was unveiled inside the museum.

In the testimonies of the university biography, Diana Solórzano (daughter) narrated: "Getting to know the museums with him was a great adventure [...] He taught for 55 years, and never missed a day, every day punctually. He always wanted his students to understand and love science in all its forms".



Figure 1. Bust in honor of Federico Adolfo Solórzano Barreto at the MPG. Own photo.

This research serves as a tribute to the memory of Engineer Solórzano nine years after his death and as a recognition of his contribution to the city of Guadalajara in particular and to science in general. The research was carried out in two of the institutions that have his indelible mark: the Regional Museum of Guadalajara (MRG) and the Museum of Paleontology of Guadalajara (MPG).

DEVELOPMENT

Within the Mexican territory there are countless public, private, university and community museums, with a wide variety of contents. On this occasion, we will focus on museums with paleontological content. According to reports from the National Institute of Statistics, Geography and Informatics (INEGI) in Mexico in 2016 there were 28 paleontology museums registered and by the year 2022 there were 25 paleontology museums nationwide.

On the other hand, Guillermo Oñate and Felicia Aguilar, in their article published in the journal *Arqueología Mexicana* number 170, noted the growing importance of paleontology and highlighted the names of some museums exclusively dedicated to this discipline, among them the Museum of Paleontology of Guadalajara (Jalisco, Mexico), which is the subject of this study. They also pointed out that there are other museums that, although they are not paleontological, incorporate one or more rooms dedicated to this discipline, such as the Desert Museum (Coahuila, Mexico), or regional museums under the responsibility of INAH, such as the Regional Museum of Guadalajara, the subject of this study.

It is worth specifying to the reader that the Museo de Paleología de Guadalajara (MPG) and the Museo Regional de Guadalajara (MRG) were compared for their paleontological themes. The MRG is more than 100 years old and its iconic piece is the De Catarina Mammoth discovered in 1962; the MPG is 24 years old and its iconic piece is the Gonfoterio Del Lago discovered in 2000.

The research covers the period of fourteen months between January 2023 and February 2024 in the MRG and MPG museums in the city of Guadalajara, Jalisco, in Western Mexico. It was carried out with the researcher's own resources and she declares that she is totally independent of any public or private, national or foreign organization, as well as free of any conflict of interest in carrying out this research, since it was carried out within the framework of a personal leisure activity, for the pleasure of visiting museums. The present work does not correspond to any exercise or product of school work, nor did it arise as a result of professional practice. The information obtained in the documentary sources is open access, the consultations in repositories are indicated in the sources,

the personal interviews were informed, the observations were direct. The purpose of writing is to create awareness in the reader of the importance of education in museums and that, in the personal opinion of the researcher, it is essential to disseminate knowledge to give meaning to heritage conservation.

One of the working hypotheses is the lack of a structural link between formal school education for children and museum collections. Some teachers seek to carry out school group visits to museums as complementary activities to students' education, however, they face logistical issues related to transportation, schedules, budgets, permits and procedures that discourage their work. On the other hand, the education areas in museums generate activities within their facilities and seek to attract the public in different ways, but their budgets are a limitation in this area. There are museums that have admission fees, apply discounts to students, teachers, senior citizens and do not charge on Sundays, among them the MRG. Other museums have no admission fee, including the MPG.

The objective is to measure the extent to which museums have an impact on strengthening museum-infancia-science links by reviewing the range of activities and the target public in the two selected museums and then comparing them. From a general approach, it is the popularization of science. From a particular approach it is to make the museum collections containing fossil remains and paleontological elements accessible to children. During the planned school visits, the activities and workshops are structured to influence subjects related to Natural Sciences, mainly Biology and Geology. During family visits, guided tours and individual visits, open workshops and activities are offered that seek to influence the non-formal learning of children, awaken curiosity for science and generate awareness about the importance of the conservation of life on earth.

