one man was running for the nearest doctor, when an old sergeant shook his head and pointed to the terrible wound in his breast. The fighting glare had gone from his eye, and just before he died, but a few minutes later, his master thought he saw a gleam of affectionate recognition therein.

The good missionary who saw the poor fellow when he was captured had concerned himself greatly about him, and firmly believed that his interest in the Christian religion was real and hearty. So they buried him next day in the cemetery in the "Happy Valley," and when the service was over, and the military chaplain took George's arm, just as they passed out under the old gateway with "Hodie mihi, cras tibi," over it, he repeated, as if speaking the result of his thoughts about the unwonted ceremony: "Greater love hath no man than this, that a man lay down his life for his friends."

We heard the last of this little story one pleasant spring morning in Paris. George Harrison was with a party of us old China and India people sitting in the covered court of the Grand Hôtel. All were homeward-bound except a couple of fellows going out to Amoy. We had been laughing at a colonel from Bengal for wearing his sun-hat in the Bois, and he had heaped coals of fire on our heads by giving us some superb cheroots. As we were lighting them, some one was reminded of Ah-King, who used always to bring in a burning charcoal ball after dinner in a little silver plate, and he asked Harrison what had become of him. He told us, with much feeling, what I have just written, and it made a marked impression on the party. We all agreed that he was undoubtedly the best, as he was also, as far as our knowledge went, the last, of the Chang-maos.

THE DRAINING OF A VILLAGE.

I was called, in the early part of 1878, to examine the village of Cumberland Mills, Maine, where there had been an undue amount of disease, indicating a possible defect of drainage. The village is chiefly owned by Messrs. S. D. Warren and Co., of Boston, and its population is mainly employed in their large paper mill. They had taken every measure that had occurred to them to provide in the best manner for the comfort and welfare of their people, and had expended in drains, sewers, and other sanitary appliances a very large sum; they had, in short, conscientiously done their very best, under the lights available to them, to make their village a model of healthfulness and convenience.

I found on every hand ample evidence of elaborate and costly work, of a charac-
ter appropriate to the different classes of buildings. The agent's house had the usual conveniences and the usual defects of a first-class house in the city; the boarding-houses were abundantly supplied with water-works, and the smaller houses had kitchen sinks with running water, cellar drains, etc.; some of the larger houses were heated with furnaces. The workmanship was generally good, and indicated that it had been guided by a good engineering skill, though quite without sanitary knowledge.

To one accustomed to the inspection of drainage works, the gravest faults of arrangement were everywhere patent. Each house had a drain leading from its cellar to a common sewer of too large size, or to the surface of lower ground in its vicinity. Where water-closets were used, they had been erected with reference to convenience, but without reference to a proper disposal of their wastes. Most of the smaller houses had common privies adjacent to them, and in the majority of cases the drainage of the kitchen sink delivered, often through an insufficiently closed channel, into the mouth of the untrapped drain of the cellar. In some instances there were indications that these drains had become obstructed, and the discharge of the kitchen sink had overrun the cellar bottom. In other cases the foul air of the drain, or of the sewer into which it discharged, flowed back into the cellar and permeated the house. In the few instances where furnaces were used, they took their supply of cold air not from outside the house, but from the front hall, the same air being cooked over and over again—certainly with the effect of economizing fuel. The soil pipes of the water-closets were unventilated, and the insalubrity seemed to be pretty nearly in proportion to the effort which had been made to overcome it.

I was entirely unhampered in my instructions, and was encouraged to do all that the most perfect sanitary condition required. The village lies on rolling ground considerably higher than the pond made by the damming of the Presumpscot River. This pond has a rapid and constant movement. The arrangement of the new system is shown in Fig. 1. For drainage, the houses are grouped mainly into three sets, each with its independent sewer discharging into the river. A is the office building, where the work was very simple, and has not been changed. B is the agent's house, of which the drainage was entirely re-arranged, with a ventilation of its main drain and soil pipe. It is to the drainage of the operatives' houses that I desire to call especial attention.

The heavier lines indicate the main sewers, of six-inch vitrified pipe, running from the flush tanks (F T) to the river. These are laid with securely cemented joints, and with Y branches to receive the house drains, which are shown by the lighter lines. These house drains are of four-inch vitrified pipe, with cemented joints. Each one of them reaches nearly to the foundation wall of the house, and is connected under the cellar floor with the water-closet, which is in nearly every case located in the cellar. The outlet of each of the main sewers is arranged as shown in Fig. 2, its extension through the bank wall of the pond and for some distance into the water being of iron pipe supported and protected by loose stone-work. At the top of the bank there is erected from a T branch of the sewer a four-inch iron pipe extending above the surface of the ground, and open at its mouth for the admission of air. There is no trap between this point and the foundation walls of the houses, each house drain being connected outside the walls with a three-inch ventilation pipe reaching above the roof, shown in Fig. 4. This arrangement secures a free circulation of air through the entire length of sewer and house drains.

