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Abstract: The wheel is a basic mechanical device regarded by most scholars as one indication of a higher civilization. The earliest known use of the wheel is depicted on a limestone relief in Mesopotamia and indicates the use of a cart dating c. 3500 BC. For many years, scientific investigation has failed to produce information supporting the use of the wheel in Ancient America. Lately, however, there have been some artifacts found which are of serious interest to the student in this field, which is further supported by the Book of Mormon's implied use of a wheel by pre-Columbian peoples on this continent.



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The Wheel in Ancient America

PAUL R. CHEESMAN*

When Joseph Smith introduced the Book of Mormon to the world in 1829, most of its claims were viewed as fantastic and unbelievable. The cultural and historical implications of the record were too much for the scientific mind of the day. The science of archaeology had not been developed, and most of the people knew very little about the ancient ancestors of the American Indian, with only a select few showing interest in their cultural background. Most of the people seemed interested only in pushing them farther west and securing more of their land. When early explorers like Catherwood and Stephens brought back paintings and data they gathered in 1839 and 1841 from Mexico and Central America, there arose some wonder about the relationship between the magnificent cities of the past and the unlettered, simple Indian.

The Book of Mormon claim of being an abridged religious history of some of the ancestors of the American Indian met early with much "scientific" criticism. That may have been just the growing pains of the science of archaeology, since presently archaeological findings generally confirm the record. Though most of its cultural implications have since proven accurate, there are still a few areas where further research is needed—the elephant, horse, iron, wheat, and the wheel are five areas in which scientists still have not produced sufficient evidence for unanimous confirmation of Book of Mormon statements that they all existed. It is with one of these controversial areas that this paper is concerned—the wheel.

The Book of Mormon uses the word "wheel" only once in II Nephi 15:28, which is a quotation from Isaiah. The implied

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use of wheels in the Book of Mormon comes from the seven references to chariots. The first reference is found in II Nephi 12:17, also a quotation from Isaiah. If the Isaiah quote is used, since there is no such reference in the Jaredite account, the first mention of wheels in the Book of Mormon would be dated c. 559 B.C. The second reference to wheels or the word "chariot" is found in Alma 18:9, which dates c. 90 B.C.

The wheel is a basic mechanical device regarded by most scholars as one indication of a higher civilization. The earliest known use of the wheel is depicted on a limestone relief in Mesopotamia, and indicates the use of a cart dating c. 3500 B.C.¹ This reference dates the presence of the wheel in the Old World considerably earlier than any for the New World, because, for many years, scientific investigation has failed to produce information supporting the use of the wheel in Ancient America. Lately, however, there have been some artifacts found which are of serious interest to the student in this field. Since the Book of Mormon implies the use of a wheel by pre-Columbian peoples on this continent, this investigation becomes even more fascinating to the interested Mormon student.

EARLY USES OF THE WHEEL

Probably the first adaptation of the wheel for machine use was the water wheel, and the first nontransport utilization of the wheel is thought to have come during the Bronze Age, with the invention of the potter's wheel. Pottery began to be wheel-fashioned about 3000 B.C. in ancient Egypt.²

Most archaeologists contend that the potter's wheel was not known in Ancient America, because evidence indicates that the pottery was handmade without the aid of any mechanical device. There is, however, every indication that pottery was made both by hand and by wheel in the Old World. Exhibits from the Old World support the claim that the potter's wheel was utilized for rapid mass production of pots. Evidently many pots were manufactured commercially. Most of domestic pottery, however, was made by hand by the housewife and was as important a task as the construction of family clothing.

¹Charles Singer, E. J. Holmyard, A. P. Hall (eds.), *A History of Technology* (Oxford, 1954), Vol. 1, p. 205.

²Cyril Alred, "The Rise of the God-Kings" from *The Dawn of Civilization*, ed. Stuart Piggott (New York), pp. 128, 198.

W. N. Holmes reports an interpretation of an ancient American custom from which one may infer the use of the wheel principle in America.

In modeling a clay vessel, a bracket may be used as a support and pivot thus becoming an incipient form of the wheel. It may be used equally well in the shaping of the bodies of vessels, thus assuming in a limited way the functions of a mold.³

This report also affirms that a device similar to a roulette wheel was in use during the pre-Columbian period, such items being found near the mouth of the Missouri River.

