

**NEW NUT TAPPING MACHINE.**

We give herewith perspective and plan views, also a sectional elevation, of a new and very efficient nut tapping machine made by Messrs. Howard Brothers, Fredonia, N. Y. This machine has seven spindles, and its capacity is 8,000 nuts per day of ten hours.

The efficiency of this machine is sufficiently attested by the fact that a large number of the most important railway corporations, car manufacturers, locomotive works, machine shops, agricultural tool manufacturers, iron works, etc., etc., in the country are using them. Some of these firms are using as many as fifteen machines.

This machine runs seven taps with three different speeds, and is so arranged that two of the taps may be run with the fastest, two with the slowest, and three at the medium speed, at the same time—the gearing being arranged to enable the operator to get the desired speed for any given sized tap; or all may be run at any of the three speeds, if so desired, by having the necessary gears. By the substitution of the necessary gearing—which is easily done—three, two, or one of the taps can be run “left hand.” The machine has a tight and loose pulley, to accommodate itself under a main line or counter line. The necessary oil is regularly supplied by graduating cocks, a device in itself a source of economy.

Of these machines two sizes are made, No. 1 and No. 2. No. 1 machine taps from one and one-half inches down to the smallest size. No. 2 taps from two inches down to the smallest size.

These machines are arranged so as to provide against any gumming, or obstructions in the sockets from the chips or oil. The sockets for holding the taps are made so that any tap will fit and work in or on any spindle. The nuts, when finished, drop below the teeth of the tap, and when the tap is full it can be removed and replaced without stopping the machine.

With these machines nuts of the same or different sizes may be cut as rapidly as one man can put them on and take them off the taps. The attendant can be kept busy and at the same time run at a speed sufficiently slow to avoid destroying the tap; the motion or speed of the tap being within the control of the operator can be made fast or slow as desired; and one or any number of the taps may be used, as required.

Further information in regard to these machines may be obtained by addressing Howard Brothers, Fredonia, N. Y.

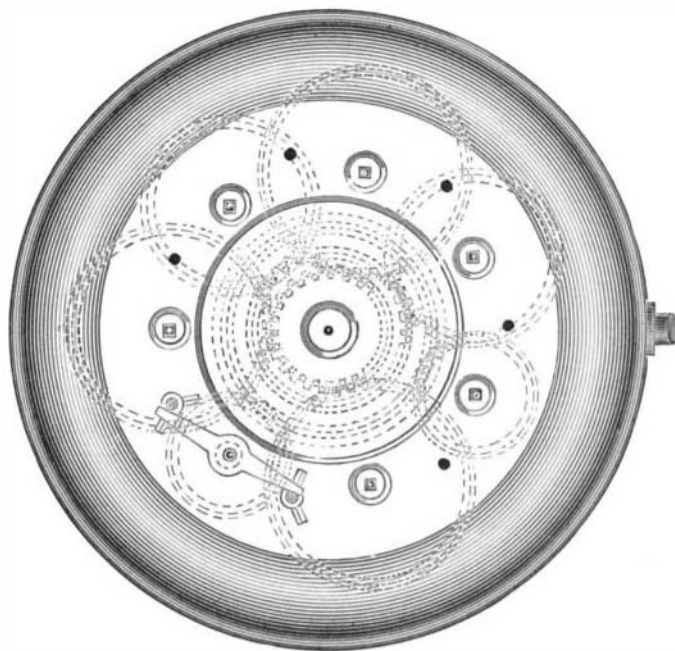
**The Glories of the Starlit Heavens.**

BY R. A. PROCTOR.

If the eye could gain gradually in light-gathering power, until it attained something like the range of the great gauging telescopes of the Herschels, how utterly would what we see now seem lost in the inconceivable glories thus gradually unfolded. Even the revelations of the telescope, save as they appeal to the mind's eye, would be as nothing to the splendid scene revealed, when within the spaces which now

pressive in the magnificence of its inner meaning; for even as seen, wonderful though the display would be, the glorious scene would scarce express the millionth part of its real nature, as recognized by a mind conscious that each point of light was a sun like ours, each sun the center of a scheme of worlds such as that globe on which we “live and move and have our being.”

