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THE EFFECT OF SOME ELEMENTS OF CLIMATE ON ARCHAEOLOGICAL SITES IN AL-MUTHANNA GOVERNORATE (THE EFFECTS OF WARKA AS A MODEL)

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Abstract:

The research addressed the impact of the climate factor on archaeological sites in Muthanna province, including the city of Al-Warka archaeological, where solar radiation affects the heating of walls to a high degree, and over time the buildings in the sites of the city of Al-Warka affected by solar radiation, as well as the temperature affects the writings and colored inscriptions, which led to the fading of colors and the lack of clarity of writings in the sites and samples of antiquities in the study area, This led to the drying of building materials and thus to break them, and the rains are an important source of moisture and has a great impact on the sites and archaeological buildings in them, as the penetration of rain inside the buildings led to the melting of materials related to the granules of stone blocks, while the speed of the wind affected the carrying of sand with large granules, which led to the carving of the building and changing its features, and the elements of the climate did not affect the archaeological sites only, Rather, the effect is on the samples of bricks and throws .

Keywords: Climate, archaeological sites, Warka .

INTRODUCTION:

The cultural heritage of all its types, including temples and palaces built of brick, brick or stone, is the backbone of tourism and an important resource of natural wealth, the pride and pride of nations, and a link between their past and present. Natural factors, especially climatic factors, are among the most important factors causing this, which is what the archaeological and geological prospector asks from the geographer to put the reasons leading to this, so it was required to shed light on the climatic impact that it leaves on archaeological sites, and because of this study of cultural and economic importance and damages that must be avoided. The researcher presented this study.

RESEARCH PROBLEM:

1- Is there an effect of climate elements on the archaeological sites in the city of Warka?
2- Is there a discrepancy in the influence of climate elements on the archaeological sites in the city of Warka?
3- Is there an effect of climate elements on the archaeological samples in the archaeological sites in the city of Warka?

RESEARCH HYPOTHESIS:

1- There is an influence of climate elements on the archaeological sites in the city of Warka.
2- There is a discrepancy in the influence of climate elements on the archaeological sites in the city of Warka.
3- There is an effect of climate elements on the archaeological samples in the archaeological sites in the city of Warka.

RESEARCH IMPORTANCE :

Because of the importance of archaeological sites and the need to preserve them, and considering that climate is one of the important natural factors affecting the environment, with all its different elements, the researcher advanced to study this topic. And to use the results as a source for further research, and to find future plans to preserve and invest in archaeological sites.

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SEARCH OBJECTIVE:

Shedding light on the impact of the climatic factor on archaeological sites and antiquities samples therein, and the extent of their impact, and finding ways to reduce and preserve this impact.

SEARCH STRUCTURE:

The research included two topics preceded by an introduction, the first topic was (Climatic Characteristics of Al-Muthanna Governorate), and the second topic included (the influence of climatic elements on the archaeological sites in Warka) and the research included results and recommendations.

SEARCH LIMITS :

The limits of the study are represented in the archaeological city of Warka, which is located (12 km) from the Khidr district (1), and it is an administratively affiliated city to Al-Khidr district, near the lands belonging to the Al-Tawbah clans, which is a district belonging to the Muthanna governorate, which is located in the southern part of Iraq. It is bordered to the south by the Kingdom of Saudi Arabia, to the north by the Qadisiyah Governorate, to the west by the Najaf Governorate, to the east and northeast by the Dhi Qar Governorate, and to the east and southeast by the Basra Governorate. Map (1), the area of the province is (51740 km2) of the area of Iraq, which is (435,244 km2). The governorate has five districts: Al-Samawa, Al-Rumaitha, Al-Khidr, Al-Warka, and Al-Salman.

Terminology

1- **Warka:** The city of Warka is the modern name of the historical city (Uruk), which was also known as (Ark), and it was called (Warqa). [2]

2- Archaeological site: It is a place that contains the remains of a person from antiquity. [3]

3- Finds: they are pieces of antiques such as pottery, coins, and weapons, and they have importance through their inscriptions as they bear the dates of cities, their princes, rulers and others as important historical texts.[4]

4- Solar radiation:

It is energy released by the sun and all the planets derive heat from it. The sun's rays are divided into: 1- visible light rays, which constitute (37%) of the rays arriving from the sun 2- Invisible (infrared) rays constitute (46%) of the rays arriving from the sun . 3- Ultraviolet rays (12%).

