istic signs of leprosy which they brought with them from a leprous country.

Mr. Hutchinson goes on to say, as leprosy can begin without inheritance, is not associated with poverty, dirt, climate, or hardships, and is, besides, with the utmost difficulty contagious, "he is driven to the conclusion that it must depend upon some very special kind of poison of rare occurrence taken in connection with food." Now there is unquestionably a great deal of truth in this statement, for, as he totally denies the possibility of leprosy being propagated in England even under the very exceptional circumstances recognised here, and which can hardly be called contagion, it leaves us to seek the true cause of the spread of the disease not only, as he says, in food, but in that particular kind of food which, although now entirely discarded, was formerly largely consumed by all classes in England. And may not that particular kind of food be some fish which has now entirely disappeared from British waters; or, like some of the fish still in our seas, which develop poison at certain seasons, and that poison rendered characteristic only when accompanied by decomposition?

The chief food of the negroes and lower orders here has been for generations past a salted fish called cod, but it might be anything else. It is imported from the United States of America. As health officer I can truly say that it does not always arrive or keep here perfectly sweet, nor did the effluvia from this food ever remind me very forcibly of the hay-fields of England.

INOCULATION AND VACCINATION FOR SMALL-POX AMONGST THE CHINESE.

By JAMES CANTLIE, M.B., C.M., F.R.C.S.,
Hong Kong.

THE question of vaccination is apparently exciting attention in England just now; and that the anti-vaccinators are obtaining a hearing from the fact that a Royal Commission is at their instance to investigate matters, it is evident that an important scientific expedient is upon its trial. As all eyes are upon the question, it may be interesting to know what is going on on the other side of the world amongst a people who have known and practised inoculation for many centuries, and to whom also vaccination has been made known by foreigners for nearly 100 years.

In this article the following significance is attached to terms: (1) Inoculation means the direct infection of small-pox; (2) variolous lymph means material gathered from a person inoculated; (3) humanised variolous lymph refers to lymph gathered from a person through whom variolous lymph has passed; (4) active and passive humanised variolous lymph are terms meant to indicate the degree of power in lymph so named.

Inoculation.—Inoculation has been practised amongst the Chinese from dim antiquity, and its origin is lost in mythical genesis. At the present day, as from early times, three methods of the artificial production of small-pox are practised: (a) The scab from a dried small-pox pustule, after being pulverised, is blown up the nostril. (b) The clothes of a person suffering from small-pox are worn by the person to be infected. (c) The matter from a small-pox pustule is inserted beneath or on the abraded skin. By a mucous membrane, by the skin, and by the circulatory system directly sums up the category of the process of inoculation. The result in every case is similar—provided the process takes—except that in the last mentioned a special local pustule is developed in addition to the general eruption of pustules over the body, and it is from these special local pustules developed at the seat of inoculation that variolous lymph is gathered for further infection.

Inoculation is only practised when an epidemic of small-pox is actually in the midst of a community; at other times it is impossible to get the Chinese to listen to the benefit of preventive measures. This is only a further proof of the semi-civilised form of Chinese government and their empiric attempts at science. But inoculation is a rare event, and it is only when the supply of humanised variolous lymph has run out that the process is reverted to. In the community of Hong Kong, even when native—that is, humanised—variolous lymph is no longer available, the vaccinators (Chinese doctors) will fall back on vaccine matter as supplied by foreigners rather than employ inoculation. It will therefore be readily seen that the same humanised variolous lymph may be used for years—may, in fact, have been at

Hong Kong when the place was first taken by the English nearly fifty years ago.

We have no knowledge from careful inquiry amongst the very oldest Chinese doctors—and some of their experiences date from the peopled history of the island—other than that they are dealing with the lymph then introduced. In fact, what is now being used is passive, not active lymph. The power of lymph is known to behave as do ferments; and as with ferments, so there is a history of increased activity, gradually tending to decline, and finally to a loss of fermentation power. From what is observed as to the protective power of humanised variolous lymph, this process of activity and passiveness is the only possible explanation to be advanced to explain the enormous prevalence of small-pox amongst the Chinese. When a Chinaman is asked if he ever has had small-pox, he answers, "Not yet," implying thereby his likelihood of catching it. He regards small-pox, in spite of all his professed practice of inoculation, as we do measles.

In Hong Kong in November and December, 1887, and January and February, 1888, there prevailed one of the worst small-pox epidemics ever known. Suffice it to say that there were "known" to have died of small-pox in Hong Kong in the month of December, 1887, as many people as died in Britain during the whole of 1887. The population of Hong Kong is but 200,000, that is, about the size of the town of Hull. Moreover, there was an epidemic in at least two large towns in England during that year.

What inferences are to be drawn from this statement?—

1. That the preventive measures against small-pox, though believed to be known and practised amongst the Chinese, are neglected.
2. That the lymph they are using is passive, humanised, variolous lymph, that is, lymph which, though fit to raise a bastard pustule, has lost the power of protecting the subject against not only catching small-pox, but that it renders no protection against a fatal issue.