Who shall pretend to picture a scene so glorious? If the electric light could be applied to illumine fifty million lamps over the surface of a black domed vault, and those lamps were here gathered in rich clustering groups, there strewn more sparsely, after the way in which the stars are spread over the vault of heaven, something like the grandeur of the scene which we have imagined would be realized—but no

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human hands could ever produce such an exhibition of celestial imagery. As for maps, it is obviously impossible by any maps which could be drawn, no matter what their scale or plan, to present anything even approaching to a correct picture of the heavenly host. There is no way even of showing their numerical wealth in a single picture.

It is not till we have learned to look on all that the telescope reveals as in its turn *nothing* compared with the real universe, that we have rightly learned the lessons which the heavens teach, so far, at least, as it lies within our feeble powers to study the awful teaching of the stars. The range of the puny instruments man can fashion is no measure, we may be well assured, of the universe as it is. The domain of telescopically visible space, compared with which the whole

that of infinite disproportion. All that we can see is as nothing compared with that which is; all we can know is as nothing; though our knowledge “grow from more to more,” seemingly without limit. In fine, we may say (as our gradually widening vision shows us the nothingness of what we have seen, of what we see, of what we can ever see), not, as Laplace said, *The Known is Little*, but **THE KNOWN IS NOTHING**; not *The Unknown is Immense*, but **THE UNKNOWN IS INFINITE**.—*Knowledge*.

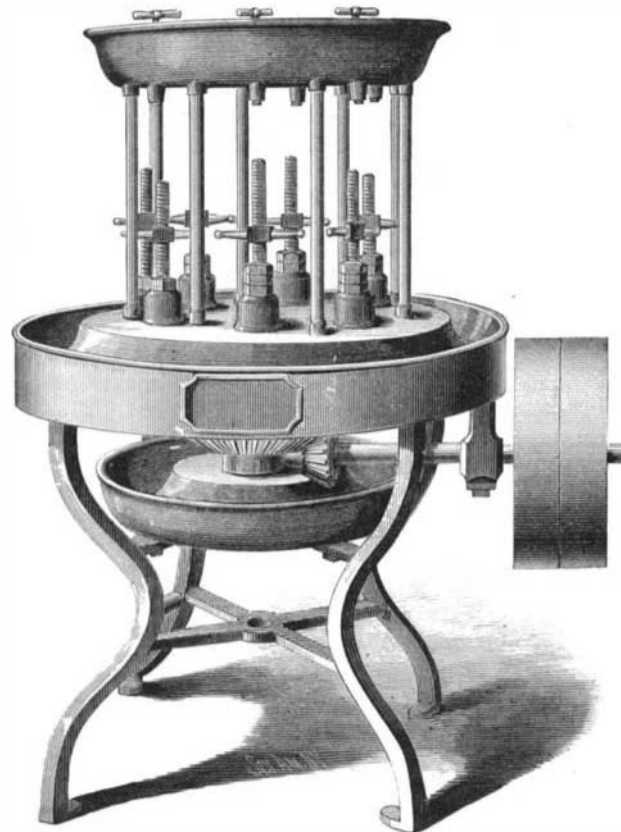
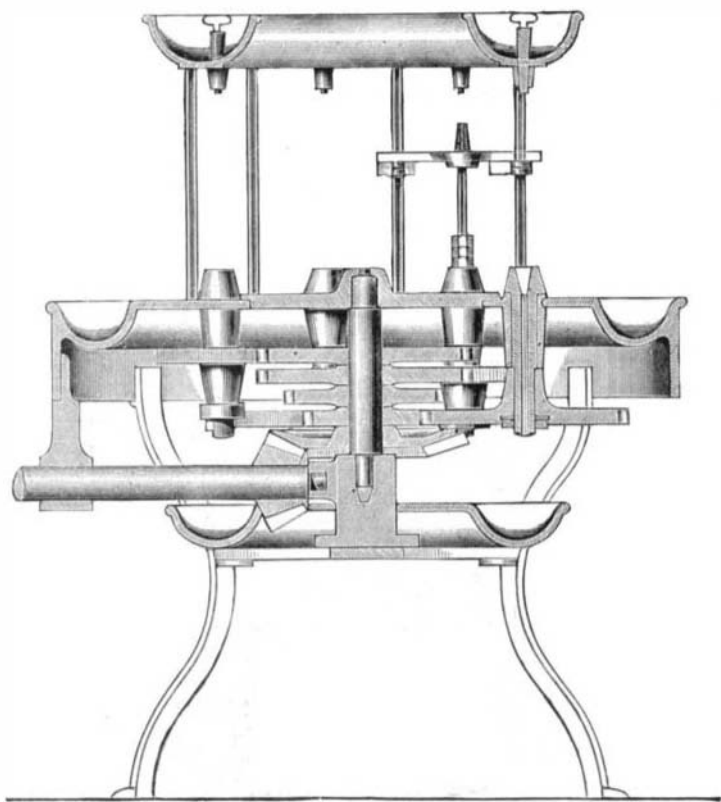
**Tenacity of Life of Bacteria.**

