

"within the concave," as Symmes called the interior. Symmes even thought the earth might consist of several hollow spheres within spheres.

As late as the eighteen seventies, a writer in the *Atlantic Monthly* defended the Symmes theory and predicted that one day the almost forgotten theorist might yet be honored as a great philosopher.

Symmes based his geophysical conclusions on such data as his observations of the planets and far-fetched explana-

tions of Indian lore. While his reasoning has long since been discounted, his persistent plea for exploration of the polar regions is believed to have been one factor leading to the Wilkes expedition, which resulted in turn in the first discovery of land below the Antarctic Circle.

Symmes' theories survive in one of the tales of Edgar Allan Poe, "The Adventures of Arthur Gordon Pym," and possibly in writings of Jules Verne.

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ticians and physicists at the meeting of the American Association for the Advancement of Science there during the Christmas holidays.

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ARCHAEOLOGY

Stone Age Venuses Were Not All Fat

DID STONE Age Siberians like their womenfolk slim while western Europeans of the same date preferred them fat?

Perhaps, and then again perhaps not. It is hard to probe the motives of people who have been dead 30,000 years.

But speculation over feminine types and the place of women in Stone Age society is raised by the discovery in Siberia of slender little female figurines.

Scientists have found the sculptured art of the Aurignacian period of the Old Stone Age before. But these figures of women were fat, grotesquely fat. The rare figures emerged in digging in France, Germany, Austria, and other countries. Aurignacian Venuses, science dubbed them, until the term promptly conjures up a vision of over-stuffed womanhood. The Venus part of the name was given because of the scientific theory that these statuettes of women bear some remote connection with the goddess of love. Just as Stone Age hunters painted deer and mammoth pictures on cavern walls, figuring that painting a

PHYSICS

Einstein's Relativity Defended at Princeton

New Compromise Theory of Indian Mathematician, Sir Shah Sulaiman, Criticized in Report to Science

LOOPHOLES in the mathematical armor of the new theory of relativity proposed by Sir Shah Sulaiman, Indian justice and mathematician, are found by scientists of Princeton University.

Sir Shah's theory claimed to be a workable hypothesis midway between the old classical theory of Sir Isaac Newton and the relativity of Prof. Albert Einstein. (*See SNL, Dec. 1, 1934*).

Prof. Harlow Shapley, director of Harvard College Observatory, characterized the Indian theory as one of the high-lights in astronomy for 1934.

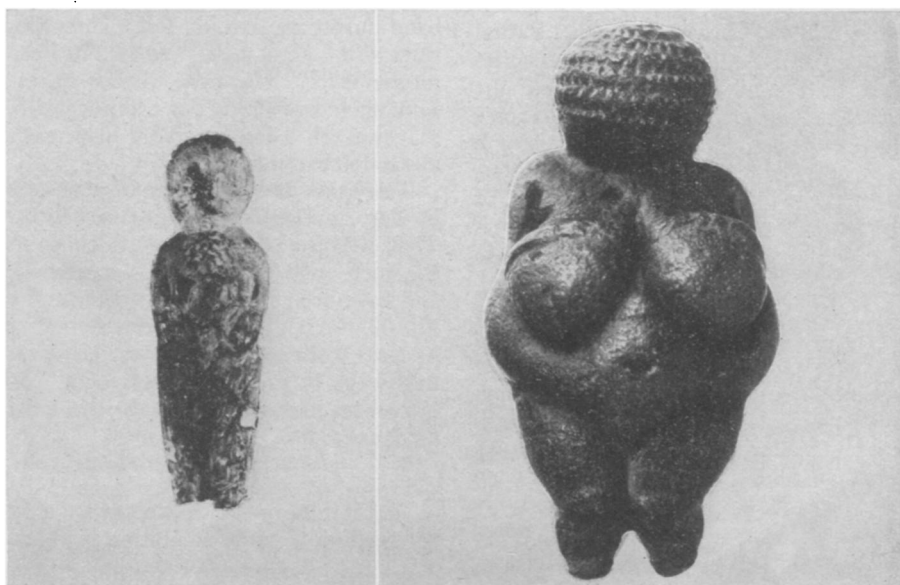
D. R. Hamilton, under the direction of Prof. H. P. Robertson of the physics department at Princeton, points out, (*Science, March 15*) that Sir Shah's theory can hardly be classed as new because it rests on the concept of fine particles called "gravitons" which are responsible for the pull of gravity. This concept he says, "is essentially the same as that put forward by LeSage in 1764."

Carrying out calculations with Sulaiman's formulae, Mr. Hamilton found the speed of propagation of gravity through space would have to be from 60,000 to 200,000 times that of light. Light travels at the speed of 186,000 miles a second.

Other calculations on the orbit of the planet Mercury, again using Sir Shah's formulae, reveal that within 300 years the planet would no longer be swinging about the sun in an ellipse but would go off on a parabolic path which would take it far from the solar system.

Although Prof. Einstein is nowhere mentioned in the Princeton report, his presence at the neighboring Institute for Advanced Study at Princeton, N. J., lends added interest to speculations on how much Mr. Hamilton's paper is a defense of Einstein's relativity theories.