THEORETICAL FRAME OF REFERENCE

To know what has already been researched, a review of sources was made and a master's thesis was found, *La comunicación de la ciencia en las actividades del Museo de Paleontología de Guadalajara* (Álvarez, 2016) that placed the research precisely in the Museum of Paleontology of Guadalajara its hypothesis was "The communication of science is proposed as the set of skills, means, activities and dialogue of the mediator to create in the public one or more positive responses towards science". In the methodology she conducted interviews with the workshop participants and opted for non-participant observation in the workshops by means of 3 formats to be filled in by the observer. His first observation was in the summer course from July 21 to 25, 2015, as well as observation in three workshops and two courses held between January 31 and February 28, 2016. He then did the classification and analysis of results. The factors he considered in the analysis were the attendees' prior knowledge, communication and their relationship to science outreach. In his conclusions he points out:

Studies on workshops continue to show their importance and demand from the public, so it is very useful that they are taken into account for the training of workshop leaders, as well as future workshops. As mentioned at the beginning, workshops are one of the science communication activities that do not necessarily require a high investment, their value lies both in the workshop leader and the activity to be performed within it (Álvarez, 2016, p.95).

The study is interesting, the observation time is short since there were five days of the 2015 summer course, three workshops of one hour each and two courses in February 2016. It is important that the people who give workshops are trained and develop communication skills. The economic

resources to carry out workshops are limited and constitute a difficulty to carry them out.

Within the documentary exploration we obtained the scientific article *Paleontology and its didactics: design and application of activities based on Cretaceous sites and their fossils for students of Primary Education* (S. Ozkaya de Juanas & F. Barroso-Barcenillas, 2019) who make a didactic proposal that contemplates a series of activities aimed at the school public, and that present as main content the teaching of Paleontology. From the pedagogical and methodological point of view, the authors share the cards of the developed activities, classified and with information on the recommended age of the participant in each one, which would allow other sites to reproduce and apply them, a gesture of generosity that is appreciated. Activity one. Paleontology vs. archaeology. Activity two. Fossils and dinosaurs. Activity three. We are paleontologists I: Field work. Activity four. We are paleontologists II: Laboratory work. Activity Five. We are paleontologists III: Cabinet work and outreach. Activity six. Discovering traces of ichnites. Activity seven. Reconstructing animals of the past. Activity eight. Fossil plants. Activity nine. Pangea: The supercontinent. Activity ten. Musical geological eras. They explain that the proposed activities have also been presented in educational events such as the Madrid Science Week, the Beteta Paleontological Conference, the Geolodía, proving their effectiveness. As a side note, draw attention to the coincidence that Tamajón is a site located in the province of Guadalajara, specifically southeast of the municipality of Tamajón in Spain. In his conclusions he points out:

The Cretaceous sites of Hoces de Beteta and Tamajón, in addition to being of interest for scientific work, can be used as an effective tool for the design of didactic and informative activities aimed at society in general, and at primary school students in particular. The

use of Extremely Intense Interests (including dinosaurs) facilitates the introduction of paleontological content in the classroom and, simultaneously, progress in the knowledge of the scientific method. Through the implementation of the Theory of Multiple Intelligences, it is also verified that the pre-established objectives are efficiently fulfilled, getting to teach the content in a diverse way and adapting individually to the students. (S. Ozkaya de Juanas & F. Barroso-Barcenillas, 2019, p.109).

Undoubtedly this document is highly recommended for those responsible for generating activities in paleontology museums, it is true that a Cretaceous site is not at hand for children to live the experience, but with creativity it can be adapted to the particular conditions and generate an approach to science. The opportunity remains open for those who want and can visit Tamajón in Guadalajara Spain to live the experience.

