

from its hidden recesses. This is collected in quantity from lakes, and reservoirs on the high levels, and carried for miles by ditches, aqueducts and flumes, to the banks of a primeval, deserted river channel, at the bottom of which, under forest covered clay banks, lies the auriferous gravel studded with boulders and resting on the bed rock. Under a head of about 300 feet "six inch rapid fire" hydraulic guns are pointed against the bank, breaking down the earth, uprooting trees, scattering boulders and washing out the gold—which remains in the traps set for it in the bottom of the sluices after all else has been carried off by the power of the water.

These "machine guns," called "giants" and "monitors," are models of simplicity as well as of ingenuity and efficiency. While working they are great consumers of water,—and can only be used when the ground is unfrozen, but this season is generally sufficient to use up all the water which can be collected at the necessary elevation.

It requires at least two men to hold and direct the force of the issuing stream from an Ottawa fire hydrant, but a boy can direct the movement of a stream, twenty times greater in quantity and fifty per cent stronger in pressure, as it rushes forth from the nozzle of one of these "giants",—which is fixed to a well secured platform, and moved forward as the bank in front of it melts away.

A thin short tube, of larger diameter, projects beyond the nozzle to which it is fixed by gimbals, so that the tube can be moved independently, both horizontally and vertically, to touch the issuing stream, which immediately recoils from the obstruction, moving the "giant's" nozzle in the opposite direction. Thus a boy "behind the gun" can control its movement and compel the "giant" to fall back upon his own resources for motive power.

HORSE POWER.

It is impossible to give anything but an approximate estimate either of quantity or value of the available water power over so vast an area, because the first would involve the survey of every power site; and, as to the second, the value begins when the power is wanted.

All which now can be done is to state the conditions and endeavour to estimate the quantity, hypothetically. What is needed for an estimate is the quantity of water and the amount of fall which can be relied upon at the site for each power. To get the first, a measurement of the minimum flow at each point would be necessary in low water years, and for the second, some local knowledge as to river levels, back water, etc.

In the absence of such surveys we must fall back upon the average rainfall of the whole region as far as that can be procured for any time,