

a flame, and the world is exposed to meet more than one in its course. This is, moreover, what has nearly happened on several memorable occasions.

In 1832 the announcement of the passage of a comet threw the inhabitants of our planet into consternation. According to the calculations of astronomy, the hairy star must necessarily cut across the orbit of the earth on October 29 before midnight. But the night passed without incident, and day broke with the sun shining over a happy world. Astronomy had erred; the earth was eighty million kilometers (fifty million miles) distant from that point of its orbit that the comet would necessarily pass, and though traveling at a speed of twenty-nine kilometers (eighteen miles) a second, it passed the danger point only the November 30 following, that is, more than a month afterward.

However, one sees that an encounter of this nature is not impossible. What would indeed happen should a comet dash against the earth? The consequences of such an event might be varied, insignificant or terrible. All would depend on the nature of the comet and on the direction of the impact. If its body was massive or made up of solid bodies, the effect of such a bombardment may be imagined rather than described.

But this kind of catastrophe is not to be apprehended. The almost invariable observation of the comets, the photographs taken thereof, and the analysis of their rays, appear to indicate that they do not contain, even at their center, masses of matter sufficiently dense to endanger the existence of our planet.

They appear to be in reality composed of gaseous atmosphere, wherein spectrum analysis has more than once detected the presence of carbon. In this case the encounter with a comet would hardly be more favorable to us. This poisonous gas might absorb the oxygen of our atmosphere, meaning a speedy death by asphyxiation and blood poisoning; for the carbonates of hydrogen, carbonic acid, and carbonic oxide seem to predominate in a certain number of comets.

But these stars must differ from one another to as great a degree as the suns and the earths. There may be, for example, comets whereof azotic protoxide is the principal component. Should such a body graze the earth, mankind would soon be ren-

dered insensible, and would gradually sink to sleep, never more to wake. Just the same would happen in the case of a comet whose atmosphere was principally constituted of ether or chloroform.

Or going a step beyond, suppose our earth was enveloped by a comet that absorbed the nitrogen of our atmosphere. Every breathing creature would experience an agreeable feeling of comfort, which would gradually develop into such a state of exaltation and physical and mental activity that they would doubtless dance themselves to death in frantic revels of joy—a sort of millenium dream come true.

If we admit that a comet does not contain in itself any element poisonous to the inhabitants of the earth, and that its core does not contain solid masses of sufficient volume to destroy our planet, such an impact would nevertheless have terrible consequences, by reason of the transformation of moving force to heat.

Let us suppose that a comet composed of a train of uranulites was to come directly in front of us. The momentum of the impact would result from the combined speeds of the comet and of the earth, that is to say, at the rate of about seventy-two thousand meters a second. The resulting vibration would be so violent that the temperature of our globe would immediately increase by several thousands of degrees. An enormous fire would burst forth in the atmosphere, and would rapidly set the ground alight. Forests, gardens, plants, buildings, towns, and villages all would burst into flame, like a bunch of dried herbs. The snow and ice of the poles, being instantaneously melted, would become reduced to vapor before even having regained the ocean. All fish would be cooked in the seas, lakes, and rivers, whose waters would at once begin to boil. Man and beast would fall asphyxiated before the flames could reach them, and would soon after be cremated. An inconceivably violent evaporation would launch into the atmosphere an enormous quantity of water, which would fall in the form of a rain of boiling drops on the terrestrial furnace.

Electric phenomena whereof our most terrible stories can give us no conception would add their numerous manifestations to the disorder of nature. Blue flames, lightning, and the yellow-green-violet-red flames of the differing gases would be burning together and bursting from the terrestrial furnace. It would indeed be a marvelous firework display.

Finally, the water of the center of the globe having been transformed into steam by a tolerably prolonged ebullition, and finding no vent, would burst open the earth like a bomb, with a deafening roar. The ruins of the carbonized world, the Alps, the Pyrenees, the Cordilleras, the remains of calmed cities, all would be projected into space to a prodigious height. All that had escaped the fire would be annihilated by this formidable explosion.

The final catastrophe might also happen without the action of the comets, by a considerable increase of solar heat which could consume our planet and its inhabitants from a distance by reducing humanity to cinders by a sort of spontaneous combustion.

A hypothesis worthy of note based on a long series of spectroscopic observation has been suggested by Sir Norman Lockyer. It is affirmed that all celestial bodies are derived from meteorites. The nebulous ones should be considered as swarms of meteorites that have collided, and thus produce their luminosity.

These nebulous bodies condense afterward toward a center, however large may have been their primary dimensions, however irregular may have been the primitive distribution of the cosmic vapors that constitute them. New globes thus formed in the zones of condensation of this primordial nebulous may be thus conceived as constituting new worlds, new solar systems, alike to our own in method of formation and development. And creation would thus be continued in as newly diversified and wholly un-terrestrial manner; not that of Mars, or Saturn, or the sun, but another, superior to that of the earth, superhuman, inexhaustible. These worlds would pass away in their turn. Others would succeed. Other

worlds whose vast world would be peopled by beings organized for a temperature that to us would mean the point of combustion, and whose senses vibrate to other radiations, other chemical and physical conditions, would show them a future universe under aspects absolutely inconceivable to our terrestrial eyes.



WOMEN AS WARRIORS

By Edward G. Holden

TRADITIONS of women soldiers are many; historical records are few. Led by various impulses—to share the fate of loved ones, to experience romantic adventure, or to give expression to patriotism—women have encountered all of war's hardships and dangers. But death either on the field or in the military hospital, or the false names under which they served, generally have kept the identities of these adventurous spirits from the historian.

