and due probably to the comparative freshness of the water. I found Limnea campestris, Planorbis trivolvis, a small Gyraulus, and a Physa, on its banks during the halt of the train. Physa does not object to strongly alkaline waters, or to springs of a high temperature, and probably occurs in most of the alkali ponds. Ducks are not common even in the migrating seasons, though one small water-fowl, which seemed to be a grebe, abounded on nearly all the lakes.

The birds of this region have been pretty thoroughly collected by Professor McCoun, who, more than any other naturalist, has travelled over these north-western plains. He made this year a list of no less than 110 species of birds during a rather limited search for alpine plants between Calgary and the Selkirks.

The railway, after crossing the South Saskatchewan, in lat. 50° at Medicine Hat, on a beautiful iron truss bridge built in Pittsburgh, takes a northerly course until it reaches the 51st parallel at Calgary. This is on the outermost edge of the foot-hills of the Rockies, which first come into view at Gleichen, 100 miles away. This was neutral ground between the Plains, Crees, and the Blackfeet; the former wandering northward, and the latter occupying the Cypress Hills and the plains between Bow River and the country of the Bloods and Piegans along the U.S. boundary. On the lower Bow River were located a section of the Blackfoot nation, named Sarcees. The site of Gleichen was known to the trappers in the long-long-ago of the last decade as Blackfoot Crossing. Since then the Bow was easily fordable. Thirty-five miles northward, where the Rosebuds flow into Red Deer River, are the Hand Hills, having bluff faces southward forming the 'Cree look-out.' The Blackfeet, going north in pursuit of buffalo, would be sighted by sentinels posted here, and instantly chased, whereupon a race would ensue back to the Crossing. There may still be discovered remains of intrenchments thrown up by hard-pressed Blackfeet as a defence in fighting off their pursuers until they could get to the safe side of the ford. This borderland of constant struggle ought to yield a rich harvest to the archeologist. How Putnam or Abbott would enjoy following the first plough!

I was told in regard to these Indians (who look and dress precisely like those in Dakota and Montana) something which was new to me; namely, that originally (not through white teaching) they kept a regular police patrol in their villages all night. This consisted of a few young men appointed daily by the chief, whose business it was to see that no one left or entered the village after bed-time without a thorough explanation, and to prevent skylarking or mischief of any kind. This was not a herd-guard or military precaution, but a civil police.

Calgary is advantageously placed at the junction of the Bow and Elbow, — names given by the Indians. It stands upon a gravelly plateau, with no trees in sight save the cottonwoods in the river-bottoms, and with the mountains grandly in view. It is the site of quite a modern post of the Hudson Bay company, which has now abandoned its stockade for a commodious store in town, and it is the headquarters garrison of the mounted police. The horse-training evolutions of this irregular cavalry are very interesting; and one hears remarkable stories of the fidelity and intelligence displayed by these animals during the arduous campaigns, often in the depth of winter, which they often share with their riders. Many a half-frozen trooper's life has been saved by the kindness and courage of his horse. Calgary is a large and growing town.

The winters here are, of course, very severe; the mercury often sinking to — 40° F., and staying below — 20° for weeks together. No one complains, however, except when the wind blows; yet harrowing tales of suffering and death are heard, where men have been caught at some disadvantage. The snow in the foot-hills lies deep, but on the plains disappears rapidly under the influence of the warm, dry wind sweeping up from the great Utah and Columbia basins, which people here erroneously call the Chinook. Cattle feed out all winter among the rolling, partly wood ridges about Fort McCleod, — perhaps the best cattle-region on the continent; but in the neighborhood of Calgary winter feeding is necessary, and as far north as the Red Deer River (a fine summer range) cattle-ranching is considered impracticable on account of the depth of snow. Between Calgary and Fort McCleod the foot-hills are devoted to sheep. ERNEST INGERSOLL.

CARBOLIC ACID AS A DISINFECTANT.

OF all popular ideas, none seems to be more firmly rooted in the public mind than the notion that carbolic acid is a disinfectant of the most powerful nature. When a disinfectant is wanted, people go to a druggist for some preparation of carbolic acid, and he gives them 'carbol,' or 'carboline,' or 'carbolcine,' or 'carbolic purifying powder,' or some similar thing, which is warranted to be 'the best disinfectant known,' and 'a sure preventive against small-pox, measles, cholera, mumps, diphtheria, whooping-cough,' etc. Then the buyer goes home, sprinkles his carbolic-

acid preparations round, smells a strong smell, and feels safe.

