PROCEEDINGS OF THE NORTH-WESTERN
BRANCH OF THE INCORPORATED
SOCIETY OF MEDICAL OFFICERS OF
HEALTH.

THE ordinary monthly meeting of this branch was held in the rooms of the Chemical Club, Manchester, on Friday, June 12th, at 4 p.m. The following members were present:—Drs. Sergeant (in the Chair), Anderson, Berry, Graham, Hannah, Hayward, Henry, Jenkins, Jones, Moles, Robertson, and Wheatley; and Mr. W. Hardman as a visitor.

The minutes of the last meeting were read and confirmed.

The report of the Committee, nominating office-bearers and representatives on the Council for the ensuing year, was read.

Letters were read from Drs. R. Dudfield and Paget.

The following nominations were then read:—Dr. G. H. Godson, M.O.H. for Cheadle and Gatley, proposed by Dr. Porter, and seconded by Dr. Anderson; and Dr. Parker, M.O.H. for Ince, proposed by Dr. Sergeant, seconded by Dr. Moles.

SLOP-CLOSETS.

BY

HERBERT JONES, D.P.H., etc., M.O.H., Crewe.

I have a double object in bringing before you to-day the subject of slop-closets. I propose to relate to you the drawbacks and the difficulties which have attended the use of this form of closet in Crewe; and, on the other hand, I am especially anxious to learn from those of you with experience of their use, your estimate of their value, what your special difficulties have been, and how you have overcome them.

It is hardly necessary to insist, before such a meeting as this, upon the advantages of water-carriage over the conservancy system in towns where main sewers have been constructed. It always seems to me that to construct costly sewers in order that sewage may be removed from a dwelling at the earliest possible moment, and then to persist in hoarding foul matter up for weeks, and when well decomposed to cart it through the streets and above the sewers, is about as rational as to lay down water mains, and then to supply each household from the water-works by means of a water-cart.

The slop-closet, as we now know it, has arrived at its present form by a process of evolution. Not to go further back than the beginning of the Christian era, the household sterquilinum in use in Pompeii was not unlike the ordinary water-closet of the present day, except that it was flushed not from an overhead cistern, but by a constant stream of water flowing in front of the seat, and

conducted along a gutter, which, curving round the end of, and underneath the seat, effectually flushed away the contents of the receptacle. Coming to the present century, I have been informed by men who were employed there that about the year 1858 there were waste-water flushing closets in the workshops of the London and North-Western Railway Company at Conway. These works have long ago been dismantled, and I have been unable to ascertain at whose suggestion the closets were erected. Then in 1874 Mr. Netten Ratchliffe reported upon a form of closet in use in Bristol, which may be described shortly as a long hopper closet, but having no water supply by cistern or otherwise, it was kept flushed with slop-water or clean water thrown into the pan by hand from above the seat. The next step was the invention of Mr. A. M. Fowler, C.E., of Newcastle-on-Tyne, whose arrangement conducted the waste water from the sinkstone and the rain-water pipes along an underground drain to the bottom of the closet-pan. And about this time in Leeds and in Birkenhead a tumbler or tipper closet appears to have been used; that is to say, the water, instead of dribbling down the drain, was made to collect in a swinging receptacle, which, when full, discharged itself in a volume. In Birmingham, too, Dr. Alfred Hill was the means of causing the same principle to be adopted, except that instead of a tumbler he employed the syphon flushing tank of Mr. Rogers Field, C.E., a method advocated by Mr. Baldwin Latham in 1878; though I believe Dr. Hill now advises the tumbler in preference to the syphon. In 1878 Mr. Whiteman, the head of the estate department over a large district of the London and North-Western Railway Company, began the erection in Crewe of slop-closets upon lines differing very little from the arrangement most in use to-day, and in 1879 the Corporation of Crewe drew up definite regulations for the erection of similar closets in connection with new property in the town; in accordance with which the buildings could be put up in pairs, each pair having one tumbler between them, made of galvanised or tinned iron, and of a capacity not less than four gallons. For some reason or other, very few builders adopted the system, although the Railway Company gradually replaced the privy-middens and cesspool privies attached to their houses by closets on the tumbler plan, until they have now over 500 so constructed.

