The Origins Of The Computer Essay, Research Paper

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The Roman Empire, founded by Augustus Caesar in 27 B.C. and lasting in

Western Europe for 500 years, reorganized for world politics and economics.

Almost the entirety of the civilized world became a single centralized state. In

place of Greek democracy, piety, and independence came Roman authoritarianism

and practicality. Vast prosperity resulted. Europe and the Mediterranean bloomed

with trading cities ten times the size of their predecessors with public

amenities previously unheard of courts, theaters, circuses, and public baths.

And these were now large permanent masonry buildings as were the habitations,

tall apartment houses covering whole city blocks.

This architectural revolution brought about by the Romans required two

innovations: the invention of a new building method called concrete vaulting and

the organization of labor and capital on a large scale so that huge projects

could be executed quickly after the plans of a single master architect.

Roman concrete was a fluid mixture of lime and small stones poured into

the hollow centers of walls faced with brick or stone and over curved wooden

molds, or forms, to span spaces as vaults. The Mediterranean is an active

volcanic region, and a spongy, light, tightly adhering stone called pozzolana

was used to produce a concrete that was both light and extremely strong.

The Romans had developed potsalana concrete about 100 B.C. but at first

used it only for terrace walls and foundations. It apparently was emperor Nero

who first used the material on a grand scale to rebuild a region of the city of

Rome around his palace, the expansive Domus Aurea, after the great fire of AD 64

which he said to have set. Here broad streets, regular blocks of masonry

apartment houses, and continuous colonnaded porticoes were erected according to

a single plan and partially at state expense. The Domus Aurea itself was a

labyrinth of concrete vaulted rooms, many in complex geometric forms. An

extensive garden with a lake and forest spread around it.

The architect Severus seems to have been in charge of this great project.

Emperors and emperors’ architects succeeding Nero and Severus continued and

expanded their work of rebuilding and regularizing Rome. Vespasian (emperor AD

63-79) began the Colosseum. Which I have a model bad of. Built by prisoners from

the Jewish wars the 50,000 Colosseum is one of the most intresting architectural

feets of Rome. At its opening in 80 A.D. the Colosseum was flooded by diverting

the Tiber river about 10 kilometers to renact a naval battel with over 3,000

participants. Domitian (81-96) rebuilt the Palatine Hill as a huge palace of

vaulted concrete designed by his architect Rabirius. Trajan (97-117) erected the

expansive forum that bears his name (designed by his architect Apollodorus) and

a huge public bath. Hadrian (117-138) who served as his own architect, built the

Pantheon as well as a villa the size of a small city for himself at Tivoli.

Later Caracalla (211-217) and Diocletian (284-305) erected two mammoth baths

that bear their names, and Maxentius (306-312) built a huge vaulted basilica,

now called the Basilica of Constantine.

The Baths of Caracalla have long been accepted as a summation of Roman

culture and engineering. It is a vast building, 360 by 702 feet (110 by 214

meters), set in 50 acres (20 hectares) of gardens. It was one of a dozen

establishments of similar size in ancient Rome devoted to recreation and bathing.

There were a 60- by 120-foot (18- by 36-meter) swimming pool, hot and cold baths,

gymnasia, a library, and game rooms. These rooms were of various geometric

shapes. The walls were thick, with recesses, corridors, and staircases cut into

them. The building was entirely constructed of concrete with barrel, groined,

and domical vaults spanning as far as 60 feet (18 meters) in many places. Inside,

all the walls were covered with thin slabs of colored marble or with painted

stucco. The decorative forms of this coating were derived from Greek

The rebuilding of Rome set a pattern copied all over the empire. Nearby,

the ruins of Ostia, Rome’s port (principally constructed in the 2nd and 3rd

centuries AD), reflect that model. Farther away it reappears at Trier in

northwestern Germany, at Autun in central France, at Antioch in Syria, and at

Timgad and Leptis Magna in North Africa. When political disintegration and

barbarian invasions disrupted the western part of the Roman Empire in the 4th

century AD, new cities were founded and built in concrete during short

construction campaigns: Ravenna, the capital of the Western Empire from 492-539,

and Constantinople in Turkey, where the seat of the empire was moved by

Constantine in 330 and which continued thereafter to be the capital of the

Eastern, or Byzantine, Empire.

Christian Rome. One important thing had changed by the time of the

founding of Ravenna and Constantinople; after 313 this was the Christian Roman

Empire. The principal challenge to the imperial architects was now the

construction of churches. These churches were large vaulted enclosures of

interior space, unlike the temples of the Greeks and the pagan Romans that were

mere statue-chambers set in open precincts. The earliest imperial churches in

Rome, like the first church of St. Peter’s erected by Constantine from 333, were

vast barns with wooden roofs supported on lines of columns. They resembled

basilicas, which had carried on the Hellenistic style of columnar architecture.

Roman concrete vaulted construction was used in certain cases, for example, in

the tomb church in Rome of Constantine’s daughter, Santa Costanza, of about 350.

In the church of San Vitale in Ravenna, erected in 526-547, this was expanded to

the scale of a middle-sized church. Here a domed octagon 60 feet (18 meters)

across is surrounded by a corridor, or aisle, and balcony 30 feet (9 meters)

deep. On each side a semicircular projection from the central space pushes

outward to blend these spaces together.