The authors (Alcalá, Luis. González, Ana & Aberasturi, Ainara., 2006) emphasize that the province of Teruel has a rich and varied paleontological heritage: sites with Paleozoic invertebrates and fish, the popular Mesozoic dinosaurs and the Cenozoic faunas. The work carried out in the field is detailed: surveys, systematic excavations, preparation of fossil material and research. Also the dissemination of paleontological discoveries in a clear and entertaining way in order to raise awareness of the heritage. In their conclusions they point out:

Within the framework of the tasks of a museum, and as a complement to the research and conservation work, public programs related to paleontology are developed in Teruel, either through their own calls that are developed regularly or by joining established events (Science and Technology Week, International Museum Day, etc.). Specific activities for schoolchildren and teachers focus on workshops, field trips, publications or open days, among others (Alcalá, Luis. González, Ana & Aberasturi, Ainara., 2006, p.221).

It is worth mentioning that the work recommended for schoolchildren are workshops. In this they coincide with the previous article and the exposed thesis. In this case, they do not share their materials as dissemination. It is also noteworthy that they talk about the International Museum Day, which is commemorated on May 18 each year and is promoted by ICOM of UNESCO, one might ask if museums that are not affiliated to ICOM celebrate it.

CONCEPTUAL FRAMEWORK

Museum. In Prague, on August 24, 2022, the International Council of Museums (ICOM) approved the new definition:

A museum is a non-profit, permanent institution at the service of society that researches, collects, preserves, interprets and exhibits tangible and intangible heritage. Open to the public, accessible and inclusive, museums foster diversity and sustainability. Involving communities, museums operate and communicate ethically and professionally, offering varied experiences for education, enjoyment, reflection, and knowledge sharing (ICOM, 2022).

National Institute of Anthropology and History (INAH). Organism of the Government of Mexico. According to its website in the section Who are we? It states that:

It is the federal government agency founded in 1939, to ensure research, technical definitions, protection and dissemination of prehistoric, archaeological, anthropological, historical and paleontological heritage of Mexico. It is also in charge of a network of 162 museums in the national territory divided into categories, according to the breadth and quality of their collections, their geographic location and the number of visitors (INAH, 2022).

Regional Museum of Guadalajara (MRG).

It is a building located at the intersection of Liceo Street and Hidalgo Avenue in front of the Rotunda of the Illustrious Jaliscienses, a few steps from the Guadalajara Cathedral. It is a building with a long history, it was built between 1742 and 1758. Its beautiful architecture stands out. According to the official information: "Since 1939 it depends on the INAH. In 1973 it was renamed as Regional Museum of Guadalajara and on July 3, 1976 its integral renovation was concluded. In 1996 the archeology and paleontology rooms were restructured". There are established criteria for charging admission, with rules to exempt students, teachers, senior citizens and Sunday is free. The De Catarina Mammoth is its sign of identity, it was found in the area of Zacoalco de Torres Jalisco 62 years ago by a fortuitous event and later it was assembled and exhibited. For the octogenarian people of this city it is the reference of paleontology that they know, that is to say, every time you ask someone about paleontology, who knew about the finding through the newspapers, what comes to their mind is the De Catarina Mammoth. In interviews they relive the emotion it caused them, they refer to pride and sense of belonging.

It consists of nine rooms. The first room of the museum is about prehistory, from the second room petrified trees are observed, the other rooms represent the state of Jalisco: viceregal era, independent era and social movements. In 2023 it celebrated its 200th anniversary as a free and sovereign state.



Figure 2. Catarina Mammoth. MRG Prehistoric Hall. Own photo.

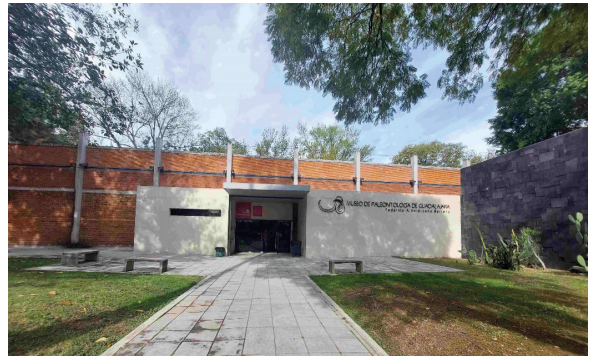


Figure 3. Facade of the Museum of Paleontology of Guadalajara. Own photo.

