## WE WANT GOOD ROADS."

## By A. W. Campbell, C. E., Road Commissioner of Ontario.

The Great Need of This Country is Good Roads--How to Build Them Economically Explained by an Expert =- Useful Hints and Diagrams to the Road which it can be turned to the best ad- should be given to any ratepayer hav- a small corner. Builders of this Country.

are bad roads preferable? Is the cry work by commuting all the labor at could be done to improve present con- and in emergency work. length and breadth of Canada and of this continent. "We want good roads;"

If statute labor has not outgrown its this continent. "We want good roads;"

If statute labor has not outgrown its one of the most profitable methods the lowest hidder the the demand of men in their sober sen- reform when a man's labor is worth of using statute labor is to utilize it ses? Or has labor and money been less than thirty-five cents a day. A in hauling gravel. In this work there placed on our roads for a century past feeling in favor of statute labor still is less opportunity for wasting time; our surplus capital in circulation. If ing weaker. There is not a country in much of the other work of grading and weaker went good roads if had roads the world of the world we do not want good roads, if bad roads the world, characterized by good roads, ditching; it is work which the averare preferable, why should we want where a system of statute labor is in age farmersunderstands to be of direct

perience which has taught us the wis- ods of applying it. If it is to be retain- other work. For the grading of the changing the pathmasters every one or ing. Gravel is still being deposited in which shoot them through an opendom of building other structures sub- ed in Ontario, the present feeling of roads there is machinery which every two years is not likely to produce men drifts and bars by the agency of ing leading to a barrel, which may be stantially, teaches us the economy of having roads that are good. We want will have to be placed on a basis where- eration of these machines one man Appointed in the spring, the pathmast- of the character of the pit gravel of the pathmast- of t roads which will withstand wear. We by satisfactory results can be obtained. should be hired, as skill and experience er has no time to make a study of the want the labor and money spent on There is a prevalent opinion that a are absolutely necessary. It cannot be subject such as it demands. Nor is the them to be a paying investment. We resident on a concession road knows passed around from farmer to farmer fact that he will be succeeded by some want roads which will be good no mat- better than anyone else the re- like a scraper or a plow. These ma- one else as pathmaster the following ter what the state of the weather. We quirements of that particular road. A chines do not know how a road should year an encouragement to effort in this want roads which will not become rut- remarkable feature, however, is that be shaped, but in the hands of a man direction. ted immediately the fall rains come on no two citizens agree in their ideas of who does, they are exceedingly valuor when the frost leaves the ground what work should be done, or how it able. For drainage and ditching it is from three to five miles in length. A in the spring, remaining in rough should be done. No doubt there are usually best to hire the work done by pathmaster should be a permanent ofon it, is largely forced down into the ed in turn from among these to plan greatest benefits from statute labor is mud, is plowed under within a year, and superintend the roadwork. The to see that the material, whether graand wasted. A good road is an econ- only result which could reasonably fol- vel or broken stone, is prepared in the

ridges for a considerable part of the cases in which one man is right; but men who are accustomed to this class summer. A road which does this is a when one man is right all the rest must of work. One of the most necessary bad road. The money and labor spent be wrong, Pathmasters are appoint- steps to be taken so as to receive the

appointed for a term of years to carry and implements, showing their condi- 5 to 10 cents a load, and when mixed out the directions of the supervisor, tion and where kept. and if to these positions the right men | 10th. He should carefully examine clay is the most expensive road materwere appointed, a considerable step all parts of the township where gravel ial for much travelled highways. When Do we actually want good roads? Or townships find that they can do more done, and at the right time much subject to the order of the supervisor,