Henry C. Mercer, while conducting the Corwith Expedition for the University of Pennsylvania in 1895, observed a true though simple potter's wheel in operation among the native potters of Merida, Mexico. Although this could have been a tool resulting from the Spanish influences, its peculiar mechanism and mode of operation distinguish it from any similar clay-molding wheel thus far known, in ancient or modern times, from any part of the Old World. The natives even call the device by a Mayan name, Kabal. Mercer is convinced from his studies, which have been confirmed by others, that this device is indigenous to ancient Yucatan.⁴

Reporting on contemporary pottery technique in Yucatan, G. W. Brainard states

The saucer-like type Kabal is found at Mama, Yucatan and it consists of two parts: first, a pottery saucer similar to a mold used in Dasacare pottery-making centers reported by Foster. And second, a round piece of wood. This piece of wood or Petcha, goes on top of the Kabal (like a plaster bat of today) to make the flat working surface upon which the vessel is turned.⁵

Lu Fawson, of Salt Lake City, concludes after nine years of research, that the Kabal of the Mayan civilization was a potter's wheel and that the Kabal was used prior to the arrival of the

³W. N. Holmes, *20th Annual Report of the Bureau of American Ethnology* (Washington, D.C., 1898), p. 69.

⁴Henry C. Mercer, "The Kabal-or Potter's Wheel of Yucatan," *The Bulletin of Free Museum of Science and Art* (Pennsylvania, 1897), Vol. 1, No. 2, pp. 63-139.

⁵Brainard, G. W. (unpublished notes from Department of Archaeology, Carnegie Institute, Washington, D.C., 1940), pp. 10-42.

Spaniards.⁶ Samuel K. Lothrop writes that he has seen what appears to be a potter's table in Peru. This was found in the possession of Dr. Tello, curator of the National Archaeological Museum of Lima, Peru.⁷

Researchers report that miniature animal-like clay articles indicating the use of the wheel have been unearthed in Mesopotamia, and their counterparts have been found in Mexico. Because these artifacts are small, they are called toys. In the Mesopotamian area the smaller article bears a resemblance to a larger, more practical model. That is, miniature carts and chariots as well as the life-size vehicles have been found. In the New World, many miniature models of wheeled vehicles have been found, but no counterparts in the larger, more practical design have been discovered as yet. The absence of these larger artifacts has caused some archaeologists to think that the practical use of the wheel was not known. Their assumption demands a stone or metallic wheel. However, there may have been large, wooden wheels in use. If there were large, wooden-wheeled vehicles, they probably would have decomposed by now.

WHEELED TOYS

The French explorer, Desire Charnay, explored an Indian cemetery in Popocatepetl, Mexico, in 1880 and found a toy animal so constructed that the four discs found with the dog or coyote fit perfectly as wheels. (Photograph No. 1)

In 1940, Matthew Stirling (an archaeologist who has concentrated his studies on the wheel) discovered eight wheels in Tres Zapotes, Vera Cruz. The wheels seemed to be clay discs which were used to make the pottery toys mobile. Along side the wheels were found a pottery dog and a pottery jaguar, each with two tubes attached to their feet. The wheels were held together two-by-two by wooden axles that passed through adobe tubes, which were attached to the animals' front and rear legs. On a second expedition, Stirling found twelve more discs which he took to be three sets of wheels for toy figurines.

He summarizes his findings: "It doesn't appear likely that

⁶Lu Fawson, *A Study of Documents that Substantiate the Existence of a Potter's Wheel in Ancient America* (Salt Lake City, unpublished paper, 1966).

⁷Alfonso Caso, *Sobretiro de Cuadernos Americanos* (Mexico: Imprenta Mundial, 1946), p. 25.

having known the principle of the wheel for five centuries it never occurred to them to use it in a more general way."⁸

Once in the National Museum of Mexico there were some small metal dogs displayed which contained circular perforations in their fore feet. Dr. Alfonso Caso classifies them as Panamanian.

