

RUINS OF THE ANCIENT INCA EMPIRE.

BY WALTER L. BEASLEY.

The writer, in a recent article in these columns, presented a general pictorial array, accompanied with brief text, of some of the rich and artistic treasures which were obtained from ancient burial sites of the Inca empire in Peru and Bolivia by the Baudelier expedition, sent out under the auspices of the American Museum of Natural History. The inventive ingenuity and marvelous technique displayed in their pottery, fabrics, and in the fashioning of gold and silver ornaments ranks the ancient Incas as the most pre-eminent artisans of the New World. A glimpse is afforded in the present narrative of some of the existing architectural remains of this vanished and cultured Indian empire, together with some new studies by the explorer of the social and tribal organization of the Incas.

It is said that this tribe did not commence to be conquerors until they had first shown themselves to be statesmen and wise and efficient administrators. Having obtained a fairly advanced civilization, they began gradually to overawe and incorporate the territory of less cultured tribes of the coast and slopes of the Andes, who slowly absorbed both the religion and superior handicraft of their conquerors. These conquests extended over a period of several centuries. The permanent establishment of Inca power is attributed to their having secured the good graces of their new subjects, and to their liberal treatment and policy of conciliation, than to force of arms. This continued until the limits of Inca rule extended from the central plateau of Bolivia to the western coast of Peru, north to Ecuador, and south to northern Chile. The inhabitants of this territory embrace many different tribes with local rulers, living in different stages of enlightenment.

Under Inca sway and influence, both architecture and the various industrial arts reached their highest degree of efficiency. Few, if any, countries of modern times have equaled the extreme and skillful utilization of land that was practiced during the time the Inca empire flourished. In many localities they built their dwellings among rough rocks, on arid slopes of hills, in order to use the limited area of soil for agriculture. They terraced up every hill and mountain-side until not a single spare foot of surface was left unimproved. They likewise constructed aqueducts for irrigation purposes, and also a series of magnificent roads, from twenty-five to fifty feet in width, paved with blocks of stone, which connected their royal capital at Cuzco with the various provinces. Part of the way these were cut out of solid stone, and often ascended precipitous heights by a series of stone stairways. Traces of these roads still exist in many localities.

The enthusiastic archaeologist investigating the archaeological ruins is somewhat handicapped by government restrictions, which limit the nature and extent of the excavations. The absence, also, of certain obtainable data and chronicles of the Spanish historians, whose manuscripts, written just after the conquest, have either been ruthlessly destroyed during the various civil revolutions, or others equally as valuable still unpublished and said to be preserved among the archives of Madrid, has deprived the modern historian of much valuable information. Fortunately, however, notwithstanding the lapse of centuries and a deal of vandalism, there still remain several groups of interesting ruined structures, designated as palaces, temples, and great religious buildings. Nothing is left of these in most cases but a series of ornamented walls, those on the coast being profusely decorated with fresco work, which attest to a superior knowledge of the art of construction and ornamentation at this early period. The interiors of these buildings were lavishly adorned with furnishings of pure gold and silver, which supplied valuable loot to the Spanish conquerors. Mr. Baudelier examined and partially excavated, made measurements, and reconstructed ground plans of several of the important ruined sites within the zone of Inca territory.

One of the most noteworthy of the coast ruins investigated by Mr. Baudelier were those of Chan-Chan, commonly called Chimú, near the present city of Truxillo, four typical views of which are here reproduced. The ruins extend for a distance of three miles,

and are one and a half miles in width. Nothing remains of the original appearance and former grandeur of the buildings except well-laid foundations, massive and peculiarly ornamented walls and groups of single-story, gable-roofed houses and courtyards. Mr. Baudelier estimates that some forty thousand persons occupied the place. The best ancient information of the Chan-Chan ruins and those in the immediate vicinity is to be derived from the early Spanish chronicler, Cieza de Leon, who visited this locality about a decade after the conquest, and is considered the most trustworthy authority. According to de Leon, this valley in pre-Spanish times was dominated by several powerful chiefs or lords, who waged warfare continually with near and distant tribes, and were feared and obeyed by their subjects. Each lord or ruler resided in a great city, the seat of his realm, which contained various imposing buildings. When these sovereigns were subdued by the Incas, still larger and more pretentious structures were erected. The architectural plan of Chan-Chan comprised a series of about twenty open squares of courtyards intersecting one another. On certain sides facing these were erected a number of palaces or religious edifices. Each square was surrounded by an exterior wall of adobe blocks, twenty-five feet in height. The larger buildings contained innumerable chambers and corridors, traversed by narrow passageways. Many treasures of gold and silver are said to have been found in these chambers and apartments. Around one of the great public squares were arranged some of the one-story adobe dwellings of the inhabitants. These are to-day graphically outlined, and preserve their original appearance, showing sharply-pitched gable roofs. There are no traces of windows. Light and ventilation seem to have been