5- Temperature:

((The degree of sensation of cold or heat, i.e. the state of heating a substance, so it is the energy that we feel through touch. Or it is measured by devices)). [5]

6- Relative humidity:

It is the percentage of water vapor in the air and the amount of water vapor needed to saturate the air at the same temperature. [6]

7- Wind: is the horizontal movement of air close to the surface of the earth, which results from different pressures. [7]

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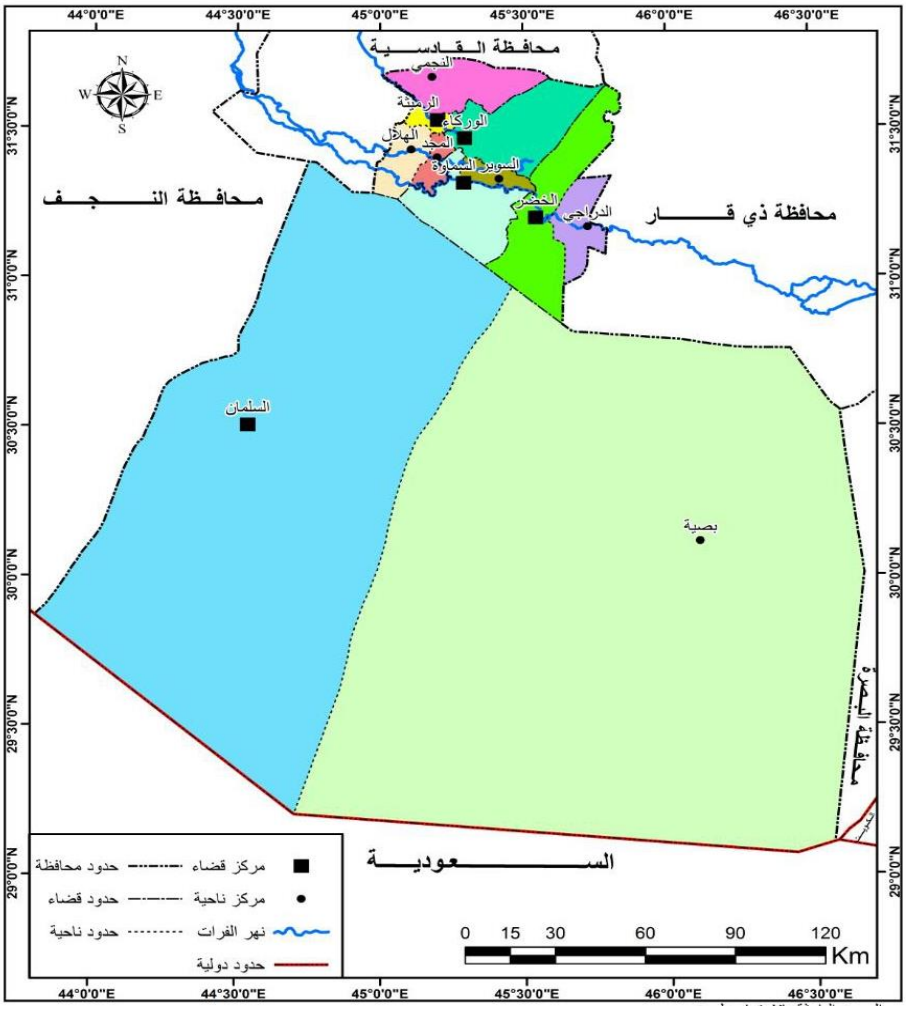
Map (1) of the administrative units in Al-Muthanna Governorate



Source: From the researcher's work based on: 1- Ministry of Water Resources, General Directorate of Survey, Map Production Department, Digital Unit, Iraq Administrative Map Scale (1000000:1) Baghdad, 2007. 2- Program (10:3 GIS ARC).

The first topic: (Climatic characteristics of Al-Muthanna Governorate):

The study area is characterized by the characteristics of a dry desert climate, and through the data of the Samawa station, we clarify the data of the following elements:

1- radiation solar; The study area receives a large amount of radiation, as it is evident from Table (1) that the average angle of incidence of solar rays reached (58,3), the highest was recorded in June, reaching (80.1), and the angle of solar radiation begins to decrease towards the southern half, due to The apparent movement of the sun after (23 September), recorded (35.4) in December, which is considered the lowest average. As for the annual average of the theoretical length of daylight hours, it was

