

ARMCHAIR ARCHAEOLOGIST



A PRELIMINARY HYPOTHESIS REGARDING
KIVA ARCHITECTURE, SHALLOW AQUIFERS,
AND THERMALLY INDUCED
VACUUM-ASSISTED WATER EXTRACTION



PRESENTED BY

Mark Melni

armchairarchaeologist.com

Website/Booklet by Al Herrin



WHAT IS A KIVA?

A kiva (kee-vah) is a circular, underground room built by the Ancestral Pueblo people more than 1,000 years ago.

Kivas were an important part of village life in the Southwest and served many purposes, including sacred ceremonies, community gatherings, and teaching.



Inside a kiva at Mesa Verde National Park, Colorado.

KEY FEATURES

- ◆ Underground, circular rooms
- ◆ Constructed of stone and adobe
- ◆ Entered through a small, square opening in the roof
- ◆ A central fire pit or hearth
- ◆ Ventilation shafts to the surface
- ◆ Bench seating along the walls
- ◆ Often decorated with symbolic paintings and objects



A kiva in the Great House at Chaco Canyon, New Mexico.



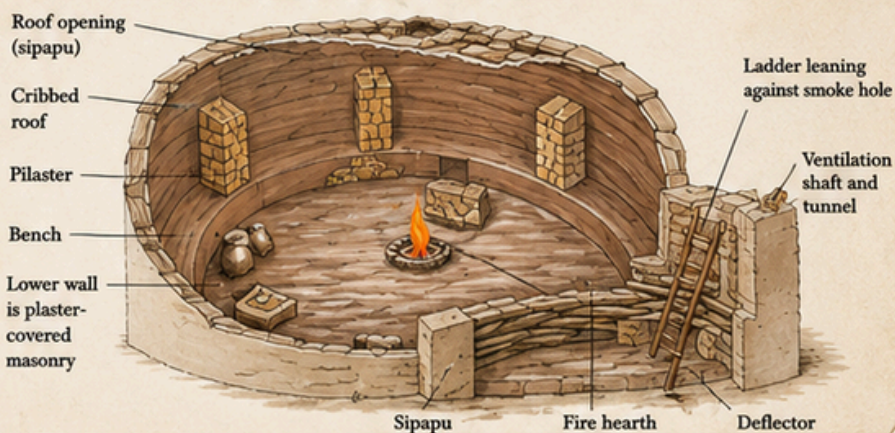
Typical entrance to a kiva through the roof.

MORE THAN JUST A ROOM

Kivas are considered to be sacred spaces that connected people with the natural world, their ancestors, and the spiritual forces that sustained life. Archaeologists believe that knowledge, stories, and traditions were passed down through ceremonies held in these special places.



ANATOMY OF A KIVA



CHACO CANYON

A CENTER OF ANCIENT INNOVATION

Chaco Canyon, located in northwestern New Mexico, was the heart of a vast ancient cultural system that flourished from about 850 to 1150 CE.

This high desert region was home to extraordinary communities and some of the largest and most sophisticated buildings in North America at the time.

At the center of many great houses are kivas—mysterious, circular underground rooms that continue to inspire questions and research today.



Pueblo Bonito, the most famous great house in Chaco Canyon, contains more than 650 rooms and several kivas.

WHY CHACO WAS SPECIAL

- ♦ Strategic location at the crossroads of ancient roads.
- ♦ Access to far-reaching trade networks that brought turquoise, seashells, copper, and more.
- ♦ Advanced planning, astronomy, and engineering.
- ♦ A center for ceremony, learning, and community connection.



“Chaco was not just a place—it was a hub of ideas, innovation, and spiritual life that influenced communities across the Southwest.”

OTHER PLACES WITH KIVAS

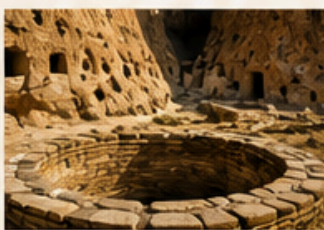
While Chaco Canyon is one of the most famous centers for kivas, they have been found in many other places throughout the Southwest.

MESA VERDE COLORADO



Home to hundreds of cliff dwellings and more than 600 kivas. Mesa Verde was occupied by the Ancestral Pueblo people from about 600 to 1300 CE.

BANDOLIER NATIONAL MONUMENT NEW MEXICO



Contains both surface and subterranean kivas. These sites were occupied between 1150 and 1600 CE.

