

I. TIME ON OUR HANDS (AND IN OUR MINDS)

*Time, that figment of human imagination which changes all things;
except Time - that figment of human imagination.*

- the author

Time: An Existential Discovery

Upon planet Earth, humans are the only species known to exhibit an awareness of the passage of "Time" and, therefore, to acknowledge the elusive concepts of Past, Present and Future. As a result of this ability, calendars and clocks became essential instruments in our lives. Due to this phenomenon we humans, especially in the mass media of the western hemisphere, constantly receive information about the year, month, day and hour of our existence. We constantly refer to past experiences, daily events and, occasionally, discuss our plans for tomorrow. In one typical evening before a television our minds reel with visions of the Past ("Gone With the Wind"), the Present (ABC Evening News) and the Future ("Star Trek"). Together, we marvel at "how fast time seems to fly."

This cultural immersion into Time does not, however, completely satisfy our intellectual craving to understand Time. We studiously watch the History Channel and anxiously read *Scientific American*. We also seek understanding in "A Brief History of Time" by renowned physicist Stephen W. Hawking and, conversely, read astrological charts. On other occasions we turn to visionaries and Futurist to find a bewildering opinion of anticipated futures that vary from the hopeful Christian "rapture" to the barbarism of "Blade Runner."

Today's scientists explain "Time" as any observable phenomenon having a measurable rate of change, e.g. the sun moves across the sky or the Hundred Years' War fought between England and France lasted from 1337-1453. To measure Time, therefore, is to fix the beginning, length and end of an event. With the assistance of Albert Einstein and others, these same scientists also reveal that Time is neither timeless nor universal. Time, in other words, did not exist until humans gave it form and function. Therefore, Time is an existential discovery, much like fire, that made humans "human" and affected all of history.

The Sky-watchers

Over two million years ago our primordial hominid ancestors mastered fire, chipped stone tools and created cultures to exploit their environment and, thereby, enhanced their physical survival. By observing the changing seasons and biological cycle of birth, life and death, humans acquired a Cosmic World View and Existential Self which permitted a rudimentary understanding of Time. As a consequence, and now burdened with a growing awareness of their mortality, these ancient kin created religious practices that required a greater understanding of the universe around them and a more precise measurement of Time. The Sun, Moon, Earth and Stars of the sky dominated this prehistoric pantheon of gods and demons.

Archaeologists find evidence of simple calendars among Paleolithic Hunters some 50,000 years BP (Before Present) as notched stones and bones that most likely served to indicate the passing of days - whether sun or moon. Paleoethnologists assume that these same people utilized ingenious methods for recording Time with knotted cords or accumulated pebbles. There is little doubt that our distant ancestors also understood the concepts of "early day," "mid-day" and "night." It is this ability to conceptualize the passage of Time that allowed *Homo* to survive and thrive.

Religious leaders, the Sky-watchers of these ancient societies, devised elaborate number schemes to track the movements of celestial bodies for both religious and social observances. Thus was born Astronomy, Astrology, festivals, higher mathematics and sophisticated devices for a much improved observance of Time. Around 12,000 BP they evolved farming villages and complex institutions of family, government, religion, education and economics to preserve their accumulated body of knowledge and to perpetuate their heritage from one generation to the next. Written language and numbers were increasingly used to chronicle the Past, Present and Future events of individuals, families, cities and empires.

Some ancient societies built monumental stone structures in order to follow the paths of stars and planets across the sky. For example, the construction of Stonehenge on Salisbury Plain in England was begun around 5,000 BP as a religious center and astronomical observatory to predict celestial events such as the Spring and Winter Solstices. By the beginning of the Christian era, Indians near Moose Mountain, Saskatchewan, Canada, constructed circular stone patterns, known as “Medicine Wheels,” aligned toward the stars Aldebaran, Rigel, and Sirius to predict the Summer Solstice.

Western historians report the world's first accurately recorded date as 4241 BCE (Before Christian Era) from an ancient Egyptian solar/lunar calendar of 360 days with 12 months of 30 days each. At about this same time, the Babylonians introduced the seven day week to the world. The oldest, continuous dating system currently in use is the Chinese lunar/solar calendar matched to a Zodiac of animals. With a normal year of 12 months and “Leap Years” of 13 months, the Chinese calendar’s annual number of days varies between 353-385, due to the synodic lunar month being only 29.53 days (11 short of a solar calendar). Their current year (2007) is 4705, Year of the Boar, with the New Year celebrated at the second new moon after Winter Solstice.

Other societies, it seems, developed calendars similar to the Chinese for specific religious reasons. The Hebrew calendar dates its years from Creation found in the Book of Genesis, currently 5767. Likewise, Muslims adopted the Hijri Calendar dated from the year Muhammad arrived in the holy city of Medina, currently the year 1428. The Rega Veda lunar/solar calendar of India was created around 1500 B.C.E. and evolved into more than 30 different versions for various religious reasons. A national calendar adopted in 1957, based upon the European model, retained its historic origins as dated from the Saka Era, making the current Hindu year 1928 with New Year’s Day occurring in March.

Europe would not see an improved calendar until the Roman Emperor Julius Caesar and astronomer Sosigenes introduced a solar calendar in 46 B.C. This new calendar required an additional 445 days in its first year to make up for past errors in calculating the solar year. In addition, an extra day was to be added each fourth year to more closely match of the “tropical solar year;” however, this eventually proved to be an error since “leap years” did not always occur every four years.

Pope Gregory XIII corrected this problem in 1582 when he decreed a new church calendar which allowed that only those years divisible by four (and those years ending in 00 divisible by 400) may be Leap Years. While the Julian/Gregorian system became the bases for today’s world universal calendar, it would not gain wide acceptance outside of Europe until adopted throughout the British Empire in 1752. Even then, certain nations would not change to the Gregorian Calendar until World War II.