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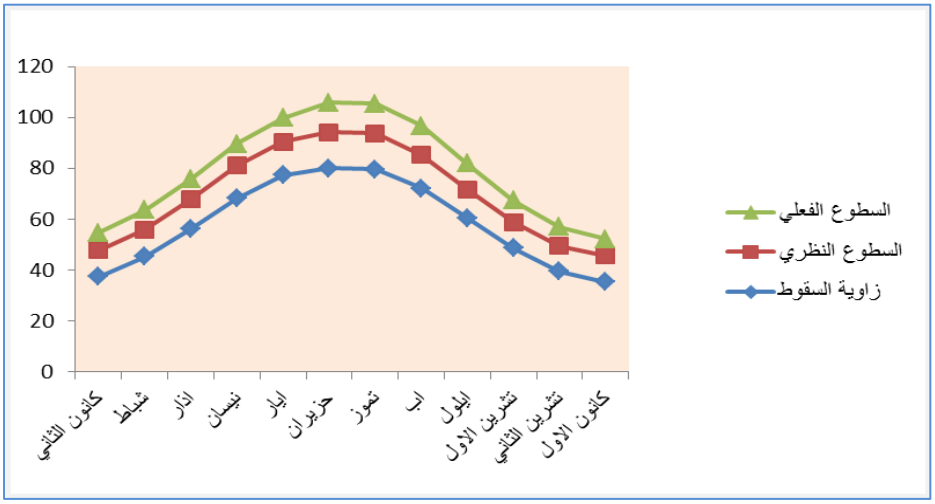
Table (1) Monthly averages of solar radiation angles and the number of theoretical and actual hours of solar radiation brightness (hour / day) for Samawa station for the period (1990 - 2020)

brightness Actual	brightness theoretical	angle of incidence	Months
6.9	10.2	37.5	January
7.7	10.5	45.3	February
7.9	11.5	56.2	March
8.5	12.9	68.2	April
9.3	13.2	77.3	May
11.6	14.1	80.1	June
11.7	14.2	79.5	July
11.4	13.1	72.1	Father
10	11.3	60.5	September
8.5	10.2	48.6	October
7.4	10.1	39.4	November
6.4	10.4	35.4	December
8. 9	11.8	58.3	annual rate

Source: The researcher based on the Ministry of Transport and Communications, the Iraqi General Meteorological Authority, Climate Department, unpublished data, 2020.

Figure (1) Monthly averages of solar radiation angles (degrees), day length (hour/day) and solar radiation (hour/day) at Samawa station for the period (1990 - 2020).



Source: the researcher based on table (1)

(11.8) hours, which helped that the region receives a large amount of solar radiation, and this helped raise the temperatures there. The annual average of actual brightness was recorded (8.9) hours. shape (1)

2- Degree heat:

It is clear from Table (2) and Figure (2) that the annual average of the normal temperature reached (25.2 m5), and the monthly rates of solar radiation angles and the number of theoretical and actual hours of solar radiation brightness (hour/month) for the temperature in the study area are characterized by a gradual increase starting from March when I reached

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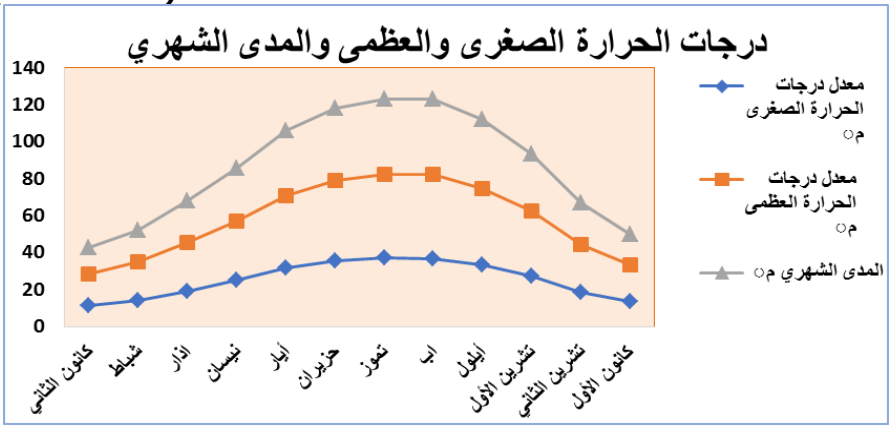
Table (2) Monthly averages of normal, minimum and maximum temperatures in the study area.Samawa station (1990 – 2020)

Monthly ◦ range m	modified grades Maximum temperature C ◦	Average minimum temperature ◦ m	Normal average temperature m ◦	Months
14.3	17.3	6.1	11.3	January
17.3	20.7	7.8	14.0	February
22.7	26.3	12.3	19.1	March
28.5	31.9	17.9	25.1	April
35.3	38.9	23.6	31.7	May
39.4	43.3	26.6	35.5	June
41.0	44.9	28.1	37.2	July
41	45.2	27.7	36.8	Father
37.3	41.6	24.1	33.1	September
31.1	35.1	19.6	27.1	October
22.2	26.2	12.9	18.3	November
16.5	19.6	8.1	13.5	December
28.9	32.6	17.9	25.2	annual rate

Source: The researcher based on the Ministry of Transport and Communications, the Iraqi General Meteorological Authority, Climate Department, unpublished data, 2020.