we must have roads. That necessity who are capable of taking the oversight a cheaper means of freeing it from tent, it may be said to be used in the whiching hands. having been placed upon us, the ex- France, but with very different meth- er means to be used in performing of road-construction, but the system of sand and earthy matter than by screenthe road. If screening, crushing or ficer, and his division should be such cient sharp sand to secure consolida- do is to turn a wheel, and bullets, low from such a system is that which pit or quarry, ready to be drawn to provements must be made in such a The pathmasters can make the road stripping a pit is necessary, it should that the most of his travel will lead tion, especially if a roller is used. Which will kill at three miles, are disway that they will last. Roads in Can- or destroy it; call out the men or not; be all done before statute labor com- him over the greatest portion of it. Gravel which retains a perpendicular charged at the rate of ada have been built on the same prin- make the roadway 10, 20, 30 or 40 feet mences. Gravel may be plentiful, but He need not receive a salary, but face in the spring, and shows on trace ciple as a wagon which breaks down wide, as may suit their individual ideas of a very inferior quality. Usually no should, as a slight recompense, be pre- of slipping when thawing out may genunder the first load, and is used for make the width uniform or of as many effort is made by the council to screen ferred in doing small jobs under the erally be assumed to be sufficiently widthe as there are nothwasters; the council to screen ferred in doing small jobs under the erally be assumed to be sufficiently widthe as there are nothwasters; the fire wood after a year of service. Most widths as there are pathmasters; the gravel, remove the surface soil supervisor, where the work is not con- clean and free from clay for use on barrel may be pointed in any direction of the leading roads of Ontario have crown the grade, make it flat or con- from the pit or in any way prepare the sidered of sufficient importance to be the road without any treatment other with the greatest facility. The prinbeen made and remade a score of times caved as may occur to them; they can gravel for being placed on the road. let by contract. He should, in ad- than is necessary to break stones ciple is that of an endless belt, which and are still bad roads. They are of notify the ratepayers on the beat of Teamsters go into the pit, one or two, dition, give special attention to all greater than one inch and a half in is made to collect the cartridges when the kind that "break up." A road the number of days to be performed at a time, it is of inferior quality, but emergency work, such as washouts, diameter. that "breaks up" is like anything else and instruct them to turn out when they cannot undertake the task of re- broken culverts and bridges. If the that breaks up, a poor investment. they see fit; the ratepayers bring such moving the earth and clay, in order time required to oversee the statute When road building is rightly under- implements as they wish, work or do to satisfy their few days of labor. In labor in his division is more than would stood in this country, township coun- not work, so long as they put in the other sections there is no gravel, but be needed for his own statute labor, cillors will no more think of building time; they haul gravel if they want field and quarry stone is to be found he should be paid for such excess unroads that break up in the spring, than to put in three days in one; haul sand in abundance, frequently along the der certificate of the supervisor or they will think of constucting houses or turf so long as taken from the road to be improved. But with this council, the object being to secure ample of progressive graciousness, the that they are built-proof, and that they will think of constucting houses or turf so long as taken from the road to be improved. But with this council, the object being to secure ample of progressive graciousness, the within such shield a sword-havenest in material unprepared for roadwork, no- proper supervision of all work percept to plow and scrape the mud, and determine whether the excess time was sorts of harsh abuse for the reason that a spring, can be made in a second to in other ways, put in their time in actually necessary to oversee the work she liked bicycling, bought a wheel for project from the front. The Chinese useless effort. If the council would of the division, in accordance with the herself and insisted upon riding it. believe that with these their soldiers crusher to prepare this stone and leave which should be framed so as to include Years before she even thought of that put them to the sword with room little purchase or otherwise employ a rock local by-law of rules and regulations, it ready for hauling, if they were to this matter. purchase screens, strip pits, etc., and see that nothing but first-class gravel aged and would willingly spend their partsc of Canada, and where it can be more than ten years ago safety bicy- an extraordinary sort, which is being

this material.

and any system of road construction, is stone, not the earthy materials which to have one man at the head of the work to act as a general supervisor. He large stones and boulders be mixed the average woman could supply. That

A SUPERVISOR.