[Side Notes: Dionysius Exiguus, a Catholic monk, introduced Anno Domini (A.D., “year of the Lord,”) to the Julian Calendar in 525. At this time, the Maya Indians of Central America were using several calendars simultaneously, including a “long count system” as accurate as the Gregorian calendar.]

The Timekeepers

While calendars measured the past and future in days, months and years, various devices were being created to measure the passage of daily Time in hours, minutes and seconds. The earliest sophisticated attempts are found in ancient Egypt where hours were tracked with a simple water clock (the *clepsydra*), marked candles and the hourglass. Other ancient societies used a sundial or a knotted rope burning slowly in an oil lamp. Mechanical clocks, powered by suspended weights, most likely arrived in Europe from China during the 13th century.

Later, the spring-driven clock was more accurate but often large and in need of constant adjustments. It seems that the one thing humans really wanted was a small, convenient device to track personal Time. This apparatus appeared in the 17th century when Christiaan Huygens of Holland replaced the pendulum (which he introduced) with a hairspring and balance-wheel. As his small clocks became smaller, they eventually evolved into the ultimate personal timepiece - a “watch.”

Today, the entire world tracks hours, minutes and seconds from Greenwich, England, along zero degree longitude as Universal Observatory Time (UTO). Hours are calculated as Universal Coordinated Time (UTC) with an atomic clock that counts the cycles of cesium atoms at billionths of a second each minute. By international agreement, UTC is calculated to within 0.7 seconds on the hour where one second marks the duration of 9,192,631,770 periods of cesium-133. A nanosecond (which seems to be of critical importance to computer Geeks) is one billionth of one second.

What does this brief discussion of Time have to do with Time Capsules? It is simply a fact of human existence that all of us are bonded together through Time and Space by the same innate desire to comprehend our place in the dogged, relentless and intractable passage of Time. Within this context, the Time Capsule becomes a symbolic, existential representation of humankind's fascination with Time - that figment of human imagination.

II. WHY PRESERVE THE PAST AND PRESENT?

*To every thing there is a season, and a time to every purpose under the heaven:
A time to be born, and a time to die;
a time to plant, and a time to pluck up that which is planted....
- Old Testament, Ecclesiastes, III, 1-8*

Culture and Human Personality

Cultural preservation occurs in its most basic form when a human society successfully creates institutions that provide their people with the necessities for living and continued life. These activities, however, produce a conundrum as proactive responses to the universal challenges of social change and constant environmental fluctuation result in more change through discovery, invention and innovation. It is these human reactions to Change that have allowed human populations worldwide to increase in number and, thereby, maintain the species *Homo*.

As stated by anthropologists Melville J. Herskovits, "Neither smallness in numbers, nor isolation, nor simplicity of technological equipment produces complete stagnation in the life of a people." Change, ever how minute, always occurs, and those societies that succeed best in meeting life's challenges generally pass from Paleolithic hunter to Neolithic farmer and, eventually, to the exalted status of Civilization.

On a more subjective level, a societies World View establishes strong emotional ties to its culture and creates in each member a feeling that their way of life is essential to their continued survival. The preservation of a peoples heritage, through this mind-set, serves to bond families and societies across Time with a sense of purpose - and a reason for living. As observed by psychiatrist Victor E. Frankl in *Man's Search for Meaning*, "It is a peculiarity of man that he can only live by looking to the future." Each person, he states, regardless of their circumstance, must draw upon their past and the present to prepare for tomorrow. Eliminate the Past or Present and there is no tomorrow. Eliminate the Future, all hope disappears and human existence descends to that of a lesser animal.

Humans As Preservationist: Libraries and Museums

If the term "preservation" is defined as an attempt to save something from one generation for another, we may include such things as photograph albums, letters, furniture, clothing and memorabilia of all sorts passed from one family member to another. Likewise, most anything saved by a society to film, paper, computer disk or artist canvas qualify for preservation, along with its monuments of temples, parks, public buildings and bridges. In other words, everything humans do to conserve for the future contributes to the continuation of their culture and to the meaning of an individual's collective existence.

This need for preservation has become so important in contemporary societies that a host of professions, institutions, public and private agencies are dedicated to the collection and perpetuation of every conceivable category of cultural artifact and belief. Archaeologists, historians, educators, theologians, sociologists, archivist, librarians, conservators, curators, anthropologist, geologists and astronomers are just a few of the professions dedicated to cultural discovery and preservation.

Libraries are the most obvious example of an agency designed as a repository of humankind's passion to preserve the Past and the Present for the Future. In the 7th century BCE Assyrian capital of Ninevah, King Ashurbanipal's library contained thousands of public and private items inscribed on clay tablets. The Great Library of antiquity in Alexandria, Egypt, founded circa 300 BCE by the Macedonian warrior Ptolemy I Soter, included over 400,000 papyrus manuscripts dedicated to a study of the nine Greek Muses. By 200 BCE the Chinese Ch'in Dynasty established an imperial library with one copy of all books found within the empire. In contrast, the United States Library of Congress, rebuilt following the War of 1812 with the British, began anew with Thomas Jefferson's 6,000-volume personal library - and today contains almost 100 million manuscripts and books from around the world.

Museums around the world are filled with relics of the past retrieved from the graves of dead societies - and new discoveries are added each year. Excavated in 1748, the Roman city of Pompeii revealed over 2,000 of its citizens buried and preserved by tons of ash from the eruption of Mount Vesuvius on August 24, 79 AD. On Mexico's Yucatan peninsula, the city of Teotihuacan existed in 600 BCE as a prosperous and cosmopolitan Mayan city of 125,000 people with a remarkable library of mathematics and astronomy inscribed on its walls. At Ma-wang-tui near Hunan, China, "Lady Tai" occupied an air-tight vault for over 2,000 years before being opened to reveal her preserved body among lavish supplies of food, jars of wine, fifty rolls of silk and 162 wooden maids, workers and musicians.