Figure (2) Monthly averages of normal, minimum and maximum temperatures in the study area of the station Samawa (1990 - 2020)



Source: the researcher based on table (2)

519.1 m) and continued to increase to reach its maximum rates in the month of June. The highest temperature was recorded in July, reaching (37.2 °C), while the lowest temperature was recorded in January, reaching (11.3 °C).

A- Minimum temperatures:

The annual average of minimum temperatures was (17.9 °C), while the lowest monthly averages in the cold season were (6.1 °C) in January, while the monthly averages of minimum temperatures during the hot months recorded their highest rates in July, reaching (28, 1 m 5).

b- Maximum temperature:

It is evident from Table (2) that the annual average in the study area station of the maximum temperature rates was

(32.6 m5), recording its highest rate in the month of (August), reaching (45.2 m5). While the temperature drops in the cold season, the lowest temperature was recorded in January, reaching (17.3 °C)

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3- Relative humidity:

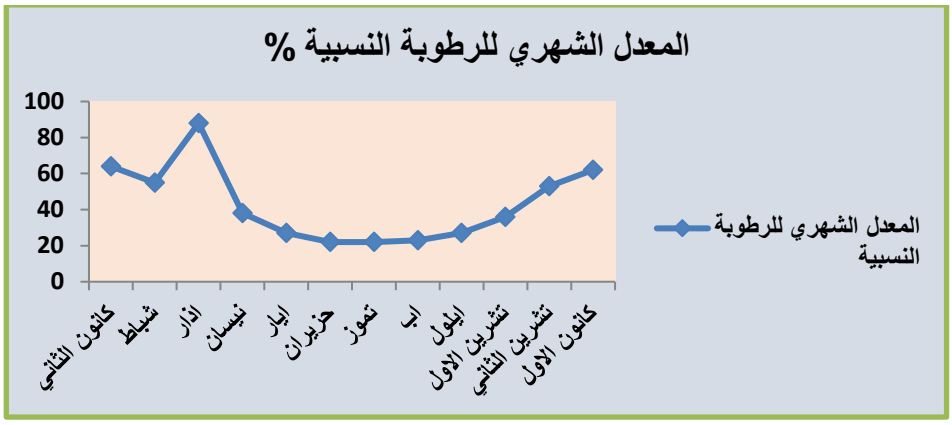
The annual average of humidity levels reached (43.1%) Table (3) Figure (3), as the relative humidity recorded in the hot season the lowest monthly rates in (June and July), reaching (22%) for both, while the cold season recorded high relative humidity rates in In January, it amounted to (64%) due to low temperatures and rainfall.

Table (3) Monthly averages of relative humidity (%) at Samawa station for the period (1990 - 2020

annual rate	December	November	October	September	Father	July	June	May	April	March	February	January	Months
43.1	62	53	36	27	23	22	22	27	38	45	55	64	the average monthly

Source: The researcher based on the Ministry of Transport and Communications, the Iraqi General Meteorological Authority, Climate Department, unpublished data, 2020.

Figure (3) Monthly averages of relative humidity (%) at Samawa station for the period (1990 - 2020)



Source: the researcher based on table (3).

4- Wind speed and direction:

Table (4) and Figure (4) show that the annual average wind speed in the study station was (3.3 m/s), and high wind speed rates were recorded in June, reaching (4.3 m/s), and these rates decreased in months (November, December and January) recorded (2.5, 2.6, 2.7 m/s) respectively. As for the direction of the winds in the study station, it is clear from Table (5) that the prevailing winds are the northwest winds, which recorded (25.1%), and the western winds came in second place, which amounted to (22.4%), while the northern winds were in the third place, as they It reached (12.6%), and in the fourth place was the eastern wind, which recorded.

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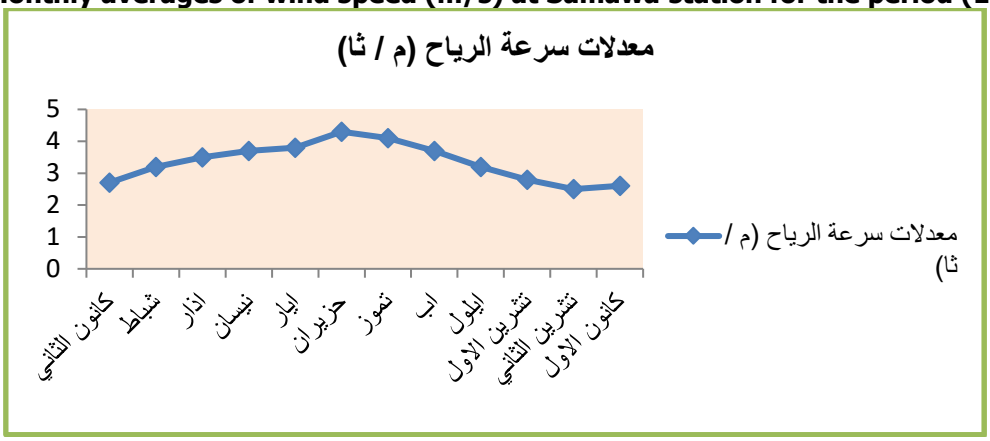
Table (4) Monthly averages of wind speed (m/s) in the study area for the period (1990 - 2020)