At the upper end of each main sewer there is placed a Field's flush tank, constructed as shown in Fig. 3. This is a brick chamber built in the ground, receiving in one case the drainage of a four-tenement house, and in the two others the drainage of the upper two houses of the series—roof water and all. This drainage enters the tank through the pipe C. A is the
surface of the water when the tank is full, and $B$ when it is emptied. The capacity of the tank between the lines $A$ and $B$ is about five barrels. In front of the entrance there is a wire screen to prevent the passage of coarse material. This is held in place by wooden wedges, and may easily be removed for cleansing. The depression below the line $B$ is for the accumulation of solid matters which may not become decomposed. A portion of the tank is carried up to the surface of the ground, with a movable cover for a man-hole. $E$ is Field's automatic annular siphon, by which the tank is emptied as soon as its contents rise high enough to flow over the top of its inner (and longer) limb. The short limb is a dome enclosing the inner limb, with a water-way all around its bottom, reaching to the line $B$. The drainage of the remaining houses flows directly to the main drain, where it may deposit more or less of its coarser matters. The drainage of the upper houses flows into the flush tank, where it is held until the top of the siphon is reached. The whole amount (five barrels) is then discharged with great rapidity into the main sewer ($D$), washing it clean from end to end. During storms the roof water increases this action, but the flow of sewage alone is sufficient to remove all accumulations from the sewer.

The arrangement within the houses is shown in Fig. 4, where $A$ is a tumbler tank, delivering about two quarts of water at each discharge; $B$ is the kitchen sink; $C$ is a check-valve trap, preventing the return of air from the water-closet to the sink; and $D$, the water-closet, in the cellar. The closets are of enameled cast iron, with iron traps, and iron connec-

tions with the house drains, the whole being securely set in cement, which forms the entire floor of the closet apartment. The whole cellar bottom is coated in like manner with cement. The closet has a wooden seat, but no riser. The whole space around the pot is open to the air and light, and to the broom and floor cloth.

Fig. 5 shows the construction of the tumbler tank, which is a small galvanized iron tank inclosed in a wooden box, of which the cover may be locked, and within which is a small faucet connected with the public water supply, and under the control of the public inspector only. Within the box, and supported on knife-edge trunnions, is a galvanized iron tumbler or tilting basin, with a capacity of about two quarts. Its normal position is shown by the solid lines ($A$), its rear end resting on a buffer of India rubber. The faucet is set to fill it at fixed intervals, usually from five to ten minutes. When
nearly full, the weight of the water in the projecting lip causes it to tilt forward and assume the position indicated by the dotted lines (B), its front side striking an India rubber buffer, and its contents pouring rapidly out, to flow off through the outlet pipe, as shown by the arrow. When empty, its rear end is the heaviest, and it drops back into position, ready to receive another charge of water. C is the lock and staple by which the cover is secured. Fig. 6 shows a cross section of the patent check valve, by which the air of the cellar or closet is prevented from returning to the kitchen.

The frequency of the flushing discharge is a perfect security against frost; the kitchen waste-pipe is kept clean, and the trapping water of the closet is renewed every five or ten minutes, day and night, all feces and kitchen waste being carried into the drain and quite on to the river before its decomposition can even begin. This frequent renewal of the water in the closet trap would be a considerable protection against foul air in the drain even were this not ventilated. In effect there is perfect ventilation only a few feet distant from the closet. The whole arrangement is entirely pure and satisfactory, and it secures the removal of all offensive waste matters in a most complete and unobjectionable manner. The same arrangements in principle are applied to the two large boarding-houses, one for men and one for women, and with equally good results.

Other minor improvements have been made, such as the under-draining of a low tract, as shown by dotted lines near the southeast corner of the map; the removal of stables, of all pig-pens, and of all privies. Where cellars are subject to soil moisture they have been drained below the concrete, and with ample protection against the return of drain air through the old drains leading to the old sewer, or to the hill-sides. These drains have absolutely no connection with the foul-water system, which delivers below the surface of the water in the river, which is frequently and thoroughly flushed, and which is abundantly ventilated close up to the wall of every house. Not as a matter of drainage, but as being very necessary to health, the cold air supply to furnaces where these exist has been cut off from the front hall registers and brought into communication with the outer air. The houses shown on the map which are not connected with the sewers are mainly either not the property of Messrs. S. D. Warren and Co., or are to be torn down or removed.

The method of sewerage above indicated, and, so far as working-people are concerned, the method of house drainage, are almost universally applicable to country villages generally, and even to very large villages. Indeed, with a very moderate increase of size in the main sewers, where a hundred or more houses are to be drained, it is the best system available for many villages which have city charters. It would often be necessary, but by no means always, to secure some better means of sewage disposal than its discharge into a river or brook. One very important fact in this connection is apt to be overlooked, which is, that while the outflow of large and sluggish sewers is poisonous to fish, and in every way unfitted for admission to rivers, fresh faecal matter and fresh kitchen waste are food for fishes, which are its natural and proper scavengers. The whole household drainage of a town should be carried immediately into a river by cleanly flushed sewers.