AZTEC RUINS NATIONAL MONUMENT NEW MEXICO



Features the Great Kiva, one of the largest kivas in the region, dating to approximately 1100 CE.

SALMON RUIN NEW MEXICO



A well-preserved site with several kivas that provide valuable insight into daily life and culture.

DOWSING

An Ancient Practice. A Personal Connection.



DEFINITION

Dowsing is the practice of using a tool, such as dowsing rods or a pendulum, to detect and locate hidden features or substances. It is based on the idea that subtle energies or vibrations can be picked up by the body and amplified through the tool, leading to involuntary movements that indicate the presence of what is being sought.



COMMON USES



WATER SOURCES

Locating underground water, wells, and aquifers.



MINERALS & METALS

Finding minerals, metals, and valuable geological deposits.



NATURAL FEATURES

Identifying fault lines, caverns, and other geological features.



BUILDING SITES

Evaluating land for construction and harmonious living.



LOST OBJECTS

Locating lost items, buried objects, or important things.



HOW IT WORKS

Dowsing is believed to work through the unconscious mind and the body's sensitivity to subtle energy fields.

The dowser remains relaxed and open, allowing the body to respond naturally to what it detects.



THE SCIENCE BEHIND CUPPING

— A Simple Experiment. A Powerful Healing Practice. —

For thousands of years, cultures around the world have used cupping therapy to promote healing, relieve pain, and improve circulation.

At the heart of cupping is the same natural principle demonstrated by a simple candle experiment—air, heat, and pressure.



Heat removes oxygen from the cup. As the air cools, pressure drops—drawing skin, tissue, and blood upward into the cup.

THE CANDLE EFFECT: HOW CUPPING WORKS

1 HEAT AND EXPANSION

The flame heats the air inside the cup. These hot air molecules expand and rise, forcing some air to escape.



2 COMBUSTION AND COOLING

When the flame goes out, the trapped air cools. The air molecules slow down and contract.



3 PRESSURE DROP

Cooler air means less pressure inside the cup. Higher pressure outside pushes the cup down. The skin and tissue are drawn up into the cup.



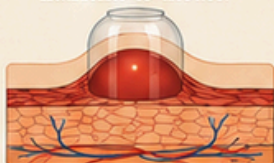
FROM EXPERIMENT TO HEALING

Cupping uses the same natural laws of air and pressure to create beneficial effects in the body.



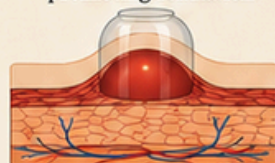
INCREASED CIRCULATION

The suction draws blood flow to the area, helping deliver oxygen and nutrients to tissues.



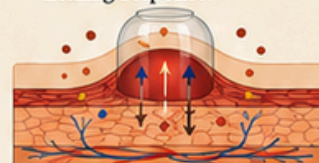
RELIEVES TENSION

Cupping helps release muscle tightness and fascia restrictions, promoting relaxation.



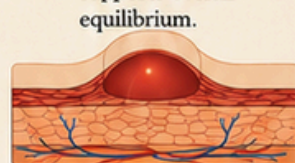
SUPPORTS NATURAL HEALING

It can help reduce inflammation, flush toxins, and support the body's healing response.



BALANCES THE BODY

By restoring healthy flow and reducing stagnation, cupping supports overall equilibrium.



ANCIENT WISDOM. NATURAL PRINCIPLES. LASTING BENEFITS.

From a simple candle to a time-honored healing art, the power of air and pressure continues to inspire wellness today.



armchairarchaeologist.com



Website/Booklet by Al Herrin

HOW IT WORKED

The Process Inside the Kiva

- A** Fire is started, and small containers of water are placed around the fire to produce steam.



- B** Heat in the room increases to about 375 degrees.



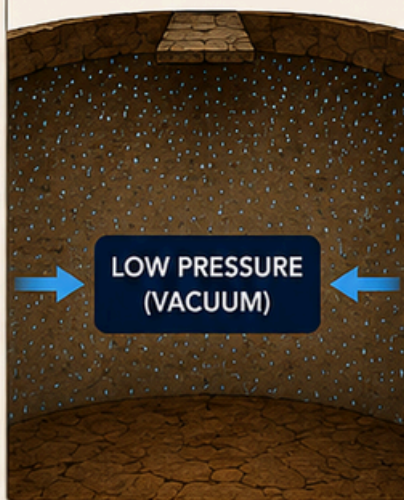
- C** The downward flue and the smoke hole are covered with an airtight door.