The demonstration of the intimate relation of bacteria to certain fevers and other diseases would seem at first sight to greatly simplify the work of the physician in searching for efficient remedies. Put in plain English the problem is: find some element or compound that is fatal to bacteria, and administer it in the way best calculated to reach the mischievous fungi in the patient's blood. But the problem is easier stated than solved. The lower forms of life which appear to cause the trouble are able to live and thrive under the widest possible range of conditions; so that, so far as known, any reagents that will kill them would be much more quickly fatal to the patients.

The eminent English chemist, Edward Frankland, recounted the other day, at a meeting of the Society of Arts, some experiments made in his own laboratory, showing the indifference of bacteria to conditions that would speedily destroy higher organisms.

A quantity of mutton broth was affected by bacteria, and when swarming with these organisms, it was introduced into a vessel filled with mercury, and standing over that liquid. Then various gases were put into these globes, and, of course, in contact with this liquid teeming with bacteria. Oxygen was tried, hydrogen, nitrogen, carbonic acid, and all the ordinary gases, some of which were respirative by animals, and some of which were believed to be beneficial to plants; but the bacteria seemed to delight equally in either of them. They got on quite as well in carbonic acid as they did in oxygen; they could live for weeks without the presence of a trace of oxygen in the liquid, with nothing but pure carbonic acid.

If the experiments had gone no further, they would show that these organisms had an extraordinary tenacity of life. But cyanogen was now introduced into the flasks, and, although they certainly did sicken a little under it, they recovered a little in the course of a week or so, and went on living in that gas in a fairly healthy condition. Sulphurous acid—the mutton broth itself being, of course, saturated with this gas, and the atmosphere of the glass globe consisting of nothing else but sulphurous acid—seemed to have very little effect on them at all; their motions were not stopped, and they seemed to be as lively after the application of it as before, and the same was the case with several other reagents which were tried.

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show black between the familiar stars of our constellations, thousands of brilliant orbs would be revealed. The milky luminosity of the Galaxy would be seen aglow with millions of suns, its richer portions blazing so resplendently that no eye could bear to gaze long upon the wondrous display. But with every increase of power more and more myriads of stars would break into view, until at last the scene would be unbearable in its splendor. The eye would seek for darkness as for rest. The mind would ask for a scene less op-

range of the visible universe of stars seems but a point, can be in turn but as a point compared with those infinite realms of star-strewn space which lie on every side of our universe, beyond the range—millions of times further than the extreme scope—of the instruments by which man has extended the powers of visions given to him by the Almighty. The finite—for after all, infinite though it seems to us, the region of space through which we can extend our survey is but finite—can never bear any proportion to the infinite save

It is barely possible that these vicious organisms may be reached and killed by some drug in doses which the human system can tolerate; but the prospect certainly is not bright. Prevention rather than cure seems to be the end best worth working for.

