vation from the mean in no case exceeded about 1 min. 5 sec. are, showing how perfect an instrument is the zenith telescope for this class of work. Time observations were generally made with a portable transit. The longitude of Pembina was established by an exchange of telegraph signals with Chicago. The boundary has been marked by cairns at points about three miles apart all along the line, these being visible from each other. The total number of astronomical stations on which these depend is forty, each one being determined by observation of about eighty pairs of stars, having a theoretical probable error of from 7tt. to 10ft.

The engraving shows the form of cairn employed for marking boundary. The cairn is commonly about 7ft. high and 10ft. the boundary. in diameter, surrounded by a ditch, which would protect it from being trodden down by buffalo. It also gives a sample of the barren character of much of the ground, being slightly reduced from an official photograph taken by the Royal Engineers of the party. The difficulties to be overcome were considered. party. The difficulties to be overcome were considerable. During the first winter—the only season, as we have said, when the swamps could be traversed—the thermometer fell at times very low, on one occasion, on Dec. 24th, 51 deg. below zero, and an instrument occasionally froze to the skin round the observer's eye, in the same way as reported by Russian officers in Siberia. During the same way as reported by Russian oncers in Sporta. During the summer campaigns, on the other hand, the attacks of the mosquitoes were very distressing. From May till August appears to be their special season, when even the horses suffer so much from them that in spite of all the protection that could be given to them by the smoke of turf fires along the picket lines, they stand snorting and stamping nearly all night, and can obtain little rest except in the heat of the day. Appalling thunder storms were of frequent occurrence, lightning playing so continually as to make the camp appear almost constantly illuminated. In the autumn the prairie grass is dry and parched, and fre-quently catches fire, so that the entire country is swept by fire except where special means are resorted to protect it. The camps had to be manufactured by the relation of the had to be guarded by clearing away all the grass in the vicinity. The buffalo occasionally threatened the party-not wilfully, but in the buffalo district, where vast numbers herd, a few individuals, alarmed by some of the party, may be the means of commencing a panic and stampede, when great numbers of buffaloes in undefined terror may come bearing down on a party with their eyes partly closed, and it is necessary to make a considerable effort to turn them aside.

The boundary being indisputably determined, the next question is the character of the country and its probable value for cultivation. On this, Mr. Dawson, the geologist of the party, informs us that the district between the Lake of the Woods and the Red River prairie is extensively wooded and very generally swampy. If the wood were cleared it is not likely that the land—which is sandy and poor-would be good for agricultural purposes, but a valuable supply of timber and peat for fuel might be obtained from it for surrounding districts. Poplar, oak and elm, and willow and much tall and slight pine abound.⁴ The fertility of the soil in the allu-vial prairie of the Red River is so great that it is difficult to eraggerate in speaking of it. The surface from 2ft. to 4ft. in depth consists of dark mould, whose colour is partly due to charred vegetable matter left by prairie fires. Beneath this there is marly alluvium of the best quality; in fact, Mr. Dawson thinks the powers of the land inexhaustible, and considers a great part to be suited for immediate agriculture. Half of it-3400 square miles, or 2,176,000 acres-might produce about 40,992,000 bushels of acre, which is the average Minnesota yield. "Hay swamps" will long continue to be a necessity to the settler. With regard to the States west of 99 deg. or 100 deg. W. longitude, the rainfall is not generally sufficient for agricultural purposes, and the question of irrigation would have to be considered. By this and arbori-culture the establishment of settlements might gradually improve matters, and so gain ground to the west.