lie buried fabulous treasures of gold, silver, and precious objects. In the sixteenth century a tunnel is said to have been made half-way to its center, and a large quantity of valuable ornaments obtained. This opening can still be penetrated, but no late investigator has attempted to push far within. Probably it was used as a religious shrine or sacrificial place, or on the other hand, from its lofty and commanding position, it may have been used as a strategic point to detect the approach of hostile invaders. The best-preserved architectural ruins, and those showing to striking advantage the extraordinary skill of the Incas in handling, polishing, and setting massive stone blocks, are the Chulpas or Burial towers. A celebrated and typical group is found at Sillistani, near Puna, built on a promontory 200 feet high. These peculiar and sumptuous sepulchers are termed by the late E. G. Squier, an authority on Peruvian culture, "The most elaborate and architecturally the most wonderful works of aboriginal Americans." The one here pictured is 25 feet high, 27 feet in circumference on the top, and 22 at the base. The majority are round; others are square in shape. In these, the bodies were interred with great pomp and ceremony, together with rich offerings of gold, silver, and choice pottery. The interiors of the Chulpas vary in size and construction; some have a single vaulted chamber, others two, arched over by stone. A few have niches. The entrance is gained through a small opening at the bottom, hardly large enough to admit the body of a man. This was closed by a stone slab.

That the coast Indians and Incas were a music-loving people is evidenced from numerous representations on pottery vessels of performers in the act of playing upon their instruments, as well as from the large number of actual instruments obtained. In their extensive religious worship and ceremonial dances music was a necessary feature, and was widely employed. Mr. Charles W. Mead, curator of the Peruvian Department of Archaeology, in a recent monograph on this subject, states that he was unable to discover any authentic musical scale or song of the Incas, and the best and only source of information is to be gained from the structure and character of the instruments themselves. It is commonly believed that they employed the five-toned or pentatonic scale, so widely used in the primitive music of ancient peoples. The most important of their instruments were the drum and pan-pipe. Both of these are modeled in the shape of water jars representing human forms, and give a clever idea of their construction and appearance. The drums appear to be identical with

those in use in many parts of Peru to-day, and were made by stretching a skin over a hoop of wood.

The pan-pipe was a series of reeds of graduated length, held in position by a cross-piece of split cane lashed to the reed with a cord made from the wool of the llama. The present natives still dance to the beating of the drum and pan-pipe, as did their ancestors hundreds of years ago. Nearly fifty different instruments, all of percussion and wind, were found. Remarkably unique among these are many double whistling jars or musical water bottles. Near the top of the first or front jar, which was usually surmounted by a human or animal figure, is the opening of the whistle. When the jars have been partly filled and are swung backward and forward, a number of whistling sounds are produced. As the vessel swings forward and upward, the water is lowered in the first jar and raised in the other. In the backward motion it rushes back into the first, forcing the air out through the whistle. One of the new musical discoveries heretofore unknown, and worked out by Mr. Mead, is the fact that shells were employed as cymbals. This is conclusively established by a terra-cotta water vessel, which is covered, showing the figure of a man in the act of striking two shells as cymbals.

Lake Titicaca.—On the islands of this lake is located the traditional birthplace of the Inca tribe, and here were built several large and imposing structures, the ruins of which still exist. Not far distant was located Cuzco, the chief settlement. The population of Cuzco and the valley in which it is situated, according to Mr. Baudelier, is said to have numbered between sixty and seventy thousand. The language spoken was, and is now, Quicha. The whole place was built around courtyards or squares, and contained

