

HISTORICAL PERSPECTIVE OF BATHROOM
DESIGN AND SPACE REQUIREMENTS
IN THE UNITED STATES

By
FRANKLIN P. BAUGH, IV
" "
Bachelor of Science
Southwest Missouri State University
Springfield, Missouri
1986

Submitted to the Faculty of the
Graduate College of the
Oklahoma State University
in partial fulfillment of
the requirements for
the Degree of
MASTER OF SCIENCE
May, 1989

Thesis
1989
B346h
cop. 2

HISTORICAL PERSPECTIVE OF BATHROOM
DESIGN AND SPACE REQUIREMENTS
IN THE UNITED STATES

Thesis Approved:

Margaret J. Weber

Thesis Adviser

Gwendolyn J. Brewer

Asha Hegde

Norman N. Durham

Dean of the Graduate College

ACKNOWLEDGMENT

There are many people to whom I wish to give credit for contributing guidance and valuable information, which was used in the preparation of this thesis. I would like to give special credit to committee members: Dr. Margaret Weber, Dr. Gwen Brewer, and Asha Hegde for instruction, suggestions and assistance.

I extend sincere appreciation to all my family and friends for their prayers and encouragement. I would especially like to thank my mother and father, Frank and Faye Baugh, who have been supportive of all my endeavors.

I wish to extend gratitude to Frances Nuessle and Thomas Kachel, under whose guidance was the inspiration to pursue the field of interior design. I also want to thank Evelyn Ferchau for the many hours spent revising and typing my thesis.

TABLE OF CONTENTS

Chapter	Page
I. INTRODUCTION	1
Purpose	5
Limitations	6
Definitions	6
II. REVIEW OF THE LITERATURE	7
Origin of the Bath Through the Centuries. . .	7
Technological Advances in Water Systems . . .	12
The Role of the Church in Maintaining Water Systems.	14
Stews	16
Garderobes.	18
First Valve Water Closet.	22
Springs of Bath	25
Chamber Pots/Jerrys	28
Bidets.	30
Pan Closet.	31
Dry Hopper.	34
Long and Short Hoppers.	35
Air-Vaccum.	38
Wash Down	38
Trap Jet.	38
Siphonic.	41
Wash Out.	41
Valve Closet.	43
III. BATHROOM TRENDS AND DESIGNERS CONTRIBUTIONS. . . .	48
1900s	48
1910s	51
1920s	52
1930s	54
1940s	58
1950s	59
1960s	60
1970s	61
1980s	63
Bathroom Remodeling	67

Chapter	Page
IV. DESIGN CRITERIA FOR THE BATHROOM	71
Getting Into and Out of the Tub	73
Cleansing	74
Bathtub Design.	76
Length of Tub.	76
Depth of Tub	77
Height of Tub.	77
Water Closet	79
Privacy.	84
Planning	87
Storage.	90
Acoustics.	91
Common Bathroom Layouts.	92
V. SUMMARY AND CONCLUSIONS.	93
Summary	93
Conclusions	101
Suggestions for Further Study	102
BIBLIOGRAPHY.	103

LIST OF TABLES

Table	Page
I. Bathroom Characteristics: Comparison of Trends by Decade	70

LIST OF FIGURES

Figure	Page
1. Map of Region.	8
2. Bath of Knossos.	10
3. Limestone Seat	11
4. Garderobe.	19
5. Close Stool.	21
6. Night Tables	29
7. Pan Closet	33
8. Long Hopper.	36
9. Tilting Basin.	37
10. Air Vaccum	39
11. Wash Down Closet	40
12. Trap Jet Closet.	40
13. Siphonic Closet.	42
14. Valve Closet	43
15. Pitti Palace	50
16. Squat Position	80
17. Modified Position.	81
18. Low Water Closet	85
19. Urinal	86
20. Lion Water Closet.	98
21. Flowered Water Closet.	98

CHAPTER I

INTRODUCTION

The purpose of this study is to show historical changes in the design and facilities of American bathrooms. Included in the study are the technological changes; design changes; and equipment size requirements and needs of users. The study will show these changes in relation to the family bathroom.

The American family home is an important contributor in the forming of attitudes concerning what the needs are of the family and how these needs should be met. The home must be more than shelter; it must also meet the physical needs of sleep, hygiene, and related activities.

Looking back over the centuries, one can see numerous changes in the home of today, and can appreciate the progress. Many things we take for granted today are the result of technological improvements over past decades. How often do we consciously think that the water coming from our faucets is possible because of the work of civic providers long ago? To have the convenience of running water is possible through technology.

In taking a look back on the developments of the bathroom from the past to the present, the various transformations are very evident. The bath goes back almost to

the first recorded existence of man. Rome is infamous for its early baths, among other things. Many of the baths were communal and this was still the case during medieval times. Facilities were mainly public; only the nobility and the wealthy had private baths which were always being changed and dismantled.

Historically, the British have not been hygienic as the French. It was not until the second half of the eighteenth century that the British became interested in better hygiene practices (Gilliant, 1971).

The first complete bathroom in America was built in 1810 in Philadelphia. In 1851, President Millard Fillmore installed the first bathtub in the White House. Some thought it was reprehensible to import a monarchical luxury into the official residence of the Chief Executive of the Republic (Gilliant, 1971).

In the 1880s, Americans became more interested in hygiene needs, giving them a reputation as the most scrubbed and tubbed nation in the world. Since that time until the present, the bathroom has been of major concern to Americans. It has undergone many changes and many studies have been conducted concerning the wants and needs of users.

Alexander Kira (1976) published a six-year survey for the Centre of Housing and Environmental Studies at Cornell University, stating the bathroom facilities were too out-of-date for current technological knowledge (this study was concluded in 1966). It was this report that caused adaptations of bathroom equipment to better match human form.

The bathroom of today is more than just a place to meet basic hygiene needs. It is a place for relaxation, exercise, and entertainment. It may contain a sauna, whirlpool or solarium or just about anything the owner wants or needs.

One important development in the bathroom was that of the commode and there have been numerous changes throughout the decades. Like the bathtub, the water closet (commode) goes back to the Roman era. Latrines were mainly for public use and were found in early Japan as well as in Rome.

Moving from the Roman latrine to a more standardized form of water closet, the hopper is what likely comes to mind. In the 1860s, George Waring developed the hopper as a more healthy and efficient waste disposal system. In general, there are two divisions: 1) hoppers which have no standing water in the bowl to receive and deodorize the waste matter. These are called "dry" hoppers as the water stands only in the trap; and 2) hoppers whose bowls are formed to retain a permanent body of water in the bowl, "improved" hoppers.

Improved hoppers can be further subdivided into seven classes, as follows: a) titling basin, b) air-vacuum, c) washdown, d) trap jet, e) siphon, f) washout, and g) self-sealing closet (Putnam, 1911, p. 465). The following thesis will elaborate in greater detail.

Sanitation was a major factor in the development of the water closet. Proper care was needed in disposing of the waste. Sewer systems were in need of change to correct the problem of overuse and misuse. Much of the plumbing was installed by ignorant tradesmen. Another problem was the water system, especially in country and suburban areas. This system emptied water into a cesspool where the waste seeped into the ground and often contaminated the water supply of the household and possibly neighboring homes.

From the time the bathroom was placed inside the home, many changes have taken place both in the physical size of the structure and in its contents. And, attitudes have changed greatly over the years. Every decade had its own ideas and expectations of what the bath should be, with trends that are from a particular era - each being an expression of the spirit of the age (Zeitgeist). According to Sir Nikolaus Pevsner, a scholar on cultural and social history, faith in technology is an essential part of the Zeitgeist (Watkins, 1977).

In studying the advances in technology in the bathroom from the past to the present, it is quite clear how one technological advance is invented based on a previous one. The first advancement is needed to create yet another, similar to a chain reaction in a continual process which holds true to this day.

Technology is not an entity onto itself, but is developed through the knowledge of individuals teaching and building upon one another. Education plays a major role in the development of technology. It is through educated trial and error that experiments are conducted, and hopefully, turn out successful. In this ever-increasing world of complexity, education and technology are dependent on each other -- one aspect is needed to gain the other.

Purpose

It is the purpose of this study to assess the literature in relation to the various developments of the bath and related subject matter. A historical account of the different changes in regard to the need for personal hygiene; societal attitudes towards hygiene through the centuries; and the many adaptations of the bathroom fixtures and accessories is given. The writer will emphasize various changes in American bathroom design dating from the 1850s to the present. A second purpose in this study is to assess the role of the designer in the various phases of bath design.

Methodology used in this study is based on content analysis. Periodicals, both trade and public were studied on a quinquennial basis. These are as follow: Arts and Decoration; Good Housekeeping; House Beautiful; House and Garden; Interior Design; Interior Design and Decoration; and Ladies Home Journal.

Limitations

Literature regarding the development of the bathroom was limited to articles found at Oklahoma State University Libraries, the Drury Library, the Springfield, Missouri Public Libraries and the Southwest Missouri State University Library.

Definitions

The following definitions are supplied for the purposes of this study:

Bidet: A bidet is a sanitary fixture for cleansing the genito-urinary area of the body (Riggs, 1985).

Lavatory: A lavatory is the plumbing industry's name for a bathroom sink (Riggs, 1985).

Hopper: A hopper is a conical pan flushed by a thin spiral trickle of water (Conran, 1978).

Pedestal: A pedestal is a lavatory on a base attached to the floor rather than set into a counter surface. The base hides waste pipes that are usually visible (Riggs, 1985).

Water closet: In Europe the toilet is often called the water closet and the plumbing trade frequently uses the term water closet or closet when referring to what the layman calls a toilet. In some areas of the country it may also be referred to as a commode (Riggs, 1985, p. 201).

Zeitgeist: (German) Zeitgeist refers to the spirit of the age.

CHAPTER II

LITERATURE REVIEW

Origin of the Bath Through the Centuries

From the onset of time, civilized man has shown interest in maintaining some level of personal hygiene, although there were many different definitions of cleanliness. These were influenced by the time period, location and technological advances of the individual. Looking through history, different concepts of hygiene are very apparent. During every century and culture, dominant attitudes and customs persisted in regard to hygiene and every culture had its own interpretation of what a clean body was.

According to historical documentation, the bathroom dates back at least 3,500 years to the palace of Knossos in approximately 1650 B.C. (Ridley, 1976). The palace was built in Crete for King Minos by his great craftsman Daedalus. The Minoan skills in hydraulic and sanitary engineering far surpassed that of the Chaldeans, Egyptians or the Greeks (Wright, 1966) (see Figure 1). Roman society reached its pinnacle at Constantinople, known today as Istanbul. The Romans are well known for baths, both public and private.

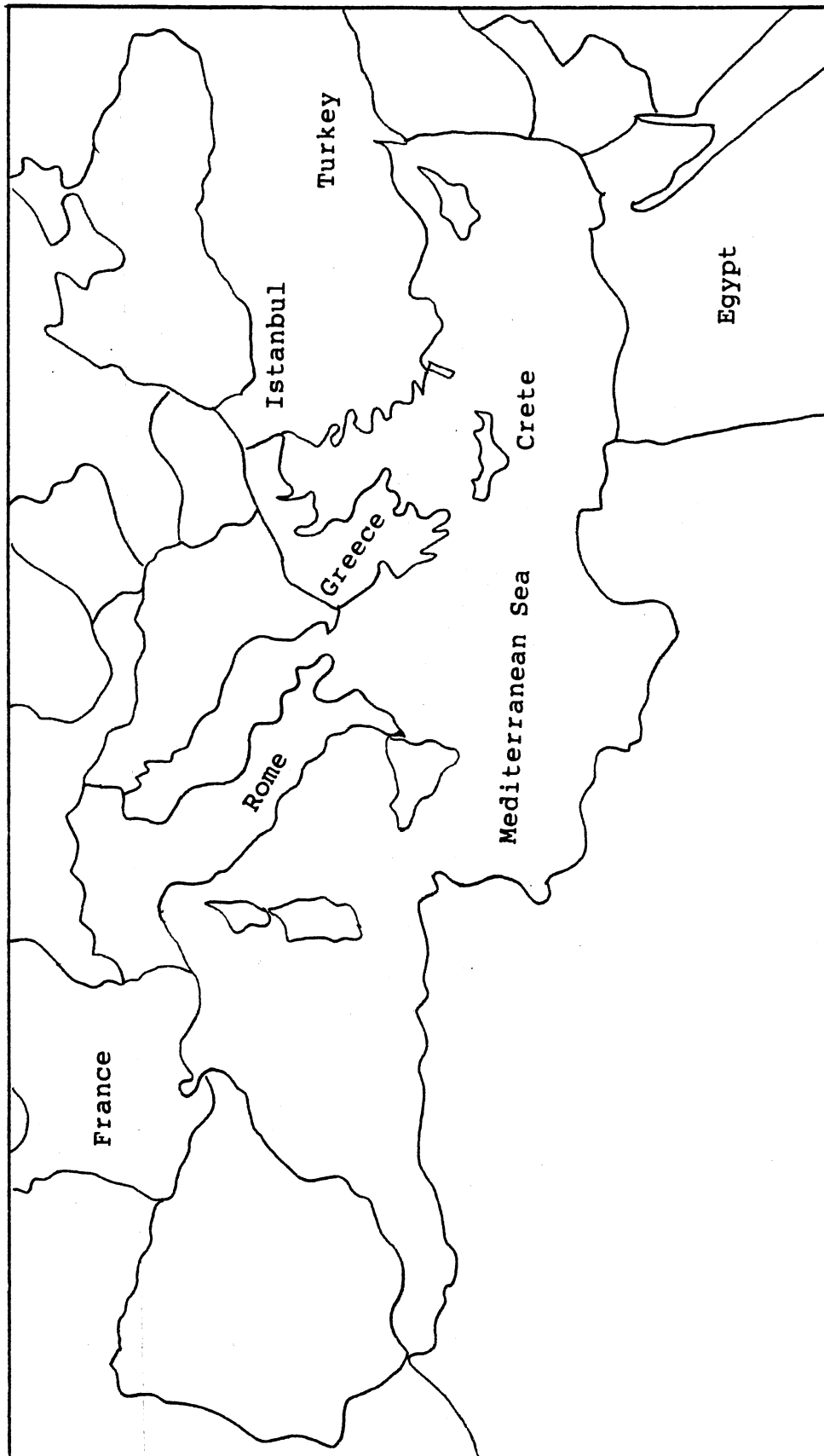


Figure 1. Map of Region

In the Palace of Knossos, water was brought into the structure through terra-cotta pipes. The pipes, neatly interlocked and cemented at the joints, had a tapered shape to give the water a thrusting motion which helped prevent the collection of sediments. The palace had a drainage system whereby wastes were deposited into a large stone-built sewer (Wright, 1966). Latrines at Knossos were very modern. One of these had a wooden seat and possibly a clay pan similar to a modern washout closet, with a reservoir for flushing water. This type of latrine was very advanced. For the Queen of Knossos a toilet chamber was planned and laid out with the necessary conveniences. For light and fresh air, light wells were installed. The bath was painted terra-cotta and was probably filled and emptied by hand. In the toilette room, there was a cistern and a drained sink in the pavement for bathwater (see Figure 2).

It was several centuries later that interest in the bath and personal hygiene resumed. The Eastern Roman Empire was invaded by the Turks who were more civilized and hygiene conscious. Turkish baths, similar to Roman baths, had warm rooms, hot rooms and steam rooms (Conran, 1978).

From about 2500 to 1500 B.C., the cities of the Indus Valley had many bathrooms furnished with water-flushed latrines. Street drains were used to take used water to pits lined with brick, similar to septic tanks. Many of the pipes and masonry sewers used in the Mesopotamian cities of 1500 B.C. are still working today.

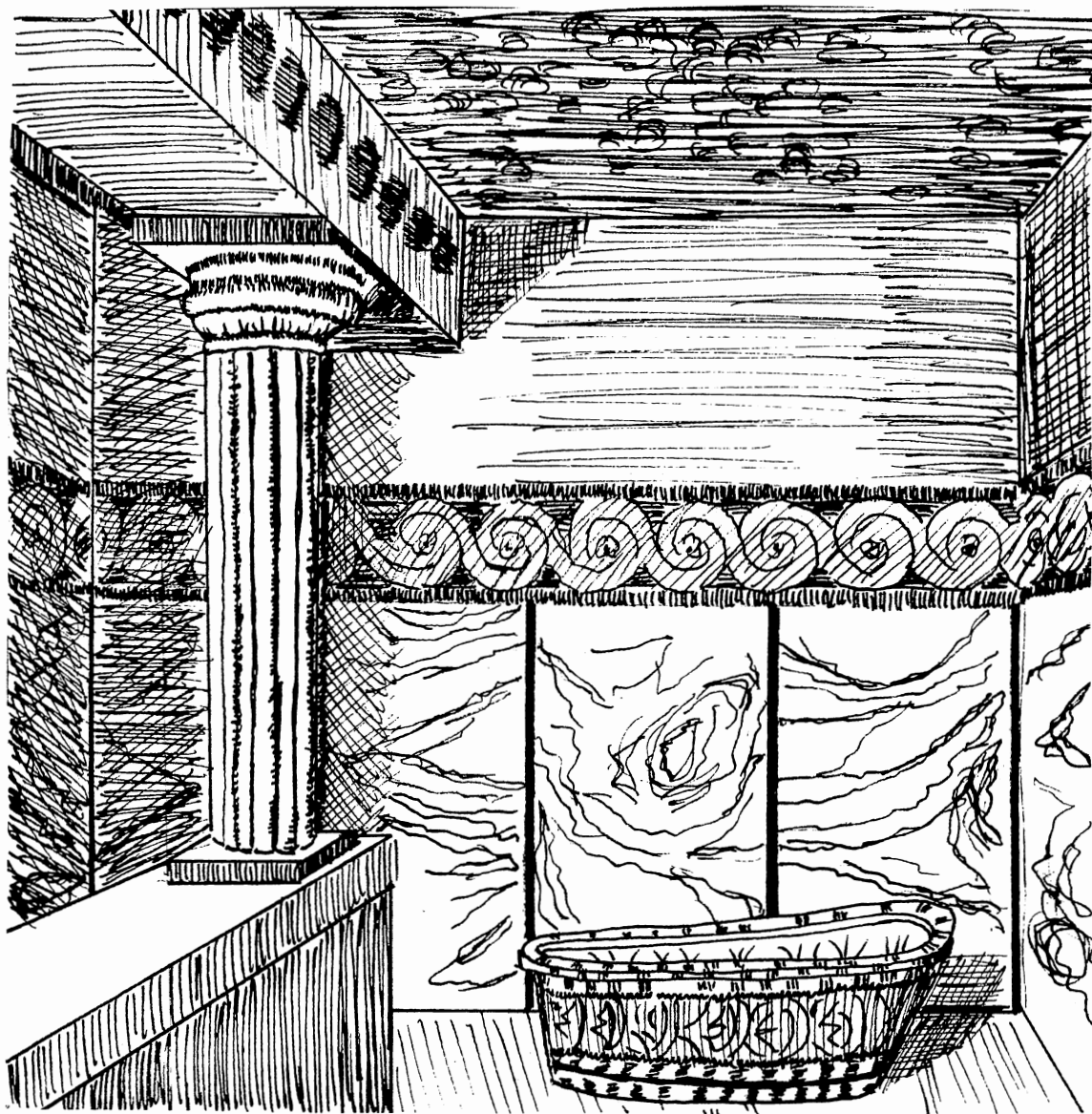


Figure 2. Bath of Knossos

Cosmetics and perfumes were used a great deal by the Assyrians, Babylonians, Hebrews, Sumarians and Syrians. Bathing was less popular - only the rich had bathtubs. Unlike these other peoples the Egyptians bathed often.