Oak and poplar abound in the vicinity of the Pembina Mountain, but the trees generally have suffered severely from prairie fires. In most parts of the Red River region water may be found by digging even moderate wells. West of the Pembina River begins the eastern part of the great treeless North American plain. About the Turtle Mountain, however, are woods, and probably a sufficient annual rainfall for purposes of cultivation. Poplar, oak, birch, and ash-leaved maple are the principal trees. Fires occur here frequently. The thickness of the oak-bark enables it to resist the destructive effect of fire better than other trees. Passing west to the "third prairie steppe," it is found that there is a want of good timber, and the ground is stony. The White Mud River, or Frenchman's Creek, is the eastern limit of the buffalo. The ground now becomes arid and bad, but improves again at the Sweet Grass Hills, and is subject to greater rainfall ; and about

twenty-five miles east of the Rocky Mountains commences the fertile belt of country, and wood abounds. The buffalo herds here are very numerous. For this part of the country the mountains supply an inexhaustible source of wood for purposes of construction and for fuel; extensive coal fields, however, exist. Pine forms the principal timber. Looking at the entire tract of country along the boundary, the Red River valley is undoubtedly the best, except perhaps the land in the vicinity of the Rocky Mountaine. At the same time, far from deserving the character of being almost entirely desert, a considerable portion may be of future agricultural importance, and a great area in well suited for stock farming.

Mr. Dawson discusses at considerable length the three most important deterrents to the settlement of the north-west, namely distance from markets, grasshopper visitation, and scarcity of timber in the open plains. The first must be met by growing those whose bulk bears a small proportion to the value. Flax and hops are suggested, but wool appears likely to be more profitable than any crops in many districts.

The inroads of the grasshopper or locust are most serious, and are specially formidable from the fact that this evil has greatly increased in late years. It appears that they breed on the slopes near the base of the Rocky Mountains. For some days after hatching in the spring, the insects move but little, but when somewhat increased in size the travel forward with an organisation and determinate direction resembling that of a vast army. Their rate of progress is not more than half a mile a day until they Their obtain their wings, generally about the middle of July, when they take to flight. This is perhaps the most remarkable phase in their life. They wit, ready for flight, and encouraged to it by a breath of wind, but ever descending again immediately, until the wind sets in the desired direction, generally the south-east. As long as the wind is favourable the flight is continued daily till about 4 p.m. A black cloud or a storm brings them to the ground immediately, and no notice is taken of any wind except that in the desired direction Thus, some time during the autumn the army arrives at its destination, when it falls on nearly all the crops existing, and reduces the land to the state of a desert. Happily, this occurs commonly too late for the destruction of a great part, and the greatest evil is not directly due to the old locusts, but to their progeny. After depositing their eggs the insects fly here and there in a feeble, aimless way, and shortly die. The next spring the young insects are hatched, and devour everything, causing a famine in the district. The insect does not, happily, thrive as a race in the eastern cultivated lands, but becomes enfeebled and perishes. The following years are those in which great incursions of locusts have taken place—1818, 1819—the crops suffering chiefly in 1819 and 1820. In 1857, for this result of the second after thirty-six years' absence, all the young grain in 1858 being devoured. Again, in 1864, with less evil than usual in the year, and 1865; in 1867, causing a famine in 1868; and again in 1869 and 1870. In 1872 locusts arrived, and consequently many farmers did not sow that year, and lastly in 1874.

How to remedy this most serious evil is a difficult question. Mr. Dawson thinks much might be effected by systematic inspection of districts, isolating the prairies where eggs are found deposited, and so protecting them from fire in the autumn, and then firing the grass in the spring when the young insects are out. When swarms arrive in the numbers, as they do, bearing down all resistance, deep ploughing and burning the eggs has been found effectual; to this should be supplemented collecting the eggs by sweeping on a large scale, and using rollers over the ground covered by young insects in the spring. The absence of timber is chiefly attribuable to the vast prairie fires, on which we can hardly speak more powerfully than by referring to what we have said of the composition of the soil in the Red River district containing so large a quantity of charred vegetable matter. Hundreds of acres of valuable trees have often been destroyed by the reckless use of signal fires by Indians. It is evident, therefore, that a great deal might be done gradually to remedy this evil by the growth of wood, and by the prevention of wholesale waste of timber, and above all, of prairie and forest fires.

TO PREVENT MARKS FROM SMALL-POX.—The following is simple preventive against indentations becoming formed from suppuration of the pustules :

Lance the pustules on the face with a needle and thus allow the poisonous matter (which alone is the cause of disfigurement) to escape, and keep the room dark. An English Surgeon stated that during twelve years' practice he had not known one case out of twenty of a person being marked with small-pox when the above simple expedient had been resorted to.