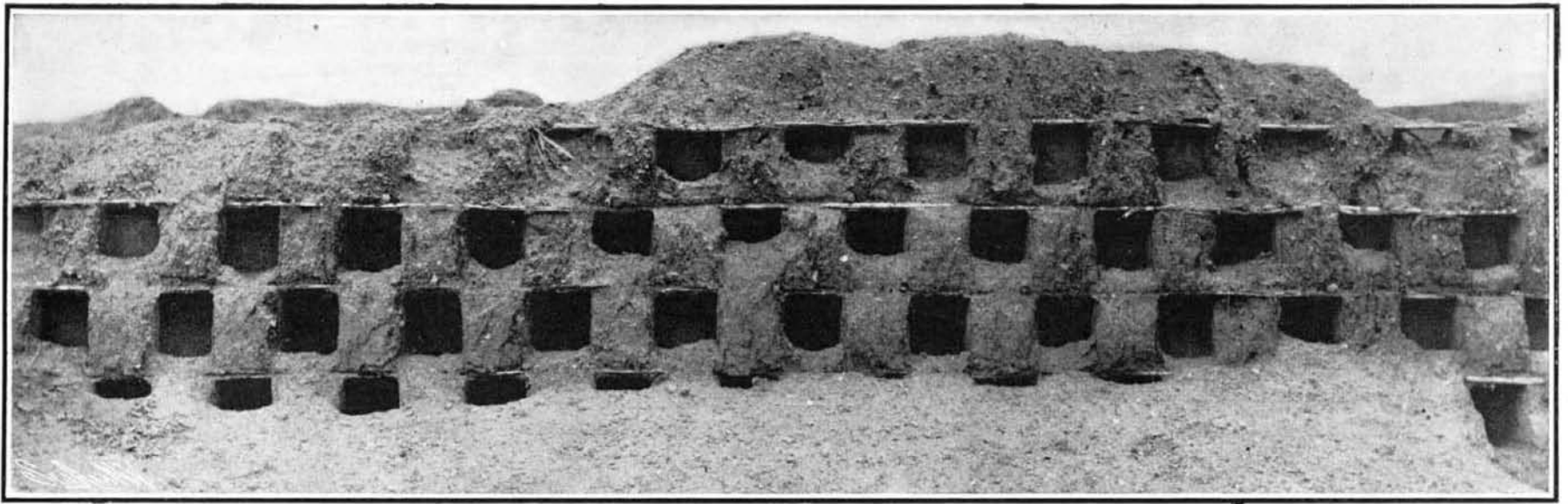


Altar in Heart of Artificial Mound, Ruins of Chan-Chan.

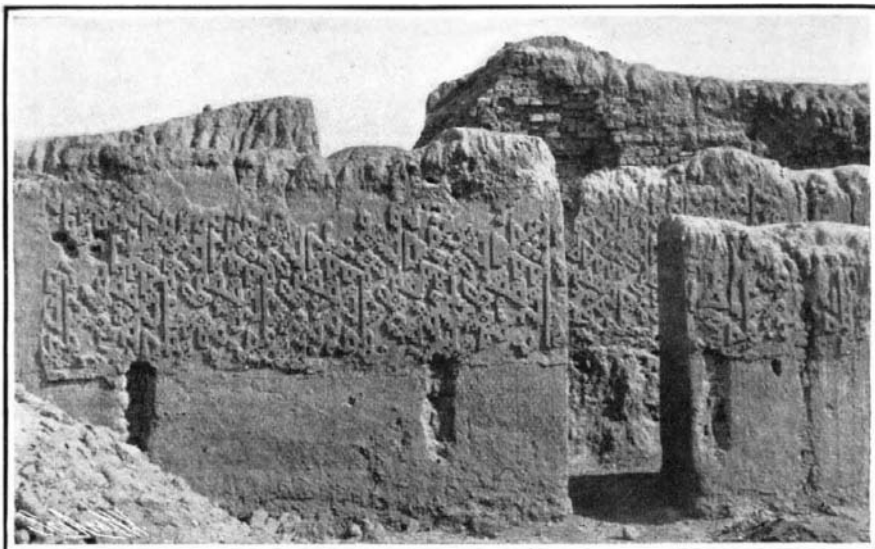
RUINS OF THE ANCIENT INCA EMPIRE.

furnished by the door alone. It is supposed that some of the great squares and inclosures were occupied by the various craftsmen and industrial workers in pottery, weavers and dyers of fabrics, and fashioners of metal ornaments for the use of the ruler, his household, and his priests. One of the curiosities discovered by Mr. Baudelier was an altar some fifty feet below the surface, which formed the heart of a great artificial mound, and which evidently occupied the central place in a large building devoted to religious worship.