The career of Helena Smolko, called the "Amazon of the Cossacks," who was recently under treatment in a hospital at Mukden, is the latest to claim the world's attention. She went under the name of Michael Nicholaievitch. The daughter of a Vladivostok merchant, Helena learned the Manchurian language from her nurse, and in her father's shop picked up Chinese. She lived much outdoors, and rode horses and practised rifle-shooting. At eighteen as interpreter she was attached to the frontier troops. As nurse she accompanied the Russian contingent in the allied expedition to Peking. When the Russo-Japanese War broke out, she went to the front as an interpreter, and proved her courage. She has just been made a ward of the Czar.

"Frank Thompson's" Experience

A WOMAN who kept her sex disguised through years of campaigning with the Union army, and whose real name was not learned by her comrades till a score of years later, was known as Frank Thompson, in the Second Michigan Infantry. She carried messages through shot and shell at Fredericksburg as an orderly for General Poe. One day the gallant orderly was missing. Then day after day went by, and nothing was seen or heard of her. There was only one conclusion: desertion.

The woman explained later at Flint, Michigan, that while the regiment was in Kentucky she had contracted an illness that she knew would result in her being taken to a hospital. She applied for leave of absence, and it was refused; so she left without permission, going to Oberlin, Ohio. She wrote a book called "Nurse and Spy," and used the proceeds for the benefit of sick and wounded soldiers. She was married later to a Mr. Seelye. Years after the conflict ended she obtained a pension and was admitted to the Grand Army of the Republic. She died in 1898.

A picturesque figure of the Civil War was Loretta Velasquez, a Cuban maid, who left her native land and joined the Southern forces. She began her career by marrying a Northern officer, whom she persuaded to go over to the Confederate side. "Lieut-

enant Harry Buford," as she was known, fought with energy and valor in the first battle of Bull Run. Afterward she became a spy, and by the wearing of male or female costume whenever it suited her purpose, gave valuable aid to the Confederacy. She finally went to California as a miner.

"Emily," a Brooklyn girl whose real name never became public, disguised herself as a boy and joined the drum corps of a Michigan regiment. In the Tennessee campaign under General Rosecrans she passed through several battles unhurt; but at Chickamauga was struck by a Minié ball and died.

Much military ability was shown by Pauline Cushman, an actress who became a spy. At one time she was captured by the Confederates and sentenced to be hanged, but was saved by the arrival of a Union force and the defeat of her captors. For her faithful service General Garfield conferred upon her the rank of major.

Probably no woman in the Civil War acted in so many different capacities as Bridget Divers, commonly called "Irish Biddy." As vivandière, nurse, hospital steward, surgeon, and private soldier, she did excellent service. She was a good horsewoman, and in combat three horses were killed under her. After the war she crossed the plains and the Rocky Mountains in campaigns against the Indians.

A Woman General

A WOMAN who saw considerable hard service was Mrs. Turchin, wife of General Turchin. In 1862, when he was ill, she directed the movements of his troops, while also serving as his nurse. In more than one battle she was under fire near her husband's side, encouraging the troops, and looking after the wounded. When her husband was court-martialed, after the war, her skill and tact brought about his acquittal and his ultimate promotion to the rank of brigadier-general.

Other women, like Mrs. Kady Brownell, a skilful sharp-shooter and the color-bearer of her company, and Ellen Goodridge, who, by her lover's side, accompanied a regiment through the war, serving as head of the officers' mess, have served their country in a more or less warrior-like way.

Among the women of Revolutionary times who adopted the soldier's life, the name of Deborah Sampson is most prominent. She enlisted as a man in the Fourth Massachusetts Regiment. She took part in several skirmishes on the Hudson River as far south

as Harlem, and in one of them was wounded, but escaped detection. Not until after the hardships of wintering at West Point, of dangerous expeditions against Indians, and of romantic adventures with young women, was her secret finally discovered. Finally she was mustered out, and married Benjamin Gannett of Sharon, Massachusetts. When, later in life, her health was broken, she was granted a pension.

A conspicuous case among Englishwomen soldiers was Mary Anne Talbot. She was born in 1778. The sixteenth child of Lord Talbot, she was given into the custody of a guardian at an early age. Terrorized and degraded by ill-treatment, she dressed as a boy and enlisted as a drummer in the infantry. She drummed faithfully through a campaign in Flanders. She was twice wounded, but dressed the wounds herself to avoid detection. She died at the age of thirty.

An Englishwoman who rose to the rank of surgeon and inspector-general was "Dr. James Barry," whose name or reason for entering the army never became known. She attended Edinburgh university dressed as a boy.

Trailing Her Husband

IN 1745, in the town of Coventry, Hannah Bell enrolled as a soldier, in order to find her husband who had joined the British army to leave her. After a time she deserted; but reentered the military service as a marine, and was sent to the East Indies. She fought recklessly, and in an extended service sustained twelve wounds. She extracted the bullets unaided to avert danger of the discovery of her sex. At last, learning that her husband had been executed, she returned to England. She confessed her disguises, and after a career upon the stage closed to live upon a pension.

An equally adventurous life was lived by Mrs. Christian Davis, an Irishwoman, whose husband was carried off to Flanders by a press-gang and forced to enlist for military duty. Mrs. Davis disposed of her children, and donning a suit of her husband's clothes enlisted for service in Holland, with the determination of finding him. After a checkered experience of twelve years, she finally found him; but he was then enamoured of a Dutchwoman. She won his affections again, and, changing her soldier's attire for a woman's dress, became with him a plundering camp-follower. Her husband was killed, and she married twice afterward, finally returning to Dublin, where she was keeping a shop up to the time of her death at the age of one hundred and eight.