Museum of Paleontology of Guadalajara (MPG). This museum opened its doors in February 2000. It depends on the Municipality of Guadalajara and does not charge admission. It is located at the confluence of Dr. R. Michel and Gonzalez Gallo Avenues, inside the Agua Azul Park. The museum has seven rooms, was remodeled in 2018 and has an auditorium, a temporary exhibition hall and a room for workshops. Its facilities are modern. It preserves extensive paleontological collection, highlights the Gonfoterio Del Lago, which was found by serendipity in Lake Chapala, which is the largest lake in Mexico. During a drought season in the year 2000, the water level dropped so low that the bones were exposed and a rescue of the specimen was organized. It should be clarified that the specimen on display is a replica. In this museum there are lectures for specialized personnel in the auditorium, temporary exhibits, guided tours and school visits with predefined schedules. From the temporary exhibitions there are thematic threads for the workshops, that is, the workshop is associated with a theme of what was seen in the temporary exhibition, thus reinforcing the knowledge.

Formal education: It is the school-based and structured system that defines study programs, grades, the way to evaluate learning and grants certifications on achievement. The aim is to certify that the people who take the courses have achieved the learning proposed in the established program. In the teaching-learning process it is required to comply with the established schedules. The study programs are evaluated and authorized by the competent authority. In the case of Mexico, it begins in preschool, primary education, middle school, high school and university. The authority is the Ministry of Public Education.

Non-formal education: comprises organized training proposals outside the framework of the formal system (Soto, 2023). Examples are workshops, conferences, talks or training courses, which are carried out to meet the specific needs of different populations. This includes minors, senior citizens, whether or not they have formal education.

Informal education: is a continuous learning process that takes place throughout life, where daily experiences are accumulated with people of different types and age groups, regardless of the space in which they occur (Soto, 2023).

Significant learning: The European University (2023) states: "According to the American psychologist and educator David Ausubel , significant learning is that in

which the student gathers new information, selects it, organizes it and relates it to the relevant knowledge he already possesses". It is situated within the framework of educational constructivism.

Multiple intelligences: Howard Gardner's 1983 theory points out that there is no single type of intelligence; rather, there are at least eight different ones: Linguistic, logical-mathematical, kinesthetic-bodily, musical, spatial, spatial, naturalistic, interpersonal and intrapersonal intelligence. This is a significant change for the educational model. Recognizing the differences and uniqueness of each person supports inclusion and integral development projects. Children must first be informed about their cultural and natural heritage. From the practices in museums, awaken their curiosity to know by offering activities that enable the discovery and appropriation of knowledge that could have an impact on their future life from the academic, technical and personal point of view.

METHODOLOGY

For the development of the research, in the first place, we searched for bibliography related to paleontology and its dissemination. Secondly, we searched for information about science museums in Mexico and particularly Science Museums in Jalisco. Thirdly, we searched for information related to education and learning for children. Fourth, we reviewed the social networks of two museums that have fossil collections, located in the city of Guadalajara, where they invited to carry out outreach activities for the general public, for adults or for children. Both museums were visited for participant observation and interviews. The activities of both museums were compared and the information was contrasted. The results were tabulated and a report on the interpretation of the results was prepared. It was presented as a paper

in an event organized by INAH "Preserving the past. 1st International Conference on Conservation and Preparation of Fossils" that took place on March 11, 12 and 13, 2024. The title "Paleontology for children in museums in Guadalajara" was specifically presented in the third session. It should be noted that only an abstract was presented, which was edited and published as an electronic document by the Félix de Azara Natural History Foundation of Buenos Aires, Argentina, and that the full content has not been published or disseminated before.

