

the statues remained the same, but a more skilled carving technique was developed. In Ecuador, Peru and Bolivia the figures were covered with carved reliefs, which grew intricate in the southern areas.

Complexity of Architecture

Architecture followed the same trend of greater complexity as the people migrated towards the south. Two stone slabs for the base of the structure and one for the roof formed the dolmenic type of construction used in Colombian temples and tombs. To the south, *tolas*, Indian mounds, made of stone heaps, and *pircas*, stone fences, were predominant. Reliefs were carved on the fences.

Construction of stone buildings such as the temples of Chavin in Peru and the palace of Tiahuanaco in Bolivia, marked the height of pre-Inca architectural development. Inca architecture was the most highly developed of all.

Dr. Hernandez de Alba's theory of a migrating Indian culture is borne out by pottery remains dug from the earth. A poorly styled, crude type of three-legged bowl is representative of San Agustin pottery. Very few variations in style and lack of any decoration emphasize the primitive nature of these Indians. Remains unearthed in areas farther south exhibit increasingly greater perfection of form, style and decoration of the original tripod.

Stone Knives Uncovered

Implements found in the San Agustin region generally resemble the type used hundreds of centuries ago in the Stone Age. Stone knives, hammers, points and axes have been uncovered. The height of development attained by these tribal weapons is exhibited in the polished stone axes and chisels.

Stone implements were rarely found in excavations farther south. Apparently, with the rise in the cultural level came the use of copper and bronze instruments in Peru and Bolivia. Again, the high point was achieved by the Incas in the development of tools.

Where the primitive Indians living in San Agustin came from is still shrouded in mystery and legend. All earlier cultural development is a matter of conjecture. On the basis of the recently unearthed archaeological treasures, the story in stone is presented by Dr. Hernandez de Alba as a record for posterity.

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DRY WATER HOLE—Ancestors of the Incas once drank cool water from the hole in this rock, now filled with weeds. It was they who carved the animals in the rock. The lizard on the right is supposed to have the face of a human.

GENERAL SCIENCE

Washington the Scientist

Balloons, submarines, crop rotation, "camouflaged" military uniforms and a patent law were among the interests of the first president of the United States.

➤ IF George Washington could see the world as it is today, he might not be amazed at modern scientific achievements. He might enthusiastically accept them as very satisfactory developments of ideas born during his day, some of which he financially backed.

Submarines, power boats, aviation and scientific farming were not unfamiliar to Washington, although in many cases they were, in his time, mere shadows in relation to what was to come.

If you look back to your grade school impressions of Washington, you would probably picture little George tearfully but truthfully standing by the fallen cherry tree, hatchet in hand. And you would probably recall teen-age George surveying the wilderness. The breath-taking exploits of Washington the soldier and statesman would also be clear in your mind. But, what many history books completely overlook is Washington, the great scientist and engineer.

As an engineer, Washington was truly a self-made man. No scientific schools existed in the American colonies at that

time, and a scientific education had to be obtained by home study of necessity. This engineering training was useful to him in later life (*Turn to next page*)

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Do You Know?

Orange seed contains enough oil to make commercial extraction profitable.

There are 6,807 *hospitals* in the United States with over 853,000 beds.

There are 94,000 square miles of potential farming and grazing lands in *Alaska*.

Chicken fat, boiled gently to remove the water, may be used instead of butter in cakes, cookies, sauces and bread.

The U. S. Government requisitioned nearly one-half of the 350 commercial *airline planes* at the outbreak of the war.

A new *X-ray machine* now in use in a war production aircraft plant is capable of inspecting 17,000 airplane castings in 24 hours.

Phosphorescent paints developed for war purposes may in post-war days be used for interior markers for exits, guide lines and obstructions in factories and public buildings.

Huge *canyons* on the bottom of the sea extending out from the continents give every indication of having been cut by rivers on dry land and later submerged in the ocean.

Although there is no less *rainfall* in the United States than there was 200 years ago, there is a growing shortage of water, with the disappearance of topsoil and forest cover.