An Egyptian bathroom from about 1350 B.C. was excavated at the city of Akhenatue at Tel-el-Amarna. It consisted of a limestone slab with a low rim which was capable of holding an inch or so of water. Low upright slabs formed splash-backs. Water was probably poured from a vase over the bather, making it basically a shower bath. The waste water ran through a trough in the wall into a sunken vase. Also found was a limestone seat that was used in the latrines (see Figure 3).

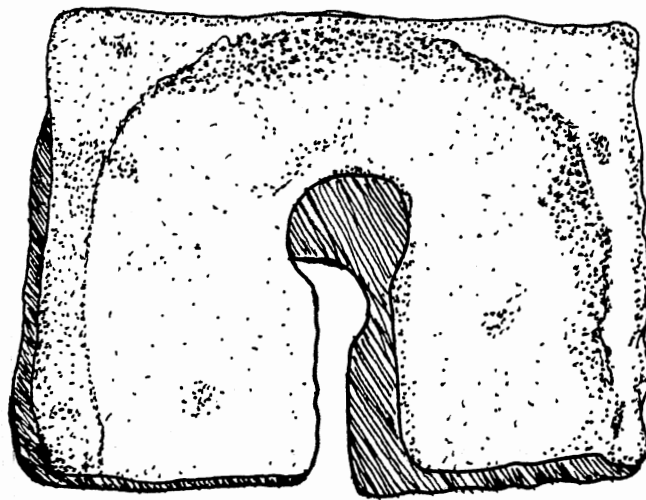


Figure 3. Limestone Seat

Technological Advances in Water Systems

Bathrooms of this time were made possible through technological advances in the water system, in which aqueducts were used. The first aqueducts originated in the Middle-East, where Sennacherib, King of Assyria from 704 to 681 B.C., built a canal which measured 30 miles long. It supplied water to his palace and made irrigation possible for the parks and orchards of the Kingdom. The aqueduct was a great engineering achievement, with a 300-yard long bridge that carried the water over the valley and featured arches rising to a height of 25 feet (Ridley, 1976).

Hezekiah, King of Judah from 728 to 697 B.C., constructed an aqueduct very different from that of Sennacherib. Because of the threat that the Assyrians might invade his land and lay siege to his cities, Hezekiah secured a water supply for his people by digging a tunnel 1,776 feet long. This structure carried the water from an external spring to an underground pool within the walls. This is described in the Bible (2 Kings 20:20).

And the rest of the acts of Hezekiah, and all his might, and how he made a pool, and a conduit, and brought water into the city, are they not written in the book of the chronicles of the Kings of Judah?

Due to the fact that Greece was often at war with other city states, water supplies could not be exposed to the enemy. Initially for protection, the people relied upon wells, springs and cisterns inside the city walls. It was only after the city had outgrown these sources that

they reluctantly considered the building of aqueducts. When building an aqueduct, conduits were buried underground to keep them out of sight of the enemy.

The city of Vathy, on the island of Samos, has one of the earliest Greek aqueducts. Constructed during the last half of the sixth century B.C., a tunnel almost a mile long, was driven through solid rock to trap waters. Pipes made of earthenware were used to distribute the water throughout the city to public fountains. The city of Athens also had underground aqueducts which supplemented its already existing water supplies.

In Classical Greece, running water, whether from a spring or through an aqueduct, was communal property. Usually the only private sources of water were rainwater cisterns and wells so the residents of the city relied on public fountains. The fountains were a center of social interaction where women came to fill their water containers and talk with one another. These fountains were usually protected with great care and extravagance by a colonnaded building.

Of all ancient civilizations, Rome paid the greatest attention to its water supply. Like the Greeks, most of the water was for the whole population, very few had private water supplies. Due to the cost of connecting to the mains, only the rich could afford such private luxuries. Most of the water went to municipal fountains or public baths. Roman officials ensured that there were enough fountains and baths for the public. Throughout most

of Europe this organized water supply came to an end with the fall of the Roman Empire in the West. When the Goths invaded Rome in A.D. 537, many of Rome's aqueducts and pipelines were destroyed or allowed to fall into disrepair. During this time, society took a step backwards as far as advancements in utilizing its water source.

In the East, the Roman Empire was still in power and the water distribution system was still efficient. In A.D. 330, the imperial capital was transferred to Constantinople, so Rome had lost much of its importance long before the Goth invasion. Various emperors took some part in the provision of water for the new capital. The leaders of Constantinople made reservoirs by damming up several springs, so public fountains could be supplied with water. After the city outgrew these sources, an aqueduct was constructed and can still be seen in Istanbul.

The Role of the Church in Maintaining Water Systems

Following the "fall" of Rome, new kingdoms in Europe began to emerge. With the old political system gone, only the Church retained an international outlook. It was the leaders of the Church, with their heritage in the Roman past, who began to re-establish artificial water supplies. In 776, Pope Adrian I restored some of the broken sections of the old aqueducts. For this reason many of the early Church undertakings were primarily designed to bring water into the church houses. This was the case in

the ninth century in St. Laurent and St. Lazare, close to Paris. When the monks tapped several springs, they supplied two public fountains with surplus water after their own needs were met.

At Christ Church Monastery in Canterbury, elaborate water systems were laid out. Close to the spring was a conduit house in which an underground lead pipe passed through five oblong settling tanks used to purify the water, each having a vent to control pressure. It then ran to a laver, where it fed a tank raised on a central pillar to give a head of water. From this pillar, there ran two pipes - one to the frater, scullery and kitchen, the other to the bakehouse, brewhouse and guest hall, ending at another laver near the infirmary. These streams of water trickled constantly into basins in the lavers. Other branches fed the bathhouse and a tank used by the town folks. The waste ran into a stone pond and from there to a tank by the prior's chamber, where it was joined by the wastes from the bathhouse and rainwater from the roofs, to provide an intense flow of water through the main drain running under the latrines. For extra supply, there was a well and beside it a hollow column on top of the main pipe, where water could be added to keep the supply up during times of drought. The efficiency of this water system may be the reason the monastery escaped the Black Death in 1349 (Wright, 1966).

By the end of the thirteenth century, many towns constructed conduits to supply water to their fountains.

During the fourteenth century, cities looked to the Church for help. Cities such as Southampton, Chester, Grantham and Lincoln received piped water from local monasteries.

During the Middle Ages, most of the water was used for consumption; however, among the upper classes it was also used for personal hygiene. The upper class was expected to wash before and during meals. This was necessary as people used their hands to eat, forks were not used (Ridley, 1976).

Stews

Water was also used for bathing. Medieval bathtubs were made of wood similar to barrels. The tubs were usually elongated to make room for numerous bathers at once. Nudity did not seem an embarrassment to the people and bathing trickled down through most of society. Poor town people who had no way of heating large quantities of water at home could visit a public bath known as a "stew" (Wright, 1966).

By the end of the Middle Ages stews disappeared within a century of coming into public use. This was mainly because: 1) as the towns grew, the forests started to dwindle and the source for heating water was limited; 2) immoral business which was conducted while visiting the stew was frowned on by the Church; and 3) major concerns about the spread of plague and other infectious diseases kept customers away. Henry VIII had most of the stews closed or strictly regulated, for nearly 150 years (Wright,

p. 60). One such regulation described in Wrights' Clean and Decent is as follows:

. . . also, if there be any House wherein is kept and holden any Hot-house or sweating-house, for Ease and health of Men, to which be resorting or conversant any strumpets, or Women of Evil Name or Fame. Or is there be any Hot-house of sweating ordained for women, to the which is any common recourse of young Men, or other Persons of Evil Fame and Suspect Conditions. Also, if there be any such Persons that keep or hold any such Hot-house, either for Men or Women, and have found no surety to the Chamberlain for their good and honest Behavior, according to the laws of the City, and lodge any manner of persons by might, contrary to the Ordinance thereof made, by the which he or they shall forfeit 20 to the Chamber, if they do the contrary (p. 60-61).

Sanitation during the Medieval period was lacking by today's standards. Many households kept pigs and cattle and thought it was natural to add human waste to the pile of manure so it could all ripen together. Cities allowed dungheaps to remain inside their limits, but people were expected not to let the pile accumulate too much before taking it out of town (Ridley, 1976).

Throughout the fifteenth century, cesspools were the main source of waste disposal. This was the best method due to the limited technical resources of the time. Cesspools and dungheaps were the breeding ground from which disease was spread. It was not unusual for people to fall into cesspools. In 1498, George Pfeffer von Hell, Chancellor of the Electorate at Mentz drowned in one (Ridley, 1976).

Garderobes

The monastic orders had the most sanitary arrangements of the Middle Ages. The location of the monasteries were planned and the buildings were constructed where streams would pass under latrines to carry away waste. The latrines for the monks were called garderobes (Figure 4). They were partitioned off and part of the space was used to hang clothes, much the same as a wardrobe (Ridley, 1976).

Garderobes within the great house or castle were usually built with thick walls, each having its own vertical shaft below. Each floor had several garderobes, with multiple shafts grouped around chimney flues. At Bodiam Castle, there were 20 seats; at Southwell Palace, the privies were placed around a central shaft and faced outward onto a circular passage. Persons using the garderobes could hear each other, but were out of sight. Many castles placed garderobes close to large and important rooms like banqueting halls. The Tower of London has garderobes which had a short shaft that turns outward through a hole where the refuse runs down the face of the wall into the moat. Originally used for defensive purposes, this moat must have become offensive (Wright, 1966).

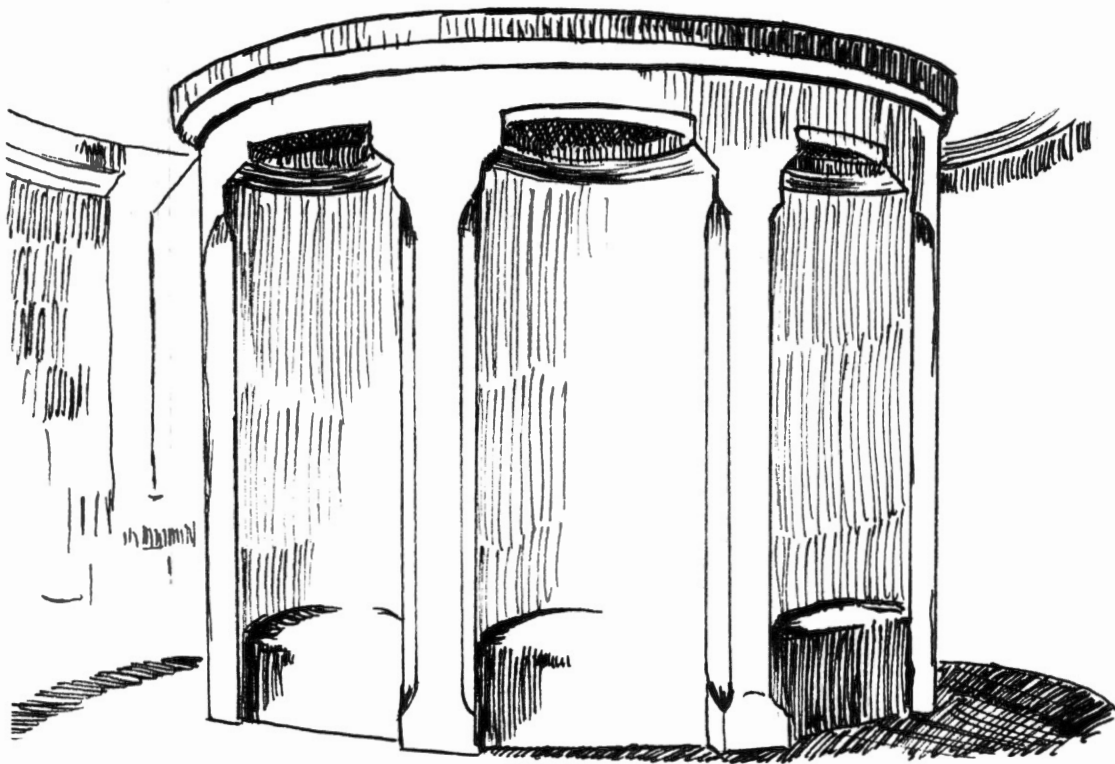


Figure 4. Garderobe

The general population, not having the convenience or privilege of using garderobes had to make due and typically built latrines between houses. They also had chamber pots, which were emptied by throwing the urine out the window into the street. They purportedly did not look to see if there were any pedestrians on the streets; they just shouted "Gardy-loo," which translated means "look out for the water" (Conran, 1978).

In poorer households which had earthen floors, urinating under the bed was commonplace; so common in fact, that officials known as petermen would enter the home and dig up the floor. The purpose of such excavation was to search for saltpetre, an essential ingredient of gunpowder, which was formed from crystallized urine. Persons with better breeding would use the fireplace when it was not burning (Conran, 1978).

J. Pickering Putnam (1911) described the sanitary conditions of the Middle Ages in the following manner:

In the middle ages cities even as magnificent as Paris and London were very dirty places, the streets being described as more foul then the most abominable sewers, the horse manure standing in them, according to one writer, 'sometimes as much as a yard deep.' It is recorded by the royal Physician Rigord that one day while King Phillip Augustus looking for recreation from his audience chamber window, he saw some citizens' carriages passing below 'when the substance forming the street, being stirred up by the revolution of the wheels, emitted a stench so powerful as to overpower Phillip. This so disgusted the King that he urged the citizens to pave the streets; and to assist in effecting the purification of the city, he built a wall around the cathedral to prevent it from remaining longer a common corner of convenience' (p. 44).

In the sixteenth century, the garderobes were being replaced by "close stools" or "stools of ease," which was not an improvement over the garderobes (Gilliant, 1971). The close stool was a basic box shape with a lid, padded seat and possibly handles (see Figure 5). Many of the stools used by royalty were very elaborate and eye-catching. One stool made in 1547 was covered with black velvet, trimmed with ribbons, fringes and 2,000 gilt nails. The seat and arms were covered with white,

downfilled material. This stool was supplied with two leather cases, one for the stool and one for the bowl and "sesstarnes" or cisterns. Another close stool which is still at Hampton Court is covered in red velvet, lace, gilt nails and handles. It has a seat padded with velvet and a lid which could be locked to prevent illicit use. There was no "sesstarnes," but a pot (Wright, 1966).

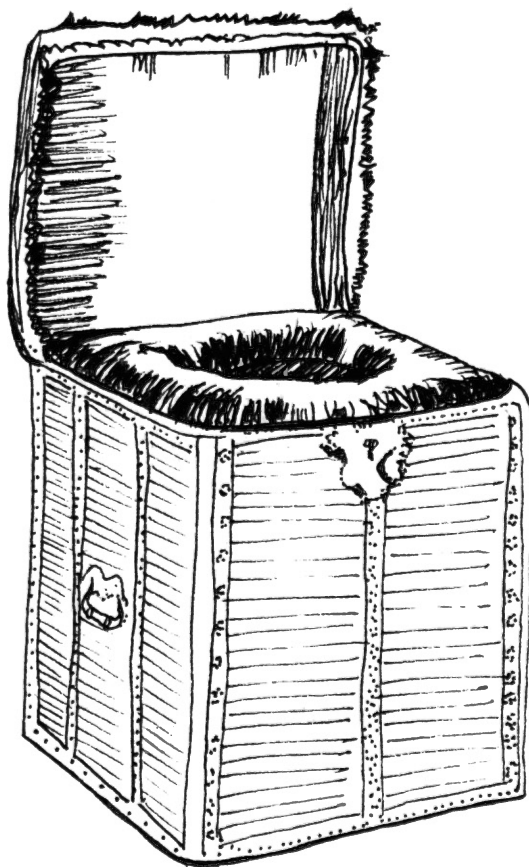


Figure 5. Close Stool

First Valve Water Closet

In searching for information on the bathroom, one finds the name Sir John Harrington, god son of Queen Elizabeth, as the inventor of the first valve water closet in approximately 1596. He constructed his invention at Kelston near Bath. It was a seat with a pan, a cistern, an overflow pipe, a value or stopple, a flushing pipe and a waste with a water seal (Wright, 1966). Sir John gives practical advice on the construction of his invention in a unique way. He wrote Metamorphosis of Ajax and in it describes the valve water closet:

To M.E.S., Esquire

Sir,

My master having expressly commanded me to finish a strange discourse that he had written to you, called the Metamorphosis of Ajax, by setting certain pictures thereto . . . where for now to instruct you and all gentlemen of worship, how to reform all unsavory places of your houses, whether they be caused by privies or sinks, or such like (for the annoyance coming all of like causes, the remedies need not be much unlike) this shall do.

An Anatomy

In the privy that annoys you, first cause a cistern, containing a barrel, or upward, to be placed either in the room or above it, from whence the water may, by a small pipe of lead of an inch be conveyed under the seat in the hinder part thereof (but quite out of site); to which pipe you must have a small cock or washer, to yield water with some pretty strength when you would lit it in.

Next make a vessel of an oval form, as broad at the bottom as at the top, two feel deep, one foot broad, sixteen inches long; place this very close to your seat, like the pot of a close-stool, let the oval incline to the right hand. This vessel may be of brick, stone or lead; but whatsoever it is, it should have a current of three inches to the back part of it

(where a sluice of brass must stand); the bottom and sides all smooth, and dressed with pitch, rosin and wax: which will keep it from tainting with the urine.

In the lowest part of the vessel which will be on the right hand, you must fasten the sluice or washer of brass, with solder or cement; the concavity or hollow thereof, must be two inches and a half.

To the washers stopples must be a stem of iron as big as a curtain rod; strong and even, and perpendicular, with a strong screw at the top of it; to which you must have a hollow key with a worm fit to that screw.

This screw must, when the sluice is down appear through the plank not above a straw's breadth on the right hand; and being duly placed, it will stand about three or four inches wide of the midst of the back of your seat.

That the children and busy folk disorder is not, or open the sluice with putting in their hands without a key, you should have a little button of scallop shell, to bind it down with a vice pin, so as without the key it will not be opened.

If water be plenty, the oftener it is used and opened, the sweeter; but if it be scant, once a day is enough, for a need, though twenty persons should use it And this being well done, and orderly kept, your worst privy may be as sweet as your best chamber.