The Real Reasons for Preservation

Although the paraphernalia of forgotten societies may amaze audiences, preservation remains much more complex than institutionalized libraries and museums. Since the dawn of humankind preservationists (by whatever name) have sought to perpetuate their cultural heritage in many forms; weave it into the very fabric of society and ingrain its messages into the human psyche. The ultimate goal of preservation, after all, is to educate the youth of each generation in preparation for their future.

The earliest prehistoric families developed "rites of passage" for birth, puberty, marriage and death - not only to publicly recognize these important events in the human life cycle but to also preserve family bonds. On other occasions, social bonds were enhanced for the entire village, town or nation through elaborate festivals or, perhaps, the construction of a new monument. In today's electronically networked world such events may even be global.

For example, the National Geographic Society may support an archaeological excavation that discovers a "lost" culture which, in turn, results in a television documentary, an elaborate Smithsonian display, scores of university lectures, artfully published magazines and a spectacular television mini-series. Millions of people are quickly brought into contact with this new knowledge about a very special moment in human history (or prehistory). Thereafter and forever, many viewers are changed in varying degrees by an expanded concept of their world and a more intense perception of self.

As we approached the end of one century in 2000 AD, and the beginning of another (2001 AD), our generation experienced the passage of Time - world wide and in living color - as no other people had done ever before. This passage from one millennium (1001-2000) into a new millennium prompted our mass media moguls to produce televised extravaganzas worldwide - and in living color. Societies all over the earth dedicated century or millennium parks that often included a Time Capsule to be opened in the next century - or the next millennium. Others, after consulting their crystal balls or astrological charts, announced that this change of the calendar portended either the dawning of the Age of Aquarius or the end-of-time Apocalypse.

III. WHAT'S THE OCCASION?

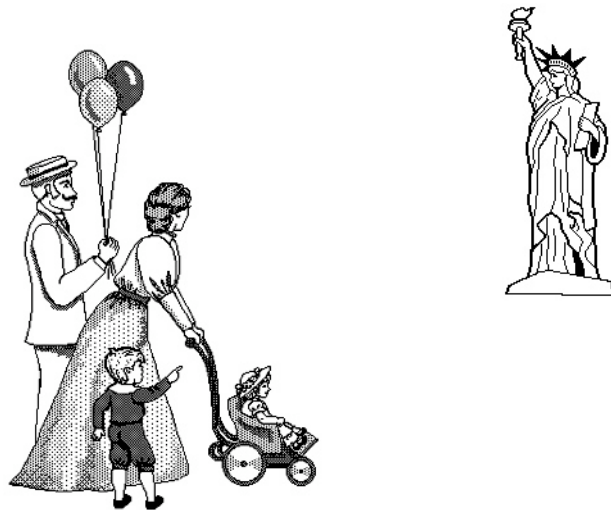
*Let us while waiting for new monuments,
preserve the ancient monuments.
- Victor Hugo 1831*

Nations, towns and villages around the world have held public exhibitions and fairs for centuries to mark special social occasions. Even the smallest county fairs and trade shows proudly display the valued artifacts of their culture. On a grander scale, the Bible's Book of Esther reports that Xerxes of Persia exhibited the riches of his kingdom for 180 days during the 5th century BCE and in 1851 the "Great Exposition of the Industry of All Nations," the first world's fair, was held in London's Crystal Palace made of glass and steel. The 1889 Paris Exposition displayed the newly constructed Eiffel Tower. Also of interest, during the opening of the 1939 New York World's Fair, a torpedo-shaped capsule was buried 50 feet below the Immortal Well, filled with millions of microfilmed pages bearing "a message of present-day America to the people of Earth of 6939 AD"

Before its bicentennial celebration in 1976, the United States experienced a revival of interest in time capsules. Federal and State governments created hundreds of committees and commissions to identify memorials to commemorate the founding of our nation. The resulting frenzy resulted in the erection of monuments, the establishment of parks or the reconstruction of historic sites in every state of the union. A highlight at many of these events was to enshrine a time capsule for opening during the tricentennial celebration of these United States to be held in the year 2076.

Whether a cornerstone or plain box, a Time Capsule adds immensely to the pomp and circumstance of a celebration and represents, in itself, a specialized act of commemoration by looking beyond that day into the future. The placement of this container filled with memorabilia proclaims confidence in a tomorrow and promotes goodwill by representing these people and this period in history to a future generation. In this manner, the vessel and its contents bond two groups together - Present and Future - across Time for the betterment and edification of both.

Obviously, anyone - a family, business, professional organization, religious group, civic club or school - may suggest a time capsule for any special happening. While most often seen at large, gala affairs, the use of a time capsule at smaller events such as reunions, memorials, anniversaries and groundbreaking adds a unique dimension beyond the ordinary - one which surely many participants will talk about and remember and speak of to children and grandchildren. A helpful, comprehensive guide (300 pp) to read is William E. Jarvis' *Time Capsules: A Cultural History*.



PLAN YOUR CELEBRATION

A. First Things First

1. Broad-based Planning Group brain-storms options, activities and organization.

B. Answer These Questions

1. "What is the central purpose of the celebration?"
 - a. anniversary, dedication, renewal, publicity
 - b. geographic focus: local, state, national, or international
 - c. identify specific goals related to the central purpose
2. "Who are the major target groups?"
 - a. employees, friends, neighbors, new constituents
 - b. platform guests, dignitaries, other participants
3. "Where, when and how will the celebration occur?"
 - a. one location - or many?
 - b. single event or multiple events?
 - c. date(s) and time(s) of the celebration - with rain date(s)
 - d. define the beginning, middle and end
 - e. speeches, dinner, dance, entertainment, awards
or drama, music, art, exhibits, symposium
 - f. T-shirts, caps, collectibles, video sales, balloons
 - g. publications, public relations, photography, television
 - h. special events: balloon rides, auction, kiddy carnival,
contests, fireworks, **Time Capsule**
4. "How will the celebration be financed?"
 - a. determine projected income and expenses
 - b. establish budgets

C. Select Events Director - individual with abilities to get the job done.

1. design logo and determine theme
2. establish events calendar
3. reserve facilities/spaces and notify major participants
4. establish and publish project calendar with "newsletter" for workers and guests

D. Appoint Steering Committee & Subcommittees - dedicated groups with authority to act.

1. Fundraising & Finance
2. Public Relations & Advertising
3. Events & Activities
4. Memorabilia, Promotions, Miscellaneous Task Force
5. **Time Capsule Tech Group (TCTG) - select site and collect materials**

E. Implement the Plan

1. Plan "A" or Plan "B" - be flexible!
2. It's Here! Have Fun! But document the event with photos, video, written accounts
and remember to **Mark the Capsule** location with plaque or monument!
3. Follow-up and Follow-Through
 - a. archive materials for future reference
 - b. produce new public relations materials
 - c. thank your workers, contributors and your guest!