The longest *air freight* line in the world operates from Patterson Field in Ohio to India; operating on a regular schedule, great cargo planes carry war essentials to American troops in the Far East.

New Haven, Conn., has appropriated \$10,000 to be used in preparing post-war *housing* plans; this is reported to be the first direct appropriation for this purpose made during the war by any municipality.

Wartime 100-octane *gasoline*, greatly improved since Pearl Harbor, is not gasoline in the ordinary sense, but is a super-fuel produced by rearranging the petroleum hydrocarbon molecules through use of agents called catalysts.

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when planning military strategy, supervising the layout of the nation's capital, and designing a blueprint for the nation.

Aside from the affairs of state of the newborn nation, Washington had an active interest in all scientific developments of the day.

Washington stressed the importance of getting into the western wilderness to extract its hidden treasure. For this purpose, he was convinced of the need of inland water transportation, and closely followed all attempts made to discover a practical power boat.

As a prologue to modern aviation, Jean Pierre Blanchard, a Frenchman, made his first balloon ascension in this country in 1793. Washington presented Blanchard with a remarkable document which the 18th century aviator called his passport. It was addressed to all citizens of the United States recommending that in his passage, descent, return or journey elsewhere they aid him with good will and any assistance which might be necessary.

The earliest known type of American submarine also attracted Washington, who financially aided its inventor, David Bushnell. As described by Washington, this machine, built to accommodate one man, could carry itself under the water at any given depth, and, by means of an attached powder-filled appendage, could strike at an anchored ship some distance away and destroy it.

This submarine was operated in New York Harbor in 1776. The purpose was to attach a bomb to the keel of Admiral Howe's flagship. However, the bomb failed to hold and exploded about one hundred feet from the ship. Half drowned, the operator of the submarine reached shore, his mission a failure.

Washington later wrote to Jefferson concerning this idea. "One accident or another always intervened. I then thought, and still think, that it was an effort of genius, but that too many things were necessary to be combined to expect much from the issue against an enemy, who are always upon guard."

Tobacco was Virginia's chief crop at that time. However, constant tobacco crops soon exhausted and ruined the soil. As land in those days was cheap and plentiful, the planter light-heartedly cleared new lands and let the old revert to wilderness.

Recognizing the problem as not one so much for his contemporaries, but as one of conserving the land for posterity,

Washington developed a system of crop rotation, demonstrating to neighboring farmers a practical soil conservation procedure.

Washington was responsible for breeding the first mules in this country. The King of Spain sent two jacks and two jennets to him as a gift. One jack died on the way over, but the remaining one upon arrival was promptly christened Royal Gift. Lafayette also sent some from France. The two strains were crossed, producing an animal which Washington christened Compound. Mules, a cross between the imported jacks and mares, were very quickly utilized by American farmers.

Even though camouflage as a phase of warfare was to appear over a century later, Washington was probably the first general to recommend concealing uniforms. He took particular notice of the fact that the blazing red of the British army and the blue and buff of his own army were not very satisfactory when compared with the buckskin uniforms of the backwoods units, which blended with the surroundings. He recognized the fact that this dun-colored skin garment with a loose-fringed coat and short shoulder cape blurred the outline and gave the garment a foliage-like sway when the wind blew.

To encourage further technology and invention in America, Washington advocated and signed the first law framed by Congress for the protection of American inventors by patents.

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ENGINEERING

"Duck's" Cooling System Reverses Fan Action

► DUCKS, those amphibian vehicles that are trucks on land and boats in the water, have a new cooling system offered in the invention of E. T. Todd of Pontiac, Mich. The radiators in such existing vehicles must be located in-board and below bow level, for protection; but this cuts off free access of air from the front and reduces cooling efficiency. Mr. Todd gets around the difficulty very simply; he merely reverses the fan and has it suck in air from the rear, past the engine, and blow it out through the radiator, after which the heated blast is channeled around the outside of the engine compartment and then deflected outboard. Rights in the patent, No. 2,341,165, are assigned to the General Motors Corporation.

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