This notion probably arose from the fact that carbolic acid is a very good deodorizer and a very good antiseptic, and that the popular mind has failed to distinguish between these properties and those of a disinfectant. Indeed, it may be said that the scientific mind made the same mistake until the ubiquitous germ theory made its appearance to explain, among other things, just what a disinfectant was. A disinfectant must, according to this theory, be a germicide; and, if it is to be of any use, it must kill the germs quickly, and when used in comparatively small quantities. The question before us is to decide how far carbolic acid fulfils this indication. The first experiments [1] made with a view to answering this question were those of Rosenbach,[2] who, in 1873, showed by experiments on unhealthy pus that a 0.5-per-cent solution of carbolic acid did not act on this substance as a disinfectant, but that a 5-per-cent solution did. About the same time Devaine [3] proved that a 0.5-per-cent solution had no effect on the anthrax bacillus. Similar experiments by Braidwood and Vacher,[4] and Dougall,[5] seem to show conclusively that vaccine virus is not changed when subjected to the prolonged action of a 1-per-cent solution of carbolic acid, and that in some cases it was not affected by a 2-per-cent solution. Sternberg [6] has also shown that nothing less than an 0.8-per-cent could be relied on to destroy the micrococci of pus and septicaemia.

The latest researches on this subject are those of Gärtner and Plagge.[7] These gentlemen, under the supervision of Koch, carried on a careful and elaborate series of experiments on thirteen different species of micrococci, using solutions of 1 per cent, 2 per cent, and 3 per cent. One part of pure culture was shaken up with forty-nine parts of the carbolic-acid solution, and allowed to stand for a longer or shorter time.[8] Then a small portion of the mixture was placed in conditions favorable to growth. It was found that under these circumstances the 1-per-cent solution did not act at all as a germicide, that the 2-per-cent solution failed to kill the germs in two out of the thirteen cases, and that the 3-per-cent solution acted in all cases as a disinfectant. A further series of experiments showed that a 3-per-cent solution of carbolic acid would probably act as an efficient disinfectant when applied to the hands, to surgical instruments, to dressings, etc.

Earlier experiments [1] by the same authors, as well as some of Braidwood and Vacher's experiments, showed that in a gaseous state about 12.5 grams per cubic metre would be needed to disinfect damp clothing, and 15 grams per cubic metre to disinfect dry clothing.

In view of these experiments, it seems very clear that carbolic acid is of no value whatever when used in any ordinary quantities to disinfect sick-rooms, water-closets, clothing, etc., and is of doubtful utility in any case unless the object to be disinfected can be thoroughly soaked in a solution at least as strong as 3 per cent.

F. S. BUNKER.

[1] An exhaustive *résumé* of the literature on this subject is to be found in the *Medical news*, xlvi. 317-320.

[2] *Med. record*, viii. 427.

[3] *Comptes rendus*, lxxvii. 821-825.

[4] *Brit. med. assoc.*, Scientific reports, London, 1876.

[5] *Brit. med. journ.*, 1879, ii. 726-728.

[6] *Amer. journ. med. sc.*, lxxxv. 321-344.

[7] *Archiv. klin. chir., Berlin*, xxxii. 403-413.

[8] In the different series of experiments the times were 8, 15, 30, 45 seconds, and 1, 3, and 5 minutes.

MALTHUS AND HIS WORK.

Two recent productions have come to our notice, having for their chief subject the Malthusian theory of population. Mr. Bonar's book [2] contains a painstaking and intelligent account of Malthus' 'Essay on the principle of population,' and the discussions which preceded and followed it; an impartial review of his other writings and controversies; and a brief narrative of his personal life. Mr. Nossig's series of papers [3] presents a pretentious medley of learning unaccompanied by insight, of that arrogance towards old wisdom which a superficial acquaintance with modern knowledge often induces in a shallow mind, and of that amusing species of childishness which manifests itself in writing down formulas having a profoundly mathematical appearance to express obvious truisms or crude scientific fancies.

One cannot help feeling, on reading an article like Nossig's, — written by an educated man, and published in a scientific journal of high standing, — that the way in which the doctrine of Malthus has fared with a considerable part of the reading and writing world is most discreditable to the average human mind. That a doctrine pregnant with the weightiest practical consequences in human affairs should for a century be disputed in every way, — with wisdom and with folly, with logic and with sophistry, by fair means and foul, — is not surprising; but that its opponents should still so often fail to grasp the meaning of the doctrine itself is

[1] Deutsch. verein für oeffentliche gesundh. pflege.

[2] *Malthus and his work.* By JAMES BONAR. London, *Macmillan*, 1885. 8°. (New York, Harper.)

[3] *Ueber die bevölkerung.* By ALFRED NOSSIG. *Kosmos*, 1885.