

for their suggestions and criticisms, which has resulted in the adoption of a new model iron post for Dominion Land Surveys based on that used in surveys of the public lands of the United States, which has just been described.

This post consists of a standard wrought iron pipe one inch in diameter, thirty inches in length to the top of which is fastened a bronze cap three inches in diameter. The cap, instead of being riveted to the pipe, as in the United States model, has in the latest model a cast-iron cone inserted in it, and the end of the pipe is forced into the annular space between the cone and the cap, forming a very tight fit. The composition of the cap is ninety parts copper, five parts tin, four parts zinc and one part lead. A malleable iron foot-plate three and one-half inches in diameter with a hole smaller than the diameter of the pipe, is forced over the other end of the pipe, which has first received six equally spaced saw-cuts, after which the cut parts are bent down, thus insuring that the foot plate will neither move up nor down along the post. The whole post then receives a protective coating by being dipped into a vat of Mexican asphaltum, after which the pipe is compactly filled with a cement mortar consisting of equal parts of Portland cement and sand. After the cement is set, the face of the bronze cap is cleaned off with gasoline.

These posts weigh about eight pounds and are packed in basswood crates, ten to a crate, the total crate weighing eighty-five pounds. They cost the government last year \$11.10 a crate f.o.b. Winnipeg, or \$1.11 each. Two years ago they cost around 70 cents each.

In planting, it is necessary to dig a hole thirty inches deep to receive the post, after which the earth is tamped back around the post so that the bronze cap only is exposed and is flush with the surface of the ground. The post is placed midway between four pits and in bush country the earth from the pits is formed into a mound. Various methods are in use for planting the post. In soil free from stone or frost, the ordinary post-hole augur is satisfactory, but in ordinary bush country where roots, stones and frost are encountered, in addition to greater difficulty in regard to transportation, an iron bar and the spade are most satisfactory.

The bronze cap comes with the inscription of Dominion Lands Surveys, the penalty for the removal and the crown in addition to a centre mark, and the chainmen are supplied with a set of seventeen dies in a leather belt, similar to a cartridge belt, which are used to stamp on the section numbers, township, range and date. Under ordinary conditions a party of two mounders will erect from four to six of these mounds per day.

In rocky country, where the rock is at the surface or within twelve inches of the surface, a special post is used. This post is entirely of bronze, the top being identical with that of the standard post from which a seven-eighths inch shank projects for three inches, the weight being under a pound. In planting this post a hole is drilled in the rock three inches in depth and filled with a paste composed of a mixture of Portland cement and water, into which the post is pressed. The necessary cement is supplied in small water-tight tins and special drills are used. The drills are well suited to the purpose; they are light and will stand for two or three holes in the very hardest of granite. When dull, they are returned to the head office for re-sharpening. A five-pound hammer has been found most suitable and the length of time necessary to plant a post in rock is seldom over twenty minutes, the average being nearer fifteen. It may be mentioned here that the rock posts are in great favor with the surveyors, who now would sooner make rock monuments than those in earth.

For use on townsite surveys, a post similar to the thirty-inch standard post but somewhat shorter and of less expensive construction is provided.

Surveys on which this method of posting is used are being carried on in the West under conditions identical with those in Northern Ontario, *viz.*, bush country through which the pack strap and canoe offer the only means of transport, and an ordinary subdivision party will, under these conditions during a season, survey four hundred miles of subdivision and plant six hundred of these posts.

The advantages of this type of monument are so apparent as to scarcely need enumeration, the principal points being increased permanence and greater uniformity of practice among surveyors in erecting monuments. After the post is in place, it is almost impossible to remove it, except by digging, and it is also inconspicuous. It does not invite needless attention; in fact, nine out of ten persons in passing these monuments will, while they at once notice the pits and mound, pass the post, unless they have occasion to look for it in particular. When, however, it is necessary to locate the exact corner, one may approach the corner with every assurance that the post is in place.

When this model of post was first introduced, it occasioned serious misgivings in the minds of the Dominion Land Surveyors as to its practicability and considerable speculation was indulged in, particularly with regard to its weight, extra transportation necessary, difficulties likely to be encountered in its installation and increase in labor. Now, after three years of successful operation, it is apparent that these fears were to a great extent groundless, and it is safe to say that, under ordinary conditions, the additional extra help necessary on a survey party due to the change in the type of monument does not amount to more than one man. The Dominion Land Surveyors have heartily endorsed this post, and it is very questionable whether there are any among their number who would voluntarily return to the old type in use prior to this.

In this province, railway facilities are now such that transportation problems are slight in comparison to what they were as late as ten years ago, and there would appear little reason to prevent our following the lead of the United States General Land Office and of the Dominion Lands Surveys, and to investigate whether it would not be advisable to adapt posts of this nature suitable to our own use, on government surveys, as well as on townsites, municipal surveys and in general local practice.

An extract from an article published in the Year-book for 1916 of the Swedish Chamber of Commerce, says:—"The utilization of the abundant water power of Sweden has from year to year become of greater importance as a lever in the extension of its industry and development. Until, however, the Swedish Water Power Association was formed, towards the end of 1909, there was no uniformity in the methods adopted for dealing with the problem. One great drawback experienced was the over-rating of the water power as a direct source of income and subject for taxation, while another was a movement towards limiting the rights of strandowners to the disposal of the water, under cover of which the water-power utilization industry had up to then been developed. To increase the knowledge of the water power in Sweden, the association has compiled comprehensive statistics, and has issued special survey maps based thereon. It has also arranged water-power exhibitions, where the Swedish water-power technicalities and the progress of the Swedish water-power industry have been illustrated by numerous collections of drawings, photographs, statistical tables, etc. In recent years, the association, which now comprises 260 private members, 100 commercial undertakings, 12 societies and other corporations, and six foreign societies and corresponding members, has specially endeavored to prepare for an increased consumption of water power, with the view of lessening Sweden's dependence on fuel from abroad."