A. Methods and Techniques . A matrix was performed and included:

- The date of the event if it was a one-time event; in the case of period events, the opening date and the time it was available were included.
- The type of activity, product or service offered.
- Target audience. If not specified, the general public is assumed and by nature they can be for adults, for families or for children.
- Differentiator: the permanent exhibition of pieces was counted by the number of calendar days the museum was open. The temporary exhibition was counted by number of days available to the public. Workshops and activities were counted by the number of times they were offered according to the schedules indicated. It should be noted that both museums work from Tuesday to Sunday and respect the official calendar holidays.

Both museums were visited, attending several of the events, tours and workshops for public observation. In none of the cases in which I participated, the organizers conducted an exit survey to measure or evaluate the public's response, perception or suggestions for improvement. Both museums have a book

of suggestions and compliments from visitors. Both museums have a registration form at the entrance to know if the visitor is national or foreign and the age group. In one of the events at the MPG they asked for the e-mail address to send proof of participation.

B. Data obtained by collection.

At the MRG the offer in the period studied was classified as . The permanent activities for the general public in the halls were: Introductory Hall, Hall: "First Inhabitants of Jalisco", Petrified Patio, Hall: "History of Jalisco II", Hall: "17th Century Painting", Hall: "18th Century Painting", Hall: "Painting by José de Ibarra", Exhibition: "From Seville to Guadalajara", Exhibition: "Vanguard and Revolution". The temporary activities for the general public were: Exhibition: "Mexico in World Heritage", Exhibition: "Polysemy - Reflections of life in the Mesoamerican West", Exhibition: "Color and Religiosity" - Antonio Enriquez pictorial work, Exhibition: "Traditional Nativity" Pantaleón Panduro, Exhibition: "The Magic of Prudencio Guzmán", Exhibition: "Being Modern" by Rubén Méndez, Exhibition: "Sacred Territories" by Gabriela Natera, Exhibition: "Altar of the Dead", Exhibition: "Clay Lineages", Exhibition: "Luis Valsoto. Between the real and the fantastic", Exhibition: "Between utility and luxury",

Exhibition: "Jalisco 200 years free and sovereign", Exhibition: "Matriz, women in graphics". Temporary activities for children were: Christmas piñata workshop, Children's choir Christmas concert (daytime), Children's workshop "Underwater archeology, submerged treasures in Mexico" in Papirolas, Summer Rally two greats of Jalisco: Mamut De Catarina and Gonfoterio del lago. Musical activities for the general public: Philharmonic Choir Christmas Concert (evening), Trombone Concert "Threbone Trombone Trio", Philharmonic Choir Concert, French Music Concert, Open Listening, concert,

Nine Concert of the Fall 2023 Season. Seven monthly meetings of Café Filosófico talks. Also various activities for the general public: First Cultural Festival of Western Cactaceae, Conference: "American Wonder, iconography of the Virgin of Guadalupe" by Arturo Camacho, Book presentation: "Murals and muralists from Guadalupe", International Day for the Elimination of Violence against Women, Digital Violence Forum, Venue of the 2nd International Congress of Artistic and Cultural Heritage, Venue of the Colloquium: "Jalisco 200 years of history", Conference: "The sons of the Conciliar Seminary of Señor San José and the birth of Jalisco", Magisterial Conference: "Women facing the adversity of the 19th century", Dialogue "Women in History", Commemorative Ceremony 85 years INAH, Ceremony 105th Anniversary of the museum, Commemorative Ceremony 84 years INAH, Ceremony 104th Anniversary of the museum. Guided group visits.

