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SCIENTIFIC AMERICAN SUPPLEMENT

No. 617.

For the Week Ending October 29, 1887.

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HASTENING THE MILITARY PIONEER.

Quick rather than fine work, our German contemporary, *Militar Wochenblatt*, insists is required of the soldiers selected as the pioneers of an army in the field. In an instructive article on the training of this corps, it suggests that the timepiece rather than the yard stick should be the test. In the work of the pioneer, the German's attention to details, following what he calls the *durch und durch*, or thorough, system acts, as may easily be supposed, to retard operations. An exposed and retarded division cannot wait while the trench shelters, already dug, are carefully trimmed, nor an advancing column be kept inactive while the pontoons of a temporary bridge be carefully aligned and mathematically arranged. If the trenches will protect or the bridge bear them across the stream, that is all that is required. In the German school of the soldier, the trench shelter must be exactly 1 foot 3 inches deep, and its parapet 1½ feet high. Gabions must be made of straight stakes of exact length, wattled with green twigs or osiers in a certain prescribed and labored fashion. Gabionades used as traverses to protect guns from enfilading fire, the gabion revetment for service in the trenches in siege operations, and the gabion trip, a protection against night surprises of cavalry and infantry, must be constructed in accordance with certain formulæ that may not be departed from. Even in the construction of the pontvalent or flying bridge to bear troops across a narrow moat of an outwork during a siege, the German school of the soldier exacts a painstaking thoroughness, though, as is pointed out by the military critic, every second lost in perfecting such work adds to the chances of failure, because giving the enemy more time to recover from his surprise at the sudden attack. So with the work of the *pontonieren*, the bridge builders; it is urged that that construction which can most quickly be put together and rendered stable and sufficiently buoyant is to be preferred to more scientific construction requiring more time to perfect.

In support of this opinion, our German contemporary might have cited the orders of Darius to his advance guard while it was engaged in throwing a pontoon bridge across the Hellespont, and again across the Danube; which were to the effect that they need not make any provision for his return, by which he meant that he desired to cross at the earliest possible moment, and cared not if the bridge were torn from its anchorages after the last man was safely landed on the farther shore.

In our own civil war the sappers and miners of both armies distinguished themselves by the rapidity of their work, notably when the Confederate General Hood essayed to stop Sherman's advance through Georgia. More than once, when the enemy's work confronted the invading army, the Federal pioneers, in the face of a sharp fire, raised parapets on hills and mounds of earth, and by this means the gunners got a plunging fire upon the covered way of the besieged work. This trench cavilier was rarely of correct dimensions, but it always gave a command of at least four feet above the crest of the protected way of the confronting works, and was constructed in an almost incredibly short time, considering the conditions.

The practical Germans have awakened, it seems, to the necessity for haste in the work of the pioneer corps.

THE CROWNED CRANE.

A Kaffir or crowned crane recently arrived stalks about the little inclosure back of the lion house in the Central Park, New York City, and, because of its peculiarity as well as its rarity, is well worth a visit. It is from the North of Africa, and will be found in the text books under the head of *Balearica Chrysopelagus*, though generally known as *B regulorum*. African explorers like Speke and Grant and Richard Lander have spoken of the South African variety of this bird, and the curious bunch of bristles which grow straight up out of the top of its head, now wide and bushy like the pompon of a hussar, and again closed up like a shaving brush after the latter has dried. It walks majestically in its gaudy plumage and scarlet wattle, as if in imitation of the African paradise crane, with whom it consorts in Ethiopian wilds, and to which it is said to be allied.

Its sometimes shrill and sometimes mellow note, may-hoo-oom! is said to be most frequently heard along the banks of the Zambesi River and Lakes Nyanza and Tanganyika. In height it stands something over three feet, measuring with wings spread about six feet from tip to tip. The body is gray, pale on the neck and darker on the scapularies, head black, with throat lappet red, which at certain seasons turns to brilliant scarlet. The wing coverts are white, with faint slate colored subterminals, sometimes rufous brown tipped; the tertials being striped with the same; breast and back pale buff and raven black. It builds its nest in the river swamps, ingeniously twisting the reeds and rushes in and out, thus making a basket-like structure resembling not a little what in military parlance is called a gabion, though of conical shape. The wattle—the fleshy excrescence growing under the throat—is well defined. The bunch of yellow bristles adorning the head is much sought after by the natives, who wear it in like fashion.

