between the two boundaries, and the whole coast-line being about a thousand kilometres in length. The whole of this wide expanse is threatened by ruin, ruin compared to which the ravages of the phylloxera are mild. The last news which we had from the western province was that around Tlemçen, on the frontier, flights of locusts were alighting unintermittently, and that a caravan just arrived there from Morocco had travelled for thirty-two days in the midst of locusts, the country being entirely devastated. I have said enough to show how the central department of Algiers is threatened, and now on the borders of Tunisia, advancing from the east, we had met once more with the dread hordes. The night before our arrival at Bône, the frontier port, a train coming thither from Tunis had been actually blocked for half an hour by a swarm at a little place called Oued-Zerga, and in the capital of the Beys the natives were trying to make the best of the plague by cooking and selling the *sauterelles* for food.

I have not the space, even if I had the technical knowledge, to describe the means by which Algerian cultivators are trying to stay the pest; how they set about the unpleasant work of destroying the eggs, and how, after incubation, they devise methods for stopping the march of the *criquets*, which, if unchecked, literally eat their way along, leaving the most verdant and fertile tracts a brown wilderness. Suffice it to say, that not only are the local authorities, the maires, and sous-préfets, organizing resistance and raising subsidies for the struggle, but, what is more significant in a territory which is above all things a military training-ground for France, the general commanding the forces in Algeria has granted a remission of thirteen days to all cultivators called to serve with the colors, whose properties are menaced by the locusts.

My last glimpse of the country, which I have the greatest reason for loving that a woman can have, was across the vineyards whose leafy lines stretch in never-ending vistas over the rich plains by the Tunisian frontier, and I thought of the sinister Arab prophecies which foretold that, after the conquest by the Franks of this fair land, an army of invaders, worse even than they, should come up from the desert, and extend the boundaries of the Sahara to the shores of the Mediterranean.

## VARIETY AND PLANTING OF CORN.

BULLETIN No. 15 of the Pennsylvania Agricultural Experiment Station is a report of experiments on the influence of variety and the rate of seeding on the yield of ensilage corn. Two varieties of corn were planted, one the field corn ordinarily grown in that locality, the other Breck's Boston market ensilage, a large-growing variety which barely reaches the glazing stage before frost in that locality. Both varieties were sown in duplicate plots, of two rates of seeding each, the plots being alternated. The rows were three and a half feet apart, with guard rows between the plots, so that the ground was all equally occupied. Manure was applied liberally, but by a mistake the thick-seeded plots received larger quantities of manure as well as of seed. The thin-seeded plots were planted so that the stalks stood fourteen inches apart in the rows, while on the thick-seeded plots the stalks were three and a half inches apart.

The average yield of each pair of plots, calculated to one acre, was: small, thin-seeded, 11,962 pounds; small, thick-seeded, 19,013 pounds; large, thin-seeded, 20,955 pounds; large, thick-seeded, 26,840 pounds. It appears, therefore, that the larger variety gave a decidedly larger yield than the smaller one, and that thick seeding was decidedly more profitable than thin seeding.

Chemical analyses were made of samples from the various plots, from which it appeared that the produce of the larger variety and of the thicker seeding showed even greater superiority than that indicated by the gross yield.

Experiments similar to the foregoing have been conducted at the Ohio Experiment Station over several seasons, and these have uniformly showed a larger yield, both of grain and fodder, and therefore of food for animals, when the corn was so planted that the stalks stood about six inches apart in rows about three and a half feet apart, than when the distance between the stalks was greater. As between planting six inches apart and three inches apart, the Ohio experiments show better results from the six-inch planting.

Such close planting as this causes the ears to be chiefly nubbins, and therefore it is not to be recommended when merchantable grain is the product desired; but for silage purposes it is not necessary that the grain should be merchantable.

## THE TRANSANDINE RAILWAY.

THE Transandine Railway now in process of construction across the Andes Mountains, for the purpose of connecting the railway systems of Chili and the Argentine Republic, is an enterprise involving many engineering difficulties. London *Engineering* has devoted considerable space to a series of illustrated articles on the railway and its construction, from which we gather the following facts.

The length of the new railway is 149 miles, of which 109 miles are on Argentine territory, starting from the city of Mendoza, which is 2,376 feet above the sea. In Chili there are forty miles, connecting with the Chilian system at Santa Rosa, 2,704 feet above sea-level. The greatest height attained by the railway is 10,460 feet above sea-level, the tunnel at that point being some two thousand feet below the summit of the mountains. There are eight tunnels grouped near the summit, aggregating 9.32 miles in length, the longest, the summit tunnel, having a length of 5,540 yards. To overcome a part of the difference in level within a short distance, and at suitable working gradients, it has been found necessary to construct a spiral tunnel 2,061 yards long, with a radius of 200 metres and a grade of eight feet in a hundred. It may be added that this grade is maintained through the whole nine miles of tunnelling, except, of course, in the summit tunnel.

It is in the boring of these tunnels that the greatest engineering difficulties are encountered. The absence of fuel, and the enormous expense of obtaining it, put steam out of the question as a motive power for driving the air compressors,—air-actuated drills being the means employed for boring the tunnels. Water power, the only other means available, was to be had, but at a considerable distance from the work. It was therefore decided to use the water-power for driving electro-dynamos, transmit the electric current by copper conductors to the sites selected for the compressors, convert it into power by means of electro-motors, thereby actuating the compressors and furnishing compressed air for the drills. The installations for this purpose are unique, as it is probably the first time that the power for compressing air for drills has been conveyed such a distance by electric cables. There are three installations, one upon the Argentine and two on the Chilian side of the Andes, each being distinct in all points, except that the primary stations on the Chilian side are both located at one place. Each installation has a primary station, where the turbines and dynamos are situated, and a secondary station, with electro-motors and air compressors.

The Chilian installation consists of two primary stations under one roof at Juncal, with secondary stations at Juncalillo and Calavera, and separate cables for transmitting the current. The power for driving the turbines is obtained from the Quebrada Juncalillo, the water being conveyed to the turbines, a distance of 1,420 yards, by a double line of steel pipes. The primary station at Juncal for the Juncalillo station consists of six Girard turbines, each giving 80 horse-power, a total of 480 horse-power. Each 80 horse-power turbine is coupled directly to the shaft of an 80 horse-power dynamo, consequently there will be no loss of power in transmission from the turbines to the dynamos. The latter are grouped in two groups of three dynamos each, each group having a main and return transmission cable. A great advantage is gained in having two groups, as should accidents or other cause prevent one from being worked, the whole of the tunnelling would not be stopped. At the secondary station at Juncalillo, about 3,281 yards from Juncal, the power available is 401.8 horse-power, cables being attached to six electric motors, similar to the 80 horse-power dynamos, which drive six air compressors.

The Juncal-Calavera installation is very similar to the one described above. The turbines are in the same shed, and take their water from the same source. These and the dynamos are also of