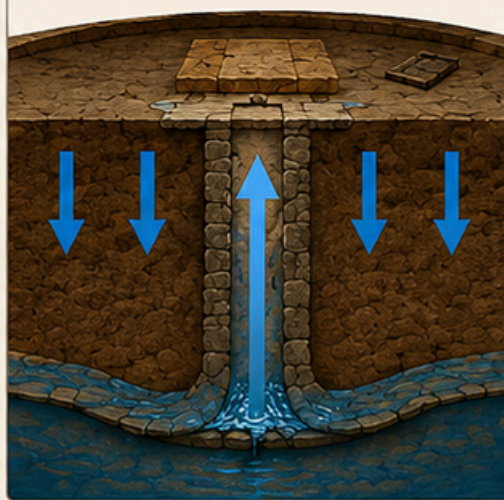
- D** The fire consumes the remaining oxygen (this produces the first vacuum).



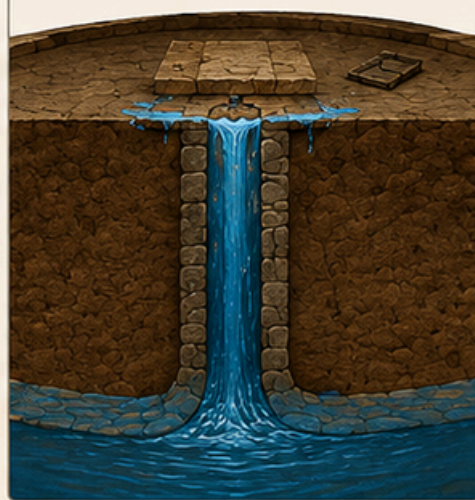
- E** The condensation of the atmosphere causes the internal pressure to drop.



- F** Atmospheric pressure pushes groundwater upward while producing a secondary vacuum.



- G** Water comes up through the sipapu.



Through heat, steam, and pressure changes, the kiva naturally draws water up from the earth — demonstrating the power of atmospheric pressure and the genius of ancient design.

A SIMPLE EXPERIMENT, A POWERFUL PRINCIPLE.

➤➤➤ *The Miniature Kiva Experiment* ◀◀◀

Long before steam engines and modern technology, the people of the Southwest understood the power of air pressure and vacuums. This simple experiment using a miniature kiva demonstrates the same principles that make the Newcomen Atmospheric Engine work.

➤➤➤ THE EXPERIMENT ◀◀◀

- 1 A small tee is placed in the center hole of the miniature kiva.
- 2 Heat is applied inside the kiva, which drives air out the top opening.
- 3 As the fire stops, the air inside cools and contracts, creating a vacuum.
- 4 Atmospheric pressure from outside pushes down on the tee, forcing it up out of the hole.
- 5 Water is drawn up through the porous walls and forms around the bottom—just as it would in an ancient kiva.

◆ WHAT HAPPENS ◆

1 BEFORE THE VACUUM

The tee sits in the hole.



2 AFTER THE VACUUM FORMS

Atmospheric pressure pushes the tee up and water comes up around the bottom.



➤➤➤ THE SCIENCE BEHIND IT ◀◀◀

Heat causes air to expand and escape. When the heat is removed, the air cools and contracts, creating a vacuum inside. Atmospheric pressure from outside is greater than the pressure inside, so it pushes the tee up and draws water into the kiva.



HIGH PRESSURE OUTSIDE

The weight of the air above pushes down.



LOW PRESSURE INSIDE

Cool air creates a partial vacuum.



WATER RISES

The pressure difference pulls water up through the ground.

These same natural laws of air, heat, and pressure were used by ancient people—and later by inventors like Thomas Newcomen—to do great work.