The road builders of this country the council, and his word is law. If plan of his district, or township, showtion. If the gravel is fit to be placed daily spins they were assailed and apshot into the midst of the enemy. They
are not given sufficient consideration he keeps his men at work in good ing all roads and the location on them have not given sufficient consideration he keeps his men at work, in good ing all roads, and the location on them on the road without such treatment, pealed to on the ground that the wheel would then burst and take instant efto the effect of building bad roads. humor, and is securing a good road, he of all culverts, bridges and water-

most expensive form of maintenance construction, together with an estimate same extent in wet weather. such special protection work on streams after a few hours' rain the road be- heart. She has succeeded in showing as he may deem worth the council's comes softened. In this slight ruts are that in the way of moderate and wellamount of money each year to be spent consideration. There should also be formed which hold water; the whole timed bicycle riding, what's good for

pathmasters, (and fewer of them) were and report to council on all machinery

would be taken towards the better man- and stone exist, and should by borings we consider the number of pits in some agement of roads in the townships. and tests, determine the quality and townships and their immense size, re- Gatling guns, torpedoes, and all the Under systematic management, money extent, and report thereon to the coun-and labor could be made to work to-cil. All material, stone, plank, gravel, been taken out, and then consider the gether to the best possible advantage. etc., should be purchased by the su-short mileage gravelled, we must readi-At present each pathmaster is given pervisor in large quantities, and und- ly see that something in the quality of a few dollars and a few days of labor, er instructions from the council, the material and the mode of construction In a few years the man-killing apparasurrounded by neighbors. Nothing but required amount to be determined by is radically wrong. In some instances tus will probably be of a far more wonpatchwork can be expected. By con- his estimates referred to above. As far much more than the value of a whole solidating this money and labor, by us- as possible the material should be pur- farm has been paid for by gravel puring the statute labor in the ways in chased by tender, and due consideration chased by the load and taken from present; for inventors in different vantage, by using the money in puring material for sale. When purchaster or der ordinary traffic, the annual respectively as possible by turned to practical which statute labor is not adapted, by at convenient points, and placed in pairs rendered necessary would be very as possible, be turned to practical seeing that all this work is properly charge of, and used by the pathmaster, slight.

al of the supervisor and all accounts form of drill. There are cases in

This material is purchased at from with an excessive amount of sand or

11th. He should prepare specifica- along the banks of streams, where any is calculated to beat the record in is thereby obtained for washing the the rate of 15,000 revolutions per minbest sources, as the gravel can be with enormous velocity, and the in-

THE GRAVEL OR BROKEN STONE IN PLACE .- Cross-section.

The first and greatest need of every free from sand and clay, since it is the misgiving.

lent quality; then a stratum of coarse To supplement the anxiety of the the arum-lily. It is not a "lily" at all,



THE FINISHED ROADWAY.

equal readiness in wet weather; where- has been rare, and the examples furof the farm. The dairying industries regrettable is that, through improper condition of all bridges, indicating sume a mechanical clasp the one of the ment being exercised by others.

of cost, and a statement dealing with | Earth and sand attract moisture and the wheelwoman now rides with a light

(To be Continued.)

TRIUMPH OF WHEEL-WOMEN.

wheelwoman was the recipient of all within each shield a sword-bayonet is cycling, and it had increased their vig- When Germany is next engaged in Gravel is very plentiful in many or and prolonged their lives. Scarcely a great war in Europe she will protime to the fullest extent in hauling obtained, of a good quality, within reaccles were in their infancy, and mak- or has been, constructed. It is a kind sonable hauling distance, makes a ing them for women's use was an ex- of land ironclad, being a big movable cheap but good road surface. As pre- periment undertaken with more or less house on wheels. It is built of imperiment undertaken with more or less penetrably thick steel with long, ugly

must be a practical man, and if pos-sible, experienced in road construcsible, experienced in road constructions to the feet of the horses was the first objection to women be- sleep is a decidedly novel idea; but tion, and acquainted with the prin-ciples underlying it. The advantage of having such an officer, appointed by having such an officer, appointed by by-law, with term of office as secure crusher with screen attachment in the as that of a township clerk will be nit. By reseing all the crusher with screen attachment in the immodest to be practiced by the gentlthat break up in the spring, barns that township pit; haul one load or ten so as that of a township clerk will be pit. By passing all the gravel through er sex. When those arguments failed thousand times stronger than chlorobreak up in the spring, or fences that long as the day is spent, and the path-break up in the spring. The same and the long as the day is spent, and the path-break up in the spring. The supervisor should prepare a large stones broken by the one operaa tendency to lure young girls into sible for a long period, and it is cal-