Footnote: The size and complexity of your event determines its timeline/calendar.

State of Washington Celebrates Centennial

Olympia, WA: Hundreds of area citizens gathered today in the rotunda of the state capitol to witness the unveiling of a time vault as the highlight to its centennial observance.

The massive steel vault is seven feet tall and weighs over 3,500 pounds. Inside are sixteen rectangular compartments for microfilmed messages and other memorabilia.

Only one compartment was filled today, since this "living time capsule" must be reopened every 25 years to fill another container. Ultimately, 400 years will pass before the vault is finally "opened."

This brain-child of Knute Berger included the selection of some 300 ten-year-olds to be "Keepers of the Capsule." Their task will be to appear in 25 years to fill the next container and to recruit another 300 children for the next watch.

By 2389, the Keepers of the Capsule will gather one last time to open each of the sixteen compartments and to marvel at their ancestors ingenuity.

Russians To Send Message To Future Colonists On Mars

MOSCOW, RUSSIA: In November of 1996, a Proton rocket will be launched from the Baikonur launch site in Kazakhstan, propelling Russia's Mars '96 spacecraft on its way to explore our mysterious Red Planet.

The mission consists of the main spacecraft, which will orbit the planet, and four descent modules to measure the surface. Two of the surface stations will contain CD laser disks inscribed with centuries of human study and speculation about Mars and Martians.

The Visions of Mars CD, compiled by members of the International Planetary Society, is designed as a greeting to future colonists of Mars. Project leader Viacheslav Linkin is reported as saying, "We are glad to meet with you here on Mars and we would like for this message to help you feel the life of your predecessors - our life."

Along with scenes from War of the Worlds, the disks contain a variety of radio recordings from renowned scientist and others. Spokesmen indicated that even television cartoons will be included for entertainment.

Only one thing is missing - a laser disk player. Project experts assume that Mars settlers will be clever enough to construct a device to play the disk.

NASA Launches Different Capsule

Hampton, VA: Langley Research Center has launched a capsule - into the earth! As an ending to its 75th anniversary ceremonies, a plastic bucket was lowered beneath the surface and capped with a bronze circular marker. A large aluminum sculpture straddles the spot, tapered like a needle pointing toward the stars.

When opened in 2017 for the Center's 100th anniversary, and resealed for another 50 years, the guest may be surprised to find a menu from the dining hall along with tomato seeds from outer space and a photo of the Center's daycare children.

IV. Selecting Memorabilia and Other Special Things

Thus the whirligig of time begins in his revenges.
- William Shakespeare, *Twelfth Night*

While determining the particulars of a commemorative event may be your most complex task, selecting memorabilia and other items to encase inside a Time Capsule will be your most important task. First, you must select items which will be meaningful for both the Present and the Future. Second, you must select items which are chemically stable and likely to arrive intact in the Future. Simply collecting a hodgepodge of bric-a-brac will not do.

A subcommittee (let's say the TCTG, Time Capsule Tech Group) must grapple with the assessment of memorabilia durability, stability and permanence as well as the issues of time-span and preservation methodologies (laser disk, microfilm, photographs, et cetera). This information should be shared as early as possible with those responsible for collecting the memorabilia. In addition, the TC Tech Group must propose to the Steering Committee the vessel's final dimensions, shape and construction. It is this group that will also propose a suitable site for placement.

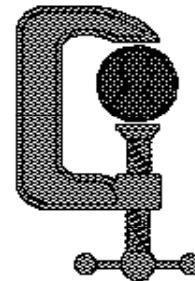
The selection of memorabilia may be delegated to another subcommittee (e.g. Search & Find Task Force) comprised of people with a clear understanding of the occasion's purpose and with an ability to involve many of the anticipated dignitaries and groups in the process. Effective communication with participants will add considerable enthusiasm for the event and guarantee that a memorable collection will be acquired. Special attention should be given to children, since they (or their children) will hopefully be present at the opening of the Time Capsule. Discussions should be held with your target groups months ahead of the scheduled date to determine the major categories of memorabilia (e.g. people, places, events, history, et cetera) and the types of information and artifacts to be included. A mailed survey form could collect initial ideas rather quickly.

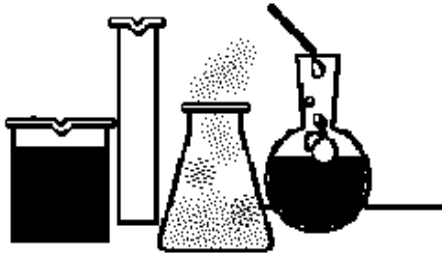
Next, the Task Force needs to develop a tentative list of chosen items and assign individuals to collect these artifacts, coordinate activities with the Steering Committee and Tech Group and remain amenable to additional suggestions, modifications and last minute surprise discoveries. From the very beginning, consideration must be given to the dimensions and shape of the vessel and to the size of its opening.

The real "fun" begins when the collection must be matched to the size of the container and several dress rehearsals may be needed to determine the best configuration for the Time Capsule's contents. Further attention may be drawn to your special event by displaying the collection and/or Time Capsule weeks before the commemorative date. Such a display provides an excellent "photo op" for area news media and, if the container is not sealed at this point, an opportunity remains for the general public to suggest additional materials or contribute written "notes to the Future."

