has at present only seven members on the association's rolls, three of them the sole survivors of the twenty-five. Was it for missionary service that Buffalo called the association to its open doors? Does Buffalo look upon itself as *in partibus infidelium?*

THE TRANSCASPIAN RAILWAY.

THE Transcaspian railway was opened for traffic on the 14th of July as far as Merv. The operations must already be far advanced on the Merv-Bokhara-Samarcand branches, for the names of railway stations, the distances, and other details over the whole length of the railway, from the Caspian to the Turkestan frontier, are already known. The following are fresh particulars of this important central Asian strategical railway:

There are altogether 63 stations from Michailovsk, on the bay of that name on the Caspian, right through the deserts and oases of the Transcaspian, across the Amu Darya and Bokhara to Samarcand. These do not include the new branch of 25 versts, made from Michailovsk along the Caspian coast to Ousun Ada, in order to have deep water for the connecting sea service, and to avoid the reshipment formerly necessary between Krasnovodsk and Michailovsk. The distances between these stations vary from 15 to 33 versts, being in most cases from 22 to 25 versts.

The whole distance of the line when completed as far as Samarcand will be 1,335 versts. The distances in Central Asia have become so exaggerated in most minds that few persons would imagine that they might travel by this new railway right through the Transcaspian Steppes, over the Oxus, and from one side of Bokhara to the other, coming out at Samarcand, in something like a day and a half, or less.

The first, or western, portion of the railway runs through a desert, crossing now and then an oasis, then traverses the cultivated territory of Bokhara, and ends at Samarcand in Russian Turkestan. The desert stretches along the line 148 versts between the sea-coast and Kazandjik, and 69 versts from the latter station to Kizil Arvat. The Akhal Tekee oasis extends as far as Gheours, 237 versts. The furthest point south, Doujak, is distant from the sea 581 versts, from Askabad 159 versts, Merv 167 versts, and Samarcand 754 versts. The railway traverses 300 versts of Bokharan territory. Were the line made from Merv over Burdalisk and Korti, instead of Charjui, 100 versts would be saved, and the distance between Michailovsk and Samarcand would be only 1,200 versts, or 800 miles, instead of 890 miles; but the Bokharan government, for some reason or other, did not consider that this shorter route would so well serve the interests of their country.

The principal stations are those of Askabad and Samarcand. Besides post and telegraph offices, lodging houses have been already partly built at several stations for travellers, though nothing in the way of luxury will be provided, as may be imagined. According to the time-table, the trains will run 20 versts an hour. In the event of war, the number of trains departing may be increased to 12 per day.

The railway at present is only a single line. Although many of the stations are situated in waterless deserts, they are all furnished with water in one way or another. At Michailovsk there is Nöbel's machinery for converting the sea water into fresh water, and at several stations large cisterns are to be regularly supplied, either through pipe lines or by water trains. Artesian wells have also been dug, and good water has been found between Michailovsk and Molla Kary, and at other points. Not far from Bala Isshem, the railway also has its own petroleum sources, connected by a branch line.

THE RECENT ERUPTION IN NEW ZEALAND.

A STEAMER which recently arrived at San Francisco from Australia brings further details of the great volcanic disturbances in New Zealand. Heavy earthquakes were still felt in the Tarawera and Sulphur Springs districts, and severe shocks continued in the Rotoli district. A relief party that was sent out reported that Lake Tarawera had fallen considerably. The oil bath at Whakarewarewa was throwing up stones and mud to the height of twenty feet, and the great boiling lagoon of Papatangi would suddenly rise as much as two feet, and then as quickly fall. A similar phenomenon was observed at the Kuirrau caldron, which would rise two feet in half an hour, and then as quickly return to its normal level. Mr. Dinsey, the telegraph officer in charge of the Rotonea station, near where the eruptions and earthquakes were heaviest, reported on June 25 that volcano No. 1 was dead, and that Nos. 2 and 3 were steaming. No. 4 was still throwing up mud. Lake Rotomahana was comparatively quiet, with only one geyser in the centre playing. The Pink Terrace geysers were still blowing up clouds of steam, but were less active than they had been. The immense crevasse created between Tarawera and White Terrace continued to steam, and the cone on top of Tarawera Mountain was throwing out volumes of black smoke and steam. The New Zealand *Herald* says: "On Galatea Plains the