and that sisters who had formerly oc- of our forests is allied. In Australia cupied front seats in the churches were the calla is such a pest as the water I to be seen decked in blouse waists and hyacinth is in Florida; It chokes up the abbreviated skirts hurrying past the irrigating channels by its rapid growsanctuary. Theatre managers charged th and requires vigorous measures to the wheel with diverting the attention of young ladies from the harmless am- subdue. Another flower called a lily, usements of the stage to the which has no right, save that of long doubtful attractions of suburban groves usuage, to the name, is the lily of the and retreats labelled "Ice Cream and valley. In medieval times the monks

tentment among the bicycle girls now The Emperor himself is much above

MANAGING A BOY.

The Awful Apparatus to Be Used in Wars

Marvellous as are our Maxim and tion has by no means exhausted itself. derful and awful character than at

In searching for gravel, the clearest | An engineer in the north of Engindications are usually to be found land has just patented a gun which

gravel is often a good metal but vari- ventor declares that at close quarters ready been made, and have proved fully satisfactory.

A new quick-firing gun will soon be turned out by a Birmingham firm, which will put all others of its class into the shade. All the gunner has to

600 PER MINUTE.

date; but the authorities at Pekin are adopting some of a very interesting kind. They are about the same size and weight as a Chinese war-shield; For more than five years that ex- but the special advantage of them are

spikes sticking out like quills from

To poison an enemy or put one to

In England our calla lily is called

FIVE-FOOT SOLDIERS.

The minimum height in the Mikado's army is a fraction of an inch over five feet, and that in the Italian army five feet one inch. As the height of individuals in Japan does not often exceed five feet four inches for males, it follows that there is wonderful uniformity observable in the physique of the Japanese troops, and this fact operates beneficially in long marches, very few falling out of the ranks. What one can do all can do. the everage stature.

METHODICAL.

A CONCRETE CULVERT.

Year after year work of a flimsy, is a good fellow, but can't be kept in courses, classifying roads according to sary to send a man over the road to ment of Satan, and that cycling "had not killed would be rendered insensiftless character is placed on the office more than two years. The job their requirements. shiftless character is placed on the office more than two years. The job their requirements. roads. The results are only temporary must be passed around even if the new 2nd. He should prepare a list of all by hand. and are destroyed by a very little man destroys the good work of his culverts and bridges, showing dimenwear and traffic. In a very short predecessor. Pathmasters must cer- sions, material used in construction, taking gravel out of the pit. In the ers were cautioned against permitting time the work has to be done over tify to the loads of gravel hauled whether their conditions and the direction of average pit we find the surface layer their daughters to ride, and husbands of from two to four feet, composed their daughters to ride, and husbands of from two to four feet, composed their daughters to ride, and husbands of from two to four feet, composed their daughters to ride, and husbands of from two to four feet, composed their daughters to ride, and husbands of from two to four feet, composed their daughters to ride, and husbands of from two to four feet, composed their daughters to ride, and husbands of from two to four feet, composed their daughters to ride, and husbands of from two to four feet, composed their daughters to ride, and husbands of from two to four feet, composed their daughters to ride, and husbands of from two to four feet, composed their daughters to ride, and husbands of from two to four feet, composed their daughters to ride, and husbands of from two to four feet, composed their daughters to ride, and husbands of from two to four feet, composed their daughters to ride, and husbands of from two to four feet, composed their daughters to ride, and husbands of from two to four feet, composed their daughters to ride, and husbands of from two to four feet, composed their daughters to ride, and husbands of from two to four feet, composed their daughters to ride, and husbands of from two to four feet, composed the ride of the this. This annual demand for repairs cils must pay that account at so much them, with memoranda as to the course of earthy matter; then a layer of four became uneasy lest their wives should is so great that no township can re- a load, right or wrong, and quality of the water and location of the out- or five feet of clean gravel of excel- wheel away.