At the MPG, the offer during the period studied was classified as follows. Temporary activities for the general public were: Photographic exhibitions in the Biocamera "Laguna de Atotonilco, treasures of biodiversity", "Yellowstone and Grand Teton", "Nature in close up", "Critters". The exhibitions were "Odontos", "La primavera pasado y presente" and the exhibition of the Bonsai Club Guadalajara. Within the framework of the Odontos exhibition, weekend workshops were created with the theme to deepen knowledge, "Odontos, natural and cultural history of teeth", "Odontos, Love...didas", "Odontos, Teeth and bites" were offered. Within the framework of the Spring exhibition, weekend workshops such as "Painting history", "The colors of spring", "We are in spring", "How to take care of an orchid" were created. Paleontology-themed weekend workshops included sessions on "I want to be a paleontologist", "Work as a paleontologist", "Giants of Jalisco"

and paleontological workshops for Easter and Passover. In scientific topics there were weekend workshops “What happens in the universe” and “The circus of science” with a variety of topics per session. An example of synergy between MRG and MPG museums was the Summer Rally. Summer workshops: “Bichos y carnívoros”, “El maravilloso mundo de los bichos”, “Mamíferos carnívoros de México”, “Historia evolutiva de los tiburones”, “Bosque y servicios ambientales”. Weekend workshops “Axolotes of Jalisco”, “Pollinators”. In the Museum’s auditorium during the period under study, 19 conferences and talks on related topics were held and 14 documentaries on science were shown. In addition, there were guided tours and school visits.

C. A table was prepared for the analysis and comparison of data, which is not included in this extensive article due to lack of space. It is available to those interested in further information, upon request by e-mail, in which the file can be shared with detailed data and individualized by museum.

D. Information analysis.

The activities in both museums were compared by means of a detailed one-to-one comparison. To take advantage of the summer vacations, a synergy was carried out presenting the two museums as a single paleontology block in the city, held on Thursdays and Fridays from mid-July to mid-August 2023. The joint activity between MRG and MPG consisted of joint visits, children and young people from six to fifteen years old visited one of the museums, then visited the other and won a prize consisting of a Mammoth or Gonphotherium figurine. If they wanted to collect both, they had to make a double cycle of visits. The MRE activity specifically for children in December 2023 was the creation of piñatas, which is a Mexican tradition and what is permanent is a checkerboard.

There was an activity coordinated by INAH but carried out in a different place from the museum, it was in Conjunto Santander, it was the Papirolas workshops specifically for children and it was about making drawings of prehistoric megafauna.



Figure 4. Announcement of joint activity in summer 2023. Photo from Social Networks.

RESULTS

The Regional Museum of Guadalajara is focused on all audiences, with a greater tendency to attract the attention of adults, specifically children, with the museum rally, the papirolas activity, piñata making and a children’s Christmas concert, a total of six. This means that the diversity of events shown in total for the period 61 with possible approaches of 1426, focused on children was only 1.19%. The Museum of Paleontology of Guadalajara had in diversity of events 89 and 80% of them are for public-family and specifically for children are 11.48% as exclusive means that their activities are more diverse, are attractive, inclusive and participatory.

Exploratory research

List of activities offered to your audiences between January 2023 and February 2024 (425 days)

SUMMARY TABLE

Regional Museum of Guadalajara (MRG)				
Quantity	Type of Activity/Product-Service Offered	Audience type	Sum of event days	Index
9	Permanent rooms (1 Mammoth, petrified courtyard)	General	425	
13	Temporary exhibits (painting, ceramics, archeology, etc.)	General	944	
2	Special workshops (Piñatas and archeology)	Children's	6	
1	Mammoth and Gonfoterio Summer Rally	Children's	10	
14	Concerts	General	14	
1	Concerts	Children's	1	
8	Philosophical coffee	Adults	8	
1	Cactus Festival	General	3	
12	Conference, colloquium, congress, book presentation, ceremonies, etc.	General	15	
61	SUMAS		1426	17
There were 61 different events. 17 activities were specifically focused on children. Of the total 1426 activities, 17 represent 1.19% .				1.19%

Table 1. MRG summary. Own elaboration.

