

have had nearly double this force working day and night to remove the vast accumulations of indescribable filth which has accumulated in the out-houses and yards as well as the streets of the city, which is reputed to be one of the most unhealthy and dirty in the world. The death rate has dropped steadily since we came in and is now about one-fourth of what it was in July.

"The city has been divided into five parts, in each of which is a relief station, where food is distributed and a physician in attendance who prescribes for those who present themselves sick and visits the sick in the houses. The police department, all doctors and the officials in each ward have received instructions to furnish these physicians a list of sick requiring attention and also of the worthy poor, in order that we may be somewhat protected in the distribution of medicine and rations. I am issuing at present about 15,000 rations per day. The physicians are probably prescribing for about 600 or 700 people and some days many more. These physicians are native Cubans, educated in the United States and employed by our government as contract surgeons.

"The garbage and the material which I collect in the streets I have dumped outside of town and burned. I have also had the lower and most unhealthy portion of the city ditched and drained and the ditches running into the harbor cleaned out, also the water front system of sewerage, which was completely obstructed and in a frightful condition.

"Later this year, when the epidemic season shall have passed, it is my intention, if I am granted funds and authority, to have the shallow places dredged out, so that at least a thin layer of water will cover them at low tide and prevent the condition of affairs.

"The receipts of the city from customs since we occupied it, I understand from Generals Shafter and Lawton, who have charge of this matter, have been about \$100,000.

The expenses of the city per week, supporting the hospitals, cleansing the streets, doing the necessary engineering work and the many little things required to keep up the different departments of the city of 50,000 are at the present \$4,500 to \$5,000. Of this about \$1,600 is for sanitary work and engineering, the balance for hospital, police, etc.

"I have been as economical as possible, but have felt that in this matter of sanitation expense should not be taken into consideration as the lives of all Americans here might be said to depend upon a prompt and thorough correction of the frightful unsanitary condition in which the city was found.

"The great expert in yellow fever, Dr. Guiterras, assured me that an epidemic of yellow fever of great severity was absolutely unavoidable and that we were destined to lose a large proportion of our people here. Thus far it has been avoided, and not only avoided, but today I don't know of an authentic case of genuine yellow fever in Santiago de Cuba proper, and every day increases our chances of escape."

General Wood says the military force has been used only when the police have been inadequate. He continues:

"I am very anxious to have the schools started in the city and get the children out of the streets; also to get the issue of rations down to such a point that we are sure we are not pauperizing the people."

General Wood thinks it would be well to get the rations out to the small places in the country, so that the Cuban soldiers, as they leave the army,

may be able to get to their farms in the vicinity of the towns. After the first corp nearly all the assistance had been brought to an end.

General Wood communicates the gratifying intelligence that all indications now point to the speedy disbanding of the Cuban army. He says the feeling of the better class of Cubans towards the Americans is very kind, and they appreciate what the United States is trying to do. The general is very hopeful that everything will come out all right.

No one can tell, he says, how long it will take to establish a government but he thinks it will be quite a period of time.

The letter from which the above extracts were taken was dated Sept. 9th.

On Sept. 16th Gen. Wood wrote another letter to Secretary Alger, in which he says:

"Since my last letter everything has been going on smoothly and the improvement is continued. People have all they want to eat and I do not think there is hunger to any extent in Santiago. I have increased the number of doctors and the relief stations of food.

"You would be delighted to see the old bronze cannon and mortars which we have taken here. Some of them go back to the middle ages and were evidently captured from the French. I hope they will be taken to Washington, where they will be most interesting and ornamental in our parks."

SCIENTIFIC MISCELLANY.

The curious fact that corn, potatoes and other plants thrive better when placed in rows running north and south has been proven by Dr. Wollny, of Munich. This reduces the shading by each other to a minimum, more uniform and regular light, heat and moisture resulting.

The high price of ivory and the great waste of its dust have induced an English manufacturer to offer \$500 for a process of so consolidating the dust that it can be used for making handles. The belief is expressed, however, that, although a fortune doubtless would be realized, no process will be found.

