

duced by all the troops in a spirit of soldierly fortitude which has at all times during these days of trial given them a most praiseworthy name among the nations of the world.

In the memorable attack by largely superior forces of the Spaniards on July 21—Aug. 1st, 1898, not an inch of ground was yielded by the Utah Batteries A and B, who were stationed in the trenches on those dates, and to be a member of one of these batteries is as great an honor as any young American could desire.

Words spoken or written cannot explain the terrors of war—"God only knows." The roar of the cannon and musketry, the crash of arms, the charge, the laying down of life for country, and above all, the victory won.

The boys lay behind the earth works on the memorable night only two hundred yards from where the thirsty Spaniards were waiting. The time had come for the enemy to strike a blow. All day Sunday, July 31, the flower of the Spanish army, 5,000, marched through the gates of the city to re-enforce the outposts and man the forts and earthworks on our front. All day their sharpshooters had been picking at our outposts and men at work on our breastworks. At 11:15 p. m. the fire opened upon our right, and ten minutes later the whole line was ablaze with the fire of musketry.

"A flash—was it lightning? No. The roar of thunder is pleasant but the roar of an eight inch—! Can you imagine a thirty foot steel rail coming through the air at the rate of 1,680 feet per second and making about twenty million revolutions per minute, and then again imagine that rail striking about ten feet away on the top of a breastwork and filling your eyes full of mud? It is a hard matter to describe the sound while in mid air and the lighting of a shell, but the above will give you an idea of high life in the Philippines. The shells were falling thick and fast, the very earth beneath our shoe-leather trembled as if in contact with a mighty crater; the smoke was growing denser every second; our little innocent looking muzzle loaders looked longingly through the embrasures. They were growing impatient as well as the boys who manned them. The time went heavily until the command came to open fire. Every man stepped into the harness with the air of a veteran, as cool and composed as if on dress parade. Every man meant to fight till the last drop of blood ceased to flow in his veins.

On our right and left were the Pennsylvania boys, and the "Keystone State" can well be proud of her gallant regiment. One glance down the line of intrenchments was a spectacle never to be forgotten. It was one long stream of fire. Sinking deep in our breastworks and tearing massive holes came the shells and solid shot from the enemy. Through the embrasures came the Mausers as thick as bees in a hive, but not a man flinched.

While in the hottest of the fight the top of our embrasure was carried away by the solid shot. We cleared that embrasure under a shower of lead without losing a man. It was a miracle, and I sometimes think that the Mormons have charmed lives. At the hour of combat, the enemy had left their intrenchments and were advancing on us. They came so close to giving us a hand to hand skirmish that some of our boys claimed they could hear enough Spanish to last them a lifetime. Every man on our left was down to his last round of ammunition. Orders came down the line to fix bayonets and be in readiness to repulse a charge. We were fighting now to hold our ground, not to drive them back. Here is where the "Utah Light Artillery" won for the "Baby State" of America a golden crown—for

every raw recruit that left her fertile soil fought like an old soldier. Veterans of the late war can well be proud of their children. The boys showed their staying qualities and while the infantry on our left was quiet and waiting for the charge, our little guns were doing their deadly work. Swinging her muzzle from one side of the embrasure to the other we sent our compliments to the men that we had come so far to see, in the form of shrapnel and percussion shells. Re-enforcements and ammunition came, but the battle was won. Streaks of light in the east warned us that day was fast approaching, and it was a welcoming sight for the boys, drenched and chilled as they were, yet they stood by their guns ready to respond at a moment's notice; but our midnight friends lay low in their blood stained trenches.

From this time on, Manila was practically ours, and when on the 13th of August we made the combined naval and land assault on the defense the enemy held out but fifty minutes.

It was a grand sight when the Colorado regiment went over our entrenchments and advanced on Manila; then within thirty minutes "Old Glory" was waving in the noon breezes over the "Old Fort."

I am proud to be one of the army who have not come as despellers and oppressors, but as the instruments of a strong free government whose purpose are beneficial and which has declared itself in this way the champion of those oppressed by Spanish misrule.

Now that it is over, we are anxious to receive word to come home. So far I have been very fortunate, having advanced to the rank of first sergeant in place of Louis B. Eddy, who held the position when we left Utah. This makes me the highest non-commissioned officer in my battery.