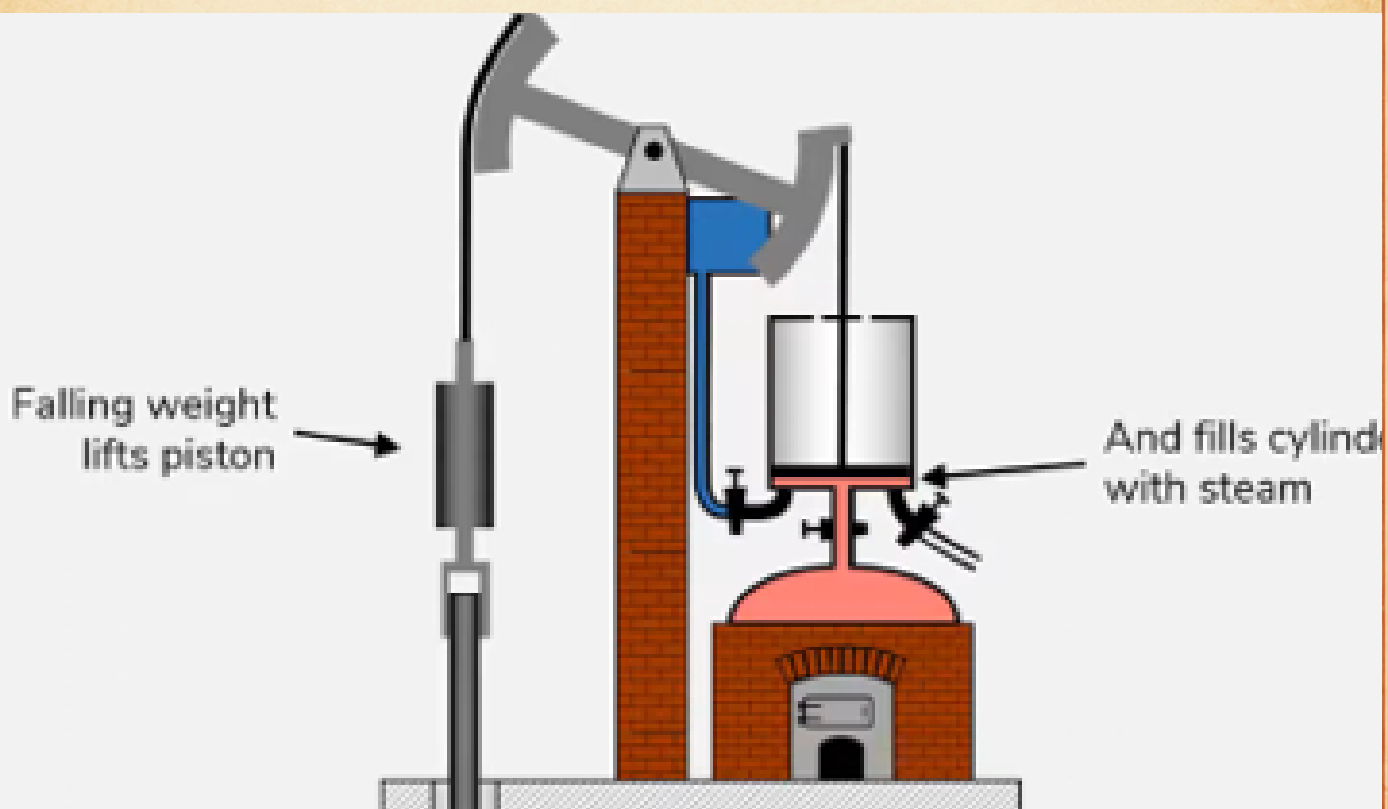
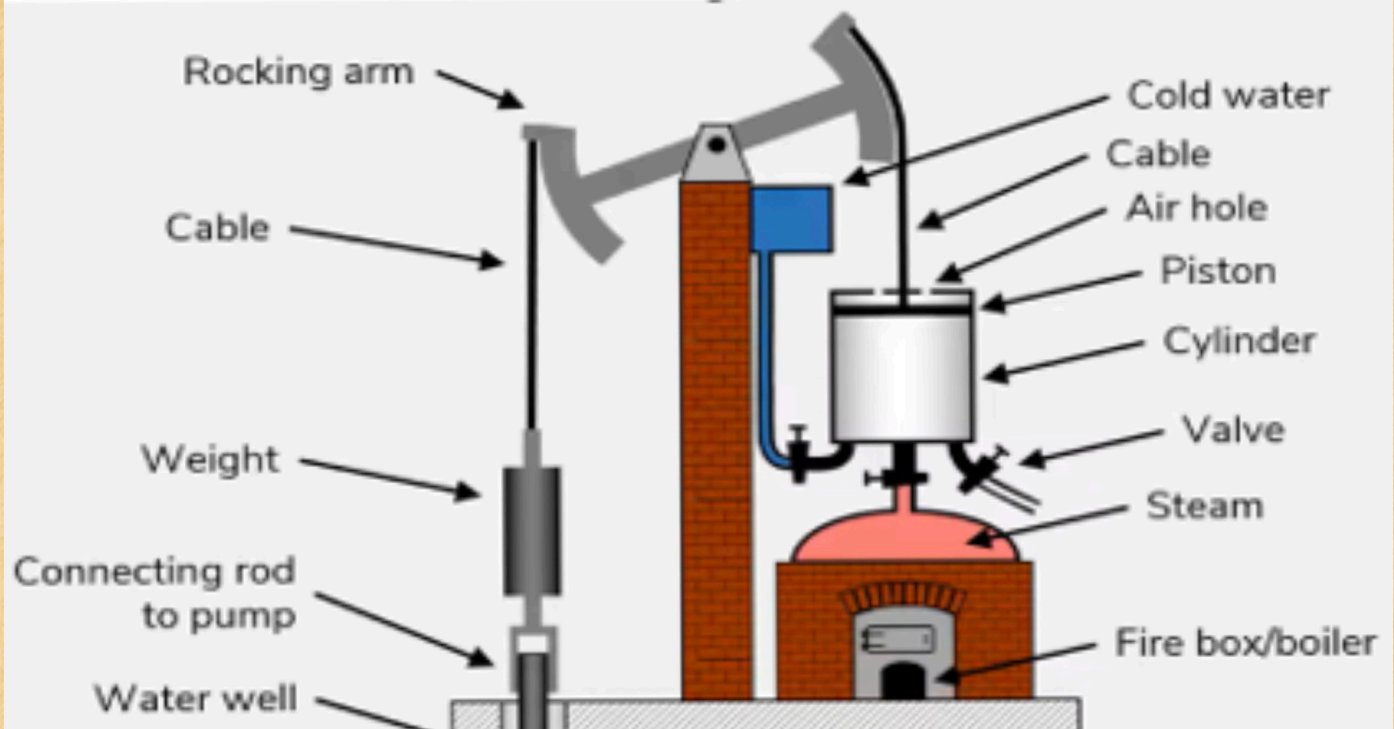
Understanding nature. Using simple tools. Solving big problems.
This is the genius that connects ancient wisdom
with the inventions that shaped our world.