Prof. Robertson, under whom the Princeton criticism was directed, is a close friend of Prof. Einstein and accompanied the distinguished scientist to Pittsburgh when he spoke to mathema-



NOT ALL FAT

From Siberia comes this slim figure of a woman (left) carved in mammoth bone by a sculptor of the Aurignacian period of the Old Stone Age. Aurignacian Venuses heretofore discovered have been inclined to excessive fat and ungainliness, as the Venus of Willendorf, Austria, (right) a stone figurine four and one-half inches high.

wounded animal would, by magic, bring the real animal more easily into the hunter's power, so the figurines of women are believed to have served a purpose of magic. Desire for love and children is held responsible for the strange art.

But now comes the Siberian discovery, to show that not all sculptors of the stone age of art made women grotesquely fat. Twenty female Aurignacian images have been discovered in eastern Siberia at the village of Malta. Photographs of several of these figurines which have reached this country show slender lines, none of the exaggerations of the typical prehistoric Venuses.

Russian archaeologists pronounce the figures objects of religious cult, and goddesses. Whether the Eastern Venuses will be fitted into a picture of Stone Age woman as something more than a mate and mother, remains to be seen.

Soviet scientists have been conducting an extensive hunt for new evidences of the Old Stone Age in their part of the

world. No less than 62 sites where ancient man took shelter or buried his dead are now known in Soviet Union territory, it is announced.

The camp and burial ground at Malta, revealed by a farmer digging a cellar, has been excavated by the archaeologist, M. Gerasimov, and the numerous relics of Stone Age existence have been transferred from the farm cellar to the Academy of Science at Leningrad.

Besides the twenty Venuses, in evidence of some ancient religious cult, the site has yielded objects used in everyday life or placed with the dead for their use. Among the familiar articles of use in this remote age in Siberia are coal bracelets, beads made of fish vertebrae, buttons of deer horn, needles, pins, pointed weapons of mammoth bone and flint. The skeleton of one three-year-old child was found covered with a large array of such ornaments and possessions characteristic of human existence long ago.

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BACTERIOLOGY

War Against Bacteria Only Sporting Proposition

BACTERIOLOGISTS—disease fighters—have for some years been presented to a sentimental public as heroes and martyrs. The bacteriologists themselves are alternately disgusted and amused by the lionizing.

An eminent member of their band now explains how they really feel about their work and answers the question, "How do bacteriologists get that way?"

Bacteriology is a sporting proposition, says Dr. Hans Zinsser in his new book, "Rats, Lice and History" (Little, Brown and Co.)

The desire to do good is the last reason why men go into this work, he thinks. The underlying motive is a love of adventure and a longing for excitement. In our modern world bacteriology is almost the only field in which a man can find excitement. Just as the British cavalry officers took to fox-hunting when there were no wars to be fought, the "men against death" have chosen to fight the microscopic organisms that prey on mankind.

Microbes are no less ferocious than dragons. A bacteriologist, Dr. Zinsser would have us believe, gets just as much thrill out of his work as the old-time knight in armor who rescued the lovely princess.

"Wars," he points out, "are exercises in ballistics, chemical ingenuity, administration, hard physical labor, and long-distance mass murder. . . . Flying is adventurous enough, but little more than a kind of acrobatics for garage mechanics, like automobile racing. But however secure and well-regulated civilized life may become, bacteria, protozoa, viruses, infected fleas, lice, ticks, mosquitoes, and bedbugs will always lurk in the shadows ready to pounce when neglect, poverty, famine, or war lets down the defenses"

"About the only genuine sporting proposition that remains unimpaired by the relentless domestication of a once free-living human species is the war against these ferocious little fellow creatures, which lurk in the dark corners and stalk us in the bodies of rats, mice, and all kinds of domestic animals; which fly and crawl with the insects, and waylay us in our food and drink and even in our love."

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RADIO

Argentina to London Record Of Ultra-Short Radio Waves

A WORLD'S record for long distance transmission of ultra-short radio waves was achieved when the Buenos Aires, Argentina, radio station LSL was heard in London, 6,000 miles away. The waves that carried the record-breaking signal were the station's "first harmonics," having a wavelength of seven meters. Their fading characteristic was quite different from that of the primary fourteen-meter signal.

Engineers of the British Broadcasting Company (BBC) are greatly interested, because there is evidence that the seven-meter signal was carried by reflected waves, after the fashion of the longer wavelengths, and were not refraction waves or waves of optical nature with their straight-line range extended by starting from a great height, as in an airplane. Hitherto all ultra-short wave transmission records have been established by one of these two methods.

The new record is far in excess of the old one that stood until recently, which was only from Berlin to London.

The British Broadcasting Company is especially interested in the reported

new long-range record for ultra-short waves, because it expects to start television broadcasting on a seven-meter band during the coming fall. Their pictures will scan at a fineness of 240 lines to the inch. The new Buenos Aires-London record holds out the possibility that this television broadcast may reach much farther than expected.

Television broadcasts are also to start in Germany within the next few months. They will probably scan at 180 lines to the inch, with 25 frames per second, and have been announced as the world's first high-quality regular television programs. With the new British television broadcasts in prospect, a sort of unofficial race looms between Britain and Germany.

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To the Empress Josephine goes credit for holding the first exhibition of roses.

The American Museum of Natural History has received from Texas an Imperial Mammoth tusk 15 feet 4 inches long, believed to have weighed as fresh ivory almost 300 pounds.