volcanic showers of mud at times took very eccentric courses, overleaping one section of land and then striking another further on, in the same line. Dr. Hector, who is making a scientific examination of the volcanic districts, said he expected that the volcanic cone which was thrown up in Lake Rotomahana during the disturbances had already on July 1 attained a height of six hundred feet, and was daily adding to its stature. He has named it Mount Hazard, after the gentleman of that name who lost his life on the first night of the great eruption. A chemical examination of the volcanic ashes shows that they are mostly composed of fine basaltic soil. Every human being has abandoned the entire portion of country situated within the limits of the volcanic system. Photographers were busily engaged taking views of the region."

GAS SUPPLY.

NUMBERS two and three of the publications of the American economic association are covered by a monograph, entitled "The relation of the modern municipality to the gas supply," prepared by Edmund J. James, Ph.D. The pamphlet contains a thoroughgoing investigation of the various systems of gas supply, and for that reason should commend itself to all interested in municipal administration and economic phenomena. The author, as is well known to readers of *Science*, is disposed to widen the sphere of state activity, basing his reasoning on philosophic conceptions. The present discussion, however, is not limited to a scholastic treatment, but assumes an intensely practical form. It is viewed from two standpoints: that of the individual, who is interested in obtaining a good quality of gas at a low price; and that of the municipality, which is interested in acquiring a revenue by legitimate economic methods. On both these points, Dr. James supplies abundant data. He shows how many European, and especially English, cities have been able to save large sums for the taxpayers by managing gas trusts on a business basis; while on the other hand, "the general opinion in England seems to be that the gas furnished by the public companies is better than that made by private companies." The experience of city upon city is adduced to support the belief that a transfer of ownership from private parties to municipal authorities would be of immense benefit. In the United States, there are at least three city corporations, Philadelphia, Richmond, and Wheeling, which undertake the manufacture and sale of gas. In each of these the results, upon the whole, have been favorable. The monograph is enriched by statistical information which makes it exceedingly serviceable; and the thoroughness of the work augurs well for the series of publications which the Economic association has undertaken.

LONDON LETTER.

SEVERAL weeks ago, attention was drawn in this correspondence to a remarkable outbreak of scarlatina in a London district, in which the hypothesis that the disease had spread from the milk drawn from one particular farm, seemed to be suggested and supported by the facts of the case. The proof, then wanting, that the disease of the animals could really produce scarlatina in man, has now been supplied by the investigations of Dr. Klein (conducted mainly at the 'Brown institution'), whose report has just been issued by the local government board. Four calves were inoculated with the matter from sores on the udders of the diseased cows, and similar sores were produced in them. Dr. Klein states that this disease, thus artificially produced in the calf, 'bears a close resemblance to human scarlatina,' and he specially quotes the appearances found in the kidney of the animal as indicative of the scarlatina attack. It is remarkable, however, that the milk of the affected cows is harmless, and does not contain, *per se*, the germs of the disease, but that it is contaminated after it has passed from the udder of the cow. Dr. Klein says that the fingers of the milker must of necessity bring down into the milk diseased particles from the ulcerations on the teats of the animal, and he points out that in the milk 'the disease germs find a good medium in which to multiply.'

As the last important act of his present official existence, Mr. Mundella, the president of the board of trade, has just announced that a 'Fishery department' is to be forthwith created, with an assistant secretary of state at its head. Mr. Berrington, who is to be the chief inspector, will be recognized as the right man in the right place, since he has already won his spurs as the successor in that post of Professor Huxley. The new department promises to be strong in practical knowledge.

The latest large engineering scheme which has been broached is that for a tunnel between Scotland and Ireland, at two points (Port Patrick and Donaghadee) where the distance from land to land does not exceed twenty miles. A shaft is to be sunk at once to test the strata. The cost of the tunnel has been estimated by competent authorities at $25,000,000, and that of the land approaches on either side, $5,000,000 more. The distance from Moville, in Lough Foyle (where the Allan line steamers now call), to London will be