HOW THE NEWCOMEN ATMOSPHERIC ENGINE WORKS

Turning Steam and Pressure into Power

1712 Newcomen Atmospheric Engine

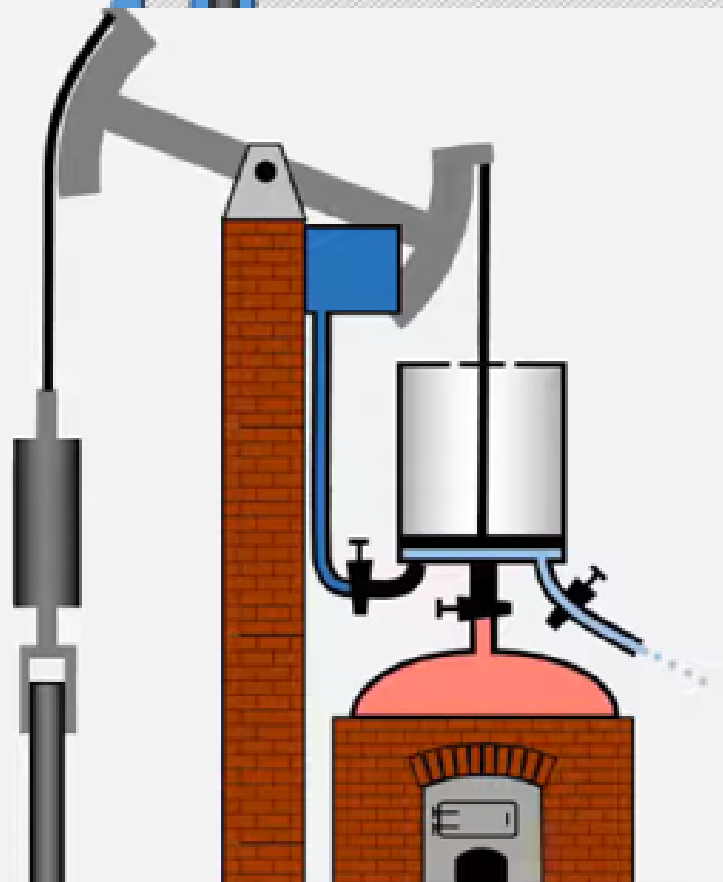


Work = force $\times$ distance

Lifting water
from pump

While air pushes
down on piston
to do work

Cold water
spray condenses
steam creating
partial vacuum



Pressure Pushes water out

SAME PRINCIPLE. DIFFERENT MACHINES.

Separated by thousands of years, these two systems use the *same natural laws* to move water.