But to conclude all this in a few words it is but a standing close-stool easily emptied. And by the like reason (other forms and proportions observed) all other places of your house may be kept sweet.
(Palmer, 1973, pp. 29-30)

Sir John's invention was certainly ahead of its time; it was not used fully for almost 200 years after its first appearance. One of the few locations which contained his valve water closet was Queen Elizabeth's Palace at Richmond. When the Queen's Palace was fitted for a water closet, Harrington placed a copy of Ajax chained to the wall and a message to the ladies of the Privy Chamber:

Faire Dames, if any look in scorn, and spites
Me, that Misacmos Muse in mirth did write,

To satisfie the sinne, lo, here in chains,
 For aye to hang, my Master me or dames.
 Yet deem the deed to him no derogation,
 But design to this device new commendation,
 Sith here you see, feele, smell that his conveyance,
 Hath freed this noysome place from all annoyance.
 Now judge you, that the work mock, envie, taunt,
 Whose service in this place may make most vaunt:
 If us, or you, to praise it, were most meet,
 You that made source, or use, that make it sweet?
 (Palmer, 1973, p. 30).

It could be stated that bathing was not a popular practice of hygiene. The people who took a bath usually took one for medicinal purposes, or they were the very elite and royalty. Queen Elizabeth took a bath once a month whether she needed it or not. One may praise the Elizabethans in regard to their interesting culture and their Age of Elegance, but they were not well-known for their cleanliness. These periods mark the beginning and end of two rather unsanitary centuries (Wright, 1966). One source suggests that the fashion during these times were heavy wigs and powder, all to conceal a stinking body, pockmarked skin and hair absent through the ravages of syphilis (Conran, 1978).

Louis XIII of France had a wooden bath for most of his life. Towards the end of his life he had more elaborate tubs of fine marble. Between 1677-1679, Louis XIV installed six baths in his own suite at the Palace of Versailles, having one octagon of pink marble, 10 feet wide and 3 feet deep, with gilded ceilings, cushions, drapes and a great pavilion made of fabric (Gilliant, 1971).

The bathroom of Marie Antoinette is still intact. In Maisons de Plaisance (1738), Blondel the architect of Louis

XV, discussed that the best bathrooms had two baths, one for washing and one for rinsing. The French generally were better equipped hygienically than the British. During the reign of Louis XIV, there were 264 chaises perceis (close stool) at Versailles. It was considered a great privilege to be received by the King sitting on one of these specially adorned close stools (Gilliant, 1971).

Although most public baths were in decline, one exception did exist; this was the hot springs of Bath. These springs, which had been lost since Roman times, were rediscovered in the twelfth century. Archaeologists of that time explained that the springs were first found in 863 B.C. by the British Prince Bladud, the father of King Lear. Bladud was described as being a leper, a swineherd and a glider pilot. He had been banished from the population because he was a leper, and so became a swineherd. His gliding is another story. By a chance immersion in the waters, the pigs' health seemed to improve, so Bladud went into the waters and was cured of his leprosy. He founded the city of Bath and dedicated the springs to Minerva. There was a statue of Bladud erected in 1699 with the inscription of the legend. Some historians suggest that Bladud gave the bath waters their power by magic (Wright, 1966).

Springs of Bath

The springs of Bath gained publicity when Mary, the Queen of James II, heard of its wonder-working powers in

cases of barrenness. She spent some time at the Cross Bath and later conceived a child. To mark the happy event, a pillar was erected in the center of the bath as a memorial.

Wright discusses another case of praise for the waters of Bath in the following:

Dr. Pierce, who practiced at Bath from 1672 to 1697, seems as they say, to have 'enjoyed very poor health' until he took the waters. At the age of ten he had dropsie, an ascities and an anasarcha together; at twelve the smallpox; at fourteen a severe tertian ague for six or seven weeks; then headaches, defluations of rheumes to teeth, jaws and palate as well as to the glandules of the throat; at twenty-one; breeding the measles; he bled at the nose for two days and they despaired of his life; at thirty, living 'near the moors and marshy country' he took an epidemick fever which determined in aquaartan ague; a swelling of huemeroid veins and scorbutical symptomes; in which state he moved to Bath, took to the waters, recovered promptly and lived healthily to the age of seventy-five (Wright, 1966, p. 81).

One other popular form of health and hygiene was that of the cold bath. Dr. Cheyne, an English hygienist, proposed a revolutionary idea when he advised people to take a cold bath at home three times a week (Conran, 1978). In America, one of the earliest supporters of the merits of the cold bath was the butler of William Penn, founder of Pennsylvania. This unhappy butler was not only deaf, but was "long vexed with wandering pains and aguish accessions." At the worst time of these afflictions, he leaped from his bed on a cold night, threw off his night shirt, jumped into cold water, ran naked around the garden, hopped into the water again, went twice more around the garden; then, taking "a good swig o' brandy" laid back in bed - and

needless to say had recovered both health and hearing by the morning (Wright, 1966).

In 1775, Alexander Cummings took out the first patent for a water closet. In his specification he avoided the older type of stinktrap, and used the superior S-bend water-seal, it was made to totally empty the contents every time the closet was used. This trap was perhaps the most important aspect of the whole design. Another innovation was a single lever connected to a sealing valve and the water-cock, where flushing and opening could be accomplished simultaneously. A weakness of the mechanism was in the valve, which slid sideways and was difficult to keep watertight (Ridley, 1976).

Samuel Prossers' invention came two years later. In his design, he used a primitive type of ball float to control the water. Following Prosser was Joseph Bramah, a London watchmaker and jeweller. His water closet used two valves, one to regulate the water into the basin and the other to remove it. This closet was very successful and it was made well into the nineteenth century (Palmer, 1973).

Wash basins in the monasteries featured elaborate fixed lavers, running water, multiple basins, separate taps, recesses for towels, and efficient drainage; however, the wash basins in private houses were fairly simple in structure. The wash basins were placed in the bed chamber and were usually small, either fixed in a recess or portable, with a tap which used a metal reservoir to be could be taken out and heated over the fire.

By the early eighteenth century, the bedroom toilet table was decidedly dainty. It was placed on a tripod and consisted of a small china wash bowl which fit into a wooden top. By the 1770s basins were more substantial, with larger bowls kept permanently in the corner of the room. Accessories usually included a mirror and soap dish. They also served as a shaving stand. Chippendale, Hipplewhite and Sheraton designed many styles of wash stands (Conran, 1978).

Night tables came into prominence during this period (see Figure 6). The basic use for the night table was to contain and conceal the chamber pot, which was usually placed next to the bed for easy access. It was also known as a night commode. In its many different forms it consisted of three steps, each with a countersunk piece of carpet, like the start of an ordinary staircase used to ascend into the higher feather bed of the time, but instead it hid a sliding stool pot. Later, the commode lost its legs and became an ordinary-looking bedside cupboard (Wright, 1966).

Chamber Pots/Jerrys

These chamber pots were also known as "jerrys," which have a very interesting history of their own. The jerry was first used in the Medieval Ages. It was made up of a vase, usually of glass, with a narrow neck and a wide funnel mouth. It had two advantages. Night clothes were not worn, and the jerry could be used without getting out

of bed. A second advantage was that it was ideal for "uroscopy," whereby a physician would diagnose all types of ailments by inspecting the contents of the vessel.

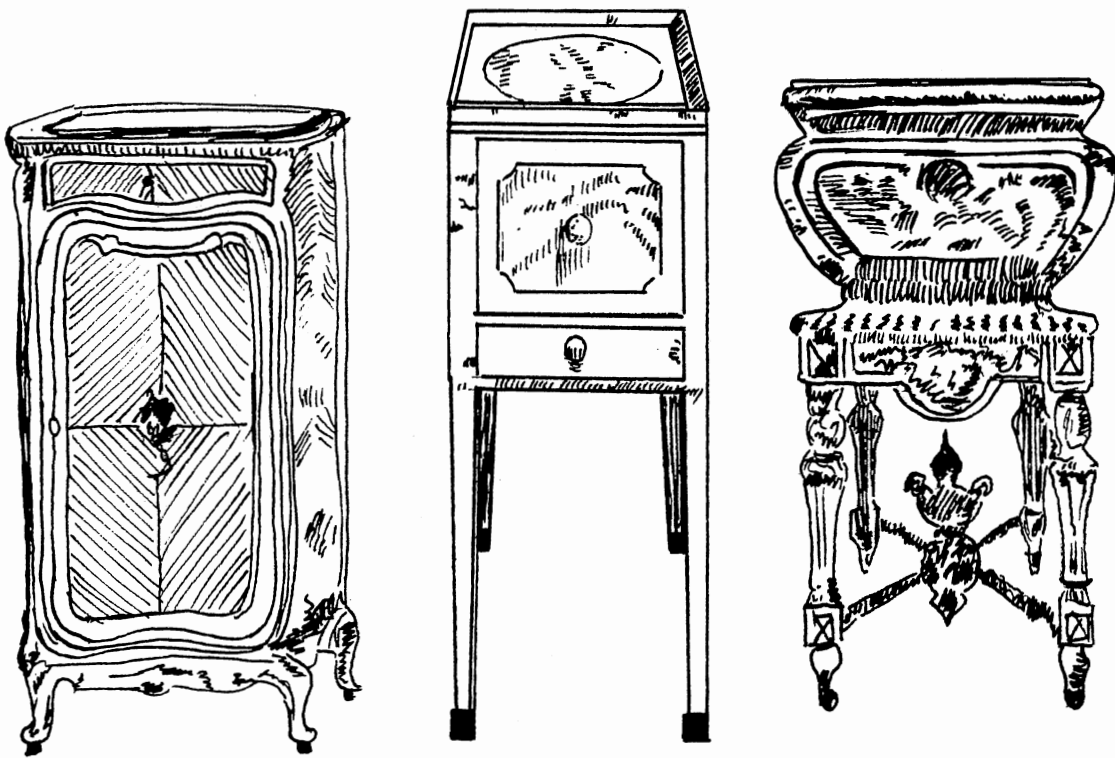


Figure 6. Night Table

Later, the jerrys were made from tin, pewter, copper, silver, or gold. In the seventeenth century, the development of native English pottery began in North Staffordshire, where a number of peasant potters were

becoming established. The first jerrys made of earthenware were fairly crude and were made more for use than show. The glazes were applied only on the inside and were usually a coarse yellow or green lead. In the mid-eighteenth century, the art of making ware white throughout was achieved by mixing white burning clays with finely-ground flint. The china jerry was now durable, impervious, non-corrodable and had a smooth surface for easy cleaning. With the invention of printing on china in 1754, this refined ware made a good base for coloured glazes and transfer-printed patterns. The jerry was then decorated and considered a thing of beauty.

By around 1800, some jerrys were very elaborate - having flowers on the outside, or possibly a frog on the inside. One could also have some more ribald fun, such as having a jerry with a portrait of Napoleon on the bottom, or one which had a large eye along with the lines:

Use me well, and keep me clean,
And I'll not tell what I have seen.

In the late nineteenth century, a jerry containing a music box which played chamber music when the lid was lifted and could not be turned off by the embarrassed guest, made the contraption more of a novelty (Wright, 1966).

Bidets

The first reference to the bidet was in 1710, when the Marquis d'Argenson was granted audience by Madame de Prie, who was seated on one. Madame de Pompadour, the mistress

of Louis XV, had at least two bidets which were elaborate and meant to be displayed and admired. The bidet was worked using a hand-pump fed by a reservoir which produced an upward spray. In England, the well-traveled upper classes imported the French bidet and English cabinet-makers disguised them within furniture. These ingenious pieces which appeared to be simple night tables by the bed, opened and unfolded to reveal a wash stand, toilet accessories, a chamber pot, and bidet (Conran, 1978). To the English, the bidet has always carried a certain aura of Continental impropriety, and has never been fully accepted. Today, in the English middle-class home, there is less than one bidet per thousand bathrooms (Wright, 1966).

Pan Closet

The pan closet originated during the 1790s, but was not used often until the nineteenth century when its low price and ability to stand up to rough usage gradually brought it into public demand. According to J. Pickering Putnam (1911), author and sanitarian, the pan closet has many design flaws. The pan closet consisted of a hinged vessel. When raised and filled with water, the pan sealed off the bottom of the conical basin efficiently. The problem was that a large iron container was needed to allow the pan room to swing down and empty. When the container was not frequently cleaned it became similar to a cesspool, readily venting its gases whenever the closet was

flushed (see Figure 7). Needless to say, pan closets were very unsanitary (Ridley, 1976). S. Steven Hellyer, a famous Victorian plumber and author, stated his thoughts on the pan closet:

. . . been improved many times by various manufacturers, one wonders what it could have been like before William Law 'improved' it in 1796, for it remains to this day, . . . about the most unsanitary closet in use The only 'bliss' that the public can have about so foul a thing is ignorance of its nature (Palmer, 1973, p. 33).

Hellyer was not the only one who criticized the pan closet. P. J. Davies, another plumber of the nineteenth century had this comment:

I consider this closet a very unsanitary piece of mechanism, and totally unfit for its intended purpose, inasmuch as in a short time the internal parts become besmeared, and consequently become offensive (Palmer, 1973, p. 33).

The form of the pan closet is complicated and bulky. The receiver occupies so much space below the bowl that there is no room for the trap above the floor. In all pan closets the bowl is too wide, and the surface of the standing water at its bottom is too small and too far down below the seat. The presence of the pan renders the use of this closet unsafe as a slop hopper because it causes spattering and overflowing when large quantities of slops are suddenly thrown into it. As a final word, Putnam comments:

In short, it is impossible to conceive of a device more ingenuously contrived than the pan closet to embrace in a single feature as many hygiene vices; and under the outward effect of security, as many real dangers (Putnam, 1911, pp. 437-438).

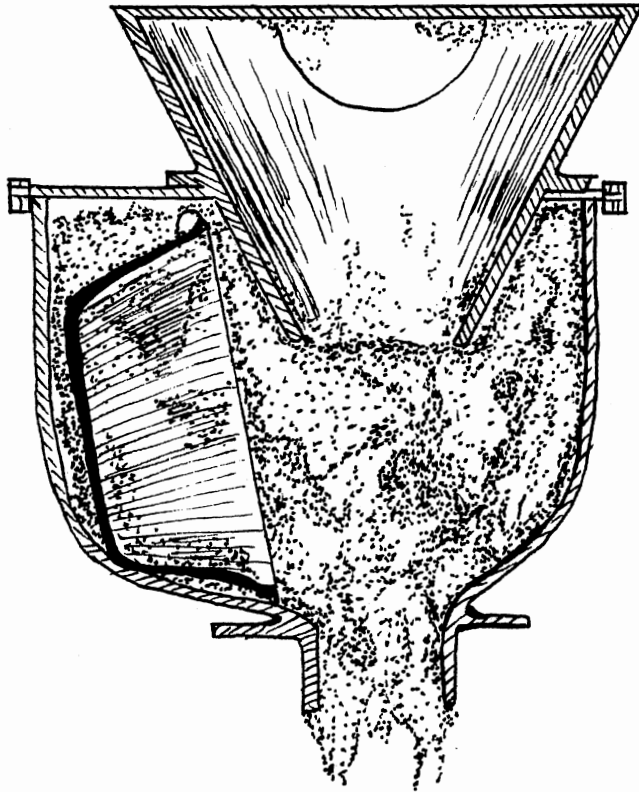


Figure 7. Pan Closet

George Warning, a sanitarian, was concerned for the deplorable sanitary conditions of the American towns and cities. Warning tried to work out a suitable plumbing system. His approach is worth looking into, not because he had better insight than his contemporaries, but because his views illustrate various solutions for a complex sanitation problem.

In 1870, Warning estimated that for half of the families in rural parts of the U.S., "the corn-field and the thicket were the only retreat provided." Many homes,

especially in the cities, had commodes for liquid wastes, but the persons living in these homes still relied upon an outdoor toilet. Much of the time the privy was in the backyard, sometimes over a hundred feet away. In the winter months snow would block the way, and there was no shelter from rain. Everyone had to overcome these conditions, but Warning found it more difficult for women. Due to modesty, if the path was in view of a neighbor's house, they would wait until darkness came. During stormy weather a woman would often wait for several days before going to the privy.

Dry Hopper

George Warning's ideal system for dealing with waste disposal was originally proposed by Henry Moule, an English clergyman in 1858. Moule had discovered that when a small amount of dry earth was covered over human waste, the fermentation of the waste and the generation of noxious gases were prevented. When the waste and earth dried, it was raked; it did not smell, and it could be used as enriched fertilizer.

A basic form of the closet was used consisting of a commode containing in the back a hopper for earth. Underneath the commode seat there was a box for receiving the waste deposits. After it was used, a lever was pulled and a certain amount of dirt fell on top of the waste. There was not a great deal of upkeep aside from filling the hopper with dirt once every four or five days and emptying

the box under the seat. This was a system with little mechanization and provided a good way to use natural processes to take care of the waste problem. There was, however, one problem with Warning's system. It was not feasible for large cities. The system required enough land per family to absorb 25 gallons of water a day through the percolating drain system, which was difficult due to the dense population (Handlin, 1979).

Water closets can be placed into two basic divisions: "dry" hoppers and "improved" hoppers. Dry hoppers have no water standing in the bowl to receive and deodorize the waste matter. The water stands in the trap only. Improved hoppers have bowls formed to retain a permanent body of water.

Long and Short Hoppers

By 1870 the long and short hoppers were classified as dry hoppers (see Figure 8). The long hopper closet was a conical pan flushed by a thin spiral of water. Both of the hoppers (long and short) resembled a dunce cap turned upside down (Palmer, 1973). The long closet had two main problems: 1) the water that twirled around the basin was not strong enough to remove the waste; and 2) it was designed too large to clean efficiently. The short hopper was a little better. These hoppers were cheap and easy to manufacture. One was advertised as "suitable for Prisons, Mills, and C."; another was available in two qualities - "The Castle" (for the rich) and "The Cottage" (for the

poor). As improvements were made in hopper design, one sanitation expert suggested that instead of destroying the thousands of hoppers already made, they might be used by gardeners to protect rhubarb from frost (Wright, 1966).

Improved hoppers can be subdivided into seven classes, as follows: 1) tilting basin, 2) air-vacuum, 3) wash down, 4) trap jet, 5) siphon, 6) wash out, and 7) valve closet.