rates monthly l wind speed (m/ s)	Months
2.7	January
3.2	February
3.5	March
3.7	April
3.8	May
4.3	June
4.1	July
3.7	Father
3.2	September
2.8	October
2.5	November
2.6	December
3.3	annual rate

Source: The researcher based on the Ministry of Transport and Communications, the Iraqi General Meteorological Authority, Climate Department, unpublished data, 2020.

Figure (4) Monthly averages of wind speed (m/s) at Samawa station for the period (1990 - 2020)



Source: the researcher based on table (4).

Table (5) Percentages of the frequency of prevailing wind trends for the Samawa station (1990 - 2020)

the total	stillness	Northeast	orient al	southeast	southern	southwest	western	North west-	north	Wind direction
100 %	11.5	5	8.8	6.5	3.5	4.6	22.4	25.1	12 6.	the average

Source: researcher based on the Ministry of Transport and Communications, the Iraqi General .Meteorological Authority, Climate Department, unpublished data, 2020

(8.8%), and the percentage of the southern winds reached (3.5%), and the wind directions are varied in the study area, due to its location in the southwest of the sedimentary plain, which helped to reach the winds from all directions.

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5- RAIN:

The rainfall in the study area is characterized by its fluctuation from one month to another, as it is evident from Table (6) that the rainfall begins in the month of September, as the monthly total of rain was recorded (0.3 mm) due to the high temperature in the month

Table (6) The monthly total of rainfall (mm) in the study area for the period (1990 - 2020)

rates monthly to fall off rain ((mm	Months
22.4	January
18.3	February
13.2	March
12.2	April
4.1	May
0.0	June
0.0	July
0.0	Father
0.3	September
5.2	October
14.8	November
20.3	December
9.2	Annual total

Source: The researcher based on the Ministry of Transport and Communications, the Iraqi General Meteorological Authority, Climate Department, unpublished data, 2020.

September as it reached (33.1m5). The actual precipitation begins in October, as it reached (5.2 mm), and the amount of rainfall increases in December, reaching (20.3 mm), while it reached its highest in January, when It reached (22.4 mm) due to the increase in the frontal depressions coming from the Mediterranean Sea. While there is no rainfall in the months of (June, July, and August) due to the predominance of the incoming subtropical marine air masses (mT), the annual total of rainfall is (9.2 mm).

The second topic: (the effect of climatic elements on the archaeological sites in the city of Warka):

Preamble:

Climate is one of the important natural factors that have a significant negative impact on archaeological sites, including (solar radiation, temperature, relative humidity, wind speed, and rain). Her, only if he took the means to maintain these sites. The sites of Al-Muthanna Governorate, especially the city of Al-Warka, the first civilized city in the ancient world, the subject of research, and other cities were affected by natural (climatic) factors.

First: The spatial distribution of archaeological sites in Al-Muthanna Governorate: The history of Iraq is brimming with antiquities and the growth of civilizations, and Muthanna governorate is one of the governorates in which many historical and cultural archaeological sites are spread, and the most prominent of these sites is the city of Warka, which is one of the archaeological sites that have an important cultural importance in the history of Iraq. The governorate, and we will shed light on the most important places of its distribution in the governorate, map (2).

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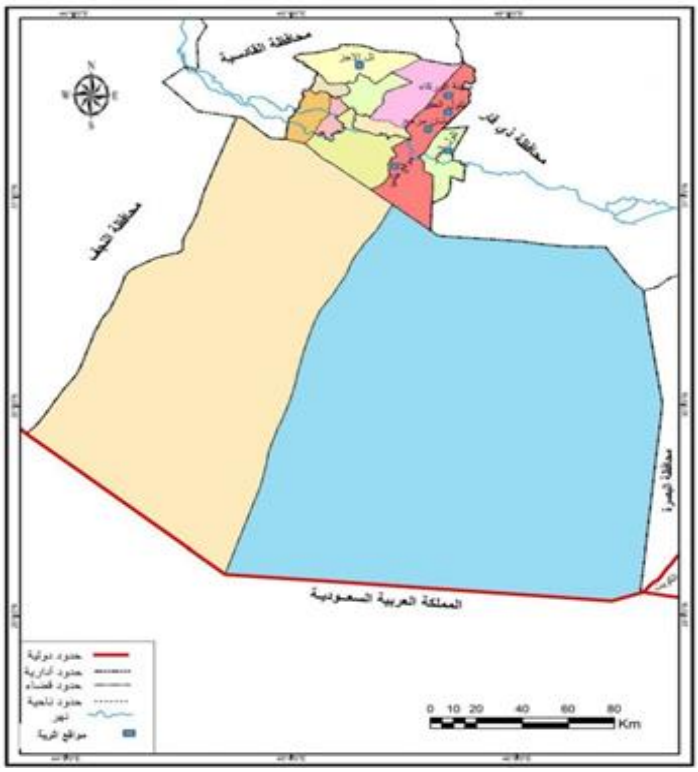
Map (2) archaeological sites in Al-Muthanna Governorate