accustomed to think of roads merely as er details, the friends of statute labor of statute accustomed to think of loads more in the statute labor; and statute la

of the farm. The dairying industries plans and imperfect construction, the those who require repairs or rewould be immensely benefited by plans and imperfect construction, together with an estimate same extent in west expensive form of maintanance construction, together with an estimate same extent in west expensive form of maintanance construction, together with an estimate good roads; fruit growing would become more remunerative, sale would be obtained for produce which is not now

bor supplemented by money grants. The statute labor system is suited to a pioneer age. It suits the abilities of the people making a home in a new country, and it suits the spirit of their circumstances. They feel keenly the need of improving their roads, and work with a will, earnestly and faith-work with a will, earnestly and faithmerely to give some other voter an opmork with a will, earnestly and faithfully. That was the history of statute
labor in the pioneer days of what are
mow the populous districts of Canada.
But where the townships have grown
But where the townships have grown
west thy and well populated, a different
west thy and well populated, a different
condition exists. To such an extent
has statute labor degenerated that some

merely to give some other voter an opportunity to earn a few dollars. In
such ways as these is the money which
should be appropriated by the countio to properly utilize the statute labor.

Sth. He should arrange with divisshould be appropriated by the counshould be available at all times for
all times for
in the pioneer days of what are
merely to give some other voter an opportunity to earn a few dollars. In
such ways as these is the money which
should be appropriated by the counshould be available at all times for
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merely to give some other voter an opportunity to earn a few dollars. In
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should be available at all times for
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spond to it. The roads instead of be- of material must not be considered, let. gleeted, grow worse and worse, and ion is mismanagement in actual road show, as to roads, whether they are lying this another stratum of fairly household, clergymen averred that but it is an arum, and the regal queen all the evils of bad roads follow. | construction. A description of the ac- of gravel, stone or earth, graded or good gravel. The common practice their congregations had been seriously of its family—the family to which the What had roads are doing for this tual work done sounds like ridicule, ungraded, the system of drainage, and followed by teamsters is to scrape diminished by the bicycle's popularity, Jack-in-the-Pulpit or Indian turnip country is only one side of the evil. however earnest it may be. A statute nature and extent of traffic upon them. The other side is what they are not labor day is short, of eight hours, but He should carefully study the present doing. The loss does not arise so much the men are rarely on the ground for and future requirements of traffic on from the money and labor wasted every more than six hours. A good part of all roads, the class of roads best suityear, as it does from the absence of the the six hours is spent in gossip, in ed to such traffic, the width and depth benefits which good roads would bring. arguing as to what should be done, and of meta!, width of graded portion, am-Our loss must be measured not so much in finding fault with what is being ount of crown and other details of by the money and labor we are throw- done. Another part is spent in look- construction. ing away on bad roads, as by the op- ing up scrapers and plows that should 4th. He should possess full informaportunities which would come to us have been provided before the work tion as to location, extent and qual-One of the greatest obstacles in the the class of teams sent out by the struction, and amount of plank and down the face of the pit, causing the Soda." Other dissatisfied persons, in- said these little flowers, the simplest of way of road improvement is the narrow ratepayers; the wagons which can carry timber obtainable from ratepayers in soil, clean gravel and sand to mix to- cluding dealers in furniture, vowed the simple were the 'lilies of the way of road improvement is the simple were the files of the view taken of the question by so many only half a load, the boys who come to the township or district, suitable for gether at the bottom. This is put in that, with many housewives, comfort field." which our Lord said were more