While the careful selection of artifacts (as well as capsule design and site) can ameliorate many preservation concerns, the following factors must be considered in an evaluation of each item included in the collection:

DURABILITY is the degree to which a material retains its original physical properties while subjected to stress, e.g. light, humidity, gravity and temperature. Obviously stone, glass and certain metals are highly durable while organic materials such as wood, paper and textiles are less durable. Longevity is achieved with proper storage and no standards exist to easily calculate how long a particular material will last under ideal conditions.



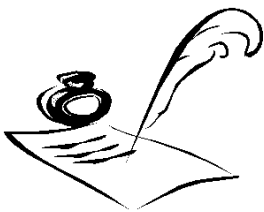


CHEMICAL STABILITY - Materials not easily decomposed or otherwise modified by stress or chemical action are considered to be relatively stable and highly desirable for collections. This issue includes both a resistance to internal chemical degradation over time and to possible contamination from other artifacts or conditions during storage.

MEASURE pH to determine a materials acidity or alkalinity on a scale from 0 - 14. Seven is pH neutral (best) while numbers below 7 indicate increasing acidity (worse). Numbers above 7 indicate increasing alkalinity. Common litmus paper found in school laboratories provide a suitable test. Typically, stored materials should have a pH between 7 and 9. Objects with a pH below 5 are highly acidic and likely to decompose over time, especially when in contact with moisture. Preservationists are also concerned with "acid migration" where acid from one material is transferred to a less acidic or pH neutral material during close contact. Polyvinyl Chloride, a PVC plastic called "vinyl" and used as a covering for many items, is chemically unstable and will emit hydrochloric acid as it deteriorates.

PRESERVATION TECHNIQUES - Museum archivist seek to eliminate or minimize harmful environmental effects to artifacts. Such efforts may include building a special container to protect an object or treatments that chemically stabilize an object. For example, an alkaline "buffer," such as calcium carbonate, may be added to paper to neutralize acids or to protect against future contamination. Artifacts are often handled with gloves to protect against the corrosive oils, salts and urea-derivatives found on human hands. Air conditioning guards against both extreme humidity and temperature fluctuations.

ENCAPSULATION - While a Time Capsule will encapsulate and protect all of the objects to be preserved, consideration must be given to the encapsulation of individual items within the collection in order to protect them from each other. A separate protective cover is recommended for wood, paper, textiles and any organic item. Although the object may exhibit some deterioration within its enclosure, overall durability and stability will be greatly increased for the entire collection. Copied documents and other paper items may be placed between thin, transparent sheets of archive quality plastic. Certain items may be completely molded in plastic. (See PLASTICS below.)



PAPER AND BOOKS - Paper is one of the most fragile materials found in a Time Capsule where suitability ranges from very poor (old paper) to the "permanent" alkaline papers, neutralized or buffered since 1984 according to ANSI Standard Z39.48. Of course, many printed documents survive the rigors of time without benefit of a protective container, but these occurrences are in themselves rare and no one knows the true number of documents lost to Time.

More About Paper and Books: Moisture, light and temperature fluctuations are the major causes of paper deterioration. A low pH, along with the glues, inks, sizings and dyes found in book manufacture, also present problems. Older publications may measure low acidity with a litmus test but suffer over an extended period from residual chlorine used in paper bleaching or from aluminum sulfate from sizing. In the case of a Time Capsule, the longevity of paper depends upon its exterior storage conditions, the time span selected for entombment, the careful selection of materials, appropriate encapsulation and overall preparation of the container. Most printed paper items and books will survive a considerable length of time if separately encapsulated. "Parchment" made from animal skin should be avoided, since it is treated with sulfuric acid. Documents with loose particles, such as watercolor drawings, should never be used. Paper materials should be stored flat and not folded. If this is impossible, consider rolling the document tightly before encapsulating.

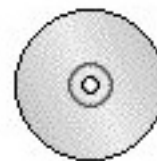


PLASTICS - Many contemporary objects contain plastic, a synthetic resinous substance derived from petrochemical polymers. Caution must be taken to avoid direct contact between certain types of plastics that can produce a chemical reaction over time. For example, polyvinyl chloride, a PVC plastic called "vinyl," may emit harmful fumes and hydrochloric acid. Archivists suggest a chemically stable plastic polypropylene, "polyester" polyethylene (trade names Mellinex and Mylar), or acrylic plastic (trade names Lucite, Plexiglas, and Perspex) for long term storage. A variety of speciality catalogs advertise these materials as "archive" or "museum quality."

MAGNETIC TAPES AND DISKS - One of the technological marvels of the 20th century was the development of inexpensive and easy to use mega-information storage systems. Within a few decades wire recordings were replaced by plastic reel tapes - which were replaced by 8-track tapes and then cassette tapes and then "floppy" disk followed by CDs and then....

All of these information devices are magnetic and - therefore - require special consideration. First, magnetic media must be protected from all electrical fields during the entire time period of entombment. Second, magnetic media consists of two parts, the magnetized field and the disk or tape material. Although chemically stable, plastic recording is subject to shrinkage with possible adverse effects on the magnetic field/data.

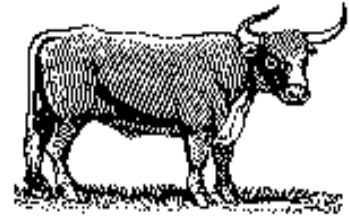
Should you elect to use these as artifacts, a simple fact remains they will require some type of playback device in the future. Your options are: 1) store needed equipment with the Time Capsule, 2) assume suitable equipment will be available in a museum of the future or (3) assume that your materials will somehow be reformatted into a contemporary medium of the future. Microfilm may be an acceptable long-term format for certain documents.