RESULTS

Exploratory research

List of activities offered to your audiences between January 2023 and February 2024 (425 days)

SUMMARY TABLE

Museum of Paleontology of Guadalajara (MPG)				
Quantity	Type of Activity/Product-Service Offered	Audience type	Sum of days of events	Index
7	Permanent paleontology rooms	General	425	
4	Thematic photographic exhibitions	General	406	
3	Temporary thematic exhibitions	General	364	
6	Odontos themed workshops	Children's	40	
10	Paleontology workshops	Children's	45	
8	Workshops on bugs, pollinators, etc.	Children's	15	
16	Science workshops, Universe, Light, IP, water, etc.	Children's	23	
12	Spring Forest Workshops	Children's	38	
3	Documentaries	General	15	
19	Conferences-Lectures	Adults	30	
1	Exploration tour in La primavera forest (field visit)	General	1	
89			1402	161
There were 89 different events. 161 activities were specifically focused on children. Of the total 1402 activities, 161 represent 11.48% .				11.48%

Table 2. Summary of MPG. Own elaboration.

DISCUSSION

The research was carried out in two paleontology museums, with an educational approach. In the framework of conceptual references, the difference between Formal and Non-Formal Education has already been established; the observation of the activities carried out in the period of analysis allows classifying them as Non-Formal Education. As was noted in the section on data obtained by collection, which were entered in the information matrix, most of the activities of the MPG are planned for the whole family, the premise being that children do not go to the museum alone, they need to be taken by adults. At the MPG, activities aimed at adults and professionals in biological, geological and paleontological sciences are mostly carried out in the museum's auditorium. At the MRG, due to its centennial construction, location and tradition in the locality, activities for adults, senior citizens, INAH protocol acts, congresses and colloquiums are mostly carried out. During the observation of this research, it was found that in the MRG facilities there are guided tours for schools upon request and agenda. There is evidence that anthropologists in training go and do their internships, there is also evidence that students of the Bachelor's Degree in History take tours through the rooms of the precinct to learn about the history of Jalisco, as well as the visit of high school students from the University of Guadalajara. During the period studied, the MRG carried out a small percentage of activities focused on children; it was not possible to obtain information to know if this is derived from an institutional policy or some other particular situation.

The attitude towards the museum of an adult with his hands behind his back who tried not to touch and was afraid to approach, as opposed to the children who approach the replicas of specimens to touch them, caught

the attention of the observer. That approach and tactile contact to live the experience is learning through the senses. The children look astonished when they see the images of megafauna, this vision marks them. It is proof of how learning can be significant in children, as David Ausubel's theory points out and reaffirms the concepts of Howard Gardner's theory of multiple intelligences, it should be encouraged in people's integral development, with activities for people who are more visual, more auditory or more kinesthetic. Developing workshop activities in museums considering logical-mathematical, linguistic, musical, spatial, interpersonal, etc., thinking. It will open possibilities to encourage the participation and enjoyment of more people and in an inclusive manner.

Research precedents were found, the first in the MPG in a master's thesis (Álvarez, 2016), in an article that highlights the concrete and practical contributions in workshops for children of different ages (S. Ozkaya de Juanas & F. Barroso-Barcenillas, 2019), as well as the importance of the dissemination of paleontological discoveries in a clear and entertaining way to make known the heritage of Teruel (Alcalá, Luis. González, Ana & Aberasturi, Ainara., 2006) that constitute a compilation of best practices that can be considered for improvement in the Regional Museum of Guadalajara and the Museum of Paleontology of Guadalajara.

As explained above, the temporary exhibitions at the MPG provide thematic threads for the workshops, so that a visitor can visit several times and will have a greater understanding of the knowledge by reinforcing specific topics in the workshops. The task of popularizing science is fulfilled by making specialized knowledge available to everyone, in accessible words and in a playful way to achieve understanding, particularly, but not exclusively, for children.