I had hoped to be able to say at this time that all were well and happy; but on the 24th of last month Corporal Wm. Q. Anderson, who was detailed at Cavite while on duty in trying to stop a quarrel between one of our boys (who was killed) and some natives, was shot through the breast, causing a very painful and dangerous wound. At this writing, surprising to all, he is improving very slowly, and it is our greatest hope that he will recover.

The rest of the college boys are doing well, especially Corporal Robert Stewart, who now ranks as sergeant.

Asking to be kindly remembered to my Logan friends, I am,

Respectfully,

F. T. HINES,

First Sergeant Battery "B," Utah Artillery, Manila, P. I.—Logan Nation.

#### SCIENTIFIC MISCELLANY.

Electric horticulture, Prof. S. Lemstrom assures us, is now practicable, although not fully understood. In his experiments of last year, the application of the electric current increased the yield of seeds at least forty per cent, and of roots from twenty-five to seventy-five per cent, the results varying with the kind of plant and the nature of the soil. The production of strawberries and raspberries was raised as much as seventy-five per cent, while the time of ripening was shortened one-third. It was proven, among other things, that electricity might damage plants on clear, hot days in the absence of abundance of water. Prof. Lemstrom is uncertain whether his electrification of the air benefits vegetation by producing ozone and nitric oxides, or by inducing the juices of the plants to ascend more rapidly in their capillary tubes. He has applied the current four hours in the morning and four hours in the afternoon. In his Finland experiments of this year, giving a gain of at least of forty per cent, he con-

tinued the application, with many interruptions, from June 17th to July 30th—a total of 151 hours.

Another curious discovery concerning the atmosphere is recorded. A German chemist, H. Teudt, has noted that when air is first heated its expansion deviates two per cent from Gay Lussac's law of 400 degrees, and three per cent at 450 degrees, this anomalous expansion being shown only by atmospheric nitrogen, and not by oxygen, carbonic acid, chemically prepared nitrogen, air previously heated, or air collected after rain. A suggested explanation is that nitrogen must have an allotropic form, changed to the ordinary form by heat.

The phenomenon of a milk white sea, much more luminous than the starry sky, is reported by a correspondent of Nature. It was witnessed on the morning of Aug. 21 in the Indian Ocean, and continued to be seen throughout fifty miles of the vessel's course. The sea was calm, while a bucket of the water showed nothing unusual.

The young leaves and roots of ferns supply a considerable portion of the food in mountain districts of Japan.

Leprosy is a disease of the Chinese, according to the results of an important investigation in China and the Pacific Islands by Mr. Sidney B. J. Skerchly, and the black races are quite free from it. In no place has it been found where there had been no Chinese lepers to introduce it. It is not distributed throughout China, whole provinces being free from it, but it has its center in Kwantung and Fokien provinces, spreading with diminishing intensity in all directions, and in Hawaii it has a new focus of unparalleled virulence. Neither topography, climate nor geological conditions appear to influence its distribution. It has followed cooile emigration, and its spread can only be stopped, so Mr. Skerchly believes, by suppressing the cooile traffic from the infected provinces.

The presence of a considerable quantity of liquid carbonic acid in the rocks is among the surprising revelations of the microscope. The bubbles of this substance, states Prof. E. W. Claypole, are now known to exist by millions and millions in gems and other crystalline minerals, their size ranging between the one-thousandth and the fifty-thousandth of an inch, but their number being so great as often to impart a white tint to the crystal. Many specimens of milky quartz owe their whiteness solely to these innumerable bubbles. Mr. H. C. Sorby has found that the cavities make five per cent of the volume of some of the Cornish granites, every ton of the rock yielding four pounds of the liquid; and Mr. J. C. Ward has estimated that more than a thousand millions of the bubbles might exist in a cubic inch of quartz. Prof. Claypole calculates that the carbonic acid freed from the primary rocks has been abundant for all vegetation.

The first discovery on tidal waters of a genuine crannog, or dwelling on piles, was that lately announced by Mr. W. A. Donnelly. This crannog is on the Clyde, a mile east of Dumbarton Castle, and is below high-water mark and fifty feet from the river at low tide. It is further unique in appearing to date back to the polished stone age, with only flint and bone implements. It is 134 feet in circumference, the outer circle being of piles of oak sharpened by stone axes, while the transverse beams and pavements are of willow, elder and oak, the small-