**THE BRYANT OIL CUP**, illustrated in our issue of June 17, is made by the Bryant Mfg. Co., 929 Filbert street, Philadelphia, Pa., and not at the address given in article referred to.

**Where the House Fly Breeds.**

As "fly time" approaches every housekeeper wonders where and how the increasing swarms of pests multiply so rapidly.

The eggs, mere whitish specks to the unaided eye, are laid in little agglutinated piles in warm manure or in decomposing vegetation, especially that about our stables and barn yards. From 80 to 100 are laid at a time, and probably at three to four different intervals by the same fly, though on this point we have no exact data. Within twenty-four hours in summer, they hatch into footless maggots, which, after rioting in filth till their tender skins seem ready to burst from repletion, become full-fed in less than a week, and descending into the earth, or sheltering under some old board, contract to brown, shining objects, rounded at both ends, and technically known as puparia. Within the darkness of this hardened skin profound changes rapidly take place, and the insect passes through the pupa to the perfect state, and finally, in about five days, the anterior end of the puparium is pushed off, and the fly quickly crawls out. At first its parts are pale and soft, and its wings are crumpled and useless, but these soon expand, and suddenly, without practice or teaching, the new fledged fly wings its way to your table to mock your displeasure—to share your repast. The length of time required from hatching to maturity varies with the season and temperature, but will not exceed ten days in midsummer, while the life of the perfect fly lasts about three weeks at the same season. As cold weather

are more frequent than is commonly supposed; and that they may help to account for some of the otherwise unaccountable failures of men in responsible places to do their duty. An engineer, or switchman, or signalman, whose hours of labor are excessive; who has been nervously exhausted by domestic anxiety or bereavement; or who has criminally wasted his strength by dissipation or lost his sleep by unwise frolicking, is liable at any moment to forget the simple duty upon the right performance of which may hang the safety of hundreds. If it were not for the fortunate circumstance that routine duties become so wrought into the organism that men will perform them automatically, the overtaxing of men's energies by corporate selfishness, or individual misfortune or folly, would much more frequently result in disaster.