Lately in Mexico and even in the southern United States, numerous adobe wheels with center perforations have been found. There is a possibility that they could be discs for sewing on clothing or could have been used in hairdos or for spindle whorls or wheels.

J. Eric S. Thompson, a renowned researcher, states, ". . . the concept of the wheel for the representation of the calendrical material is, without doubt, pre-Columbian."⁹

Dr. Gordon F. Ekholm, a director of the American Museum of Natural History in New York, reports

During the winter of 1942, while I was making some excavations in Panuco and in the vicinity of Tampico, I found a certain number of small discs that I suspected of having been the wheels of rolling toys like those found by Dr. Stirling in Tres Zapotes and in Charnay in Popocatepetl. In the excavations of Panuco I felt most happy when my helper informed me of the finding of a complete toy with wheels just after having left the place myself and only a few meters from my excavation. This finding, together with the other known examples, convinced me that the Mexican Indians, before the conquest, had made small vehicles with wheels in the form of animals and therefore had some knowledge of the principle of the wheel.¹⁰

In 1960 Hasso Von Winning reported the discovery in Central America of eighteen figurines presumably mounted on wheels. In addition to these, the author has noted two more figurines now in the Museum of the American Indian in New York, five wheeled toys in the Stendahl collection at Los Angeles, three in the Los Angeles County Museum, and two in his own collection. It is estimated that there are at least thirty or more examples of pre-Columbian wheeled toys that have been unearthed in Central America.

Dr. M. W. Jakeman of Brigham Young University has stated

⁸*Ibid.*, p. 5.

⁹*Ibid.*

¹⁰*Ibid.*

There can now be little question but that the principle of the wheel was known and utilized in ancient America, at least in the case of toys. And it seems likely that these apparent playthings are fashioned in imitation of larger vehicles used in a workday life of the children's elders.¹¹

The wheeled toy is definitely found in the Old World in the Mesopotamian area. They are approximately the same size as the ones in the New World, possessing hollow bodies and crudely-made wheels which might be mistaken for spindle whorls.

It appears that the American specimens found thus far have not been dated earlier than 200 A.D., which is significantly pre-Columbian, although most of the European wheeled toys have considerably earlier dating. This time gap was shortened considerably with the report of a wheeled toy located in Old Corith, Greece, and dated in the first century A.D.¹²

The suggestion that there were manufactured toys which used a basic mechanical principle not in practical use in a larger model is not probable. In fact, this idea is extremely uncommon in the so-called primitive cultures in the world. If we consider the nearly universal use of dolls which are miniatures of people or animals and small so-called items common to everyday life (such as pottery vessels, grinding stones, or weapons), it is noteworthy that we have not found any toys in a culture which were not at least partially replicas of the larger, practical model.

HIGHWAYS

The remarkable highways uncovered in Peru and northern Yucatan—one which extends for a distance of 100 kilometers between the ruins of Coba and Uaxuna—suggest the use of the wheel or rollers. Some of these roads, up to thirty feet or more in width, were elevated and had smooth masonry surfaces.¹³ There are some archaeologists who argue that the pre-Columbian Indians did not use the wheel, but that they did use rollers