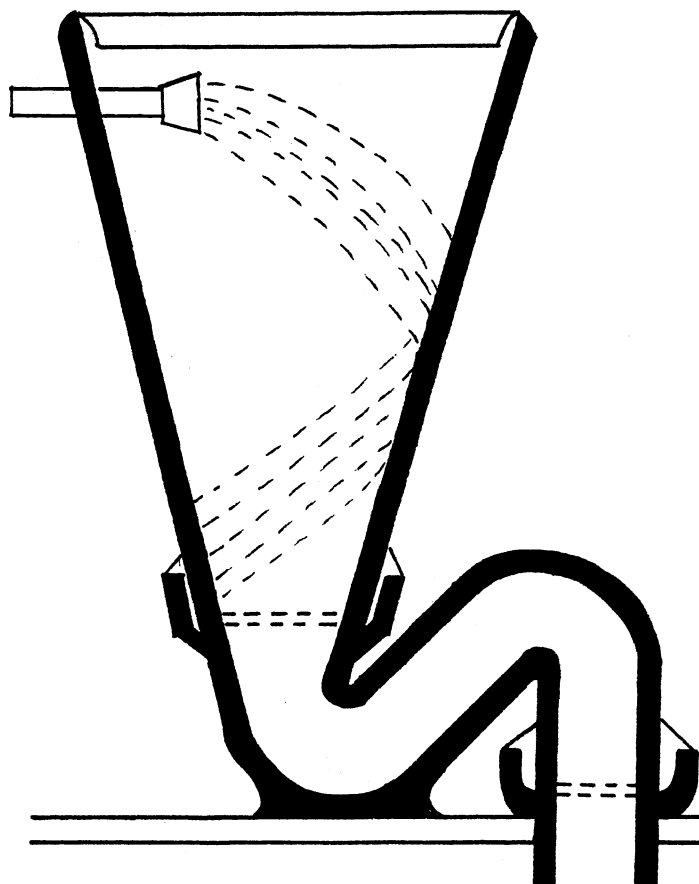


Figure 8. Long Hopper

Tilting Basin

The tilting basin has a double bowl, the outer basin is connected with an ordinary strap and is stationary. The inner basin is pivoted to tilt after use and empty the waste into the stationary basin, then pass out into the soil pipe. Tilting is done by hand. This is not a good design, it is an awkward and clumsy arrangement (see Figure 9). The stationary bowl corresponds with the receiver of the pan closet and has similar shortcomings. The inner bowl conceals the trap, which should be visible, and adds greatly to the complexity and cost of the closet without providing any advantage. It also requires disagreeable manual labor involved in tilting the basin (Putnam, 1911).

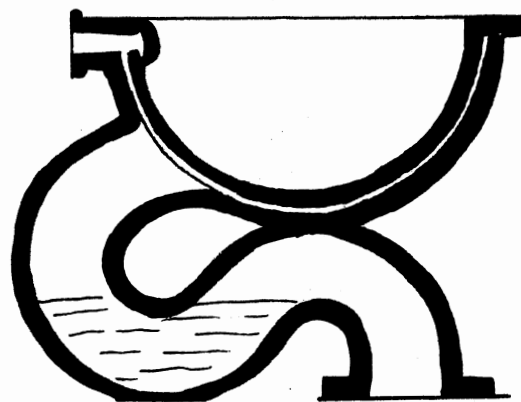


Figure 9. Tilting Basin

Air-Vaccum

The air-vacuum with a double trap has space between the two to create a vacuum chamber. The vacuum is formed by the use of a cistern, which, in supplying the flush, withdraws air from the trap to take the place of water. This is one of the first closets having a scientific form of basin and standing water system (see Figure 10). However, its complicated cistern and double trap devices work against it, and are now found to be superfluous in water closet construction (Putnam, 1911).

Wash Down

The wash down closet is in common use today in the United States and many other parts of the world. Flushing depends upon the power of the stream and the separate jets of liquid striking from above the surface of the water basin and the waste in the bowl (see Figure 11). The advantage is that the flush is exerted directly on the water in the basin (Palmer, 1973).

Trap Jet

The trap jet closet was invented in England by Thomas Smith in about 1842 (see Figure 12). In the trap jet the flushing stream is used to have more advantage than other closets of its time. To overcome the amount of water standing in the bowl and trap, a jet of water is used directly in the water below its normal level and in the

direction of its outward flow. A stream of water creates force to remove waste (Putnam, 1911).

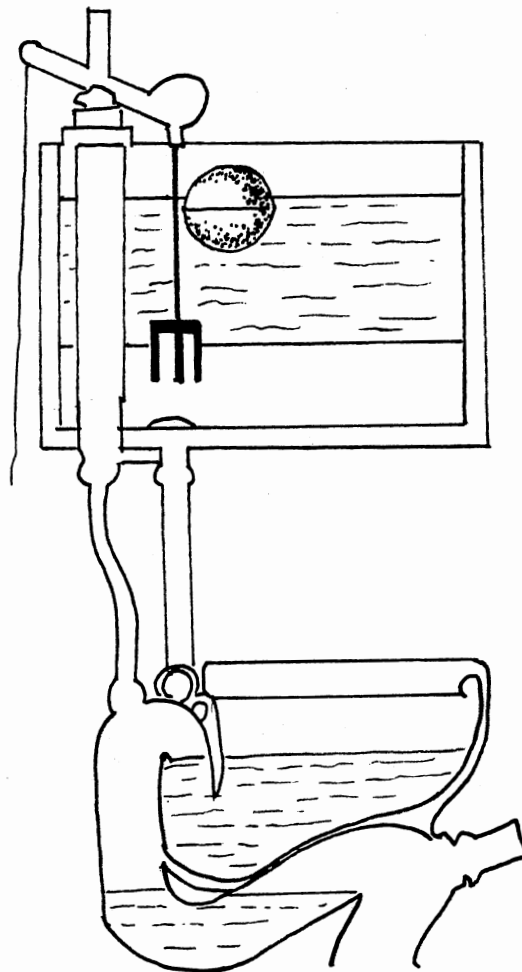


Figure 10. Air Vaccum

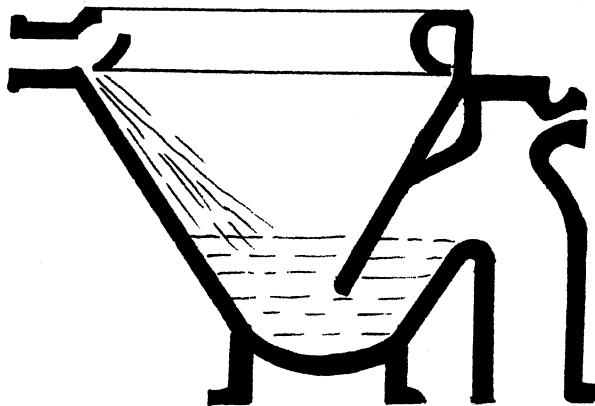


Figure 11. Wash Down Closet

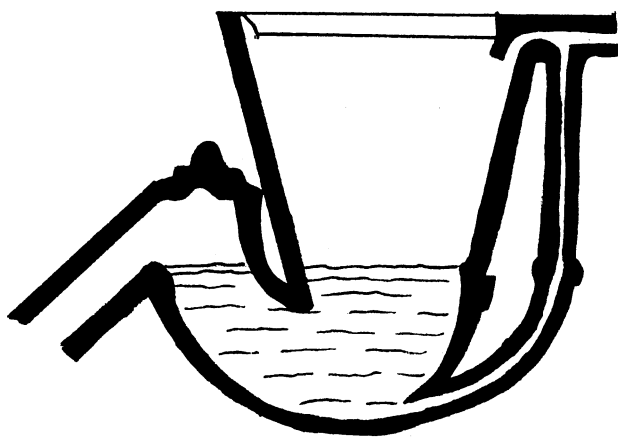


Figure 12. Trap Jet Closet

Siphonic

Water and waste in the basin of the water closet are carried away by means of a siphonic action (see Figure 13). A chamber below the trap aids in charging the siphon. When first introduced, the chamber was under the floor; in later construction, the chamber has been placed alongside the closet above the floor. To activate the siphon, the water is let into the basin through a pipe and the flushing rim until it overflows the outlet of the trap and tilts into the chamber below. Water drives out the air between the trap and the chamber; when enough water is obtained it closes the inlet of the chamber before it can escape through the outlet. This prevents air from entering the siphon. When the siphon lowers the water in the bowl to the bottom of the dip of the trap, air follows it and breaks the siphon. Then the contents of the chamber fall below the inlet and allow air to enter the siphon again. The bowl is refilled by the after wash (Putnam, 1911).

Wash Out

Wash out closets have basins which are made to hold a certain amount of standing water while the trap is placed on a lower level than the standing water. This was a highly effective and popular water closet and the forerunner of today's models. The valve at the bottom of the pan was not used, a small amount of water which acted as a seal was left after every flush (Palmer, 1973).

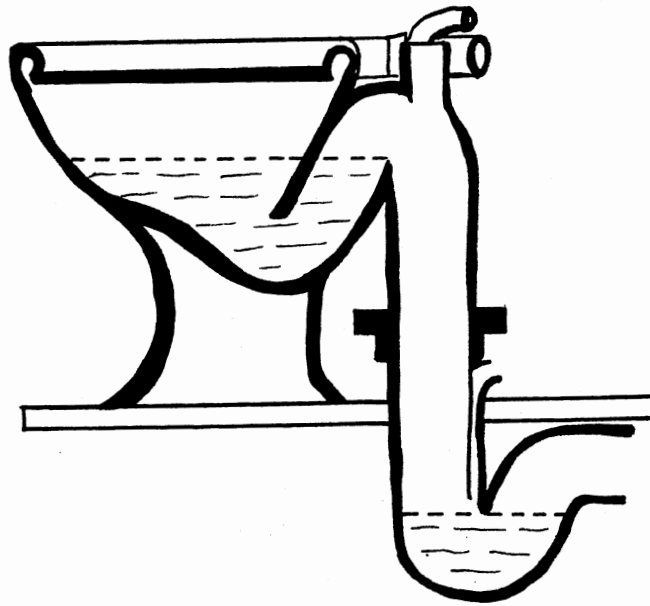


Figure 13. Siphonic Closet

Valve Closet

Many developments took place through the centuries, the basic feature being the use of a valve to regulate the amount of water in the basin (see Figure 14). The valve closet was first patented by Alexander Cummings in 1775. In later designs the valve was manufactured with a rubber seating while some models had a self-closing valve. The most famous of valve closets was made by Hellyer in 1892. The following are improvements in valve closets he listed: a flushing rim to the basin, elastic valve for ready changing and table-top and basin in one piece (Palmer, 1973).

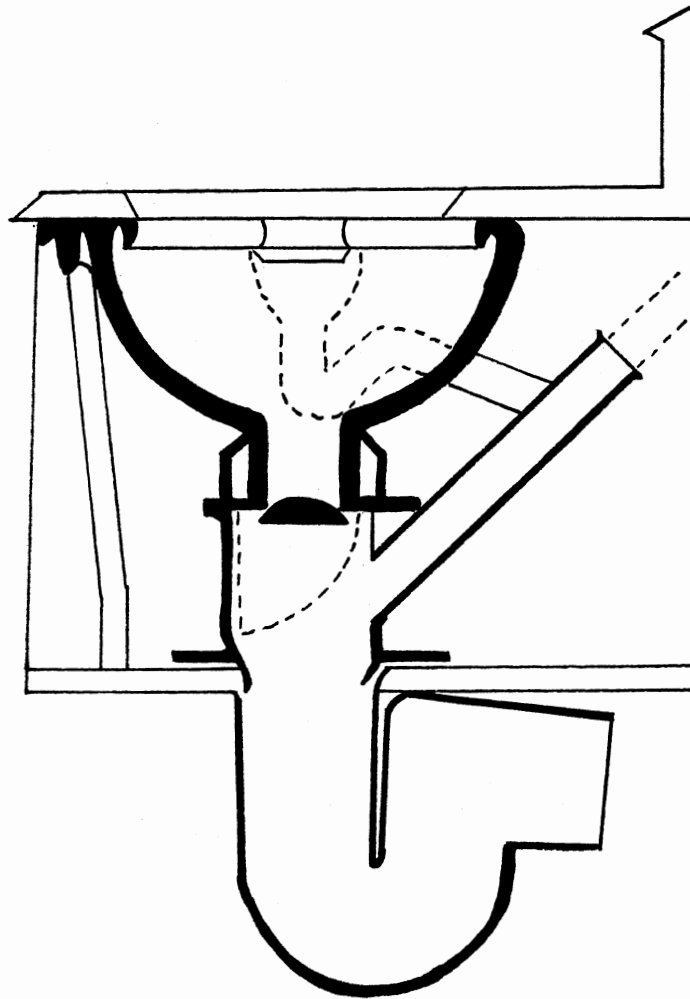


Figure 14. Valve Closet

The water closets that were being designed and manufactured during the nineteenth century needed to have certain requirements in order to function to maximum efficiency. Putnam (1911) lists specific requirements of the ideal water closet in his book, Plumbing and Household Sanitation:

Classification of Requirements

The ideal water closet should possess the following characteristics relating to: 1) the method of flushing; 2) the form; 3) the material; 4) the construction, including methods of connecting with soil and supply pipes, and provisions for ventilation; 5) the cost; and 6) the appearance.

- 1) The Flushing
 - a) Should be so contrived as to thoroughly remove all waste matter immediately and carry it completely into the wastepipe.
 - b) Should pass through the closet rapidly and concentrated in a mass or large volume so as to act powerfully in flushing the closet and drains.
 - c) Should thoroughly scour all parts of the closet and trap.
 - d) Should act noiselessly.
 - e) Should be effected by a single simple movement, and require the minimum of strength or effort.
 - f) Should be effected without spattering.
 - g) Should do the work with minimum of water.
- 2) The Form
 - a) Should be as simple as possible, and the extent of surface to be flushed as small as possible to facilitate the scouring, and there should be no surface, angle, or corner which does not receive the scouring.
 - b) Should be compact, allowing the closet to be put in the smallest possible space.
 - c) The level of the standing water in the bowls should not be over six inches below the top of the closet bowl.
 - d) The sides of the bowl above the water level should be substantially perpendicular.
 - e) The form of the bowl and trap should be such that the whole interior of the former and the deepest part of the latter may be visible and accessible from the outside.
 - f) The form of the closet should be such as to allow of its convenient use as a slop-hopper or urinal as well as a water closet.
 - g) The bowl should have in it a body of standing water of sufficient area and depth to receive and deodorize immediately all the waste matter it receives.
- 3) The Material

Should be tough and durable, with a perfectly smooth surface, which cannot be injuriously affected by the waste matters, changes of

temperature, or any of the influences which are brought to bear upon it.

- 4) The Construction
 - a) Should be as simple as possible and have no pan, valve, gate, plunger or other obstructions to the water way.
 - b) Should be such that the water in the trap when properly connected up with other fixtures cannot be destroyed by evaporation, siphonage or suction.
 - c) The closet should be constructed strong enough to hold the seat without the aid of any external support.
 - d) It should require the minimum of labor in setting and permit of disconnecting with the minimum of effort.
 - e) It should provide for thorough local ventilation.
- 5) The Cost

The cost of material manufacture and setting should be at a minimum.
- 6) The Appearance

Appearance should be neat and ornamental, so as to require no casing or wood work to conceal it (Putnam, 1911, pp. 427-429).

Mention should also be made of some of the inventors and manufacturers involved with the various technological changes in water closets during the nineteenth century. The following is just a partial listing as there were many inventors, and much controversy over who the first persons were to create various adaptations to the water closet.

In approximately 1870 Thomas Twyford, a potter, produced one of the first water closets made from pottery. Before this time, metal parts costing as much as 25 times more than pottery were used. The Twyford firm was, and still is, at the forefront of the lavatory manufacturers (Reyburn, 1971).

John Randall Mann's Syphonic closet of 1870 had a powerful first flush followed by a slower after flush, while syphonic action reinforced the clearing. In 1884, George Jennings', sanitary engineer, pedestal vase was in dispute with Britain's Twyford's for the claim to be the first pedestal closet needing no casing (Conran, 1978). In the United States, William Smith patented a siphonic water closet. Wash down and siphonic closets have stood the test of time. There have been various alterations in styling but the basic essentials have been unchanged since the turn of the century. It has been only recently that water closets' use of excessive amounts of water has caused concern. A standard cistern uses two gallons for each flush. In arid countries, this becomes a major problem where climate and increasing populations place a major strain on limited water resources. One solution was developed by Joel Lilljendahl, a Swedish engineer, who invented a new vacuum water closet. A small pump is used to reduce pressure in the soil pipe so that the contents in the basin are forcefully siphoned out and only a small cleansing flush of about one-eighth the usual amount of water is required. The small amount of soiled water is collected in a special tank and piped to a chemical treatment plant. Vacuum closets have been used in Sweden since 1959, and have also been used in Mexico City and the Bahamas (Ridley, 1976).

One could not conclude developments of the water closet without at least mentioning Thomas Crapper, more

famous for his name than being an inventor and water closet manufacturer. Crapper, a sanitary-ware manufacturer, developed the modern water closet cistern, known as the "Water Waste Preventer." This cistern was valveless with one moveable part only. To flush, one just pulled a chain with ease. The cistern would flush when only two-thirds full. Crapper tested his water closets with various techniques, to prove the flushing power of this cistern. At a health exhibition in 1884 Crapper had a super flush which had completely cleared away: 10 apples; 1 flat sponge (4 1/2 inches in diameter); 3 air vessels; plumbers smudge coated over the pan; and 4 pieces of paper adhering closely to the soiled surface. This record stands today (Reyburn, 1971).

CHAPTER III

BATHROOM TRENDS AND DESIGNERS

CONTRIBUTIONS

1900s

At the turn of the twentieth century the bathroom had certain requirements for its contents and interior design. One author, Lillie Hamilton French, thought that the perfect bathroom of moderate size should have a white tile floor, white bath tub and basin, and a varnished wall paper with pink roses and leaves covering the walls and ceiling (1903). According to French, the wall space should be broken up by a mirror running from the floor to the same height as the top of the window. This window should be a pinkish tone of leaded glass, while the curtains should be a soft green china silk, or the same the color as the rose vines in the wall paper.

Blue and white is always good for the bathroom, the blue and white of the walls repeated in the bath mats or the oil cloth or linoleum flooring. If varnished papers, marbles and tiles are out of the budget, painting could be utilized.

According to French,

something to hold medicines and simple household remedies is of paramount importance in bathrooms One of the cleverest of housekeepers and the most considerate of hostesses gave me a list of things which she keeps in hers (medicine cabinet): camphor, Pond's extract, quinine, Jamaica ginger, mustard plasters, whiskey, brandy, camphorated vaseline,

absorbent cotton, a new toothbrush, a new spool of dentist's silk, a spirit-lamp, alcohol, and smelling salts (p. 135).

White towels with elaborate monograms of colored drawnwork or embroidery on the border were the only color to be used; towels should never have a colored stripe. Glass rods and shelves were to be used to hold the towels.

A bathroom is always marred by the presence of rumpled and carelessly tossed towels, the display of too many bottles, and exhibitions of underwear. Like a dining-room table, a bathroom should be put in spotless order after each occupant (French, 1903, pp. 136-137).

The ideal bath, according to Edith Wharton and Ogden Codman in The Decoration of Houses (1902), should have waterproof walls and floors. Tiled floor and high wainscoating were usually seen, as well as a detached enamel or porcelain bath. The bathrooms of larger houses should be lined with marble, the use of which gave opportunity for fine architectural effects. Very few modern bathrooms can, in this respect, be compared with the great houses of Europe. The authors considered the bathroom in the Pitti Palace to be beautiful and of good composition where a closet is transformed into a grand room, in which the harmony of parts distinguishes interior architecture from mere decoration (see Figure 15). Marble-lined bathrooms with the bath and basin ranged along the wall, regardless of relation to the composition of the whole, is no better architecturally than the tiled bathroom of ordinary houses. "Design, not substance, is needed to make the one superior to the other" (Wharton & Codman, 1978, p. 172).