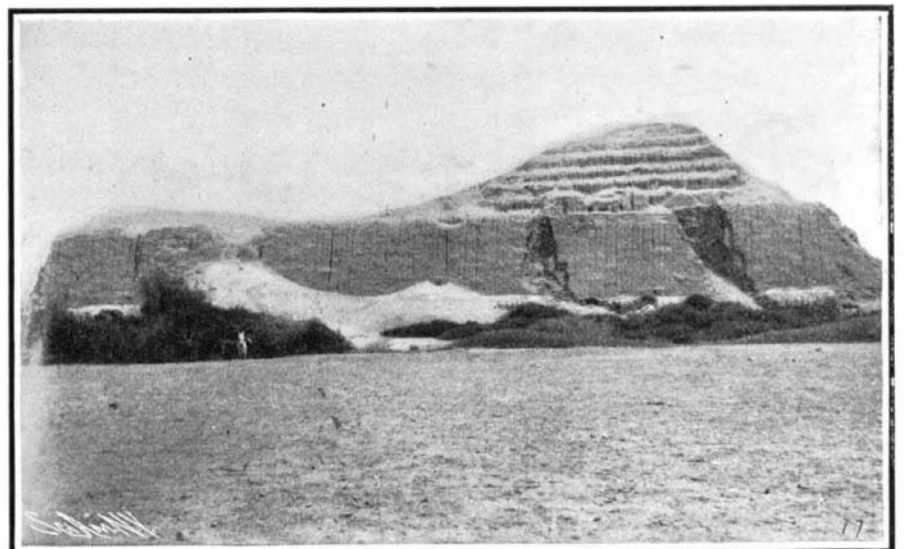
One of the noteworthy phases of the Chan-Chan ruins were the ornamented walls of two of its buildings, thought to have been devoted to sacred purposes, or to have served as the abode of the ruler. In one instance, a series of designs had been sunk a half-foot or more in the adobe over the entire wall, now seven feet high. Possibly these may have been apertures for hiding gold and other ceremonial offerings, and afterward sealed up by an additional adobe coating. Another façade, ten or more feet in height, is tastefully decorated with a network of frescoes in a series of duplicated designs of a conventionalized bird. These walls are surrounded by a mass of fallen debris; and nothing is left to throw any light upon their ancient splendor. Probably the most monumental and puzzling of all of the Inca ruins is the great pyramid on the banks of the Moche River. Sphinx-like, this majestic artificial mound rises upward in the air 150 feet, crowned by a series of terraces. It is 800 feet in length. The massive and imposing mound, reared by ancient builders, has marvelously defied time and vandalism, and still holds fast the secret of its creation, for it remains to-day a veritable enchanting riddle to the archaeologist. No attempt has been made in recent times to excavate it. Tradition affirms that within



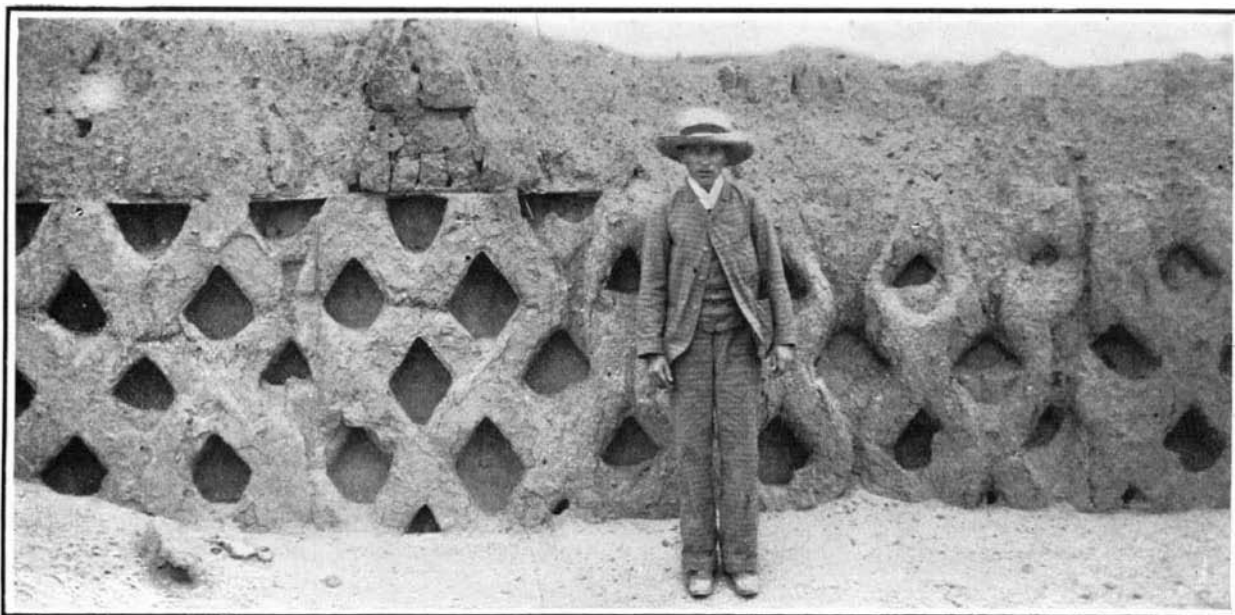
Niche-like Apertures in Ruins of Ancient Structure, Chan-Chan, Coast of Peru.



