

water-closet system, which discharges amongst the rocks which form D. and N.'s oyster-beds (Nos. 2 and 3 on the map). The wool-scourings also discharge here. Inshore from N.'s and M.'s beds are a cemetery, a fell-mongery, and a tannery, all draining on to the beach. There is, then, plenty of opportunity for these oysters to receive pollution. The beds below the Mangere Bridge are only threatened by the ebb from the Mangere Creek, and it must be fairly diluted by them, as there is a large volume of water up to Onehunga Wharf and a swift tide. I have had a good deal of experience of boating, &c., in this part of the harbour, and never found any signs of pollution visible to the senses. The Puketutu (No. 10), Ihumatao (11), and Pukaki Creek (12) beds are free from all possible danger. Although the beds (1 and 2) from which W. was supplying certain dealers in Auckland are thus open to risk, I do not think that there is any good evidence that they were responsible for the typhoid outbreak. A large amount of the products of all these beds above Mangere Bridge is consumed locally in Onehunga; yet here we have not had a single case of enteric reported, and Dr. Scott, Health Officer for the port, informs me that, while there have been one or two cases in the neighbourhood this year, all were imported from other parts, none arose locally. Had these oysters been at fault it would be reasonable to expect a local outbreak in June. Again, the dealer in Auckland (W.) to whom the greater number of the typhoid cases can be traced (see Table B) has not at any time this year bought Onehunga oysters (so he and the local man, W., assure me). On the other hand, B. was dealing in Onehunga oysters at the time his employee (E. W., case 5) received the infection. Also we have the one patient (H. P., case 16) who got oysters directly from W.'s shop, but as he took ill almost immediately after, and had oysters from Auckland shortly before, this is not an absolutely clear case. It is possible, of course, that the parties interested may be concealing the facts. One dealer asserts that about the end of May and early in June Auckland was entirely supplied from Onehunga, as the influx of visitors for the Duke and Duchess of York's arrival had produced a great demand, and dealers who otherwise disliked using the inferior oysters from Manukau were driven to do so, especially on the closing of the Russell beds. But this was probably at a later date than 25th May, and we see from the shipping returns that W. and J.—both of whom deny having Onehunga oysters, while both have many cases traceable to them—were getting their usual supply from Russell. I think, on the whole, the weight of evidence is against Manukau oysters being at fault, dangerously situated as some of the beds are. As B. was shipping Onehunga oysters at the end of May down to New Plymouth, it would be important to learn whether they had caused an outbreak there.

Another source of supply to be considered is the smuggled oysters picked in the Waitemata Harbour. Two dealers have assured me that they were aware such oysters were sold in Auckland at the end of May, and added that W. had bought them. As they were trade rivals it cannot be looked on as reliable evidence. Yet it is certain that smuggling does take place, the Customs officials having detected a case in June; and, as the closing of the Russell beds produced a shortage at a time when visitors were crowding into Auckland, the increased price would be a great inducement to the dealers. The pickers cart these oysters round to the retail houses and sell them at the door. It is, of course, difficult to obtain any history of such transactions, and probably they are not recorded in the books. We have an instance (case 17, Q. H.) where the patient may have been infected by oysters taken directly from the rocks around Ponsonby, and there is sufficient sewage running into the harbour to render dangerous the beds here and further down about Mechanics' Bay and Parnell. Again, I am told that the smugglers are in the habit of concealing the sacks until convenient times, in shallow parts of the harbour, such as Mechanics' Bay, where the outfall from the Grafton Road sewer is. This theory would explain the outbreak completely, a cartload of such sacks—having lain for twenty-four hours or so near a sewer—being taken round and sold to the various shops concerned. I was at first inclined to believe that this was the case.

PICKING AND TRANSMISSION.

Taking now the question of the possibility of pollution during picking and shipment, there is a difficulty in imagining a wholesale infection in this way. The oysters are torn from the rocks by means of shovels, and at once placed in sacks; these are then brought in boats to the port of shipment (Russell), where they may lie for a day or two awaiting the steamer. All the dealers agree that it is unnecessary to keep them in sea-water, as they continue to live in the sacks for some weeks after storing. It is improbable that they were kept at Russell in the sea near the village. In the case of the Mangere beds the oysters are sacked and carted directly into town. On board the "Clansman" (the steamer running to Russell) they were in the habit of loading the oyster-sacks last, putting them on the top of the hatchway-covers. There is then small chance of contamination here. As an argument against the infection having been at Russell or during transmission, I may mention that the shipping returns show that the same picker who was in the habit of supplying W. and B. also supplied a merchant in Paeroa, and on 16th May, and again on 23rd May, shipped loads of oysters to all three. Dr. Buckby, of Paeroa, informs me that there has been no enteric there for eighteen months (one case came from Waihi in June, however). Had these loads been infected it would have been reasonable to expect an outbreak there also.

THE DEALERS.

In the hands of the dealer there is every chance for infection of the oysters. I have inspected the premises of most of the retailers in Auckland, and in none can the conditions be called ideal, while in some there are evident dangers. The oysters are stored in sacks in a cellar or the back premises of the shop. As required, they are taken out and opened on a rough block of wood (usually very dirty); then placed in basins, tins, or bottles, none of which have been cleaned with any special care, generally only rinsed with cold water. When more oysters have been opened than can be sold immediately, some of the dealers—B., S., and W.—store the bottles or cans in cool-chambers at the freezing-works, each having his own compartment. I have inspected these chambers, but did not find any likely source of contamination there. Foul cellars, dirty pails and bottles, the hands of the oyster-opener, all afford a ready means of infection. It is noticeable that a large number of the enteric patients bought their oysters in bottles.

TABLE B.

Name of Dealer.	Cases certainly owing to Oysters got here.	Probably obtained here.	Possibly obtained here.	Total.	Source of Oysters.	Remarks.
W.	3 cases, Nos. 1, 2, and 3	5 cases, Nos. 4, 5, 8, 9, and 20	2 cases, Nos. 7 and 15	10 cases	Russell ..	No. 7 may have got the infection at this shop, living, as he does, next door.
B.	..	1 case, No. 5	2 cases, Nos. 15 and 17	3 "	Russell and Manukau	No. 15 may have been infected here or S.'s, or possibly W.'s.
S.	..	..	4 cases, Nos. 10, 11, 15, and 16	4 "	Russell and Manukau	None of these cases are very clearly attributable to S.'s.
J.	..	..	4 cases, Nos. 10, 11, 13, and 14	4 "	Russell ..	None very certain as to origin.
C.	..	..	2 cases, Nos. 7 and 19	2 "	Russell ..	Both doubtful.
B.	..	..	2 cases, Nos. 7 and 14	2 "	Russell and Manukau	
W.	..	..	1 case, No. 16	1 "	Manukau	Very doubtful.