Source: From the researcher's work based on: 1- Ministry of Water Resources, General Directorate of Survey, Map Production Department, Digital Unit, Iraq Administrative Map Scale (1000000:1) Baghdad, 2007. 2- Program (10:3 GIS ARC).

First: The sites affiliated to (Al-Rumaitha District):

1- The site of (Tel Al-Ajz): This hill is located in the Najmi district, and its height is (5 m) and its area is (15,000 m2). The time of this hill dates back to the Parthian occupation.

Second: Sites affiliated to (Al-Khidr District):

1- Ishaan Merhej site: This site is located in the village of (Al-Adour), and it is a hill that has not been excavated, and it is not guarded.

2- The site of the Afar hills: it is an unexcavated hill, and it dates back to the Parthian era as well as the Islamic era.

3- Talli site: It is located near the village of Al-Tawail. It is one of the large archaeological hills that have not been excavated until now, and its height is approximately (10 m), and its area is (17500 m2). It is located between the Al Jawaber clan and the Al Ziyad clan.

4- Tulul Al-Hamr: It is a group of hills within several provinces (Al-Khader, Al-Daraji, and Ain Seid). It was identified through broken pottery obtained by the excavators of the area, most of which date back to the Babylonian era. This site has been exposed to a lot of theft and illegal excavation, especially in the year 1991.

In addition to the site of the antiquities of Warka, which is one of the most important sites in the governorate in general. We will discuss it in some detail.

5- The city of Warka: It is one of the most important sites from which the Mesopotamian civilization was launched, and we will shed light on it in detail.

Second: A historical overview of the city of Warka:

The city of Warka is one of the ancient cities that the Sumerians inhabited and built their great civilization in. The construction of the city of Warka dates back to the fifth millennium BC. AD, the city of Warka is located in the district of Al-Khader in the Muthanna Governorate, on the eastern side of the ancient site of the Euphrates. They used clay tablets and papyrus reeds as writing tools, and many arts, including agriculture, construction, architecture, and literature, were found on its lands. The pottery in it was divided into three phases called the Warka phase (the ancient, the middle, and the modern) (8). And the most famous of its kings (Gilgamesh, Watu Hekal), and the

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Seleucids, Achaemenids, Persians, Parthians, Assyrians and others followed it, and the control of the Essen dynasty continued over it until the time of its king. The reeds covered with mud, while the inhabitants of the lands with rocks used the nests. The first of their dwellings were the houses of poetry and bricks that they built on the banks of the river during the period of solid stone to build the walls of their homes, after that they used roasted bricks (10). The brick building, picture (1). The inhabitants of Mesopotamia, in general, had a technique in construction, including the inhabitants of southern Mesopotamia in the city of Warka. In the construction process, they took into account the weather and climate conditions, which made this construction continue for a long time, but with the passage of time and with the climatic conditions and the lack of scientific maintenance of it from the fluctuations of the weather began to be affected These buildings are in these conditions.

Picture (1) The Seleucid temple in the archaeological sites of the city of Warka

Source: A scientific visit with students of the fourth stage, Faculty of Arts, Department of Archeology 2022

Third: The climatic factors affecting the archaeological sites in the city of Warka:

1- Solar radiation:

Solar radiation affects archaeological sites (buildings) and extends its impact on the building material. When the weather is clear and the relative humidity decreases, temperatures rise, and solar radiation heats the walls to a high degree, while the building material varies according to the building, as one wall contains Many building materials differ in their mineral compositions, as each metal has a coefficient of expansion that differs from the other metal. It has the property of heat loss and gain according to its color and construction materials, where dark colors absorb solar rays to a large extent compared to light colors that absorb solar rays to a lesser degree. Through Table (1), the monthly average of the theoretical brightness in the study station for the summer months (June, July and August) was recorded (13.8 hours/day). The highest was recorded in July, reaching (14.2 hours/day), while the monthly average of actual brightness was recorded for the same summer months (11.6 hours/day). The highest was recorded in July, reaching (11.7 hours/day). This indicates that the region has received (actual and theoretical) hours of solar brightness. The effect of this led to the exfoliation of the columns of the temples and the separation of their walls, especially those built of mud (11). This was reflected on the buildings and temples of the archaeological sites in the city of Warka, especially those that were built of clay. Cooling and heating showed their effect on shrinkage in the building material, which led to cracks in it (12). The writings and inscriptions on the antiquities samples found in these archaeological sites were subjected to fading and lack of clarity, picture (2)