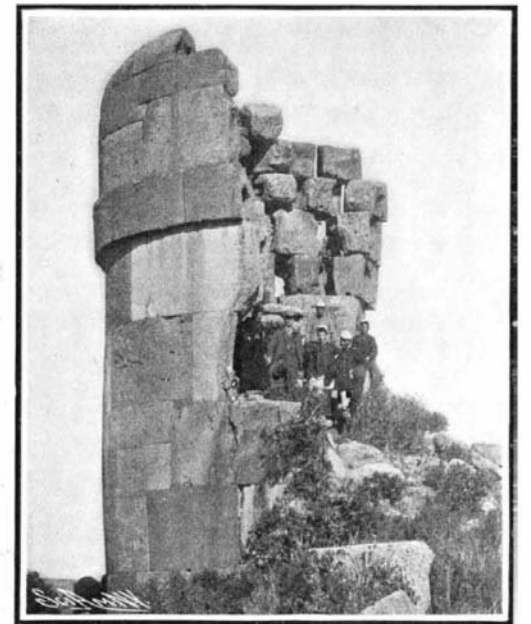
Decorated Walls, Ruins of Chan-Chan.



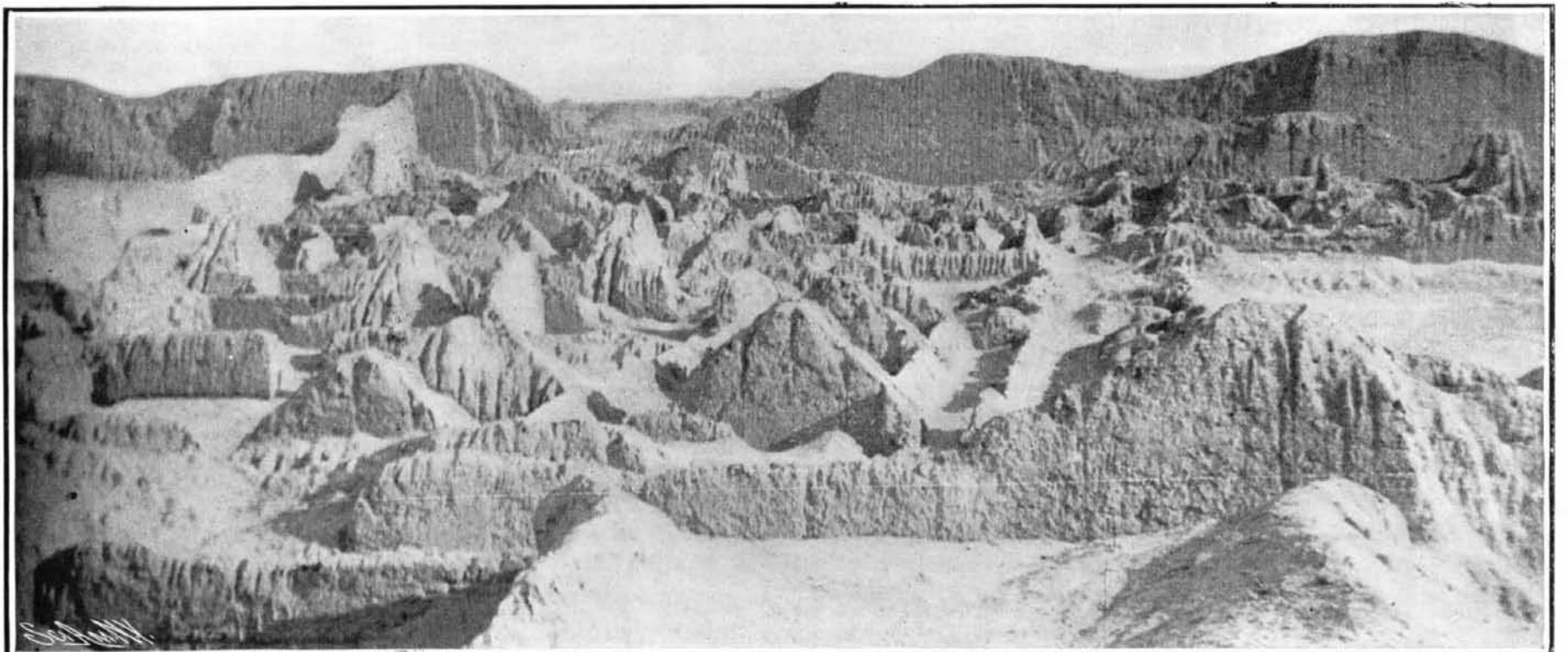
Great Pyramidal Mound of Moche. 800 Feet Long, 150 Feet High.