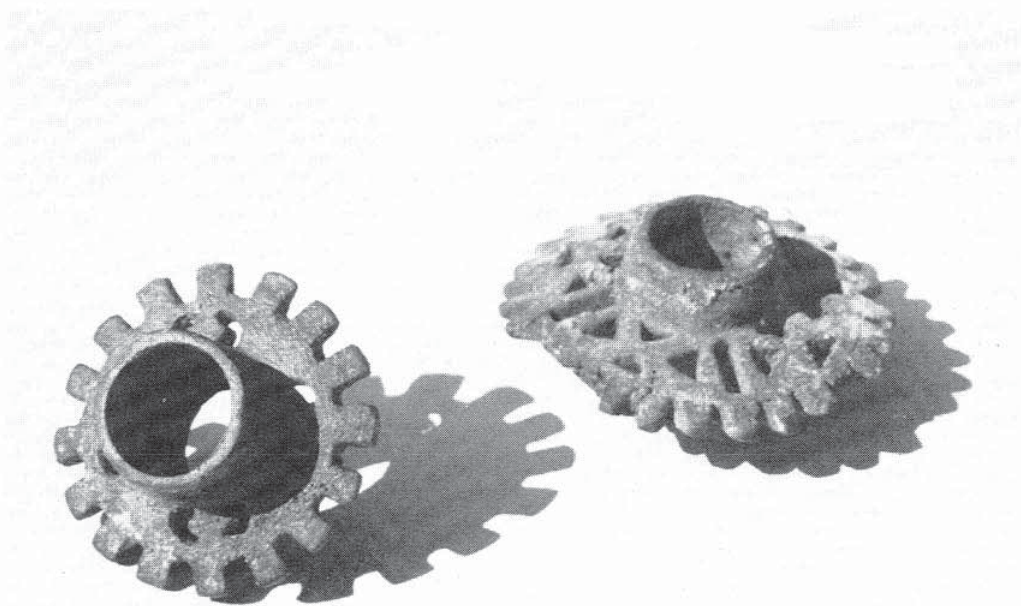
¹¹M. Wells Jakeman, *Discovering the Past* (Provo, Utah, 1954), p. 335.

¹²Morris Bishop, "Terracotta Horse, First Century, A.D.," *Archaeology*, Vol. 6 (Autumn 1953), p. 153.

¹³J. E. S. Thompson, H. E. O. Pollock and J. Chariot, *A Preliminary Study of the Ruins of Coba, Quintana Roo, Mexico* (Washington, D.C., 1932), publication #424.