whereby each pathmaster can get a Statute labor is performed at a time culverts and small bridges to be rewhereby each pathmaster can get a Statute labor is performed at a time culverts and small bridges to be rewhereby each pathmaster can get a Statute labor is performed at a time culverts and small bridges to be rewhereby each pathmaster can get a Statute labor is performed at a time culverts and small bridges to be rewhereby each pathmaster can get a Statute labor is performed at a time culverts and small bridges to be rewhereby each pathmaster can get a Statute labor is performed at a time culverts and small bridges to be rewhereby each pathmaster can get a statute labor is performed at a time culverts and small bridges to be rewhereby each pathmaster can get a statute labor is performed at a time culverts and small bridges to be rewhereby each pathmaster can get a statute labor is performed at a time culverts and small bridges to be rewhereby each pathmaster can get a statute labor is performed at a time culverts and small bridges to be rewhereby each pathmaster can get a statute labor is performed at a time culverts and small bridges to be rewhereby each pathmaster can get a statute labor is performed at a time culverts and small bridges to be rewhereby each pathmaster can get a statute labor is performed at a time culverts and small bridges to be rewhereby each pathmaster can get a statute labor is performed at a time culverts and small bridges to be rewhereby each pathmaster can get a statute labor is performed at a time culverts and small bridges to be rewhereby each pathmaster can get a statute labor is performed at a time culverts and small bridges to be rewhereby each pathmaster can get a statute labor is performed at a time culverts and small bridges to be rewhereby each pathmaster can get a statute labor is performed at a time culverts and small bridges to be rewhereby each pathmaster can get a statute labor is performed at a time culverts and small bridges to b whereby each parlimaster can built or repaired, with a detailed er, to remove sand and clay from discard their steel roadsters with than likely that the plant on which the farm which will be of direct personal use his time to good advantage on his statement of all material required for which is work and an estimate of the cost own land, but instead of remaining this work, and an estimate of the cost. which is wanted on the road-not the interessei, lumbricales and adduct- er the crown-imperial, or the marta-They do not see nor appreciate the work he uses his time in review a probable estimate of material re-They do not see nor appreciate the work, he uses his time in paying a road a probable estimate of material reday already on the road without. In the last year or two wheelwomen flowers of sumptuous coloring and all benefits which would accrue to the work, he uses his time in paying a road a probable estimate of drawing it several miles from the gray. benefits which would accrue to the tax. A large part of the time spent township, county and province. They tax. A large part of the time spent quired during the following year, predaming it several miles from the gravtownship, county and province. They in road work is unquestionably wasted in road work is unquestionably wasted. township, county and province. They overlook the public good. But public in road work is unquestionably wasted, sented each fall so that, if thought adequate on the road should be readed the public good. But public in road work is unquestionably wasted, visable, it may be purchased and de-greatest value on the road should be overlook the public good. But public good, But public good, But public good is merely individual benefit congood is merely individual benefit connual tax bill is also expended on the good is merely individual benefit con-ferred on every citizen. Money and nual tax bill is also expended on the livered on the ground during winter nearly free from sand and clay. Dirty exhibited bad taste by engaging in like a king in his glory, nor, what is ferred on every citizen. Money and roads. A careful consideration of this months or other most convenient sea- gravel, while it unites readily and long club runs composed of men with more conclusive, does it grow wild in expenditure will show that many of son, so as to utilize as much as poslabor spent on the roads of the township will enhance the value of every expenditure will show that many of son, so as to utilize as much as posforms a good roadway in dry weather, whom their acquaintance was little the Holy Land. farm land; it will increase the profits should cost. Nor is this all, the most of the farm by reducing the expense should cost. Nor is this all, the most condition of all bridges, indicating sume a mechanical aleas the condition of all bridges, indicating sume a mechanical aleas the condition of all bridges.

has been imposed. WASTE OF MONEY. STATUTE LABOR.

The great majority of roads in Canada are under the control of township councils, and are built by statute labor supplemented by money grants.

The statute labor system is suited to a Structure becomes saturated, breaking deviation of existing roads with a view to doing away with bridges, culverts, expensive grades, cuts or other features which tend to prevent permanent which all path.

The statute labor system is suited to a Structure becomes saturated, breaking the bond and permitting each successive vehicle to churn these ruts deep bicycle she has won a victory over the to doing away with bridges, culverts, expensive grades, cuts or other features which tend to prevent permanent which tend to prevent permanent which all path.

The statute labor system is suited to a Spent in small sums for repairing tends.

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