FILM AND PHOTOGRAPHS - Traditional photographic prints, slides and negatives are chemically stable and considered permanent; however, photographs produced on certain ink jet and laser printers may not be. In either case, photographic materials should be boxed or encapsulated for extra protection. The same precautions apply to microfilm, video film and motion picture film. Self developing Polaroid prints may contain residual chemicals and, therefore, are not recommended. If you have doubts, contact a local or state archivist for assistance.

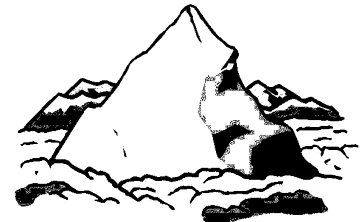
ANIMAL - Leather, fur, feather, shell, ivory and similar items of animal origin may be durable over long periods of time within a capsule but extra care must be taken to encapsulate each article. Salt in shells and tannins in leather may react with the other materials. Furs and feathers should be placed at the top of the collection to avoid damage from the weight of other items. Animal products may also harbor insects and other crawly things, so clean and inspect these items carefully.



VEGETABLE - Memorabilia constructed of wood products are subject to dimensional changes, warping from high humidity and shrinking from low humidity. These effects are not normally significant in the stable environment of a Time Capsule; however, paper, textiles and similar materials placed near wood may become stained and brittle. Oak woods, for example, contain tannic acid which can corrode certain metals. The durability of wood inlays and veneers depends upon the stability of the glue. Encapsulation will reduce damage to the article and other items.



MINERAL - Metals of unknown alloy or content should be avoided, since they have a potential to be reactive with other materials. Tin and lead are common non-reactive metals. Stainless steel, bronze and similar alloys are non-reactive and also highly resistant to corrosion. Precious metals, such as gold and silver, are also highly stable. Non-processed minerals (rocks), non-glazed clays and stone artifacts may leach harmful minerals into the capsule and must be encapsulated. Both fire glazed ceramics and glass are durable and chemically stable.



TEXTILES - Synthetic textiles are normally durable. Materials made from natural fibers are durable over long periods of time under controlled conditions. In the absence of light and major fluctuations in humidity and temperature, both organic and synthetic dyes are chemically stable; however, all textiles should be separately encapsulated. These items should be placed near the top of the collection and, when possible, not folded. If you must conserve space, roll textiles tightly and bind with ribbons - not strings or rubber bands.

OTHER TIPS - As stated earlier, the collection should attract the attention of the audience and serve to bond the Present with the Future. People are, after-all, the primary focus of this event. If major sponsors are to be recognized, it may be possible to be creative in developing the time capsule collection around their interest. For example, a health agency may include certain tools of their trade. Manufacturers, on the other hand, will most likely want to preserve examples of their products - either in blueprints or as miniature models. The DAR, UAW, NAACP, AAUP, and similar alphabet groups could suggest their own particular items for the collection.

Likewise, you may wish to be creative with the capsule itself by selecting an appropriate design or material suitable to the occasion. For example, the Time Capsule could be molded from clay, plastic or glass into a shape or object that speaks to the occasion. And one final suggestion, place a typed list of the collection inside the capsule to aid Future discoverers in determining the identity and significance (and perhaps function) of each item.

Dead Sea Alive with Biblical Scrolls

Khirbat Qumran, Palestine: Only two years after WWII, a discovery by local shepherd boys has startled Jew and Christian alike. From a small cave along the northwest shore of the Dead Sea, the boys removed from tall, cylindrical clay jars several parchment scrolls wrapped in musty linen.

The dry desert air and coolness of the cave had protected the documents for over 2,000 years. First sold to a local merchant, eleven scrolls eventually made their way into the hands of Biblical scholars.

Experts believe the scrolls were written in the Qumran community by a Jewish sect known to Romans as Essenes.

Man Frozen 5000 Years

Oetzal, Austria: The Tyrolean Ice Man was found in 1991 at the base of the Oetzaler Alps in Austria. Radiocarbon dates place his death at over 5,000 years ago.

Hair, skin and other body tissues were well preserved and a close examination revealed that he had been in basically good health. The Ice Man appears to have died from natural causes.

Forensic anthropologists from the University of Innsbruck believe that he was 25-40 years of age and almost 160 centimeters tall. The man was dressed in leather trousers and shoes. His animal hide parka was lined with straw.

Baltic Sea Gives Up a Ghost

Stockholm, Sweden: After twenty years of dragging the local harbor for the remains of the Vasa, a 17th century Swedish war ship, Anders Franzen's core sampler struck something different in the seabed. He pulled to the surface a piece of ancient black oak - a wood that takes over 100 years to turn black in these cold waters.

Navy divers soon confirmed his wish, the Vasa lay 120 feet down, lodged in 16 feet of mud. Over the next two years, steel cables placed under the hull slowly bounced the ship into shallow waters. Hydraulic jacks raised it to the surface to reveal chests, cloths, weapons and coins from a ghostly past.

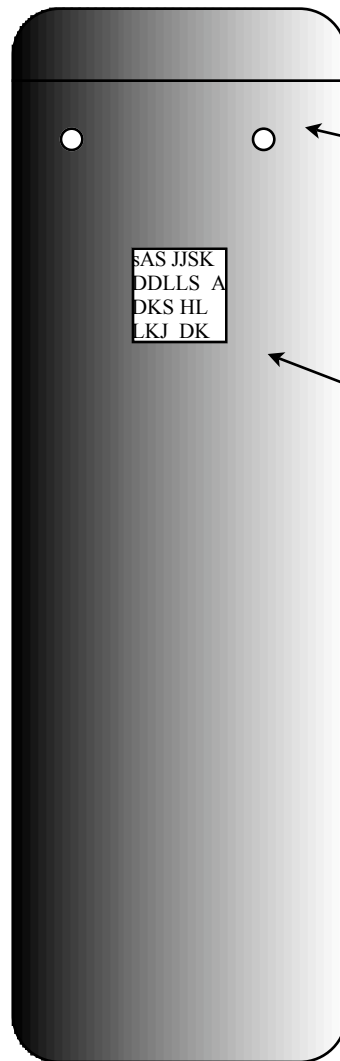
V. Constructing Your Time Machine (the ideal)

SIZE of container is dictated by event's purpose, vessel materials, location and contents. Shape and design varies.