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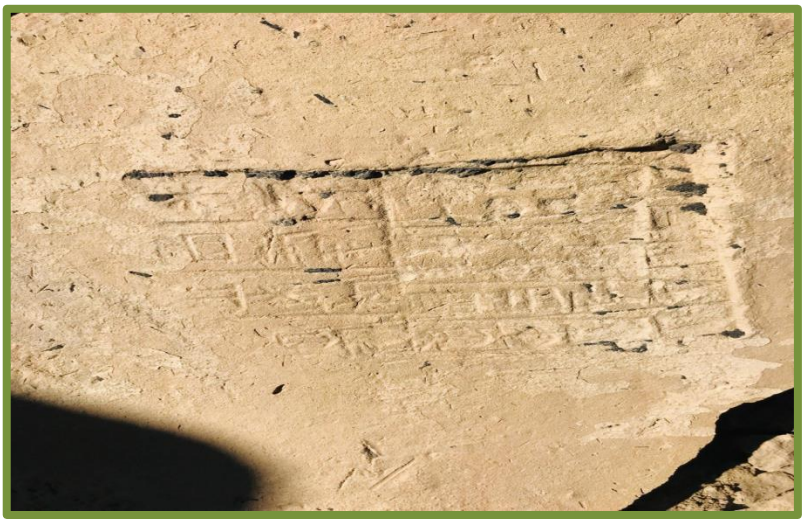
Picture (2) The writings and inscriptions exposed to the sun in the archaeological sites in the city of Warka



Source: A scientific visit with students of the fourth stage, Faculty of Arts, Department of Archeology 2022

Second, the temperature:

Sites and buildings are affected by temperature, and the effect of temperature varies according to distance and proximity to the sun during the Earth's rotation around it. Where the high temperature affects the outer surfaces more than the inner surfaces. The high temperature, especially on the roofs or facades of archaeological sites and buildings exposed to the sun, especially those bearing colored writings and inscriptions, led to fading colors and blurring of the writings, and since the relationship between temperature and humidity is an inverse relationship, the increase in temperature leads to a decrease in humidity, and through what It was presented from the temperature characteristics in Al-Muthanna Governorate in Table (2), the high temperature in the hot season led to the drying out of building materials or wood panels and thus to their breaking. As a result of the occurrence of the study area in the field of dry desert climate, this affects the temperature variation between night and day, as the monthly averages of minimum temperatures for the hot months recorded the highest rates in the month of July, reaching (28.1 m5). And that the annual average in the station of the study area of the maximum temperature rates reached (32.6 m), the highest rate recorded in the month (August), which amounted to (45.2 m), this discrepancy affects the building materials in the archaeological sites where the expansion works. And shrinkage on the continuous expansion of the outer surfaces and on their shrinkage, and the variation in temperatures between night and day works if the drought reaches its maximum, it works to crack the parts of the materials included in the construction, and when the temperature drops, the building materials represented by stones and bricks in the buildings of the city of Warka are soaked with water, which leads to their damage . Thermal variation in the study area has a severe impact on the occurrence of physical weathering processes, especially in buildings that have multiple

It has building materials such as the city of Warka, whose materials, as we mentioned, consist of clay and stones due to the different coefficients of expansion and contraction, which leads to the deterioration of these buildings (13).

Third: relative humidity:

The high relative humidity affects archaeological sites in terms of damage to buildings by molds, as its enzymatic device converts cellulose in wood into simple-composition materials that dissolve in water, in addition to its oxidation and conversion to carbon dioxide in order to convert into energy needed for its continued existence, and this leads to wood shrinkage. Which is used for ceilings as well as for walls (14). It also affects the lack of cohesion of the plaster in the

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building, while the low relative humidity leads to the breakdown of organic materials.

The effect of the relative humidity is not only on the archaeological sites, but the effect on the samples of bricks and finds is picture (3). As for the sources of moisture, rain is an important source of moisture and has a significant impact on the sites

Picture (3) samples of bricks and pottery fragments affected by climatic elements.