Photograph No. 1



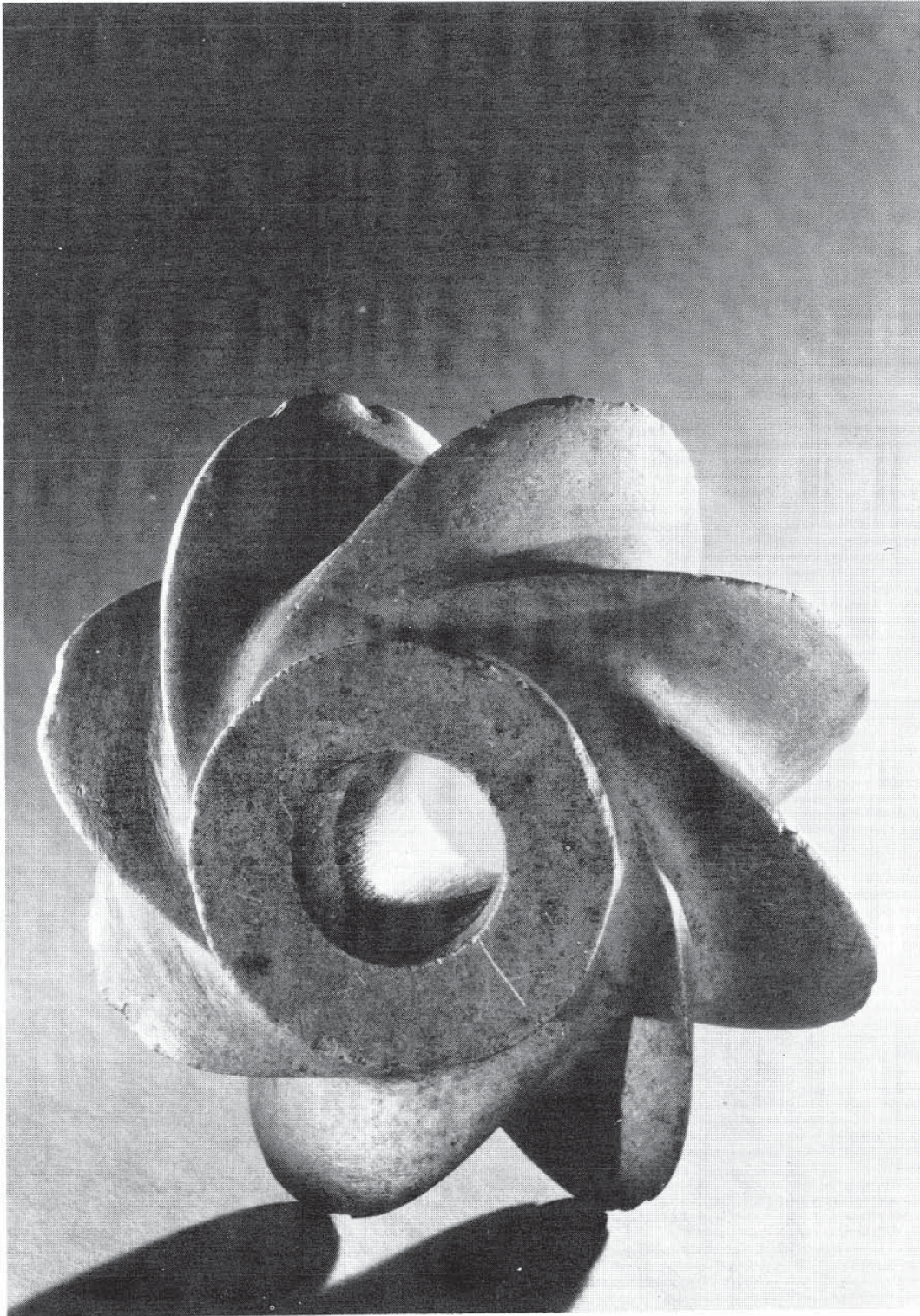
Photograph No. 2



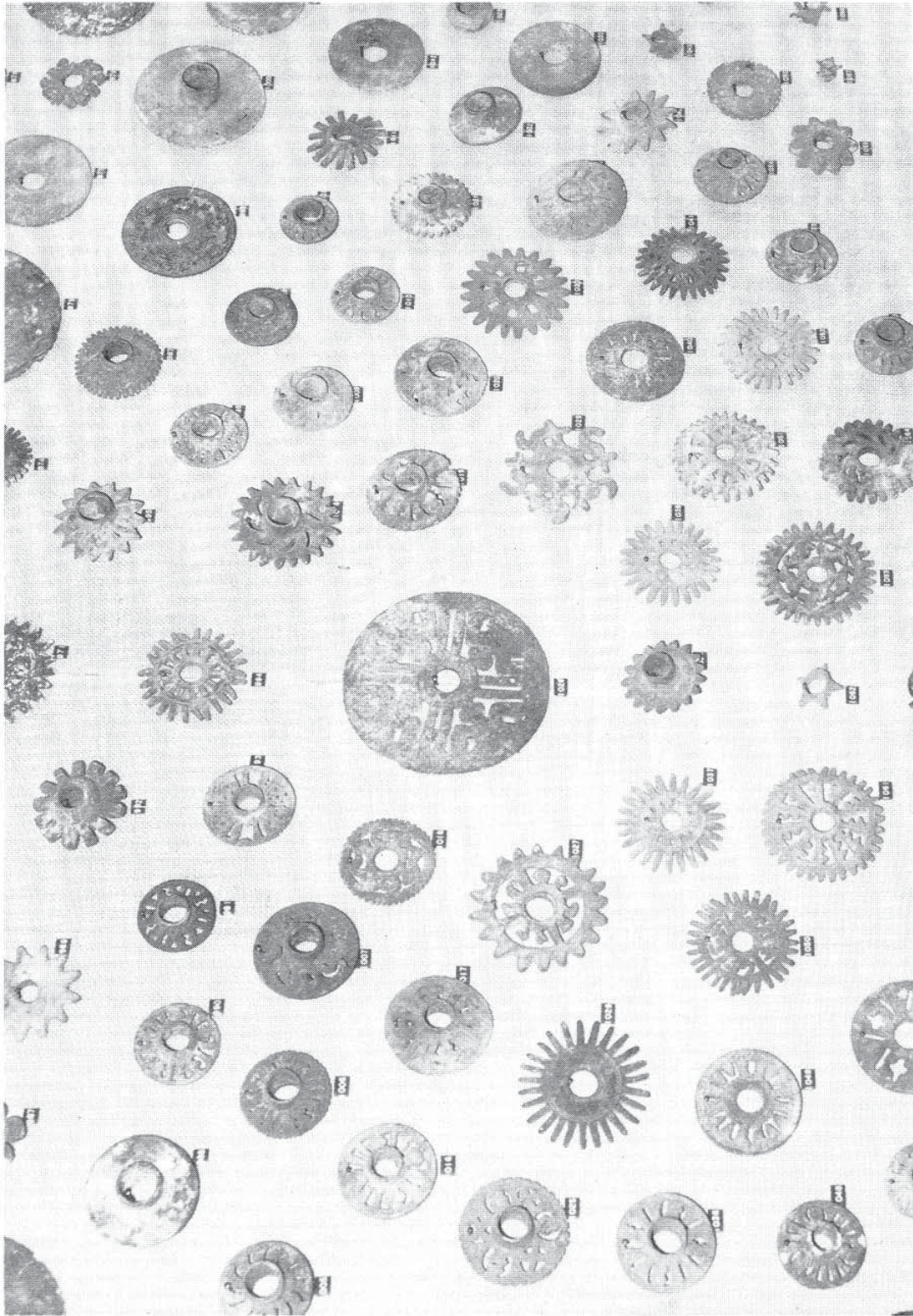
Photograph No. 3



Photograph No. 4



Photograph No. 5



Photograph No. 6



Photograph No. 7

on their roads to carry loads.¹⁴ That they constructed such huge highways for roller transportation and did not see the wheel principle in those rollers seems inconceivable.

OTHER WHEEL-LIKE OBJECTS

Circular smooth discs are found throughout Mexico and the southern United States which could be spindle whorls or small wheels. If they are whorls, and some of them are attached to spindles, they could be construed to represent the wheel and axle principle.

William Salazar of Lima, Peru, discovered some metal discs. Much conjecture has been advanced on such devices, generally calling them mace heads. The mace was common in Ancient America. But true maces were constructed of heavy metal or stone pieces so they would form formidable weapons of war. What is most interesting concerning the pieces shown in Photograph #2 is that they were *NOT* made heavy, but purposely made light. Near the periphery openings were cut into the metal which lighten it. As a matter of fact, they seem to be early examples of our present gear principle with an axle hole and precision-made gear-like teeth.

While touring through the magnificent National Museum of Anthropology in Mexico City, I especially looked for wheel-like pre-Columbian sculptured pieces and was pleased to find several. Photograph #3 is one of these on display in the museum. (What about it?)

Other types of revolving objects with widespread use among the American cultures might have contributed to the discovery of the wheel principle. These include the pump drill, the top, the buzz disc, and possibly even the roller. Portions of the carvings on the pre-Columbian "Newspaper