SCREW JOINT
Connection is screwed together and sealed with 50 year silicone caulk.

INPUT VALVE
Nitrogen or argon gas is pumped into the container at low pressure.

RELIEF VALVE:
Air and moisture escape as dry gas fills the container.



INSTRUCTIONS
for future opening are engraved onto an attached plate or etched into the container.

VESSEL is made from a seamless material such as glazed ceramic, glass, polyethylene plastic or steel when placed underground.

EXTRA PROTECTION is achieved by sealing the entire capsule inside polyethylene or polypropylene bag or bucket.

Technical Footnotes

SIZE: Time Capsules need to be neither large nor elaborate to be appropriate for the occasion. The size of the vessel should simply be appropriate for your event, location, collection and budget. Entombment above or below may also be a consideration. However, being different can be fun. For example, the CIA could include thousands of micro dots inside an ink pen size Time Capsule or a computer retailer could bury a computer - complete with a full hard drive.

INPUT AND OUTPUT VALVES: Water is one of the major concerns of preservation and excessive atmospheric moisture trapped inside your Time Capsule can spell disaster. This potential problem will be greatly reduced by sealing the vessel following storage inside an air-conditioned room or, if necessary, on a low humidity day. When these conditions are not possible, other and better options do exist.

Argon (Ar) and nitrogen (N₂) are inert, dry gases that should be pumped into the container to replace any moisture-laden natural atmosphere. Small pressurized tanks of nitrogen and argon may be purchased locally through The Real Yellow Pages. If you choose to construct a capsule based on the illustrated model, a common brass or steel automotive wheel valve may be used for input and relief valves.

The input gas pressure need not exceed 10 lbs. psi (pounds per square inch), since the gas will settle to the bottom, fill the container and displace the atmosphere inside by pushing it out of the open relief valve. At that point, close the relief valve to keep the inert gas inside. If you choose to make use of a less sophisticated container, it is still possible to "fill" the vessel with nitrogen or argon by venting a small flexible tube on the bottom of an upright Time Capsule. With an opening in the top, wait several minutes until filled, remove the tube and quickly seal the vessel. Since pressurized gas can be cool, you may observe condensation rising upward on the outside wall of your container.

SCREW JOINT: If designed as described in the Ideal Model, a screw joint is the best preservation technique for connecting the two parts of a container together. A local plumber should be able to easily cut spiral threads into metal or plastic. Unique ceramic or glass designs should be constructed with one section fitting tightly into the other. Of course, you may use a commercial vessel with a screw-on lid, a flat lid or plug. In all of these examples, the connection must be sealed with a long-life silicone caulk (or perhaps "tar" as used by ancient wine makers).

LEAVE NOTES TO THE FUTURE: Unless you, or another participant at the ceremony, plan to attend the official capsule opening, it may be helpful to provide certain information to the Future. Etch into the vessel's surface or onto an attached plate specific information about the container seals, gas inside, contents, and/or precautions before opening (e.g. THIS END UP, Store At Room Temperature Before Opening, etc.). In addition, you may wish to provide directions to another location (local Library?) for more information about your ceremony and participants. Copies of these materials should be placed into folders entitled "OPEN JUNE 6th 2044" (or whenever) and left at several locations. ALWAYS place a plaque or monument at the Time Capsule site indicating the date to be opened.

VESSEL: While seamless stainless steel or polyethylene plastic may be the material of choice, ceramic or glass (clear or colored) may provide a more entertaining vessel. Crafted hardwoods may be used under ideal conditions and when enclosed in a chemically stable material. There are relatively inexpensive containers on the market that will do the job just as well when all other precautions are taken, e.g. terrarium, aquarium, fish bowl and glassware such as wide mouth utility jars with lids. If in a hurry, an industrial supply catalog sales 55-gallon polyethylene drums.

SEALANTS: Do the Future a favor and avoid sealing the capsule's tomb with cement, concrete or like materials. A long-life chalk will most often suffice. Should an entombed capsule require the removal of brick, stone or mortar, try sandblasting. However, care must be taken to protect the surrounding structure and/or marker from damage. Hopefully, the vessel can be returned to its space for another 100 years.

VI. Selecting A Suitable Location

"Location, location, location," the time honored mantra of real estate agents everywhere, is an equally important consideration in selecting a site for the placement of your Time Capsule. Not only should your location be easily accessible and otherwise suitable for the commemorative event, the site should be protected from the harmful effects of moisture and extreme temperature fluctuations for the entire period of interment. It is also helpful if this location is likely to be visible to the public for the anticipated time that your Time Capsule will be locked away.

After your artifacts are collected and encapsulated - and your Time Machine is carefully designed and prepared - and your location meets the standards described, then you have little to worry about for a hundred years or so. While placement within an interior wall of a building is perhaps the ideal - above ground (dry) or below (cool) should not be a major concern if all other conditions are met. A constant temperature and controlled environment can be readily achieved by placing the Time Capsule inside an interior vault or air-conditioned building but such locations are not practical for certain events - and the building may not be standing a hundred years later. When an outside, above ground location is selected, the site should not be exposed to excessive temperature fluctuations from the sun (and, thereby, rapid cooling at night) or to water seepage.

Another solution is to place the capsule below ground-level five feet or more where a constant temperature will be maintained. If the capsule is properly sealed, moisture should not be a problem. As an extra precaution, however, the vessel could be placed inside a concrete vault or into a bored shaft lined with water pipe (both sealed at the bottom and top) to lessen the chance of water leakage.