Niche-like Decorations of Walls, Chan-Chan.



Burial Tower, Sillustani, Peru.



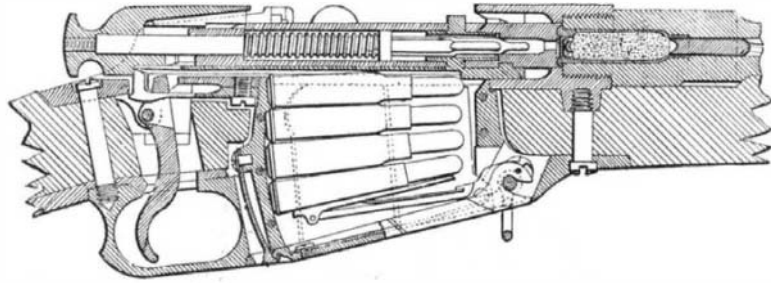
Adobe Ruined Houses in Courtyard, Chan-Chan.
RUINS OF THE ANCIENT INCA EMPIRE.

spacious buildings, constructed partly of huge, well-cut stones. The roofs, however, were of thatch. Some of the stones were of such stupendous size and dimensions as would test the best skill of the modern contractor to transport and put in place. This was accomplished by means of wooden rollers, ropes, and crowbars. In most cases no mortar was used, the stability of the building depending on the skill in the close joining of the stone blocks.

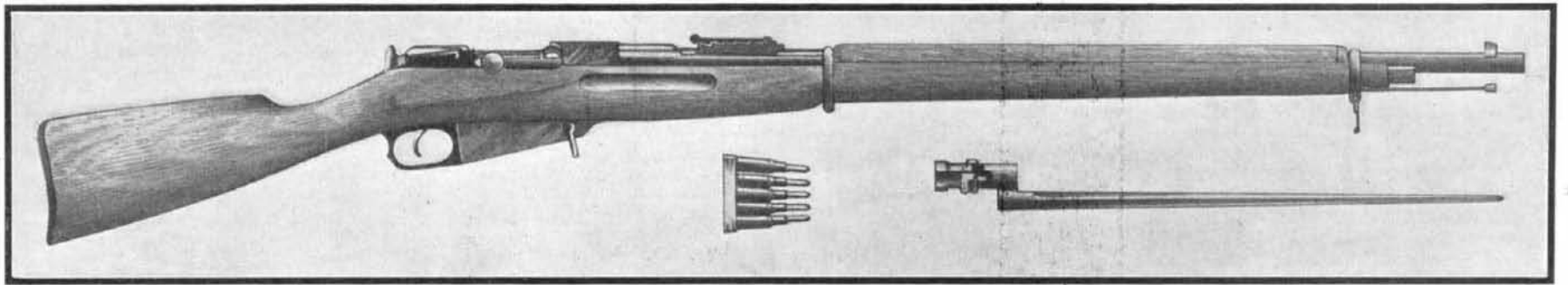
The government of the Incas is said to have been the most enlightened despotism that ever existed, and about the nearest approach to a Utopia which has yet been reached by any people. There was allotted to each man, free of charge, a dwelling site and extended area of land for him to till and cultivate for the maintenance of his family. The surplus of products from this tract, left over from the immediate needs of the owner, was given as tribute to the Inca government, and used for religious, charitable, and other purposes at their sovereign city of Cuzco. Under their wise and just civic administration, crime and public corruption and theft were not known. In

tensive religious code, feasts and offerings of some kind were of almost daily occurrence, and the preparation for and observance of these occupied a great deal of the time of the people. Contrary to statements hitherto made, the sun was not the chief object of worship, but the moon, stars, thunder, lightning, and many natural objects and phenomena were included in the religious code. In Cuzco some forty different shrines existed.