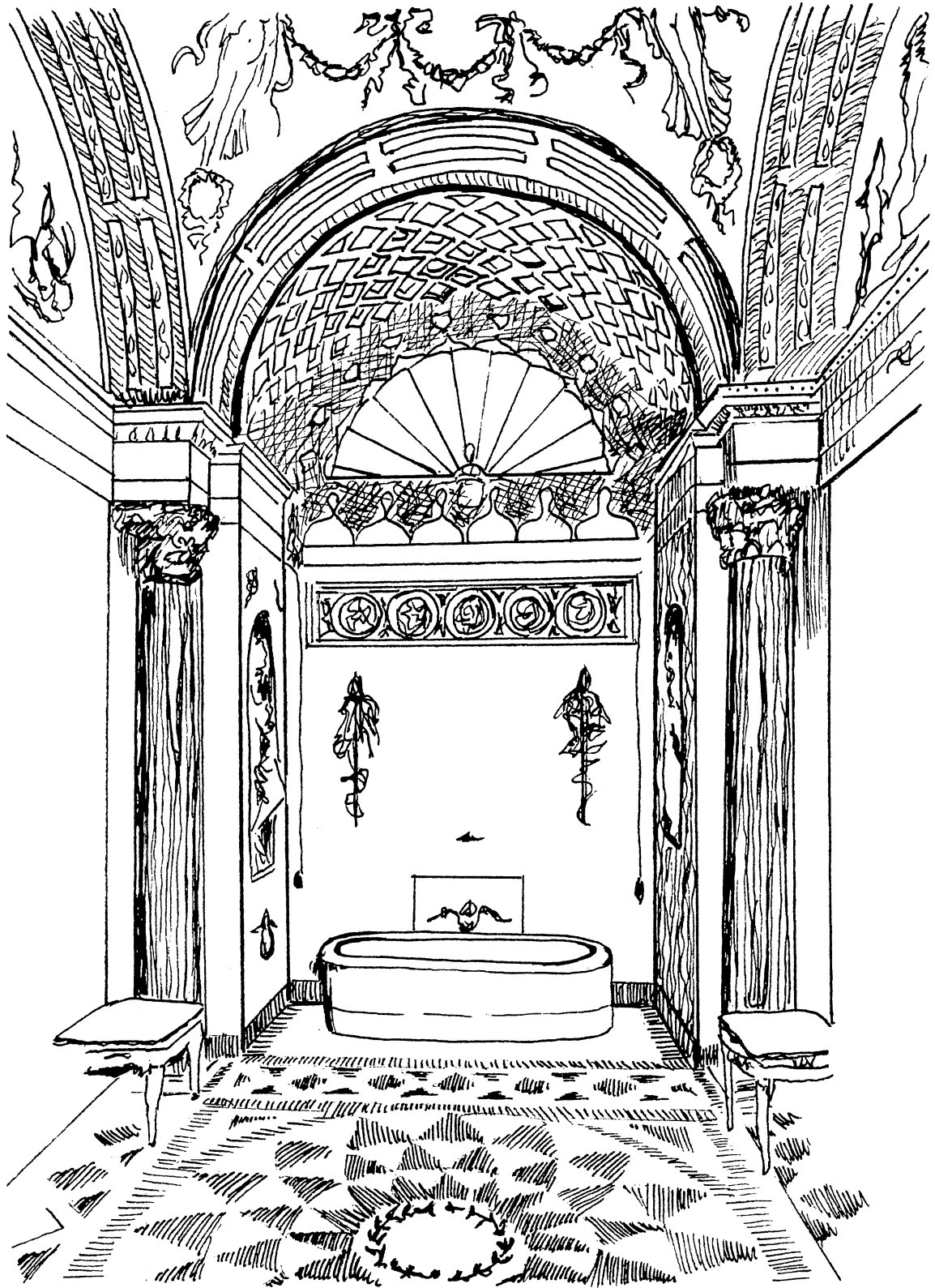


Figure 15. Pitti Palace

Elsie de Wolfe, probably one of the most famous and first interior designers of the nineteenth century, designed fantastic baths during the 1900s to 1940s; much of her work was for the elite and wealthy as was shown in her use of colors and textures. Many of her bathroom designs included strong Chinese influence, marbled walls; lacquered furniture; bold colors (pomerian red, greens and black); a great deal of chintz fabric, and marble (Lounsbery, 1926).

For the apartment or small house bathroom, one example of treatment was to cover the walls with a waterproof wall covering which was white with small black polkadots. The ceiling and woodwork were painted white. The door and window frames were covered in an ivy leaves border. A plain white framed mirror painted with green ivy leaves, and a glass shelf with glass bottles and dishes above the wash basin were used. The curtains were white muslin, and a small white stool was covered in a green and white ivy-patterned chintz. The floor was white with a green rug. Towels were cross-stitched with the name of the owner in green. Such a room was bright, clean looking and refreshing.

1910s

In modern apartments of the 1900s, the bath tub was usually placed in the recess of a wall to leave more space for dressing. There should have been a large screen to conceal the tub and a folding chair that could be placed in

a small closet when not in use. Bathrooms had a dressing table, but if not large enough, the table was placed in the bedroom. Heated towel racks were used to heat the towels; often the bathroom was fairly cool and the warm towels were very desirable. Wolfe thought it was practical to have a separate dressing room and separate bath (1914).

During the period from 1910 to 1920, many manufacturers produced a wide range of fixtures, from a regular bath to a sitz bath which is used to soak feet. Manufacturers used words like "a necessity" or "well-equipped" in their advertisements to inform the public that the bathroom needed to be up-to-date and efficient (Brown, 1912).

1920s

A decade later Fitz-Gibbon (1925) stated that society was becoming the slave, not the master, of mechanical convenience and sanitary efficiency. Subservience to sanitary considerations had warped our views; factors should contribute to the pleasure and comfort, but society had permitted sanitation to dominate our attitude and become the end instead of the means to an end.

The views commonly held regarding baths and bathrooms could well stand a good deal of shaking up, readjustment and broadening with profit and eventual satisfaction to all concerned. So long as we look upon our daily bath merely as a physical obligation and an act of decent compliance with hygienic requirements, we shall entertain a stupid and commonplace notion of what a bathroom ought to be (p. 63).

The bathroom should make bathing a pleasure and luxury, not be limited only to personal hygiene; it should be pleasant to look at and to be in. It should be convenient and well planned, not just a bathroom but a bathing room. Fitz-Gibbon identified two principles concerning the bathroom: 1) sufficient space should be allotted to the bathroom so it can be treated in a dignified and worthy manner; and 2) no effort should be spared to render it engaging and replete with appropriate decorative interest. Fitz-Gibbon believed that the average bathroom appliance could be designed with more imagination on the part of manufacturers.

An article from Fairman (1923) describing the different ways to decorate a bathroom, discussed the use of tiles--i.e., a soft tone of gray for the floor and walls with a touch of dull rose or blue which was a favorite decor color during this time. Gray-green was used with yellow as the complementary color and with another creamy buff containing a hint of rose. When completed, the effect was very unusual. And, tiling a wall was less expensive than using marble. If the homeowner could not afford tiles, a wall could be made of cement market to simulate a tile effect, then enamelled paint was applied. One other technique was the use of metal tiling. These sheets of zinc were enamelled and fired to resemble a tiled wall.

Accessories for the bath included plenty of towel racks, a medicine cabinet, and a laundry chute which

carried soiled towels directly to the laundry room. Wherever possible, it was better to have the bathroom split into separate rooms--one room for bathing, cleansing, and grooming and a separate room for the toilet (Fairman, 1923).

1930s

A bathroom of the early 1930s shown in an article "Bathroom Building" (1933) had light seagreen fixtures, creme walls, light olive-yellow linoleum walls in the bath and shower area, and light green linoleum flooring and windows trimmed in bright yellow. The bathroom was surprisingly neat and well color coordinated.

Emily Post, author of various books concerning etiquette and home decoration, thought it was essential for each member of the family to have his own bathroom. Size and decoration were secondary requirements. She postulated that a comfortable and pretty bath could fit in a 5' x 6' space. Her ideal bathroom would consist of the following:

. . . my personal bathroom recipe might be: A short broad tub, and a big basin set in a wide fixture; a shower over the tub, a square floor-space, big medicine closet, mirrors for decoration, a big window (this should be underscored), a slipper chair, bathroom scales, and a velvet carpet covering the whole floor when the tiles are not pretty ones. There must be attractive color, plenty of towels, and plenty of heat in cold weather. This recipe is given merely so that you can accept or reject as much of it as you happen to choose (Post, 1930, 1933, p. 380).

Post was in favor of colored plumbing fixtures and proposed ripping out all that was white and bursting into color throughout the room. She was not particularly

pleased with the combination dressing room-bathroom. If you had a personal maid where would she be and stay? Where would the homeowner go for privacy (p. 382)? Many Americans did not have this problem, since most did not have servants or maids.

In a 1933 House and Garden article ("Latest Bath News") showing the latest in bath designs from the World's Fair, one bath featured an aquarium with fish, recessed in the wall. Walls were white sanitas with black linoleum dado and panels of deep blue glass. The fixtures were blue, and the shower curtain was red oil silk. Another bathroom combined Neo-Classic details with modern features. The walls were a grayish turquoise with white pilasters and black and white marbleized panels and silver moldings. The flooring was cream and black checked rubber and the fixtures were a glossy black. Yet another bath was done in black and silver with hints of Chinese red (House and Garden, 1933). Mirrors, silver paper and venetian blinds in silver illuminated the room. Accents included a glass dressing table and lights with a mixture of crystal and painted lacquered red. The fixtures were black. A bench was covered in a zebra print alongside a fur rug. These bathrooms were eyecatching and very well designed even by 1980s standards. It was surprising to see how advanced these interiors looked. One must realize that these were not the normal bathroom of their time, but possibilities of what the bathroom could resemble. The designers

were surely in the spirit of the time, the progression of bathroom design.

Manufacturers were continuing to design new accessories for the bath. The woman of the house was the target. One line was dedicated to the beauty activities of women. It had a vanity table ensemble, including make-up stands, beauty boxes, mirrors, cabinets for supplies, hampers and chairs to match. The psychological justification for the line was that it made bathrooms and washrooms into attractive private dressing rooms for women. The potential market was 15 million outdated bathrooms as well as new construction (Glorified Bathrooms, August 19, 1933, p. 15).

Lydia Powel, a interior decorator, had a different view of how a modern bathroom should look (1939). It should be all white including flooring, ceilings and fixtures. The walls were finished in gloss white, if not tiled or covered with linoleum. She thought the bathroom should look spotless, like that of a hospital. Color could be used in bath mats, towels, shower curtains, etc. According to Powel "only vulgar, newly rich people are tempted to throw away their money, putting too much decoration in their bathroom" (1939, p. 98). This is certainly an individual opinion, but white was a very popular color for the bathroom.

The modern bath of the 1930s should be designed as a unit, harmoniously planned and decorated. The walls, floors, fixtures, mirrors, lights and hardware need to be

considered from every point of view with no pains spared to make the bathroom as efficient and convenient as possible. Sound-deadening was important for proper bathroom construction of the mid 1930s. A variety of materials, including acoustic tile and board, mineral wool and quilts, were used for this purpose. These materials were commonly built into partition walls or wrapped directly around the plumbing pipes. Sound-deadening was one of the unseen, but positive additions to bathroom planning.

During this era Art Deco was very popular. This decorating scheme is defined by Bevis Hillier (1971) in the following manner:

. . . an assertively modern style, developing in the 1920's and reaching high point in the thirties; it drew inspiration from . . . Art Nouveau, Cubism, The Russian Ballet, American Indian art and the Bauhaus . . . it ran to symmetry . . . and to the rectilinear (p. 16).

Special glass work became popular in all of the styles of Art Deco. Etched, engraved, beveled, and silvered glass were all used. Glass block and glass brick were widely used during this period. A glass block had no structural powers but had good insulation qualities. It allowed diffused light to pass through it, yet from the outside a person could not view the interior. The blocks were available in standard sized squares of 4", 6", 8", and 12", all were 9" thick (Steinman, 1984, p. 19). Glass panels and glass trim was available in a variety of

delicate or bold colors; the glass could be transparent or opaque (Bathrooms, 1936).

In 1936, the firm of A. Kimbel & Son designed a bathroom for the Frank Jay Gould estate at Ardsley-on-Hudson. An article by Capran (1936) describes the bath in the following manner, "there is one (bathroom) all black marble, chrome and mirrors which has all the streamlined functionalism of a battleship and yet has about it an air of warm luxury that is unmistakable" (p. 39). This modern movement regarding the changing attitudes on bathroom design and technological advances is characteristic of the Zietgeist (spirit of the times).

1940s

In the early 1940s, the bathroom's new developments continued to occur. Bath tubs were constructed low in height, with straight sides and larger flat bottoms. An interest in safety as well as structural beauty was beginning to come into focus. Adequate lighting above lavatory and dressing table was a main concern (Distinction in the Bathroom, 1940).

Many decorating books were on the market to help the homeowner with their design needs. The guides covered every aspect of home decoration, including the bathroom. Helen Koues, in her book Encyclopedia of Decorating, (1948, p. 542) discussed the bathroom:

Have you an up-to-date bathroom? This doesn't mean just modern fixtures. They, like the size of the room, are the foundation; they are essential and in a

good bathroom should be of today's better designs. But you should go on from there and have attractive color and related designs on your walls, floor, rug, towels, curtains, hamper, towel racks, toilet bottles, mirrors, light fixtures If all of these things are thrown together hit-or-miss you may get a certain amount of convenience but you are not likely to have an attractive room. Putting them together with style is what makes an up-to-date bathroom.

In 1948 Kohler, who is a manufacturer of bathroom fixtures, suggested using two or three colors in a bathroom to keep the color treatment simple. In addition, the fixtures were also one of these colors. Kohler suggested using the same basic color with varying proportions and different shades and occasional new accents to provide a pleasing unity of effect. Kohler offered five choices of color for fixtures: Spruce Green, Peachblow, Cerulean Blue, Tuscan, and White (Kohler, 1948, p. 11).

1950s

In the 1950s, the bathroom continued to gain importance compared with the house as a whole. During this period, linoleum was used more than carpet; tile was used often, especially in bath/shower areas, and colored fixtures were very popular. One manufacturer listed 72 colors. Pink was so popular that it was available in 22 shades (Conran, 1978, p. 194).

According to Ethel Brostrom, who was a decorator during the 1950s, bathroom styling could be placed into three categories:

- 1) The theme can be continuation of that used in the balance of the home. If the room adjoins another room or if a section of it . . . the same theme should

dominate both. 2) Then there is the departure in theme. This type of styling may not have any period flavor whatsoever. 3) The third category is really a combination of the first two. It consists of a good combination of colors of pattern, with the accessories carrying the decorative or imaginative theme (Brostrom, 1956, pp. 46-47).

Bathrooms were both simple and lavish in their designs. They were well planned and thought out in an attempt to try to get away from a clinical-look (all white was somewhat cold). Bathrooms had become more individualized using color, both in fixtures and the decorative treatment. Many of the interiors were bold and unique. Plastics and vinyl were used for walls, countertops and flooring. Twin lavatories were becoming very popular. It was during this time that the garden bath came into prominence. This type of bath design was for the larger interior. Many times, the bath was sunk and overlooked a private patio or garden. This type of bath was considered a great luxury. One particular garden bath had a glass sliding door, a shower and a sunken tile bath with a double set of taps and plugs for fast filling and emptying (Harling, 1964, p. 201).

1960s

According to William Pahlman, a leading interior designer of the early 1960s, "The bathroom is America's big contribution to the art of living. Our technology is responsible for the modern bathroom, and we have experimented and perfected it to its present high stage of development" (1960, p. 220).

He suggested that people should be careful when choosing fixtures and not decide on heavy, dark colors. Colors soon become dated (this is very true--some colors that were in vogue in one period now look out-of-date and a short lived trend. Pahlman believed the bathroom should be slick and clean, but should not resemble an operating room. If a person is rich enough to afford gold plumbing, dolphins and swan's neck faucets, malachite soap dishes, and marble walls and floors, they will find them all practical and magnificent. If one cannot afford such extravagant beauty, it is still possible to have a good bathroom at every level of income. Pahlman thought the bathroom was a very personal place so it must be planned and arranged to suit ones' own personal tastes and idiosyncracies. There are three basic requirements of the bathroom, that it be: serviceable, washable and capable of ventilation (Pahlman, 1960).

1970s

In the late 1960s and early 1970s, bathrooms much like other design areas were very mod and loud. Design trends during this era were: shag carpeting; and large modern floral, plaid and psychedelic wall papers. Decorative tile was used often on the walls and floors. Showers and bath tubs were available in one-piece units made of fiberglass. Popular colors were harvest gold, light blue and avocado green. Kohler manufactured a low one-piece

water closet that was virtually silent when flushed (Schram, 1976, p. 92).

Despite the shocking departure of the styles from the 1950s, the garden bath was still very popular as there was a desire to bring the outdoors inside and to spend more time in the sun. Privacy was very important when planning a garden bath. Many of the designs were planned with no drapes or curtains. Tall walls, fences, trees, shrubs and other elements were carefully employed to achieve privacy (Dunn, 1976, p. 61).

According to David Hicks, an interior designer, when accessorizing a bath an individual should avoid certain looks: marbled plastic flooring; three-quarter height tiling; wooden lavatory seat covers; plastic lace head rests; ceiling fixtures that reveal the bulb; fluorescent lighting (unless well diluted by tungsten); bath's with jazzy sculpted sides; black basins; fish-patterned plastic curtains and wall paper; and over-mannered taps that are uncomfortable to the hand. "In fact shun all kinds of vulgarity and gimmickry" (Hicks, 1970, p. 9).

Hicks' philosophy of what a bathroom should entail can best be understood by the following:

My own ideas for luxurious bathrooms very often depend on great understatement. Whereas the commercial world would have us believe that to wallow in a sunken marble bath is the epitome of sybaritic living, to my mind this is one of the most impractical recipes for luxury ever concocted. For me the essentials for a really congenial bathroom are simplicity, style and utter cleanliness.

These highly personal feelings are what have influenced me in coming to the conclusion that good

results can only be achieved by research, careful planning and the close attention that the bathroom deserves. A bathroom is a room not just a plain tiled cubicle (p. 9).

1980s

The bathroom of the 1980s has become one of the most important rooms in the house. It has evolved from a room of necessity to a room of luxury. This is not a negative statement, but the bathroom has become a status symbol in the American culture. The bathroom is a statement of personal taste and has become a status symbol just as the neighborhood in which one resides and the type of car one drives.

The word used to describe these bathrooms is luxurious; a combination personal health spa and gym. In the 80s, Americans have become concerned about their health--how to maintain it, prolong it and make the body a well toned and tanned machine. The bathroom has become a body and soul room, it is a place where one can go to get away to relax from life's daily pressures. "Instead of sitting in your living room after work, you can relax in a whirlpool or climb into a tub for two," (Hottest Room in the House, February 6, 1984, p. 56) remarks Thomas Klein, a product manager for the Kohler Company. The president of the American Institute of Architects predicts that the bathroom will follow in the tradition of the family room and kitchen in becoming a social center where people will relax and spend free time. American Standard, Inc. in an

ad for its 1984 line of products states, "a bath style for every lifestyle" (p. 56).