A German metallurgist, Herr Hae-dicke, has devised a process for the direct tempering of steel under pressure, only saws and steel ribbons being treated thus far. The tempering is accomplished by first hardening the steel by plunging it red hot into cold water, or by plunging it into certain chemical baths, and then drawing the temper. In saw-making the steel is first hardened in oil or fat, and then while still hot, it is placed in a press between hot dies, and the temper is thus drawn while under pressure. A special press is used, the die being hollow and arranged to allow of the circulation of steam or oil.

In a recent address to pharmacists, at Belfast, Ireland, Dr. Charles Symes mentioned about fifty products of synthetic chemistry having a medical importance that have appeared since 1890. Great progress in a similar line has been made with synthetic esters and odorous substances. Artificial musk and vanillin have long been known, as have the amyl, butyl and ethyl compounds resembling fruit flavors, but more recent are heliotropine (heliotrope), ionone and iraldine (violet), cumarine (new-mown hay), tepineol (lilac), bergamot (bergamot), jasmine oil, geraniol (rose geranium), carvol (caraway

oil), etc. These substances are now not only used for toilet soaps, but also for the essences named after flowers.

While the gold fields of the world cover an area of more than 1,500,000 square miles, Mr. B. J. Skertchley, an Australian geologist, finds that the fields of tin, which metal is the most sparingly distributed of any of those in general use, occupy less than 12,500 square miles. The area of the gold-bearing ground is therefore 132 times that of yielding tin. Europe has seven tin districts, producing about 8,300 tons yearly, of which the Cornish mines furnish about 8,000 tons. Asia's two districts supply the bulk of the world's tin. One of them—the Straits Settlements and adjacent principalities—turns out 58,000 tons yearly; but the other—Hunan, in China—is shown by official figures to have an annual production of less than 2,500 tons, although credited by some of the best authorities with 10,000 to 20,000 tons. No tin mine is known in Africa, no payable one exists in North America. The only in region in South America—Bolivia and Peru—yields less than 4,000 tons a year, and Australia furnishes about 6,000 tons.

A new magician's slate, for exhibiting "spirit writing," consists of a grating of tinned iron wire, which is covered in each side with an insulating sheet of mica, over which is placed a sheet of Russia iron, which may be given a more slate-like appearance by a coating of mineral paint. In the usual frame, this cannot readily be told from the ordinary school slate. Hidden conductors pass from the iron wire to screw eyes in the frame, and the cord by which the slate is suspended on an easel is a wire connecting with other concealed conductors running from a source of electricity. If a powerful current, like one for lighting is used, a safety fuse is placed in circuit. The magician lays a sheet of paper on the slate, places pen and ink on a little shelf directly beneath, closes his cabinet about the easel, and in a few moments his question of the spirit is found to be answered by a writing on the paper. The paper is prepared beforehand by writing the word or sentence required with dilute sulphuric acid, the writing being invisible until heated. As the cabinet closes, and assistant switches on the current, the electric stove in the slate becomes hot in thirty seconds, and on opening the cabinet the spirit writing appears in black.

The mysterious region to which Tesla introduced us in 1891, an electrostatic field of weird and startling effects, is being diligently explored. The lack of necessity for special apparatus brings the experiments within reach of many physicists. Tesla's simple method of producing alternating currents of great frequency being to connect the secondary terminals of a high tension coil, with the internal armatures of a Leyden jar which discharges itself disruptively, the disruptive discharge yielding the desired current. Details have been greatly varied and improved. In a recent striking exhibition in Paris, M. Radiguet connected a rheostat, vibrator, induction coil, D'Arsonval oscillator and Oudin resonator, the rheostat being placed directly upon a 110-volt circuit. The coil, giving a 22-inch spark, had condensers of variable capacity, insulated in paraffine. The induced wires were connected with the armatures of a Leyden jar, this being D'Arsonval's arrangement for producing alternating currents of great frequency, and the external armatures of the jar were connected with the Oudin resonator. The latter was formed of a solenoid of 195 feet of 1-10 inch uninsu-