POSITIONS OF THE PLANETS IN NOVEMBER.

SATURN

is morning star, and an interesting object for observation, as he approaches the cluster of stars called Prasepe. He rises on the 1st at 10 h. 34 m. P. M. On the 30th, he rises at 8 h. 40 m. P. M. His diameter on the 1st is 17·4″, and he is in the constellation Cancer.

VENUS

is morning star. She is charming in the eastern sky, as she moves westward from the sun, rising nearly four hours before him at the close of the month. Venus rises on the 1st at 2 h. 59 m. A. M. On the 30th, she rises at 3 h. 5 m. A. M. Her diameter on the 1st is 37″, and she is in the constellation Scorpio.

MARS

is morning star, and may be found as a small ruddy star, southeast of Regulus. He rises on the 1st at 1 h. 31 m. A. M. On the 30th, he rises at 1 h. A. M. His diameter on the 1st is 5·2″, and he is in the constellation Leo.

URANUS

is morning star. He is in conjunction with Venus on the 24th, being 1° 7′ south. Uranus rises on the 1st at 4 h. 23 m. A. M. On the 30th, he rises at 2 h. 38 m. A. M. His diameter on the 1st is 3·4″, and he is in the constellation Virgo.

NEPTUNE

is morning star until the 21st, and then evening star. He comes into opposition with the sun on the 21st at 1 h. A. M. He is then opposite the sun, rising at sunset and setting at sunrise, and at his nearest point to the earth. Neptune rises on the 1st at 5 h. 52 m. P. M. On the 30th, he sets at 6 h. 11 m. P. M. His diameter is 2·6″, and he is in the constellation Taurus.

MERCURY

is evening star until the 17th, and then morning star. He reaches his inferior conjunction on the 17th, passing at that time between the earth and the sun, and reappearing as morning star on the sun's western side. Mercury sets on the 1st at 5 h. 39 m. P. M. On the 30th, he rises at 5 h. 21 m. A. M. His diameter on the 1st is 7·4″, and he is in the constellation Scorpio.

JUPITER

is evening star until the 8th, and then morning star. He is in conjunction with the sun on the 8th at 9 h. P. M., and so near him as to be invisible during nearly the whole month. Jupiter sets on the 1st at 5 h. 6 m. P. M. On the 30th, he rises at 5 h. 37 m. A. M. His diameter on the 1st is 29·4″, and he is in the constellation Libra.

At the close of the month, Venus, Mars, Uranus, Saturn, Mercury, and Jupiter are morning stars, and Neptune is evening star.

England and America.

This was the title of a lecture recently delivered in the trophy room of the American Exhibition in London by Mr. J. S. Jeans, secretary of the Iron and Steel Institute, and was the first of a series promoted under the auspices of the London Workingmen's Association. In the course of his remarks the lecturer said that the American resources were infinitely in excess of those of Great Britain, and unless the working population of the latter country were to atone for their deficiencies in this respect by greater industry and a more extended use of mechanical appliances, so as to economize labor and produce cheaply, they would not be likely to hold their position in the race. There was not much danger of American competition in manufactured goods for a long time to come. Fully 80 per cent of the exports from America took the form of raw materials. If American protection were continued at its present range, England would not have much fear as regards manufactures; but if the tariff were abolished, the industrial prospects of England would become very much blacker, in consequence of the enormous resources that America possesses for cheap production. The lecturer concluded by referring to the extent to which national prosperity and industrial prospects were affected by military and naval expenditure. He mentioned as a striking fact that was at variance with the general opinion of economists and politicians, that the United States had actually since 1861 expended 921 millions sterling on their army and navy, as against 626 millions sterling in England. But at the present time the annual expenditure on this account in Great Britain was £35,000,000 to £40,000,000 a year, as against about £13,000,000 in America, so that the English *per capita* expenditure was about 20s. as against 4s. 2d. in the United States. America had, however, the further advantage of having only a comparatively small handful of men withdrawn from industrial and productive occupations for military purposes, whereas England has over 200,000 of the flower of its manhood that were not only producing nothing, but hanging like a dead weight around the neck of the productive community.