3. That preventive measures used in the height of an epidemic, at any rate as attempted by the Chinese, are useless to stay the death-rate. All this is easily understood when it is remembered that in Hong Kong they may be using lymph derived from its parent source fifty years ago.

4. Reinoculation—what we call revaccination—is never practised; and from what we know of infant vaccination it would seem to confirm the belief that a single insertion in infancy is valueless for adult protection.

Vaccination.—Vaccination amongst the Chinese, at any rate in Southern China, has been practised since the end of the last century. The East India Company brought vaccine matter from India to Macao (a Portuguese settlement at the mouth of the Canton river), and vaccination was practised upon the Chinese there, and in Canton. Whilst a small-pox epidemic prevailed, which it did with more or less severity annually, there was no difficulty in getting subjects; but when the scare was over the Chinese did not see the necessity for vaccination. Lymph became exhausted now and again, and a fresh supply had to be obtained. This fresh supply was obtained from India or from Manilla. Manilla, the farthest outpost of Spain, was in the early days more in touch with the Pacific shores of South America than with the Asiatic littoral, so much so that vaccine virus was conveyed from South America to Manilla to replenish the played out stock there. A long, long way to reach its destination was the precious fluid carried. From Spain across the Atlantic, and then across the broad continent of South America and over the treacherous Pacific, was the route chosen, without steam to aid its advance, and the dense jungle tracts impeding its reaching its destiny. Such was the belief, however, in the efficacy of vaccine matter as a preventive of small-pox, and such the care of His Most Catholic Majesty for his distant subjects. The lymph was many times freshened on the way by reinsertion, so that by the time it reached Manilla an active lymph was obtainable. From the two sources enumerated was vaccine lymph introduced, not only to Macao, but to Canton. We read that A-He-Qua, a Chinese vaccinator, was engaged in the practice of his art in the Hall of the British Merchants in Canton in the year 1800. Lymph was brought by the East India Company ships to replenish A-He-Qua's supply, enabling him to practise vaccination many years. By this method vaccine matter was introduced into Southern China, and the practice is now widespread.

Revaccination and Reinoculation.—As stated above, revaccination and reinoculation are not practised by the Chinese. During the epidemic of small-pox in Hong Kong, referred to above, only two adult Chinamen were, to my knowledge, revaccinated. These were educated

men of the most liberal type, but no such practice is thought of by the Chinese doctors or the public. Were we convinced that Chinese children were universally vaccinated we could have an excellent proof of the futility of infantile inoculation or vaccination for adult protection, as judged by the enormous death-rate. But whatever is the belief, it is a fact that vaccination is rather the exception than the rule, except when an epidemic is rife.

Vaccine Matter.—To Hong Kong vaccine matter is brought from England, and by each mail a certain number of tubes are imported. Vaccine when brought out during the winter and used at once is generally active and reliable, but if imported during the hot weather many tubes have to be thrown away. Instead of bringing lymph by the Red Sea route we are trying the Canadian Pacific route, and hope to get an improvement in our supply. The most reliable lymph met with here is the Japanese calf lymph. It is stored in fusiform-shaped tubes, and sealed with wax at each end. The Japanese authorities allow of the lymph being mixed with glycerine. It is thoroughly reliable, develops enormous scars, and causes much constitutional disturbance even in re-vaccination. We are also attempting the importation of lymph from India, but the experience of the Dutch in Java, who have already made the attempt, and are many days nearer India than we are here, does not favourably impress one with the possibility of success. My own attempts with lymph from India have not been successful.

THE MINERAL WATERS OF BRIDES-LES-BAINS.

By C. E. FITZ-GERALD, M.D.,
Folkestone.

THE little town of Brides-les-Bains, in Savoy, possesses natural advantages unrivalled, or at any rate unsurpassed, by those of any watering place in Europe. I have long been seeking a spa which had at the same time a really active mineral water, an Alpine climate and scenery, and a good hotel. At Brides-les-Bains all these advantages are combined. The bathing establishment is situated in a beautiful but somewhat narrow valley, through which rushes the mountain torrent of the Doron, a tributary of the Isère. It is sheltered from the north by lofty wooded mountains, whose bases are covered with smiling vineyards, and their summits clothed with walnut-trees, sycamores, acacias, and pines; while at either end of the valley tower lofty, snow-clad mountains, which not only impart grandeur to the scene, but refresh the air by the cool currents which come from their glaciers.