What height Inca culture might have reached had it been allowed to follow a natural course of development



Details of Breech Mechanism.



Length of gun with bayonet, 5.7 feet. Weight, 9.5 pounds. Caliber, 0.27 inch. Initial velocity per second, 2,035 feet. Sighted to 1,600 yards. Weight of cartridge, 390 grains.

THE RUSSIAN ARMY RIFLE.

Cuzco it is stated that a resident with one hundred bars of silver and gold piled up in his house, left it wide open, only placing a small stick across the door as a sign that the master was out—and nobody went in. Agriculture was the chief pursuit followed. Cotton, beans, maize, and coca were raised by the coast people. On the plateau the domestication of the llama and alpaca was the favorite occupation.

The whole tribe was divided into numerous clans. The powers of administration were centered in the elective dignitaries, a military leader, and the head of the religious system. There was also a council of chiefs. None of these offices were hereditary, and could not be occupied by sons unless they were specially chosen for the position. The succession of the chief Inca did not fall upon the shoulders of his child. This was due to the clan organization, which governed the affairs of state. Inheritance was by mother-right. A man could not marry a woman of his own clan, but had to select one from another. This was the main unit for holding the tribe together. Woman had no voice in public affairs, but ruled supreme in the home. She was admitted to esoteric societies, of which there were many. They also practised healing and became priestesses. Many complicated and elaborate ceremonial and religious rites were observed, and fre-

is one of conjecture and speculation. Judging from their cyclopean architectural remains, and from the splendid examples of their technique, which is so strikingly displayed in the specimens obtained, it seems most likely that they would have kept abreast of the ancient Mexicans.

THE SMALL ARMS OF THE RUSSIAN AND JAPANESE ARMIES.

The contest between Russia and Japan will prove fertile in military instruction. Two intelligent, brave, and well organized adversaries have now met in the full shock of battle and tactics and new weapons are going to have something to say. In order to appreciate the results of future operations at their just value, it is necessary to be well informed as to the armament of the forces that are arrayed against each

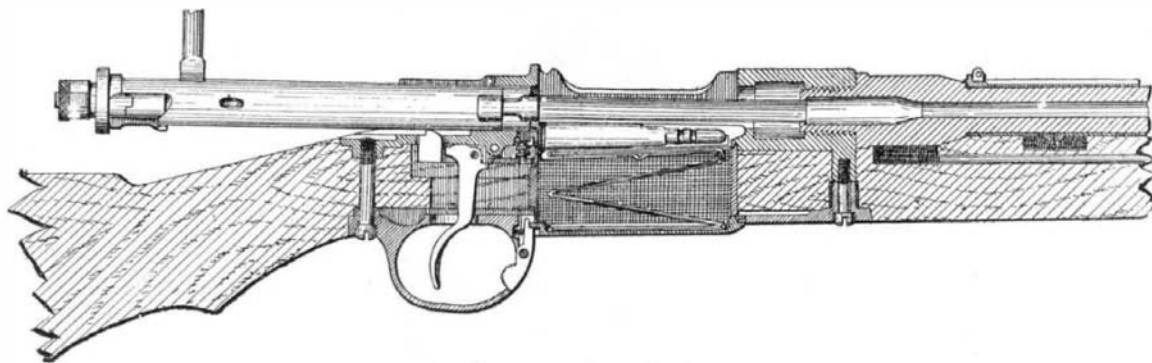
on the side to the left with a piece that performs the double rôle of a cartridge shell ejector and an isolator between the cartridge introduced into the chamber and the cartridges of the magazine. The movable breech is of the bolt type and swings back at the side. The magazine consists of a box formed of two lateral walls and closed by a cover at the lower part. It contains the elevating mechanism, formed of a lever jointed to the cover and a plate jointed to the lever. Two springs tend to raise the latter and the plate respectively. It receives a loader provided with five cartridges. If it be desired to use the gun as a single-shot weapon, the magazine must contain but four cartridges, and care must be taken to press the upper cartridge with the finger in order to permit the movable head to pass over its flange. The stock is of walnut or birch and is provided with the usual accessories. The breech-sight is stepped and provided with a slider. It is graduated upon its right-hand side into hundreds of paces (28 inches) from 400 up to 1,200. The movable plate likewise is graduated into hundreds of paces, from 1,300 to 1,600. Its movable slider,

which is held in place by a spring, serves for indicating distances.