And, finally, to repeat a statement above - there are certain advantages in selecting a site visible to daily pedestrian and/or road traffic. Especially when a plaque or monument marks the spot. A public location permits the capsule to exist over the years both as a focus of your commemorative event and as a helpful reminder of the Time Capsule's future opening date.



VII. Putting It All Together

*See childhood, youth, and manhood pass,
and age with furrowed brow;
Time was - Time shall be - drain the glass -
But where in Time is now?*

- John Quincy Adams, The Hour Glass

Your events have gone very well; large crowds attended, the featured speaker inspired her audience and now the hour approaches for the *tour de force* - placing the Time Capsule into its crypt for 100 years. People move silently toward the site as a rousing rendition of John Philip Sousa's "Nobles of the Mystic Shrine" is played in the background.

Wrapped securely in a polypropylene bag, the sealed capsule awaits upon its podium. Gentle hands carefully position the vessel at its entrance, sliding it carefully into its new home to rest securely in this place of honor for the allotted time.

As the last speech ends, the band plays softly "Oh, Glory to the Knights of Old." Fireworks burst and crackle overhead sending rays of multi-colored lights dancing across the daytime sky. The crowd claps as workers quickly caulk the enclosure. The crypt is almost complete. All are silent as a lift truck inches forward to place a small monument near the site - its bronze plaque gleaming in the bright afternoon sun with its memorable words inscribed as reminder to "OPEN SEPTEMBER 21, 2100."

VIII. Sometime Later: Opening The Time Capsule

A discussion of Time Capsules would not be complete without a tip or two about extricating the contents of a recovered vessel - especially those of unknown origin found accidentally in a construction site. Prior to opening the vessel, you must assume that some of the contents may be in poor condition and in need of special attention. Therefore, after careful removal from its location, the container should be taken to a suitable work area and not opened at the site.

First, place the capsule in a workroom overnight, allowing the container and its contents to adjust to room temperature. Next, carefully break the seal, open the container and examine its artifacts without touching anything. If the contents appear to be intact, document and photograph each item as it is removed. Place each item on or into archival boxes, bags or covers.

If the contents appear to be damp or otherwise damaged, let the container partially air dry before attempting to remove anything. Items bonded together should be removed, if possible, as one piece - including the entire collection when fused into a single glob. On the other hand, if the contents are exceptionally dry and brittle, special care must be taken to avoid destroying these materials. Damaged collections such as this require the knowledge of a conservator, archivists or archaeologists - perhaps available from a nearby library or university.

Finally, even with the contents totally lost to time, you publicize the discovery and display its contents. With a little research, enough information may be found about the past event and the people who buried the capsule. In this way, the uncovered Time Machine will have accomplished some of its mission.

IX. POSTSCRIPT - THE GRANDDADDY OF ALL TIME CAPSULES “The Crypt of Civilization” Oglethorpe University, Atlanta, Georgia

During the late 1930s, Dr. Thornwell Jacobs dreamed of an extraordinary Time Capsule to store examples of the world’s cultures of 1936 for over 6,000 years. Selecting what was once a below ground swimming pool on the campus of Oglethorpe University, he began to construct the “crypt” into a 20’ long, 10’ wide and 10’ high subterranean chamber.

He and a bevy of graduate students then began the task of recording 640,000 literary pages onto microfilm, collecting still photographs, motion pictures and voices of the famous and near famous. Representative artifacts were received from around the world. On May 25, 1940, during an appropriate ceremony, the crypt’s stainless steel doors were welded closed, not to be opened until 8113 AD.

This date was selected from the first date in history (4241 BC on an ancient Egyptian calendar) and 1936 marked the passage of 6,177 years. This number added to 1936 produced the 8113 AD date to open the Crypt of Civilization. Just in case those people of the future no longer used electricity, Jacobs placed in the crypt a wind operated generator along with a machine to read the microfilm library. In an attempt to cover all possibilities, he also installed at the entrance a machine to teach the English language.

INTERNATIONAL TIME CAPSULE SOCIETY AND OTHER RESOURCES

Also at Oglethorpe University is the The International Time Capsule Society (ITCS), an organization established in 1990 to promote the study of time capsules and to document all types of time capsules throughout the world. This later service includes listing information about your capsule. Register and examine their reports at www.oglethorpe.edu/about_us/crypt_of_civilization. And while on the Internet, access thousands of references to archival materials by searching the Web.

In 1991 The International Time Capsule Society listed the "10 Most Wanted Time Capsules." To date, only a few of these “lost” capsules has been recovered. Lessons may be learned from this list of missing time machines and the mistakes of past generations:

1. Bicentennial Wagon Train Time Capsule - July 4, 1976, President Gerald Ford arrived for the sealing ceremony in Valley Forge, Pennsylvania, but officials discovered that someone had stolen the capsule.
2. MIT Cyclotron Time Capsule - in 1939 a group of MIT engineers placed a brass capsule under a new cyclotron. To be opened in 50 years, no one could figure out how to remove its 36,000 pound “lid!”
3. Corona, California, Time Capsule - the city seems to have misplaced a series of 17 time capsules dating back to the 1930s. Efforts to recover the capsules in 1986 were in vain.
4. George Washington's Cornerstone - he performed a Masonic ritual in 1793 while laying the cornerstone at the U.S. Capitol. After years of remodeling and reconstruction no one can find the original site.
5. The Gramophone Company Time Capsule - in 1907 sound recordings on disc were deposited behind the foundation stone of the new Gramophone factory in Middlesex, England. During renovations in the 1960s, the container was officially removed, but before it could be reburied, someone ran off with it.
6. Blackpool Tower, Lancashire, England - a 19th century ceremony included a time capsule. A recent search before new construction began found nothing, not even with remote sensing and the help of a clairvoyant.
7. Lyndon, Vermont - first reported in an 1891 newspaper, their time capsule is an iron box containing proceedings of the town's centennial celebration. Scheduled to be opened on July 4, 1991, local citizens searched the town in vain and failed to find the box. In 1991, they vowed not to lose this year’s capsule.