Bathroom fixtures are now available in many colors and with many options. According to one source, the whirlpool is almost a must. One particular whirlpool offered by American Standard has a computer-controlled Sensorium Ambiance. It can be preset by phone to fill at a specific time and at the correct temperature. A video camera at the front door allows the bather to see who is calling while in the bath and permits the caller entrance by use of remote control. Separate showers and tubs increase the bathroom's value. "Showers are for getting clean," says Bryan Patchan of the National Association of Home Builders (NAHB), "Baths are for luxury and recreation" (Hurlock, 1987, p. 168).

Saunas are used in many of the bathrooms of today. With people being so health conscious they are becoming quite common. Saunas are usually taken in this manner: first a shower, then approximately 15 minutes in the sauna followed by another cool shower, a plunge in a cold pool, a longer sauna at a higher temperature, another cool shower, some exercise, a cold soaking and finally a massage (if one is fortunate) (Brown, 1984).

Bath tubs come in a wide range of styles and sizes, they are available in rectangular (recessed or corner); square and receptor (recessed or corner); platform and sunken; and even a reemergence of the turn-of-the-century clawfoot tub is being seen. Lavatories can be wall-hung, placed in vanities or on pedestals (which has also made a

comeback). Sinks are usually made of synthetic marble, fiberglass or vitreous china. These units have no joints and are easy to clean. Countertops are covered with plastic laminate, ceramic tile, synthetic marble and natural marble (Clark, 1983).

Laminates have advanced the perfection of the countertop. New types of laminates such as Corian (Du Pont), and 2000X (Formica), are solid throughout, scratches can be sanded away and they resist stains, chipping and cracking. Both types are expensive (Wolfe, 1981, p. 58).

Lavatories are also a status symbol in the bathroom. They can be made of semi-precious stone (Malachite and Tiger's Eye)--even in gold or platinum. The basins come in a number of sizes and shapes. Some resemble the basins of the Deco period, others are shell shaped and some are very slick and contemporary. People who choose these types of basins are not exclusively the wealthy. One manufacturer of luxury bathroom fixtures Sherle Wagner, reports that the bulk of their business comes from the middle and upper middle classes, not the super rich (Givens & Springer, 1986, p. 81).

The bathroom of today has no set design, it is a personalized room, where anything the owner wants can be placed. Many of the past design trends are now popular again. Glass blocks, which were popular in the 40s, are now very "in." The classic black and white color scheme is in vogue; many colors are popular today such as: peach, sea foam green, mauve and grey, just to mention a few.

According to J. Rosemary Riggs (1985):

As all bathrooms have the same three basic fixtures, it is the designer's challenge to create a bathroom that is not only unique but functional. A knowledge of the different materials used in these fixtures and the variety of shapes, sizes, and colors will help meet this challenge (p. 191).

The bathroom needs to be functional and efficient, but it also needs to be therapeutic and pleasureable. Keep in mind, this is where you can really unwind after a tiring day. It should be a place where you can pamper your self-- treat it as a haven of peace and solitude; add a comfortable chair for languishing after a hot bath and install heated rails to warm towels, which help ease the transition from steaming hot water to normal room temperature; finally, install good lighting so you can read as well as groom yourself (Conran, 1985).

When planning a new bathroom, it is wise to consult an architect or plumber familiar with local building and water regulations. Use materials that are moisture proof - never uncoated wall papers, matt emulsion paint, corrodible metal or juke backed carpets. The bathroom can be leisurely, luxurious or streamlined.

Bathrooms have become an important aspect of interior design. This is a new and exciting field in design. Many designers of today are specializing in one area of interior design such as kitchen and bathroom planning and decorating. Some of the work is new construction, but much involves remodeling existing bathrooms. All of this remodeling has flushed out a new school of interior decorators who

concentrate almost exclusively on bathrooms. "I felt there was a need for someone specialized in state-of-the-art bathroom equipment," says interior designer Doris Bachmann, who switched to bathrooms three years ago (1986) and is now creating about 50 ultra-chic bathrooms a year (Givens & Springer, 1986, p. 81). For an overview of the various changes in bathroom design, materials, and trends refer to Table I on page 70.

Bathroom Remodeling

Many of the bathrooms today are remodeled from already existing facilities. Remodeling the bathroom has become a major portion of home additions and remodeling. This current trend increases the value of the home and gives more prestige to the homeowner.

In a recent survey of 1,102 home owners, conducted for Kitchen and Bath Business (Hart, 1988), the top reasons for remodeling the bathroom are as follow:

- 1) to improve the value of the home, 2) to have a room they feel comfortable having guests use,
- 3) to replace outdated fixtures, 4) walls or floors water damaged, 5) to update the vanity, 6) to add a vanity, 7) to increase storage space, 8) to change the color of fixtures, 9) to create a place to relax and pamper oneself, 10) to make a bathroom larger, 11) to add a whirlpool, 12) to add a tub big enough for two or more people, and 13) to add a bidet.

Homes, 20 or more years old, account for 73% of the bathrooms remodeled. The following types of baths remodeled are: 70% for master bath; 41% for another full bath; and 21% for half bath (adds up to more than 100% due to multiple responses) (p. 53).

When consumers remodel a master bath they are most likely to buy a new vanity (67%), new faucets (68%), a vanity top (63%), a sink (57%), toilet (58%), and medicine cabinet (52%). The tub is less likely to be replaced (27%). Thirty-three percent of the respondents purchase resilient flooring while redoing a master bath; 21% select ceramic tile floors; and 4% use carpet. In 50% of the master baths, new lighting is added.

Consumers are conservative in their choice of bath fixtures. Almost 44% chose off-white sink and 39% went with white, 5% selected a light blue sink and 4% gray. For tubs, 45% chose white, 36% for off-white, 6% chose light blue, 4% gray and 2% chose light pink. Fifty-four percent purchase white toilets, 29% purchase off-white.

Fiberglass is the most popular material for tubs (58%). Enamel on cast iron was chosen by 16% of respondents, making it second choice in tub materials. The third most popular tub material is enamel on steel (14%). Only 3% selected cultured marble tubs and 7% purchased an acrylic tub.

In selecting a tub, quality is the first consideration among consumers, followed by material. Third most important is easy maintenance. Color and price tie as the fourth most important factors in a tub purchase. Almost 50% of the consumers used cultured marble for vanity tops, when they redid their baths. The second favorite for vanity tops is laminate, chosen by 26% of consumers.

Corian was used 9% for new vanity tops. Ceramic tile was chosen 6% and 4% chose real marble.

According to Kitchen & Bath Business, the products purchased when remodeling a bath are as follow:

<u>Product</u>	<u>%</u>
Vanity	88
Sink faucets	88
Vanity top	81
Accessories	80
Toilet	79
Sink	73
Lighting	70
Medicine cabinet	63
Faucets for tub	54
Resilient flooring	45
Ventilating fan	43
Tub	29
Tile flooring	27
Other cabinetry	27
Tile walls	25
Window	24
Separate shower stall	24
Sliding doors for tub	23
Tub with surround	20
Heater	20
Hand shower	16
Pedestal sink	8
Whirl pool	6
Skylight	4
Marble walls	3
Marble flooring	1
Bidet	1

Source: Hart, 1988, September, p. 71.

TABLE I
BATHROOM CHARACTERISTICS: COMPARISON OF TRENDS BY DECADE

	Wall Covering	Flooring	Fixtures: Color/Material	Trends
1900	Paint, Wallpaper, Tile	Linoleum, Tile	White/Cast Iron	Floral Wallpaper, Varnished Papers
1910	Paint, Wallpaper, Tile	Linoleum, Tile	White/Cast Iron, Porcelain, Enamel	Wainscoating, Blue and White, White and Black, Muslin Curtains
1920	Wallpaper, Tile	Rubber Tiling, Tile	White/Cast Iron, Porcelain	Gray Flooring, Dusty Rose/Blue, Sitz Bath
1930	Paint, Wallpaper	Rubber Tiling, Tile	White, Black/Cast Iron, Porcelain	Glass Blocks/Sea Green, Chinese Red, Glossy Black, White Chrome, Mirror
1940	Paint, Wallpaper, Tile	Linoleum, Tile	White, Peach, Blue/Cast Iron, Vitreous China, Enamelled Iron	Structural Beauty Important/Spruce Green, Peach, Blue, Beige
1950	Paint, Wallpaper, Tile	Linoleum, Carpet, Tile	White, Pink/Plastic, Vinyl, Pressed Steel, Enamel	Pink was so popular it was offered in 22 shades by one manufacturer/Twin Lavatories, Garden Bath
1960	Paint, Wallpaper	Linoleum, Carpet, Tile	White/Fiberglass	Individualized Taste/Stripes/Orange Tones
1970	Paint, Wallpaper, Tile	Linoleum, Carpet, Tile	Harvest Gold, Light Blue, Avocado Green/Fiberglass, Enamel on Steel	Bold Colors, Large Modern Florals, Psychedelic Wallpaper, Shag Carpet
1980	Paint, Wallpaper, Tile	Vinyl, Tile, Carpet	White, Off White/Fiberglass, Cultured Marble, Acrylic, Glass Reinforced Polyester	Health Conscious, More Space, Glass Blocks/Grey, Rose, Seafoam Green, Peach

CHAPTER IV

DESIGN CRITERIA FOR THE BATHROOM

The two most common methods of cleansing the body are the tub bath and the shower. While both have significantly different psychological and operational aspects, they both share some common functional characteristics, and these characteristics can form the basis for design criteria. Standing or sitting under a stream of water is very different from lying back soaking in tub while the activity of washing is essentially the same for both.

The bathing fixture needs a seat, flexible or multiple water sources for rinsing all parts of the body, auxiliary support devices, storage shelves, location of controls, and overall size. This suggests a design that must serve both functions equally well; however, the difference between standing and reclining postures is substantial enough not to preclude designs focusing specifically on the unique characteristics of the tub and the shower. When a bathtub has a shower head installed, it can serve as a shower as well, so this consideration must be adapted into the design; in fact, most bathtubs are mainly used as showers (Kira, 1976).

For example, in 19% of the households that had only a tub-shower combination, no member of the household ever

used the fixtures for taking a tub bath. Considering only adults in family households, the figure rises to 40%, and in households of adults only, 43% never used the fixture for taking a tub bath. With the increasing trend toward the use of showers among the young, this statistic is even higher today, some 16 years later (Kira, 1976).

Body cleansing is a complex, strenuous, time consuming, and sometimes, potentially hazardous undertaking. In 1972, the U.S. Department of Housing and Urban Development estimated that 275,000 persons are injured annually in the United States using bathtubs and showers, a number ranking these fixtures second as a source of injuries involving home equipment (Kira, 1976).

Studies conducted by the Bureau of Product Safety of the U.S. Department of Health, Education, and Welfare indicated that among such injuries, lacerations accounted for almost half; contusions/abrasions (22.7%) with fractures (10.6%) third most frequent. Further follow-up revealed falls and slips were the cause of almost half the accidents (Kira, 1976).

Several experimental approaches have tried to solve the problem of slips and falls by creating "soft" bathrooms, where almost all the fixtures, fittings and room surfaces were covered with varying densities of plastic foams of one sort or another creating a completely impact-absorbing environment. Although it is not possible at the present time to fully assess the potential problems of such a solution in regard to longevity, cleanability,

repairability, and fire hazards, it does represent the ultimate "idiot-proof" approach. However, it is possible with conventional materials and finishes, to achieve significant gains in user comfort and safety simply by paying attention to certain basic design criteria that are commonly ignored (Softening Up the Bathroom with Plastic Forms, 1971).

Cleansing the body is composed of several major components, washing is only one process. These include getting into and out of the tub; relaxing; and cleansing, which consists of wetting, soaping, massaging, and rinsing.

Getting Into and Out of the Tub

A bathtub, by definition, must be a vessel capable of containing the body and a quantity of water sufficient to cover most of the body. Bathtub dimensions become such that even getting into and out of the tub needs to be regarded as a major component of the overall activity. This may be extremely difficult for persons with limited physical capabilities, and is potentially hazardous for all persons.

Basically, there are three methods of getting into (and out of) a tub: 1) stepping over the rim with the body held erect; 2) bending forward and supporting the body by holding onto the rim and swinging the legs over in back; and 3) sitting on the rim and lifting the legs over to the front.

There are basic differences between getting into and out of the tub. Getting in involves lowering the body from a standing or sitting to a squat position, using mainly the body's own restraint mechanisms, and then shifting each weight-bearing leg into an outstretched position and lowering that side of the buttocks unto the tub bottom while simultaneously shifting much of the body weight to it. Getting out involves shifting the weight of the body from the buttocks onto the feet, which must become positioned underneath the major weight of the body, and then pushing or pulling the body into an upright position (Kira, 1976).

Relaxing in the tub is mainly a passive and static position where the body is relieved of muscular tension and strain. The majority of tubs in the United States have not permitted the user to do so. Because Americans shave, tubs are mostly used for shower receptors. But in Europe where tub bathing is preferred, the tubs are usually much more spacious but are usually unsuitable as shower receptors. Obviously, the possibilities and problems of relaxing as well as with those of cleansing the body according to cultural preference for tub bath or shower.

Cleansing

Cleansing, the basic process of washing, is more or less constant and includes wetting, soaping, massaging, and rinsing. It is important to be able to reach all parts of the body with ease and comfort, both in and out of the

water. Wetting is achieved by immersing the body as completely as possible, often this is difficult due to the design of the tub. To be effective, soaping and massaging must be done while part of the body is out of the water, and usually requires many changes in body position. For safety, it would be desirable to minimize the amount of movement that takes place and make sure all postures assumed are stable. The rinsing operation is accomplished by using clean and clear running water.

When tub bathing it is assumed that a fully reclined posture is desired, whether for relaxing or wetting the body, we should look at the requirements since it is distinguished from the fixture designed for showering. One important criterion is that the user will be able to lie back and recline comfortably. The fixture needs to be elongated, of sufficient size, and contoured to provide an integral back and head rest. Many modern tubs are inadequate in these respects (Kira, 1976).

For maximum comfort while fully reclined, the angle and configuration of the back must to be considered. Complete support should be provided for all parts of the body, especially the head and back. To gain full support requires careful analysis and design because the majority of the body's weight is on a hard surface.

Bath Tub Design

Length of Tub

The length of the tub becomes a function of the angle of the back of the tub, when assumed that a fully reclined posture must be accommodated. In designing a suitable length one must consider, besides just anthropometric dimensions, the fact that there is a tendency for the body to float from the back rest and slide until the feet find support. With this in mind, an overall tub length that is not too long for shorter persons is as important as one that is long enough for taller individuals (taller people can always bend their legs if necessary). A variety of lengths would be desirable.

For shorter people, with approximate length from the back of the buttocks to the feet in a sitting position is 37 inches, the minimum length of the tub bottom is 42 inches. The bottom will be level enough to stand on, measured from the front well to the point where the slope of the backrest begins. This allows for the distance from the buttocks to the actual start of the back contour. For larger persons, with the approximate length of 43 inches, the maximum bottom length is approximately 48 inches. A compromise length of 45 inches would be acceptable and comfortable to accommodate the relaxed postures of both groups. When these length figures are combined with the desirable configuration for the back, the overall maximum

length of the tub is close to 6 feet, as opposed to the 5 feet length usually found.

Depth of Tub

The depth of the tub (inside) is determined mostly by its relationship to the angle and contour of the back and to its length. If the general slope of the back is set within the comfortable 25 to 40 degree range, the depth of the water that is needed to cover the shoulders of large persons while fully reclining would be 12 to 16 inches. The total inside depth must be sufficient to prevent water from splashing out while the person is washing. For this reason, another 4 inches is necessary as a minimum giving a tub depth of 16-20 inches.

Height of Tub

Another consideration must be given to the height of the side in relation to the ease of using it as a support and in relation to the width of the tub. The higher the sides, the wider the tub must be in order to have sufficient clearance for washing movements while the person is seated in the tub. The width of the tub should be approximately 21 inches.

Getting into and out of the tub presents a specific concern for safety. It can be dangerous and the design of the fixture should minimize this hazard as much as possible. The basic way of getting into and out of the tub is done by stepping or climbing over a barrier into a hard

and slippery surface and then the lowering of the body from a standing to a reclining position. When leaving the tub the process is reversed. With each step the body is momentarily off balance and is in danger of slipping and falling because the normal functional resistances that keep people balanced are reduced with a wet surface. The way to reduce these hazards is to have auxillary support devices that can brace the body. The old fashioned tub with high sides, which is thought to be unsafe, is actually safer from the standpoint of access than the modern low sided tub, if no support is provided. The higher the side, the easier it is to reach out and steady oneself on the rim of the tub. A tub with the normal height of 12 to 16 inches is so low that it is almost impossible to steady oneself on the rim.

When examining the process of cleansing the body and the various component parts, it is quite clear that our customary provision of a simple tub for water is very inadequate. From the standpoint of function, comfort, and safety, many things are necessary. A complete bathing facility includes not only a properly sized and shaped fixture but also seating, storage, support devices, controls, and rinsing devices, which need to be provided as part of a comprehensive fixture package. This is not usually done, the completion of the bathing facility is usually left to the user to solve any way he can. An integrated bathroom can ensure not only the inclusion of

the essential items but also their proper location and design.

There is a wide range of possibilities to this integrated bathroom. Including possible variations based on the height of the tub rim and the methods of entry. It should be remembered that while basic criteria remain constant, certain conditions change with time and require making adjustments in dimensions, configurations and various locations. This is not to suggest that specialized facilities are necessarily desirable, but rather that the facilities should be designed for specific purposes. Trying to provide a universal bathroom that attempts to accommodate all possible functions almost invariably fails to meet any function adequately (Kira, 1976).

Water Closet

Many of the water closets of today need to be designed lower to permit the correct postures for defecation. The natural posture of defecation is the squatting position (see Figure 16). H. L. Bockus (1941) discusses the correct way to use the water closet in the following manner.

The ideal posture for defecation is the squatting position, with the thighs flexed upon the abdomen. In this way the capacity of the abdominal cavity is greatly diminished and intra-abdominal pressure increased, thus encouraging the expulsion of the fecal mass. The modern toilet seat in many instances is too high even for some adults. The practice of having young children use adult toilet seats is to be deplored. It is often necessary for them to sit with their feet dangling. Unless the toilet seat is low enough that the feet may rest firmly on the floor and some flexion of the thighs is possible, the accessor muscles which aid in defecation normally have

little opportunity to fulfill their function (p. 511).

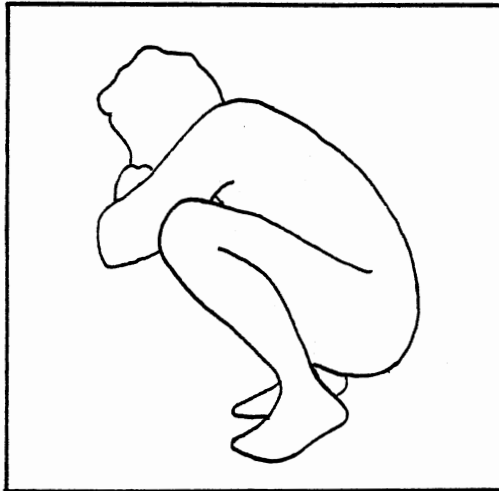


Figure 16. Squat Position

In the book The Culture of the Abdomen, F. A. Hornibrook continues the subject of the natural way to defecate as follows:

Man's natural attitude during defecation is a squatting one, such as may be observed amongst field workers or natives. Fashion, in the guise of the ordinary water closet, forbids the emptying of the lower bowel in the way nature intended. Now in this act of defecation great strains are imposed on all the internal organs It is no overstatement to say that the adoption of the squatting attitude would in itself help in no small measure to remedy the greatest physical vice of the white race, the constipation that has become a contentment (1933, pp. 75-76).