Brides is essentially a bracing place. It is situated at an altitude of about 1,800 feet above sea-level, while the salt baths of Salins are some 300 feet lower down the valley. The best season to visit Brides is from the middle of May to the end of June, and again from the middle of August to the middle of September, when the climate is almost perfect, ranging from 65° to 70° F. It is, I think, a great mistake to go there, as the French do, in July and the early part of August, when the temperature is decidedly too hot. From noon till 2 P.M. it is often too warm for walking, and the patient may with advantage take a *siesta* after the mid-day *déjeuner*; but the mornings and evenings are deliciously cool, fresh, and invigorating, and there is none of that sultriness at night so often experienced in Continental towns, and which is so fatal to sound and refreshing sleep.

The waters of Brides may be described as mildly aperient, slightly alkaline and tonic; their more active ingredients are sulphate of soda, sulphate of magnesia, bicarbonate of lime, carbonate of iron, with a trace of iodine and arsenic. They may be compared with the waters of Marienbad and Carlsbad though, unlike the latter, they do not contain carbonate of soda; their action is at once tonic and aperient, and they are superior to many mineral waters in that they do not upset the digestion. On the contrary, they act on the bowels without griping; they favour the secretion of bile, soothe the mucous membrane, and improve the appetite. The waters issue from the source at a temperature of about 80° F., and should be taken in doses of about eight ounces on an empty stomach; it is well to let an interval of from ten to twenty minutes elapse between each dose. From two to four glasses *per diem* is usually sufficient to secure two or three loose, bilious evacuations. Their action is also mildly diuretic and diaphoretic; their analysis is as follows:

	Grammes.
Carbonic acid gas	0.1258
Silica	0.0340
Bicarbonate of lime	0.4032
" magnesia	0.0230
" protoxide of iron	0.0191
Sulphate of lime	1.7680
" magnesia	0.5079
" soda	1.2576
Chloride of sodium	1.9471
" potassium	0.0899
" lithium	
{ Arsenic	Traces.
{ Iodine	
Organic matter	0.0052
Total, per litre	6.1808

The taste of the waters is vapid, but not unpleasant; in fact, the patient soon comes to look forward agreeably to his morning drink. On issuing from the source the waters are quite limpid, but deposit a sediment of iron and lime after prolonged exposure to the air; when bottled, they remain for long periods unchanged, and bear transportation perfectly well. They seem to have a special action on the liver and portal system, and most certainly (in spite of all theories to the contrary) favour the flow of bile through the intestines. The Brides waters are an almost typical aperient, for, although certain in their effect, they are gentle and painless in their action, and, unlike many alkaline aperients, do not lose their effect by repetition; being also an excellent tonic, they improve the digestion, and exhilarate instead of depressing the spirits. They act admirably in all the Protean diseases resulting from the retention of uric acid in the system, notably in gout, chronic rheumatism, dyspepsia, gastric catarrh, and "Indian liver." In obesity their action is marked, and most beneficial; they appear to act partly by their purgative effects, and partly by stimulating the eliminative action of the liver and favouring oxidation.

Dr. Delastre, a highly intelligent resident physician, who has made a special study of the action of the Brides waters, claims that they have a special, and indeed specific, action in cases of diabetes.

A system of shampooing, similar to that of Aix, is practised at Brides, the treatment being also supplemented by the use of the powerful salt baths of Salins, which are situated some two miles distant. The waters of Salins-les-Bains issue from their source at a temperature of 95° F.; they are strongly impregnated with chloride of sodium, and also an appreciable quantity of iron and arsenic, and are highly charged with carbonic acid gas. They are used chiefly as baths, although they may be taken internally in certain conditions; they are suitable in cases of scrofula, anæmia, general debility, and chronic rheumatism.

The treatment at Brides may be described as "waters supplemented by baths;" at Salins as "baths supplemented by waters." Both places manufacture and export pastilles from the salts extracted from the waters, those of Brides forming an excellent laxative, far superior, to my mind, to those of Carlsbad; those of Salins consisting of carbonate of iron, arsenic, and chloride of sodium, are principally used in cases of anæmia and chlorosis.

One great feature of Brides—its speciality, indeed—is what is called there the "combined cure," that is, the administration of the purgative waters of Brides, supplemented by the bracing and tonic salt baths of Salins, a combination which will at once commend itself to the physician.

One great advantage which Brides possesses over most other watering places is the beauty, variety, and accessibility of the surrounding walks, drives, and excursions. The most delightful walks present themselves almost before one is well beyond the grounds of the Hôtel des Thermes (the hotel *par excellence* of the place); walks, moreover, suited to every capacity, from "the pottering around" of the gouty and rheumatic to the mountain climb of the athlete. You may stroll gently on over well kept paths, through lovely woods, and by the side of rushing torrents; drive along excellent roads to various interesting places, or to spots commanding extensive views; or make numberless mountain ascents. The flora and fauna, too, of the neighbourhood are calculated to gladden the heart of the naturalist from their beauty and luxuriance.

Why then is Brides, which combines all these great natural advantages, so (comparatively) unknown and unvisited by the English? Its scenery and climate are far superior to Carlsbad, or