Source: A scientific visit with students of the fourth stage, Faculty of Arts, Department of Archeology 2022

And the archaeological buildings, as the penetration of rain inside buildings while falling on the roofs of buildings leads to the loss of inscriptions and colors, and the melting of the bonding materials for the granules of stone blocks (15). Through Table (3), we find that the study area receives the highest relative humidity of (64%) during the winter season in January, while it receives the lowest relative humidity, which amounted to (22%) in the winter season (June and July). The high humidity is considered a vector medium and incubator for the presence of microorganisms in the sites and buildings of the city of Warka, as it is affected by the humidity of the characteristics of the region. While moisture is responsible for damage to buildings caused by freezing in the event of a drop in temperature. While drought cracks building materials, as mentioned earlier.

Fourth, the wind:

Iraq is affected by two types of winds, winds coming from the Mediterranean, which are northwesterly winds, characterized by being cold and humid, and the other winds are winds resulting from Asian pressure that are east winds, falling in the center and south of Iraq, and resulting in rain with a rise in relative humidity (16) . The study area is affected by the northwest and southwest winds, and the wind performs its work through the grooves in the rocks, which works on lines in the rock through the sand they carry as it blows, which is what happens in desert rocks and buildings. Also, its wind speed and direction have a major role in the damage to buildings, when its direction is parallel to the surface of the buildings, its effect will be in the form of straight lines, which affects the building in general and the writings and decorations on the buildings is a special form, but when the direction is vertical, the effect appears In the form of a circular cavity, while the wind speed is affected when its speed increases as it is more capable of carrying sand with large grains, which sculpts the building and changes its features (17), especially if the building materials are bricks and bricks. With dust, especially the sites that have not yet been excavated, which helped the wind to make and paint the buildings, picture (4). The city of Warka, according to the climatic characteristics of the region, is exposed to a maximum wind speed of (4.3 m / s) in June. Archaeological and historical buildings, and whenever the wind removes layers from the sites and buildings of the region, it exposes them to weathering factors. The wind also deposits what it carries on these buildings to cover the buildings of the city of Warka when its speed decreases

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Picture (4) archaeological sites covered with dust in the ancient city of Warka

Source: A scientific visit with students of the fourth stage, University of Al-Muthanna, College of Arts, Department of Archeology 2022.

Fifthly, rain:

The rain factor is one of the most influential factors in the archaeological sites, as it works on the disintegration of building materials and mortar, and the dissolution of the materials that bind the grains of the stone blocks, in addition to the fading of the inscriptions in the building. Or the reeds between the rows of mud or mud in the walls to increase the cohesion of the building for fear of flooding, as well as in the roofs of the building to prevent rain from leaking into it, and they created square holes inside the buildings through which rain was extracted (18). At the present time, these buildings have been neglected, which has exposed the ruins and buildings of the city of Warka to the danger of rain as a source of moisture inside the building materials. When the study station is exposed to the frontal depressions coming from the Mediterranean, the amount of rain increases, as it reached its highest in January, reaching (22.4 mm). To increase the amount of carbonic acids that fall with rain, and some of it dissolves in the air with raindrops, forming carbonic acid, and seeps into buildings, causing parts of them to lose or collapse, as we note in construction sites in the city of Warka, which can be completely affected if it is not maintained Or to avoid the danger of these rains, as the sulfuric acid falling with rain caused damage to these buildings (19). Picture (5).

Picture (5) The effect of the rain factor on the archaeological sites in the ancient city of Wark

Source: A scientific visit with students of the fourth stage, University of Al-Muthanna, College of Arts, .Department of Archeology 2022

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CONCLUSIONS:

1- The buildings and sites of the archaeological city of Warka are affected over time by climate factors, which showed their effects from the fading of decorations and colors.
2- As a result of the location of the study area in the dry desert climate, this affects the temperature variation between night and day, which leads to expansion and contraction.
3- The thermal variation in the study area has a strong impact on the occurrence of physical weathering processes, especially in buildings in which there are many building materials, such as the city of Warka, whose materials consist of clay and stones.
4- The wind works to remove the surface layer of antiquities buildings in the city of Warka, and it is also affected when the soil it carries is deposited on the surfaces of the buildings and accelerates the process of erosion.
5- The buildings and samples of antiquities were also affected by the elements of the climate, not the loss of sites and buildings, as it led to the fading of colors on the brick samples and found in them.
6- Rain carries the amount of carbonic acids resulting from an increase in carbon dioxide in the atmosphere, which leads to its precipitation with rain.

RECOMMENDATIONS:

1- Preserving the archaeological sites in the city of Warka from the influence of climatic and other factors, preserving them from extinction and making them an economic tourist place for the country.
2- Establishing a rainwater drainage network so that water does not collect on the walls of the buildings.
3- Covering the ceilings and walls to protect them from the effects of rain water.
4- Removing dust and debris from the ancient buildings in the city of Warka.
5- Working on ventilating buildings and sites to get rid of high humidity.

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