When the height of the toilet seat is improperly high unsatisfactory results are common. The best designed seat

would place the body in the position usually assumed by man in primitive conditions (see Figure 17). The seat should be low enough to bring the knees above the seat level (Williams, 1932).

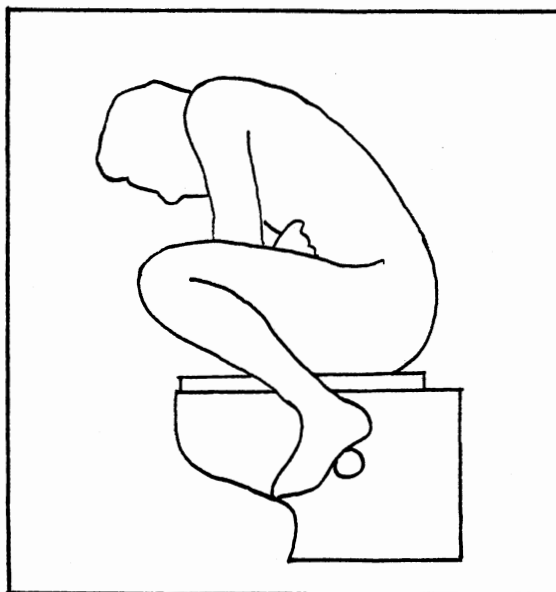


Figure 17. Modified Position

According to H. Aaron, author of Our Common Ailment, the correct position for using the water closet is as follows:

. . . the high toilet seat may prevent complete evacuation. The natural position for defecation, assumed by primitive races, is the squatting position. Dr. Hurst points out that in Japan there are no seats in the toilets. The pan is sunk in the floor, and in some places a shoe is fixed to the ground on each side of it so that a firmer foothold may be obtained when the individual squats. When the thighs are

pressed against the abdominal muscles in this position, the pressure within the abdomen is greatly increased so that the rectum is more completely emptied.

Our toilets are not constructed according to physiology requirements. Toilet designers can do a good deal for people if they will study a little physiology and construct seats intended for proper defecation (1938, pp. 66-67).

The proper posture can contribute substantially to the ease of defecation. If we are going to continue to use the water closet as we know it, we need to pay attention to the basic problems of function associated with it. Keeping in mind that, because of a lack of exercise, a full squat posture would be difficult and uncomfortable for most people to assume and maintain for any length of time. Also, we need to realize that Americans constitute a relatively small percentage of the world's population using the conventional water closet.

Ironically, virtually all of the "squat plates" used elsewhere in the world are manufactured in the civilized western countries. In a World Health Organization report on hygiene facilities for developing nations, no mention is made of water closets, but detailed instructions are provided for the construction of squat plates (Wagner, 1958).

The major problem is that the body needs a certain amount of exercise in order to keep it functioning properly. The musculature considered in the defecation process is also the musculature used in assuming or rising from a squatting position. One solution to assuming the correct posture is the use of a block of wood or stool on

the floor in front of the water closet, so adequate support is available for the feet while allowing the thighs to be flexed upon the abdomen (Bockus, 1944).

A substantially lower water closet would provide us with some of the exercise needed to help in the defecation process (see Figure 18). The more apathetic one is in making the necessary effort, the more difficult it will become, especially for older persons (Kira, 1976).

Reginald Reynolds, author of Cleanliness and Godliness, tells of the shortcoming of the water closet. Reynolds describes lines of poetry reportedly found in a jake (bathroom) in a Inn's of court, or similar location:

I do not like this place at all,
The seat is too high and the hole is too small.

Words of reproof showing the subjectivity and presumption of this unknown person, were written beneath the original complaint:

You lay yourself open to the obvious retort,
Your bottom's too big and your legs are too short
(1946, p. 320).

From a functional standpoint, a fixture that is designed to accommodate defecation should observe the following criteria: encourage and permit the comfortable assumption of a squat-like posture; have an opening adequate enough to permit hand access to the anogenital region; provisions for anogenital cleansing; have functional controls easily handled from both a seated and standing position; minimize soiling problems and permit easy cleaning; and be conceived of as part of a

comprehensive modular system of personal hygiene facilities (Kira, 1976). In order to provide adequately for male urination in the home, there are several possible approaches: provide a separate standard wall-hung urinal, design a new non-urinal looking urinal, modify the water closet so which more adequately accommodates urination and try to persuade men to sit when urinating (most men will find this unmanly) (see Figure 19).

From a practical standpoint, the latter would seem unworkable. Besides changing a natural, age-old habit, it will meet with resistance in regards to convenience. Having to virtually undress for an operation that at present is so simple would certainly meet considerable opposition (Kira, 1976); it is much faster to use the urinal.

Privacy

Privacy demands emerge as the major determinant of bathroom usage and numbers since it is these demands that cause people to insist on individual time and space to use the facilities. There are a number of degrees of privacy that are obtainable or may be desired. There are three major categories of privacy: 1) being heard but not seen, 2) not being seen or heard, and 3) not being seen, heard, or sensed. These categories generally represent degrees of desired privacy, in that, given a choice, most people tend to pick maximum privacy. The degree of tolerable privacy obviously varies greatly, depending on the activity and the particular individual (Kira, 1976).

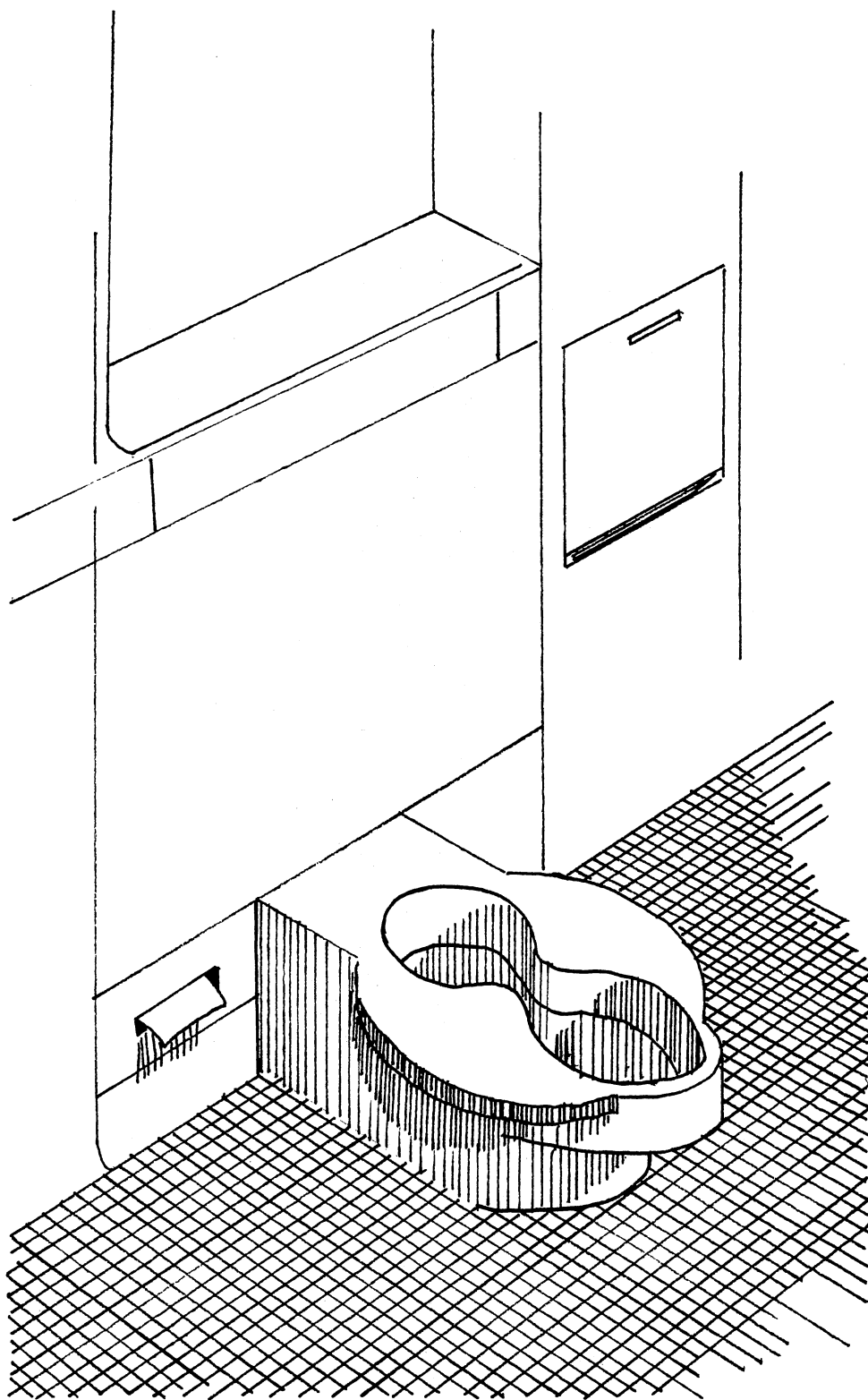


Figure 18. Low Water Closet

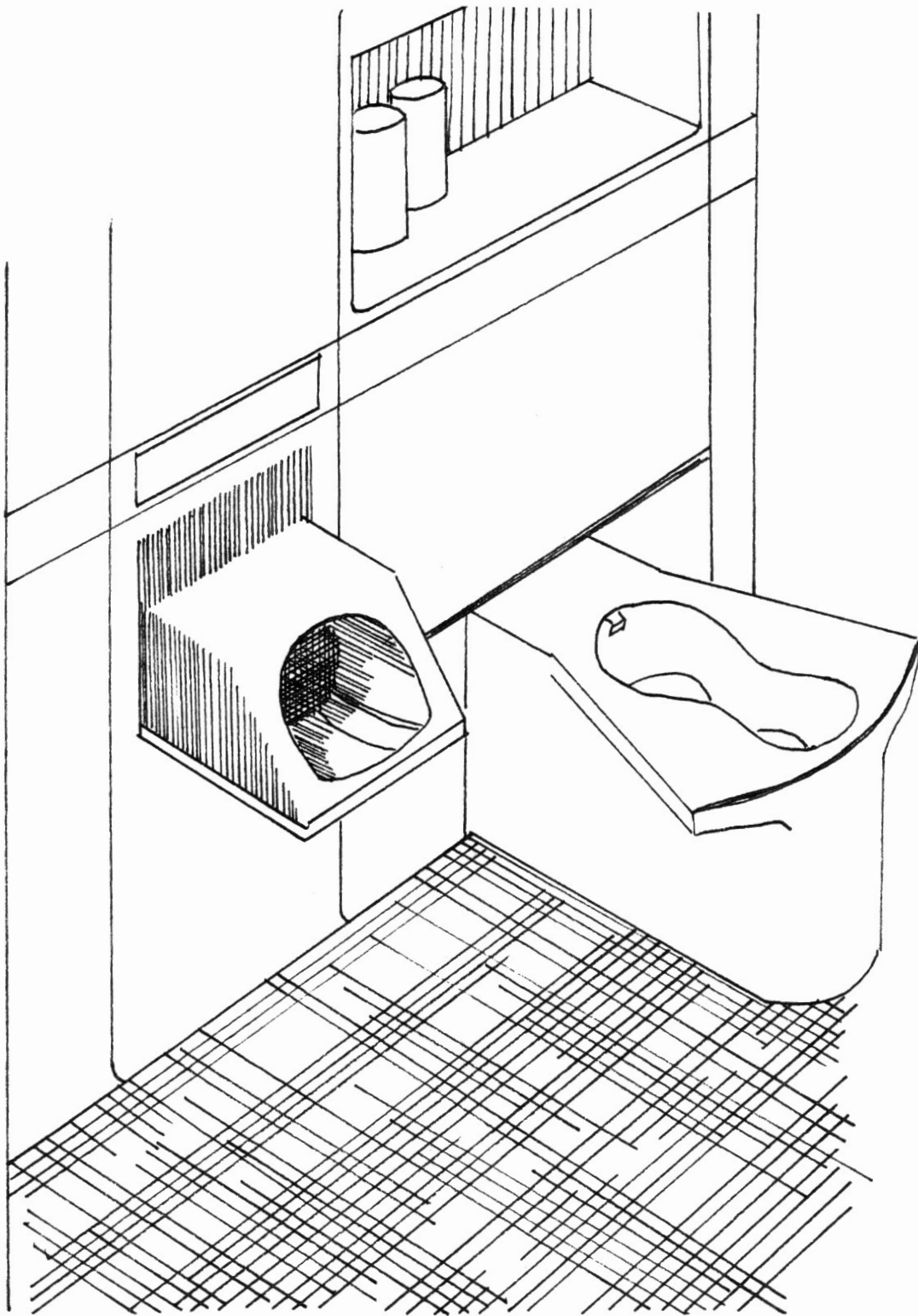


Figure 19. Urinal

If it were not for these privacy needs, the average family could probably manage comfortably with one simultaneously shared bathroom. However, mostly the sequential use of the one-person bathroom is desirable. When finances allow, a bathroom for each member of the family is desired.

F. S. Chapin's article, "Some Housing Factors Related to Mental Hygiene" observes:

The sentiment of self-respect, the respect for self as an individual with status, can hardly thrive when the person is continuously open to pressures of the presence of many others in the household. Privacy is needed for thinking, reflection, reading and study, for aesthetic enjoyment and contemplation. Intrusions on the fulfillment of personal desires need to shut off in order to avoid the internal tensions that are built up from the frustrations, resentments, and irritations of continual multiple contacts with others (1951, p. 165).

Planning

Several questions need to be answered in the beginning stages of planning for the bathroom. The cost of the project is very important and is linked by the amount of money a person is able and willing to spend. Available money will be the main determinant of what can be provided, regardless of need in terms of family size.

Space available is also important, especially when one is remodeling existing bathrooms or when one is attempting to add individual hygiene facilities to existing multiple-family dwellings. In many instances, the basic problem is not so much cost as it is available space, especially in Europe. One solution is minimal prefabricated

components. Avoiding traditional free-standing fixtures and taking advantage of possible counter space over water closet tanks, and possible storage under water closets can create more available space.

The third basic consideration is need in relation to family or household size and composition, and the stage of the family in the family life cycle. Variations in family size and composition affect the need for hygiene facilities in a qualitative as well as quantitative way. This is not only true of the bathroom but the entire house. Each bathroom should be designed with the user's life style and layout of the particular house in mind. Alexander Kira, author of The Bathroom and consultant expert on every aspect of the bathroom, has designed a detailed analysis of the composition and distribution of the bathroom in relation to family needs. The following outline illustrates some of the more common variations of users categories.

Adults - Single

- Facilities:
 - Full range of fixtures: toilet/urinal/bidet, lavatory, tub/shower
 - Counter space with mirror
 - Full length mirror
 - Complete storage including private storage
 - Drying cabinet for hand laundry
- Location:
 - Probably central, if this is the only facility, but closest relationship to sleeping area.

Adults - Family heads (2) (with children and additional facilities)

- Facilities: - Full range of fixtures: toilet/urinal/bidet, tub/shower, 2 lavatories
 - Extended counter space
 - Full length mirror
 - Selective storage but including private storage
- Location: - Private, related to master bedroom, or may also need to relate to living areas for guest use
- Also: - Assumes separate, nearby laundry and drying facilities
 - May also have relation to dressing area plus space for exercising, etc.

Children - Under age 10 (with separate facilities)

- a. Facilities: - Full range of fixtures - probably shared
 - Counter space with mirror
 - Limited storage
- Location: - Off children's bedrooms but accessible from hall, related to laundry and to kitchen
- b. Facilities: - Toilet and lavatory
 - Minimum storage
- Location: - Off kitchen and/or back door (this assumes heavy use by children, including some from outside the household, and the need for supervision. Also useful for adults in connection with yard work and so on. This facility is sometimes referred to as a "mud room")

Children - Teenage (with separate facilities)

- Facilities: - Full range of fixtures: toilet/urinal and tub/shower, probably shared, individual lavatory
 - Counter space with mirror
 - Selected storage
- Location: - Private to bedrooms, close to laundry area

Guest and Visitors - adult

- Facilities: - Toilet/urinal, lavatory
 - Minimum counter space with mirror
 - Minimum selected storage
- Location: - Related to public areas, easily located but still private (Kira, 1976, p. 179).

Storage

Proper storage is a major concern and is typically inadequate in today's bathrooms. Some bathrooms may have only a medicine cabinet for storage. Yet, there is a great amount and variety of items stored in the bathroom. Each category of items has particular requirements for storage that need to be considered. The following list suggests the many categories of items for desirable storage.

Enclosed Storage:

Limited Access:

- Prescription medicines and contraceptive devices
- Patent medicines and drugs
- Sick room supplies (bed pan, vaporizer, fountain syringe, ice bag, hot water bottle, heating pad, and sanitary supplies and devices)

Free Access:

- Daily use items (water glass, toothbrush and other dental equipment and supplies, shaving equipment, deodorants, make up, brush and comb, tissues)
- Grooming aids (hair dryer, hot comb, curlers, hair clippers, scissors, nail clippers, sun lamp)
- Scales
- Linens (including bathmats, extra shower curtains)
- General supplies (soap, toilet paper, tissues)
- Cleaning equipment and supplies (brush, mops, sponges, cleaning agents)
- Soiled laundry
- Children's equipment (potty seat, diaper pail)

Active Open Storage and Work Spaces:

Daily use items (same as above but while in actual use)

Soap, wet washclothes, sponges

In-use towels

Robes

Clothing worn in or brought in (in connection with bathing) (Kira, p. 181).

Acoustics

Noise in the bathroom is a concern and embarrassment to many people. Sounds in the bathroom, whether of human or hydro mechanical origin, tend to be pronounced, easy to identify and cause a great deal of embarrassment for many people, both for the one making the noise and the listeners. The sound of a flushing water closet is considered objectionable both because of modesty and because, especially at night, it makes a loud noise. Attention should be paid to cutting down sound transmission. Hard-surface materials commonly used tend to aggravate the problem. Insulated walls, floors and ceilings lessen the direct transmission of sound. In order to meet the criteria for cleanability, water-proof, sound absorbing, moisture-resistant ceilings and carpeted floors also help to reduce noise.

A practice which increases noise is the undercutting of the door to allow for ventilation. Ironically, ventilation supplied in this way is poor. A mechanical exhaust system would not only permit a tighter door fit but could also contribute an additional anonymous masking noise of its own. Additional noise can be treated by piping

systems that are improperly sized and not isolated from the fixtures or the enclosing structure (Kira, 1976, p. 185).

Common Bathroom Layouts

The four most common bathroom layouts are classified by the arrangement of fixtures.