One of the workshops stands out: I would like to be a paleontologist! In each of the workshops, the aim is to awaken, through the senses, additional knowledge by reinforcing a piece, an activity or a process. Knowledge is progressive and Non Formal Education contributes to generate significant knowledge.

In the previous section the new definition of Museum (ICOM, 2022) was already mentioned, a breakdown is presented as an analysis to compare both museums in order to question, in the light of this research, what would the MRG and MPG still need to do to fulfill the broad mission of being a MUSEUM?

- Regional Museum of Guadalajara: Is an institution/Yes. Non-profit/Yes. Permanent/Yes. At the service of society/Yes. Researches, collects, preserves, interprets and exhibits tangible and intangible heritage/Yes. Open to the public/Yes. Accessible and inclusive/No rating. Promotes diversity and sustainability/Not rated. Ethically and professionally/Yes. Offering varied experiences for education/Partially. For enjoyment, reflection and knowledge sharing/Yes. This museum presents areas of opportunity for improvement in accessibility and inclusion, diversity and sustainability and the one that concerns us in this study: offering varied experiences for education.

- Museum of Paleontology of Guadalajara: Is an institution/Yes. Non-profit/Yes. Permanent/Yes. At the service of society/Yes. Researches, collects, conserves, interprets and exhibits tangible and intangible heritage/Yes. Open to the public/Yes. Accessible and inclusive/Not rated. Promotes diversity and sustainability/Not rated. Ethically and professionally/Yes. Offering varied experiences for education/Partially. For enjoyment, reflection and knowledge

sharing/Yes. This museum presents areas of opportunity for improvement in accessibility and inclusion, diversity and sustainability and the one that concerns us in this study: offering varied experiences for education.

Both museums offer varied experiences, according to the results of the research:

MRG: There were 61 different events. Of the total of 1426 activities, 17 activities were specifically focused on children, representing 1.19% of the total.

MPG: There were 89 different events. Of the total of 1402 activities, 161 activities were specifically focused on children, representing 11.48%.

While both museums comply with offering experiences for education, 1.19% and 11.48% reveal that there is a lack of work to make them varied, accessible, inclusive and diversity-friendly.

Some people will ask about the impact that museum activities have on children, it is difficult to measure them beyond an exit questionnaire or a satisfaction/dissatisfaction questionnaire. Would it be possible that some of the participating children decide their vocation by participating in the workshops given in the museums? It would be difficult with the elements of this research to answer that question. For this purpose, we take the testimony of Dr. Sara Ladrón de Guevara, former rector of the Universidad Veracruzana, and Director of the MAX Museum of Anthropology of Xalapa, Mexico. Sara narrated in a videotaped meeting (ColNal, 2020) the impact that visits to the museum had on her as a child and what she heard in her childhood about the discovery of Coyolxauhqui in the historic center of Mexico City that would give rise to what is now the Museo del Templo Mayor, the reference was the laureate Eduardo Matos Moctezuma. She shared: how since she was a child she decided

she wanted to dedicate her life to archaeology. With this testimony it is clear that different significant contacts can mark a life.

CONCLUSIONS

With ICOM's new definition of a museum, museums should encourage visitors to get to know their collections in an accessible, inclusive, diverse and sustainable way. They should focus on motivating and awakening children's interest in knowledge. Non-formal education and its tools are an appropriate vehicle to strengthen the museum-infancia-science links. The research was based on bibliography, corroborated with field work and comparatively studied the activities offered by both museums for visitors, focusing on the target public. The results show that one museum has a percentage ten times higher than the other, however, it is a relative proportion since it is 1.19% versus 11.48%. There is room to learn from the best practices of other museums to improve performance.

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For whom do we preserve paleontological heritage? For the next generations! If we bring heritage closer to children, they will be able to know it, love it and preserve it; if they do not know it, they will not value it and will not take care of it.

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