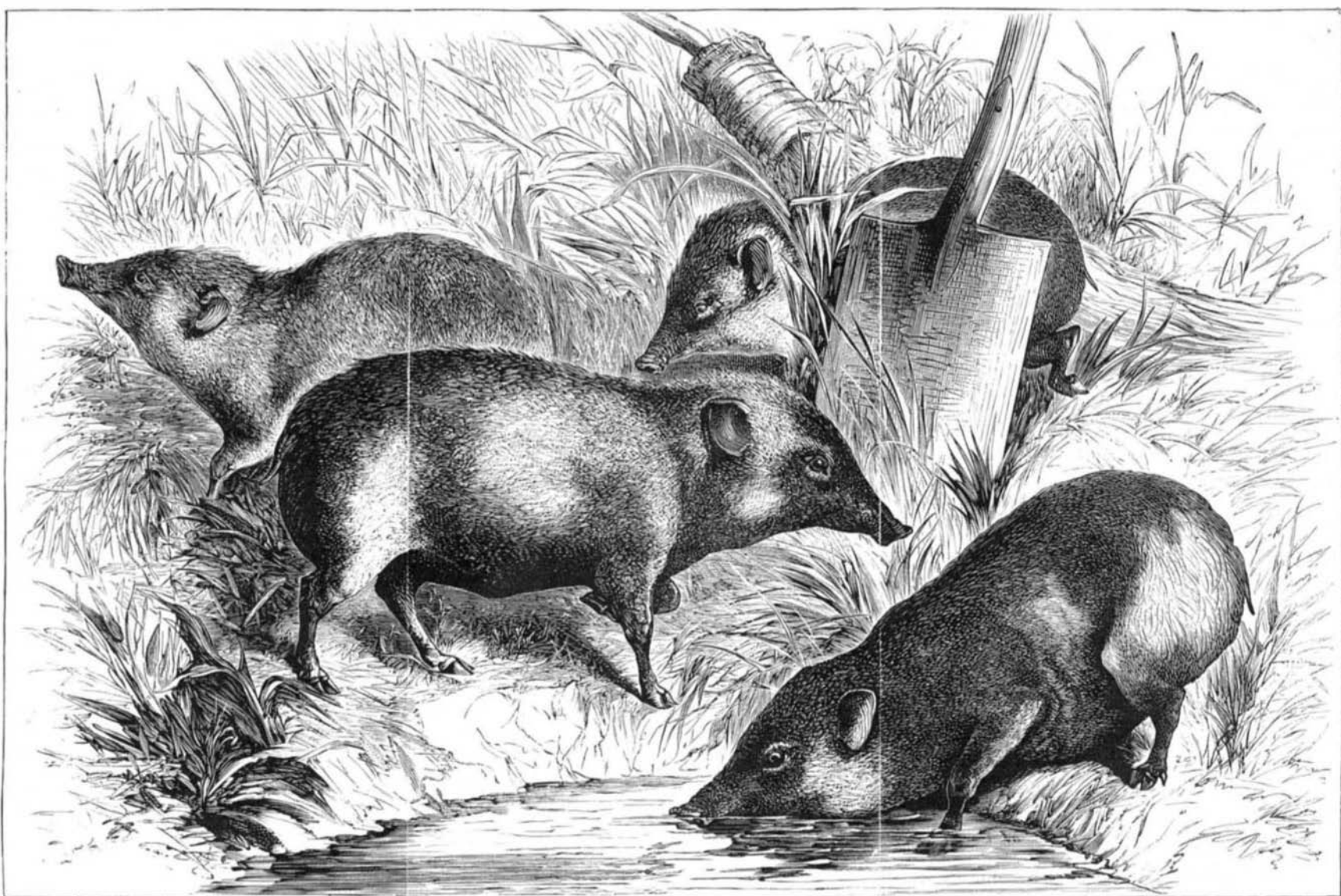
**THE PYGMY HOG OF NEPAUL.**

For our first knowledge of the existence of a diminutive form of the pig family in the Sub-Himalayan forests we are indebted to the researches of Mr. Bryan H. Hodgson, formerly resident at the Court of Nepaul, who described the pygmy hog so long ago as 1847, in an article published in the Journal of the Asiatic Society of Bengal. He named it *Porcula Salvania*, from the forests of Saul trees (*Shorea robusta*) in which it is chiefly found. While the wild boar, or a species closely resembling it, abounds all over India, the pygmy hog is exclusively confined, as Mr. Hodgson tells us, to the deep recesses of the primeval forests, where it

miles in extent. Though, on their first arrival, they were very wild, they are already becoming tame and confidential. In its general appearance, the pygmy hog is not unlike a small variety of the common boar; but measures only about two feet in length, and has a very small tail. The color is a nearly uniform brown, slightly shaded with dirty amber. The coat of hair is thin, except upon the back. The pygmy hogs will be found by visitors to the Zoological Society's Gardens in what is usually called the "Ostrich House," just beyond the Zebra House, where a compartment has been specially fitted up for their accommodation.