rock" found in Indian Creek Canyon near Monticello, Utah, bear a marked resemblance to "wheels." (Photograph #4) A mace head belonging to the Chavin culture of Ancient Peru is shown in Photograph #5. This 9th Century B.C. club head utilizes the principle of the screw (a modification of the wheel principle) several centuries before Archimedes. (Courtesy of American Museum of Natural History.)

¹⁴Alvin M. Josephy, Jr., ed., *The American Heritage, Book of the Indians* (New York, 1961), p. 20.

Photograph #6 shows a sizeable collection of circular objects which has been found in Peru. It is thought by some that these were used as weapons or for ceremonial purposes. The use of some of these as simple gears is certainly a possibility.

Photograph #7 is a large circular stone with a hole in the center. It is thought that this could have been used for the ball game that was so common throughout Central America. Since the center hole is not as large as most of the game "baskets," other uses are possible.

CONCLUSION

In Copan, Honduras, the writer observed a sculptured stone slab with a figure resembling a wheel. The doughnut-shaped hoop used in the ball game of the Ancient Americans indicates the idea of a circular unit. The large reservoirs of the Cusco area of Peru are arranged in circular compartments. Even the large, Aztec calendar stone suggests the idea of a wheel.

With the number of wheeled objects that have been found and the additional wheel-like units that are evident, it seems evident that archaeological opinion will soon have to recognize the wheel as an instrument of use in ancient America. Since the Book of Mormon has specifically mentioned chariots which imply the use of the wheel, we shall eagerly await for future research to uncover more evidence of the practical uses the Ancient Americans made of this principle of the wheel.