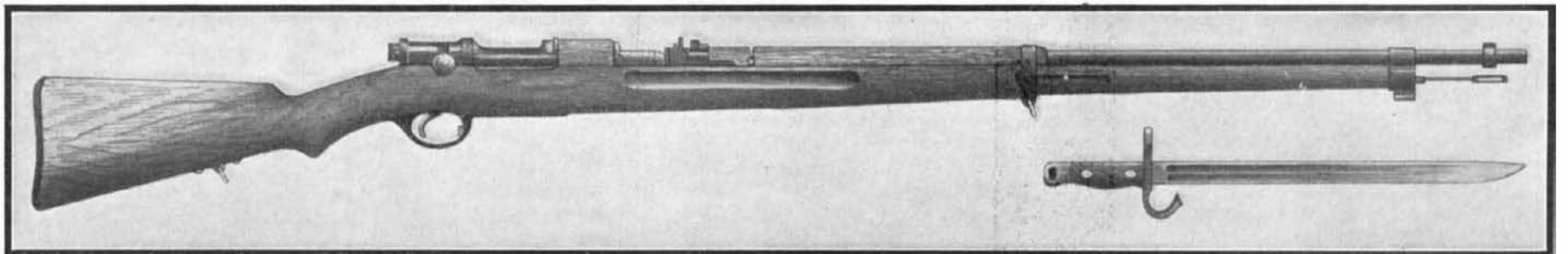
The bayonet comprises a quadrangular blade, which becomes progressively narrower toward the point, and the usual socket and catch, and remains fixed at the end of the barrel, even during firing. The cartridge comprises the shell, primer, powder-charge, and ball. It has no wad. The shell is of brass and provided with a flange. The primer contains fulminating powder covered with a disk of tin. The charge consists of thirty grains of smokeless powder of a basis of gun-cotton. The ball, which is of hardened lead, with a German-silver jacket, weighs 310 grains and is 4 calibers (1.2 inch) in length. The total weight of the cartridge is 390 grains, that of the loader, when empty, 147 grains, and that of the same when loaded, 4.25 ounces. The elevation of 00 paces corresponds to the line of fixed aim constituted by the sight-plate folded.

It gives a sweeping trajectory up to a distance of 600 paces. It is employed when there is no time to spare to give the exact elevation, up to 600 paces, against infantry and 800 against cavalry. In such a case the marksman aims at the upper half of the object.

Firing by volleys is employed at all distances, and individual firing up to 600 and even 1,200 paces, if it is concentrated by groups of marksmen upon the same



Details of Breech Mechanism.



Length of gun with bayonet, 5.4 feet. Weight, 9.6 pounds. Caliber, 0.25 inch. Initial velocity, 2,378 feet. Sighted to 2,000 yards. Weight of cartridge, 336 grains.

THE JAPANESE ARMY RIFLE.

quent sacrifices offered up to their deities. The Incas, under their enlightened system of government, had, however, incorporated in their religious worship some uncanny customs. Human sacrifice was practised, and on certain occasions a number of young maidens captured from other tribes were offered up to some of their principal deities. These young women were for a long time kept prisoners, and during the interval were employed at making pottery and weaving gorgeous fabrics out of the silk-like threads of vicuna wool for the sacrificial celebration. Owing to their ex-

other, and to give such information is the object of this article.

RUSSIA.

Armament of the Russian Infantry.—The gun is that of Col. Mossine, of the Russian artillery, and bears the name of "3-line (.275-inch) gun of the 1891 type." It is a repeating arm with a central magazine for five cartridges.

The barrel is 30 inches in length and has four grooves directed from left to right. The breech box, which is screwed to the rear of the barrel, is provided

point. Rapid firing is done at the command of "Rapid fire!"

Complementary Data.—Initial velocity, 2,035 feet; maximum pressure per hundredth, 4,400 pounds; pitch of the trajectory at 1,970 feet, 72 feet; length of the gun without bayonet, 4.25 feet; length of the gun with bayonet, 5.7 feet; weight of the gun without bayonet, 8.8 pounds; weight of the gun with bayonet, 9.5 pounds. The number of cartridges carried by the Russian foot soldiers is 120, partly in two cartridge boxes secured to the belt, and partly in the knapsack.