

HOW TYPHOID FEVER IS SPREAD?

DR. FRANKLAND, in a recent address to the Fellows of the Chemical Society on the Organic Impurities of Drinking-water, adduced, as a striking instance of the persistency of the typhoid poison when diffused in water, the outbreak of a violent epidemic of typhoid fever in a Swiss village through the use of spring-water which, after contamination with the poison, had filtered through nearly a mile of porous earth, but had nevertheless lost none of its virulent properties. The occurrence in question is one of the most remarkable, if not the most remarkable, on record, and the circumstances in connexion with it have been exhaustively investigated by Dr. A. Hägler, of Basle. The facts have been set forth by the late Professor Parkes in the last volume of the Army Medical Bluebook, and briefly by Professor Frankland in a communication to *Nature*.

In the village of Lausen (on the railway from Basle to Olter) epidemic enteric fever had never occurred in the memory of man, and the neighbourhood was also free. The ground consists of marl and lime, and is tolerably water-holding. Certain well-water was only used by the inhabitants of six houses, while the other inhabitants (780, in 90 houses) used the water from a public spring which arises at the foot of a hill, the "Stockholden." This water is received into a reservoir, and then led, by wooden pipes, into four stone tanks. On 7th of August, 1871, ten inhabitants were attacked, and, in nine days more, fifty-seven persons were sick with typhoid fever. These cases spread over the whole village using the spring water, but the inhabitants of all the houses which had wells of their own were entirely spared. To the end of October, 130 persons were attacked, besides several children; and, towards the end of the epidemic, two persons were attacked who lived in the houses which did not have the water from the common spring. The proof that the "spring-wasser" had distributed the "infectious matter" was based on the following:—Stockholden is a hill 300 feet high; its westerly spur extends into a little side valley. Through this little valley runs the Furler streamlet, beyond which the village of Lausen ends in the

"Ergolz." In the Furler valley were some scattered farm-houses. In one of these farm-houses, in June and July, two persons were attacked with typhoid, and later on two others. The latrines of these houses were all in direct connection with the brook, but this opens into the Ergolz below Lausen. After accurate inquiry it was found, however, that the Furler brook communicated directly with the spring descending from the Stockholden. It was known to the inhabitants of Lausen that when the meadows in the Furler valley were watered, the spring increased in amount; besides, about ten years ago, 100 paces below the infected houses in Furler valley, the upper earth strata had fallen in, and formed a large opening, into which some of the water of the Furler brook flowed without again reappearing. After the hay harvest in July the meadows were water-manured, and the spring in Lausen shortly afterwards obtained a turbid and bad-tasting water. The ground was geologically explored, and when the above-named spring was dug up, salt water was poured into the Furler brook and made the spring in Lausen quite briny. As Professor Frankland puts it in his communication to *Nature*, the passage of water from the irrigated meadows to the spring at Lausen was proved by dissolving in it, at the meadows, eighteen hundred weight of common salt, and then observing the rapid increase of chlorine in the spring water; but the most important and interesting experiment consisted in mixing uniformly with the water fifty hundred-weight of flour, not a trace of which made its way to the spring; showing that the water was filtered through the intervening earth, and did not pass by an underground channel. The conclusion is obvious—viz., the risk which attends the use, for dietetic purposes, of water to which even so-called purified sewage gains access, although, as in the case of Lausen, such water may be used with impunity until the moment when the sewage becomes impregnated with typhoid poison.—*London Lancet*.

WE regret to learn of the death of Dr. Andrew Wynter, at his residence, Chestnut Lodge, Grove Park, Chiswick.