**Electric Lights in Sea Fishing.**

A French paper reports a trial by government permission of an electric lure for sea fish. It consists of an electric light in a glass globe with a device for sinking it to the desired depth. As soon as the light is turned on the sea in its vicinity is illuminated brilliantly, and the fish, over whom light is well known to exercise an irresistible influence at night, come eagerly, and sometimes in large schools, within the rays. They may be seen from above disporting themselves in the unaccustomed brightness, and little dreaming of the sinister purpose with which the little fete is organized for them. It is then that other fishing boats, armed with nets, come up and set to work at the unconscious victims, which they surround as well as they can without interfering with the apparatus connected with the lighted globe. It may be supposed that this device is calculated to operate



**PYGMY HOGS FROM INDIA AT THE ZOOLOGICAL SOCIETY'S GARDENS IN LONDON.**

approaches propagation ceases, and the older flies perish. A few of the more vigorous females, however, retreat to some nook or cranny, where, in a state of torpor, they survive until the ensuing season—links 'twixt the summer gone by and to come. The insect may also hibernate in the pupa state in the ground. In rooms kept continuously warm, or in more southern latitudes, the fly remains active all winter, and our palace sleeping cars bring them daily to us from Florida during the coldest months of the year.

**Curious Partial Loss of Memory.**

An English scholar, during a holiday excursion in the Hartz Mountains, subjected himself one day to a severe physical strain, which produced a singular mental disturbance. He was on his feet from morning till night, and in the course of the day's wanderings, made several arduous ascents, taking no rest, and neither eating nor sleeping. At night, when he reached a place where he could supply his needs, he was unable, to his great astonishment, to recollect a single word of the German language, although he ordinarily spoke it with fluency. His memory did not fail him in any other respect; he knew his own language as well as ever, and recalled perfectly all the incidents of the day. As soon as he had thoroughly rested, and had eaten the food which he procured by signs, his German returned to him completely.

It is probable that such temporary aberrations of memory

roams about in herds. It is very rarely seen, even by the natives. A well known hunter informed Mr. Hodgson that during fifty years' abode in the Saul forests he had obtained but three or four of these animals to eat, partly owing to their scarcity, and partly to the speed with which the females and young disperse, and to the extraordinary vigor and activity with which the males defend themselves while their families are retreating. Dr. Jerdan, in his volume on the Mammals of India, tells us that the full-grown males live constantly with the herd, which consists of from five to twenty individuals, and are its habitual and resolute defenders against harm. These animals feed principally on roots and bulbs, but also devour birds' nests, eggs, insects, and reptiles. The female has a litter of three to four young ones. Dr. Jerdan adds that, while at Darjeeling, he in vain endeavored to procure a specimen from the Sikkim Terai, and Sir Joseph Fayrer, who hunted many years in the Terai, was also unsuccessful in meeting with the pygmy hog. Under these circumstances, it will be readily understood that the authorities of the Zoological Society of London have been much pleased at the recent acquisition of a small herd of these animals, consisting of a male and three females, of which we give an illustration. They were obtained in the Western Doors of Bhootan by vast trouble and expense, and were brought to England by Mr. B. H. Carew, who has parted with them to the society. They were caught by Mr. Carew's hunters in snares, which were set for them in hundreds, over a range of country twenty

with much deadly effect whenever it is used; and there seems to be much doubt whether it will ever be allowed as a recognized kind of fishing within territorial waters. Indeed, the license granted by the government is said to be merely provisional, and for the purpose of testing the new machine.

**Railway Construction in 1882.**

What effect the strikes of the ironworkers may have upon railway construction during the rest of the current year cannot be told; thus far the work has greatly surpassed that of last year, when the increase of mileage—between 9,000 and 10,000 miles—exceeded that of any previous year. Indeed, during the first five months of the year the increase was more than double that of the corresponding months of 1881. According to statistics compiled by the *Railway Age*, in 36 States and Territories, on 120 roads, no less than 3,480 miles of new railway were laid down during the time mentioned.

**A Canadian Land Speculation.**

A syndicate of English and Canadian capitalists are negotiating with the Canada Pacific Railway syndicate for the transfer of the rights of the railway company to some millions of acres of land in the Canadian northwest. The Duke of Manchester, now in Winnipeg, is said to be at the head of the gigantic speculation. It is reported that to encourage emigration the land company will erect houses for settlers. The railway company's land grants cover 10,000,000 acres.