ANCIENT KIVA



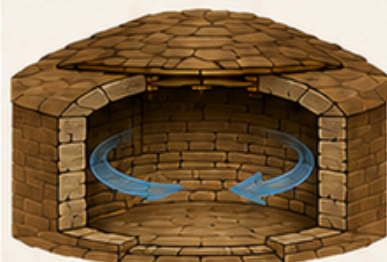
Heat from the fire warms the air inside the kiva.

HEAT



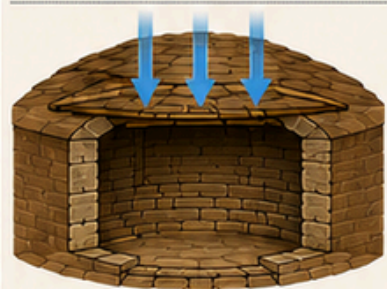
Cooler air enters and pushes the warm air out the roof vent.

COOLING



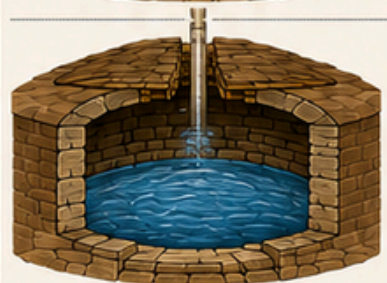
Warm air leaves, cooler air cools, creating a partial vacuum.

VACUUM



Atmospheric pressure pushes down on the water outside the kiva.

ATMOSPHERIC PRESSURE



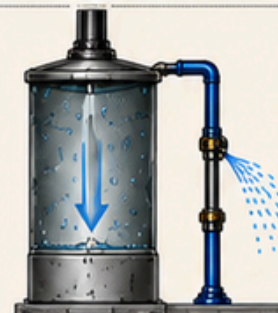
The pressure moves water from outside the kiva and into the well.

WATER MOVEMENT

NEWCOMEN ENGINE



The fire heats water in the boiler, turning it into steam.



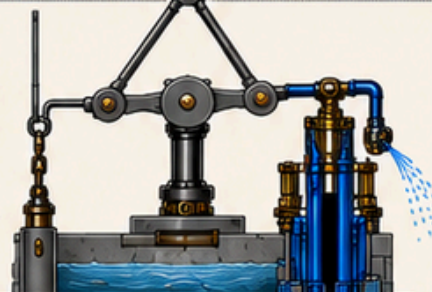
Cold water is sprayed into the cylinder, cooling the steam.



Steam condenses into water, creating a partial vacuum.



Atmospheric pressure pushes down on the piston.



The pressure lifts the piston, pumping water out of the mine.

A LEGACY THAT INSPIRES

➔ *From the Past, Guidance for the Future* ➔

The people who built Chaco Canyon were master planners, skilled engineers, and strong community leaders. They used the resources around them wisely and worked together to create places that continue to teach, inspire, and connect us today.



The kivas of Chaco remind us that great things are possible when people share knowledge, work together, and respect the land.

LESSONS FOR TODAY



COMMUNITY MATTERS

The Chacoan people built more than buildings—they built relationships, traditions, and a sense of belonging that lasted for centuries.



INNOVATION ENDURES

Through observation, creativity, and problem-solving, they designed spaces that were advanced for their time and still impress us today.



RESPECT THE EARTH

They lived in balance with nature, using what they needed and caring for the land that sustained them—for generations.



LOOK TO THE FUTURE

Their legacy challenges us to be thoughtful stewards, to learn from the past, and to build a better future for the generations to come.



Chaco Canyon is more than an archaeological site—it is a story of people, ideas, and a deep connection to the land. May we honor their legacy by learning, respecting, and protecting these sacred places.

THE PAST INFORMS US. THE FUTURE IS OURS.



LEARN ♦ RESPECT ♦ PRESERVE

ARMCHAIR ARCHAEOLOGIST

EXPLORING THE ANCIENT WORLD
FROM YOUR LAPTOP



*Love ancient ruins, lost civilizations, and 'what if' theories at 2 a.m.?
You might be an Armchair Archaeologist—and we've saved you a seat.
No passport. No shovel. Just curiosity and a comfy chair.*

JOIN THE ARMCHAIR CLUB!

Scan the QR code to visit
our website and explore:

-  Fascinating articles and discoveries
-  Curated resources and booklists
-  Travel guides to ancient sites
-  And a community of curious minds just like you!

SCAN ME



armchairarchaeologist.com