The one-wall bathroom. This layout suits a long, narrow room - as narrow as 4 1/2 feet. It's an economical layout because all of the plumbing connections, drains, and vents - are in one wall.

The L-shaped bathroom. In this layout, fixtures are arranged in an L; a bathtub usually occupies the short leg. Commonly used for 5 by 7 foot or 5 by 8 foot bathrooms, this design provides ample floor space. All plumbing is in one wall.

The corridor bathroom. Access is a feature of this layout, with fixtures located along two opposite walls. It's a practical arrangement for a small bathroom tucked between two bedrooms, with a door to each. The corridor should be at least 30 inches wide. Two walls require plumbing.

The U-shaped bathroom. In a square room, fixtures are often placed along three walls. Though practical to use, the U-shaped layout requires plumbing in all three walls (Clark, 1983, p. 24).

CHAPTER V

SUMMARY AND CONCLUSIONS

Summary

Over the centuries, human hygiene, bathing practices, and sanitary facilities have changed from public to practices to private events. The Greeks and Romans had numerous large public baths where one could take hot and cold baths. Water for the Roman facilities was supplied by aqueducts. After Roman influence declined, the practice of bathing was limited only to a very few people during the Dark Ages. In the 1800s and early 1900s one reads of the Saturday night bath where a metal tub was brought into the kitchen and hot water was poured by hand. But it has been the last 30 years which have produced nearly 90% of all the progress ever made in the actual design of the bathroom (Riggs, 1985).

American hotels were paramount in popularizing bathing rooms. The first hotel to have bathing rooms was the Tremont House Hotel in Boston in 1829; it contained eight bathing rooms in the cellar and inside water closets. In 1836, the Astor House opened in New York with 18 bathing rooms. In 1853, the Mount Vernon Hotel in Cape May, New Jersey advertised a bath with hot and cold water for every room. And, in 1908, Ellsworth Statler opened the Buffalo

Hotel with the slogan, "A room with a bath for a dollar and a half" (Gilliant, 1971). The idea was very popular and spread to private homes across the country. Today, as a nation, Americans take more showers and baths than any other population of the world.

The adoption of the bathroom gradually replaced the wash stand, jug, and bowl; through the 1800s with the wash basin having hot and cold running water. As early as the 1850s, fitted wash basins with taps were pictured in trade catalogues. It was not until the 1870s that the wash basin caught on, and not with the middle-class, but the wealthy. Wash basins looked more like elaborate pieces of furniture than plumbing fixtures. Having marble tops and mahogany to hide the piping made them very costly, hence, only the rich could afford them. In the 1880s, a cheaper variety of wash basin was produced, using a cast iron framework to support an earthenware bowl; their one-piece basins which are very similar to those used today (Ridley, 1976).

The bathrooms of the 1870s and 1880s were made for the very wealthy and were designed with elaborate interiors, a great amount of carved woodwork, stained glass and tiled floors. The Victorians were known for overdone interiors complete with heavy draperies; ornate furniture with every type of turnings and trimmings imaginable; and rooms filled to the brim with bric-a-brac, which were very floral in nature.

Victorian interiors were beginning to lose their flair in society. The main reason was the prevention of illness. According to Gwendolyn Wright,

the following attitude was emerging: An architecture of visible health emerged in many domestic guides and home magazines. Draperies, upholstered furniture, wall-to-wall carpets, and bric-a-brac all 'abiding places for germs' - were evicted from the home since dust was thought to be a principle carrier, any place where it could collect was suspect. The purifiers urged that doorways and window casings become simpler, moldings and statuary niches disappear; cornices and irregular corners be eliminated more windows now became a goal in every kind of housing windows let in the maximum of sunlight and fresh air (Wright, 1980, p. 119).

This welcoming of high cleanliness was not always the case, during the 1870s, wealthy people who could afford to have indoor plumbing hesitated to install a fixed bath. According to the sanitarian S. S. Hellyer, "one may as well look for a fountain in a desert as for a bath in any of our old English houses" (Ridley, 1976, p. 123).

During the 1890s, the bathroom was the most important addition and was a standard fixture in the middle class home. Reformers publicized the issue of sanitation in the tenements, this also increased middle class awareness of plumbing facilities. Large plumbing supply companies and utilities companies pressured builders to install bathrooms in every home.

Cast iron began to replace sheet metal in bath construction, free-standing models replaced the wood panelling around the tub, because a decorative finish was applied to the outside (Ridley, 1976). The cast iron bath

was made with a flat rim, followed by the roll rim. The enamel paint which decorated the bath caused problems. The paint was similar to regular house paint, and until the introduction of porcelain enamel in approximately 1910, required constant painting because the colors faded very quickly.

Porcelain enamel was not actually porcelain, or enamel. It was a hard, vitreous coating, similar to glass, that was fired onto metal at a high temperature. In many middle class homes the bathtub was decorated with bright paints and stencils (Conran, 1978). Because of technological advances, fixtures were more compact and a 5" x 5" or 5" x 7" bathroom became more familiar, although many older homes still provided a larger amount of space for the bathroom, since the owners probably converted bedrooms for the purpose (Wright, 1980).

The period between 1890 and 1910 has been known as the "gold age of public health" in America. During this period, physicians and statisticians concentrated on collecting information about sanitary conditions in U.S. cities and in the 1890s they began to work with politicians, political reformers, home economists and sanitary engineers toward the scientific control of communicable diseases. Municipal and state boards of health were given more authority. There was municipal control of services - sewage, garbage collection and water supply legislation was introduced to ensure fresh air, sunlight, sanitary facilities and adequate space.

Sanitation education was the main focus of the day. Public health officials rallied large campaigns, trying to teach persons the practices of personal and domestic hygiene. Manufacturers of household products immediately seized upon the idea of how the individual family might protect themselves against germs. Often, advertisements for soap products, plumbing equipment, casement windows and furniture featured a sick child dying or a tubercular wife looming out of a dark background (Wright, 1966).

Water closets during the 1870s to 1890s were often very elaborate and eye catching. One popular type of water closet was shaped like a dolphin--the mouth had a shell-type bowl to sit on and collect waste. One other water closet consisted of a poised lion with a bowl on his back (see Figure 20). It appeared the lion statue would interfere with business but people became accustomed to it. Many of the closets were very beautiful, perhaps making more of an artistic statement than meeting functional needs. Some were painted on the inside and out with fantastic detail. As a popular motif, chrysanthemums were used often by the Victorians (see Figure 21). Even the poor man's closet was decorated (Palmer, 1973).

White was the clearest symbol of cleanliness and by 1900, had become very popular for interior spaces. Wall coverings made for bathrooms - tiles, less expensive enameled sheet metal, light weight oil cloth, and enamel paint were usually specified as white. Bathrooms not only had to be clean, they had to look clean (Wright, 1966).



Figure 20. Lion Water Closet



Figure 21. Flowered Water Closet

With the building boom of the early 1920s, all new residential construction was required to provide a private bath for each unit (in urban areas). This was reinforced by law. The 1920s were also a period in which a number of elegant, innovative, and lavishly equipped custom designed bathrooms were produced for the wealthy.

Unfortunately, these have not survived as well as the famous and familiar furniture of the period. With the onset of the Depression, there was a period of three decades or more when, because of economic conditions and wars followed by great building booms, bathroom design remained fixed at virtually the same levels. During the 1960s, a trend developed toward providing several bathrooms for the average house in the U.S., but construction still tended to follow the standard minimal pattern. It has only been in the last 20 years that people have been more liberal and original in bathroom design. It has been suggested that, whereas the 1950s and 1960s were the era of the kitchen and family room, the 1970s and 1980s will be the eras of the bathroom and body care.

During the 1930s, especially during and immediately after World War II, a number of ingenious improvements were proposed and tried, mostly in the area of prefabrication. None were successful, and few were ever put into practice. The actual significant progress that had been made in this era was small, so that the average bathroom of the mid 1970s was barely distinguishable from one built over 50 years ago (Kira, 1976). The 1980s have seen an

emphasis on the bathroom as a whole. Americans are more health oriented and having a bathroom that meets all of their needs (mind, body and spirit) is of great importance.

The bathroom must be functional as well as beautiful. According to R. W. Kennedy, the author of The House and the Arts of Its Design:

The proper character of bathrooms, like all the other rooms in the house, must be a function of the peculiar combination of activities which the client elects to combine in its space. Obviously the sybaritic atmosphere, designed for pleasure in warmth, steam, nudity, sex, flowers and alcohol, cannot be appropriately combined with the bathinette, the toidy seat, and the diaper pail. On the other hand, the well designed family bath, large, commodious, practical, somewhat ascetic, can be a magnificent thing, not only in terms of utility, but also in terms of its expressive message. Ideally perhaps, every family should have one of each. But where for practical reasons this is impossible, a little of each, a compromise, is certainly possible, and a great challenge to the designer (1953, p. 258).

Every era in bathroom design is distinctly its own--each design period has its own style. Over the last century the designer has played a major factor in how bathrooms are designed and decorated. The designer must realize for whom they are designing. The needs of the users are varied and individual, and must be kept in mind when creating the bathroom. A specialization in bathroom design is a relatively new area in the design field, but is growing. The designer needs to be on the cutting edge of technology and design trends. His designs need to be inspired by the zeitgeist.

Conclusions

The purpose of this study was to explore the literature available in relation to the development of the bathroom in America. A historical account of the bathroom was presented with emphasis centered on the 1850s to the present. One intention of the study was to assess the role of the designer in the various phases of bathroom design.

It is through the house that one can get a measure of a society. A great deal can be learned by looking into the bathroom. Going back through past eras, one can see various transformations in attitude concerning hygiene, design preference, and technological advances in the bathroom and its contents.

Every era has its own expression of society that is unique to that particular time period. In looking at the bathroom of the past to the present, one can hypothesize about future adoptions.

Through the development of the bathroom, one constant variable is the family. The needs of the family have always been a main concern when planning the bathroom. Meeting the needs and keeping the family healthy is important in every society. Although the attitudes toward hygiene vary among cultures, the desire of meeting needs is universal.

The bathroom of today is varied and individualized. No longer is the bathroom a small room that is hidden from view. It has become a major room of the home, a personal

as well as social space. The bathroom is an expression of the lifestyle and attitude of its owners.

Suggestions for Further Study

During the course of this study it became evident that there is a need for a specialization in the field of bathroom design. The Certified Kitchen and Bathroom designer (CKB) is one association that responds to this need. It is a new design area with a growing demand; designers need to be on the cutting edge of bathroom technology.

The researcher makes the following suggestions for a more detailed observation of bathroom design:

- 1) study the differences of bath design among various geographical locations;
- 2) compare differences in warm versus cold climates in relation to bathroom design;
- 3) study the relationship between materials used for bathroom use and hygiene; and
- 4) compare the maintenance, contents and durability of materials chosen for bathroom use and hygienic qualities.

Further research is needed for special groups concerning bathroom design. The major emphasis should include the visually impaired and the elderly. Both groups have needs which require proper design, new technological advances and education to create an environment which meets these needs.

BIBLIOGRAPHY

- Aron, H. (1938). Our Common Ailment. New York: Doge Publishing Co.
- Bathrooms. (1936, June). House and Garden, pp. 63-70.
- Bathroom Building. (1933, November). Ladies Home Journal, p. 10.
- Bathrooms for Living. (1975, December 22). Time, p. 48.
- Bockus, H. L. (1944). Gastro-Enterology. Philadelphia: W. B. Saunders Co.
- Brostrom, Ethel. (1956). How to Plan Your Bathroom and Powder Room. New York: Greenberg.
- Brown, Erica. (1984). The International Collection of Interior Design. New York: Grosvenor Press.
- Brown, Henry Collins. (1912). Book of Home Building and Decoration. New York: Country Life Press.
- Caparn, Anne. (1936, November). America is Bathroom Conscious. Arts and Decoration, pp. 38-55.
- Chapin, F. S. (1951). Some Housing Factors Related to Mental Hygiene. Journal of Social Issues, 7, 165.
- Clark, David E. (1983). Sunset Bathrooms Planning & Remodeling. California: Lane Publishing Co.
- Conran, Terence. (1985). New House Book. New York: Villard Books.
- Conran, Terence. (1978). The Bed and Bath Book. New York: Crown Publishers, Inc.
- Conran, Terence. (1976). The House Book. New York: Crown Publishers, Inc.
- Derby, Richard B. (1920, February). The Importance of Your House Plumbing. House Beautiful, pp. 106-136.
- Development of the Bathroom. (1926, September). House and Garden, p. 158.
- Distinction in Bathrooms. (1940, January). Interior Design and Decoration, pp. 52-57.

- Dunn, Robert J. (1976). Bathrooms Ideals. New York: Bantam/Hudson Idea Books.
- Elliott, S. Maria. (1911). Household Hygiene. Chicago: American School of Home Economics.
- Fairman, Agnes Rowe. (1923, August). The Bathroom of Today. Good Housekeeping, pp. 43-166.
- Fitz-Gibbon, Costen. (1925, December). Very Elaborate and Very Practical Bathrooms. Arts and Decoration, pp. 63-84.
- Frederick, Christine. (1919). Household Engineering. Chicago: American School of Home Economics.
- French, Lillie Hamilton. (1903). Homes and Their Decoration. New York: Dodd, Mead and Co.
- Gilliant, Mary. (1971). Bathrooms. New York: The Viking Press, Inc.
- Givens, Ron, & Springer, Karen. (1986, May 5). Splish, Splash, It's More Than a Bath. Newsweek, pp. 88-81.
- Glorified Bathrooms. (1933, August 19). Business Week, p. 15.
- Godfrey, Hollis. (1910). The Health of the City. Boston and New York: The University Press, Cambridge.
- Handlin, David P. (1979). The American Home. Boston: Little, Brown and Co.
- Harling, Robert. (1964). The Modern Interior (House & Garden). London: The Condi Nast Publications Ltd.
- Hart, B. Leslie. (1988, September). Consumer Bath Remodeling Report. Kitchen & Bath Business, pp. 49-103.
- Hicks, David. (1970). David Hicks on Bathrooms. England: World Publishing.
- Hillier, B. (1971). Art Deco. New York: E.P. Dutton & Co.
- Hornibrook, F. A. (1933). The Culture of the Abdomen. New York: Doubleday, Doran & Co.
- Hottest Room in the House. (1984, February 6). U.S. News & World Report, p. 56.
- Hurlock, Jim. (1987, March 23). Make A Splash In a High-Tech Bathtub. Business Week, p. 168.

- Kennedy, R. W. (1953). The House and the Art of its Design. New York: Reinhold Publishing Co.
- Kira, Alexander. (1976). The Bathroom. New York: The Viking Press.
- Kira, Alexander. (1972, May). The Case for the Live-in Bathroom. House and Garden, pp. 108-195.
- Kohler of Kohler. (1948). Kohler, WS: Kohler Co.
- Koues, Helen. (1948). The American Woman's Encyclopedia of Home Decorating. New York: Garden City Publishing Co., Inc.
- Koues, Helen. (1928). On Decorating the House. New York: Cosmopolitan Book Corporation.
- Lamb, Curt. (1979). House Styles. New York: St. Martin's Press.
- Lamb, H. A. J. (1937, March 4). Sanitation: An Historical Suvey. The Architects Journal, pp. 385-403.
- The Latest Bath News from the World's Fair. (1933, August). House and Garden, pp. 44-45.
- Lounsbery, Elizabeth. (1926, October). The Bathroom Both Lovely and Sanitary. Arts and Decoration, pp. 56-59.
- MacMillian, Donald D. (1954). Good Taste in Home Decoration. New York: Henry Holt and Co.
- Pahlman, William. (1960). The Pahlman Book of Interior Design. New York: The Viking Press.
- Palmer, Ray. (1973). The Water Closet. Great Britain: David & Charles: Newton Abbot.
- Plumbing for Today's Houses. (1940, June). House Beautiful, pp. 52-77.
- Post, Emily. (1933). The Personality of A House. New York: Funk & Wagnalls Co.
- Powel, Lydia. (1939). The Attractive Home. New York: The Macmillian Co.
- Putman, J. Pickering. (1911). Plumbing and Household Sanitation. New York: Double, Page and Company.
- Reyburn, Wallace. (1971). Flushed with Pride: The Story of Thomas Cupper. U.S.A.: Prentice-Hall, Inc.

- Reynolds, Reginald. (1946). Cleanliness and Godliness. New York: Doubleday and Company, Inc.
- Richards, Ellen H. (1908). The Cost of Cleanness. New York: John Wiley & Sons.
- Richards, Ellen H., & Talbot, Marion. (1898). Home Sanitation. Boston: Whitcomb & Barrows.
- Ridley, Anthony. (1976). At Home. London: Heinemann.
- Riggs, J. Rosemary. (1985). Materials and Components of Interior Design. Virginia: Reston Publishing Company, Inc.
- Schram, Joseph F. (1976). Book of Successful Bathrooms. Michigan: Structures Publishing Company.
- Softening Up the Bathroom with Plastic Forms. (1971, October). Modern Plastics, pp. 60-61.
- Steinman, J. D. (1984). Analysis of the Art Deco Style of Architecture. Unpublished master's thesis, Oklahoma State University, Stillwater.
- VenderRyn, Sim. (1978). The Toilet Papers. Santa Barbara: Capra Press.
- Wagner, E. G. and J. H. Lanoix. (1958). Excrete Disposal for Rural Areas and Small Communities. Paper presented at the meeting of the World Health Organization, Geneva.
- Watkins, David. (1977). Mortality and Architecture. Chicago: The University of Chicago Press.
- Wharton, Edith, & Codman, Ogden, Jr. (1978). The Decoration of Houses. U.S.A.: W. W. Norton & Company, Inc.
- Williams, J. R. (1932). Personal Hygiene Applied (4th ed.). Philadelphia: W. B. Saunders Co.
- Wolf, Ray. (1987). Rodale's Home Design Series Bath. Pennsylvania: Rodale Press.
- Wolfe, Elsie de. (1914). The House in Good Taste. New York: The Century Co.
- Wright, Gwendolyn. (1980). Moralism and the Model Home. Chicago: The University of Chicago Press.
- Wright, Lawrence. (1966). Clean and Decent. London: Routledge & Kegan Paul.

VITA²

FRANKLIN P. BAUGH

Candidate for the Degree of
Master of Science

Thesis: HISTORICAL PERSPECTIVE OF BATHROOM DESIGN AND SPACE
REQUIREMENTS IN THE UNITED STATES

Major Field: Housing, Interior Design and Consumer Studies

Biographical:

Personal Data: Born in St. Louis, Missouri, April 25,
1959, the son of Franklin P. and Lois Faye Baugh.

Education: Graduated from Eldon High School, Eldon,
Missouri, in May, 1977; received Bachelor of Science
in Home Economics degree in Interior Design from
Southwest Missouri State University in May, 1986;
completed requirements for the Master of Science
degree at Oklahoma State University in May, 1989.

Professional Experience: Display Designer/Consultant, 7
Seas Art Gallery, Lake of the Ozarks, Missouri,
1981-1983; Design Consultant, Martin's Home
Interiors, Springfield, Missouri, 1984-1986.