It should be noticed that in the Crewe closets the excreta falls first of all into a receptacle having cemented sides and bottom, and measuring about 4 ft. by 2 ft., by 2 ft. deep; in the middle of this swings the "tipper," and it is as regards this receptacle that Mr. Duckett, of Burnley, has made such a vast improvement. It is found that the excrement falling on to the dry sides of this chamber is often with difficulty dislodged by the flush of water; indeed, when the cement begins to

wear away, the objectionable elements of a cess-pool privy become evident. But in Duckett's closet there is a stoneware trap at the lower end of the pan, and the tipper is fixed in a compact stoneware box close beside it; a moat is placed immediately above the trap, the excrement consequently always falls into water, *i.e.*, either into the trap itself, or into the moat; and as the tipper is discharged first of all into the moat, a whirlpool action is given to the flush, which very effectually clears the contents of the trap away. The tippers of all makers are now, I believe, constructed of stoneware, and are provided with india-rubber buffers to lessen the chance of breakage, though I have heard a theoretical objection to stoneware being used, to the effect that if a tipper breaks the drain rapidly gets choked up. I have not yet met with such an accident, but several cases of corroded metal tippers have come under my notice; for where the pivot is fastened on to the tipper, a small portion of the galvanised surface gets chipped off, exposing a weak spot, which is soon taken advantage of by the water, and before long the tipper refuses to "tip," and a closet on Fowler's principle results.

There are now several patterns of the slop-closet, all more or less alike, that one differing the most, perhaps, being made by Day, of Wolverhampton, and called the "Stafford" closet, where the tipper is immediately under the seat, the excrement consequently falling directly into it. The advantage claimed for this method is that the tipper can very easily be got at in case it goes wrong; but as far as my experience goes, this is not of very great importance, for it is possible to place the tipper of many other makers in such a position that they may be readily exposed and attended to. To my mind, the most admirable feature of the Stafford closet is the shape of the upper part of the pan, to which I shall have to refer presently. The greatest difference in all the patterns in the market is in the position of the tipper as regards the closet pan. It is obvious that the tipper may be placed either close beneath the discharge-pipe from the sink-stone, close beside the closet-pan itself, or anywhere on the line of drain midway between these two points. To the first position I have found very grave practical objections; the sediment from the slop-water, or the sweepings of the yard, settle at the bottom of the tipper, and its equilibrium being upset, it is unable to upset itself. I therefore never advise this arrangement to be adopted. There seems to be no objection to placing the tipper in the course of the slop-water drain, although I think that absolutely the best position is close to the closet-pan; indeed, I always suggest that it shall be placed immediately under the floor of the closet, and in a chamber made with a movable cover above. There is one arrangement which I have never seen, and which I can hardly think is a particularly good one, where

the tipper is situated close underneath the closet-seat and to one side of the pan, the sink-stone pipe emptying itself directly into the tipper. The closet building in this case must adjoin the back kitchen, and the waste pipe cannot discharge into the open air as required by most bye-laws.

Leaving the tippers, we come to what is unquestionably the chief drawback to these closets. With the flush at the bottom of the pan, it is at once apparent that the sides of the pan between the seat and the flush are never cleansed, so that excreta clinging to the sides becomes extremely offensive. The makers of the closets are evidently quite alive to this defect, and have exercised considerable ingenuity to overcome it. Mr. Duckett has tilted his pan from behind forwards, so that the back of the pan gets but little soiled. Mr. Day has contracted the diameter of the first half-foot of the Stafford closet-pan some six inches, so that, as a fact, only this upper half-foot gets soiled; and Messrs. Oates and Green, of Halifax, have fitted to the upper part of their pan a contrivance of stoneware, in shape like a bucket with the bottom knocked out, and it is the sides of this which alone or principally get soiled; lastly, the difficulty has been in a great measure overcome by having the inside of the pan highly glazed; and I have found that an occasional bucket of water thrown down such a closet will keep it tolerably clean and sweet.

But what about the blocking of these closets? Undoubtedly they do get blocked up, though I am convinced there is a great deal of exaggeration as to the amount which occurs; and I am further quite certain that a large proportion can be prevented. The choking may arise from articles such as tin cans, rags, etc., being thrown down either carelessly or wilfully, from imperfect initial workmanship, or through making a connection with an unsatisfactory outlet. Among the 500 houses belonging to the London and North-Western Railway Company in Crewe, the average number of stoppages was 50 per year until the last few years, when it has been reduced to only 25, as the result of the posting up of a notice inside each closet to the effect that the tenant will be charged with the cost of reopening the drain in case it becomes choked. In this connection, too, I would mention that the Corporation of Crewe supply to property owners, free of charge, the following handbill, to exhibit in the closets of houses owned by them:—

"THOSE WHO USE THIS WATER-CLOSET ARE CAUTIONED NOT TO ALLOW ANY SUBSTANCE TO BE PUT INTO IT WHICH IS LIKELY TO CHOKE THE DRAIN."

"Under the 16th Section of the Public Health Acts Amendment Act, 1890, any person who does so is liable to a penalty of £10. In the event of any blocking taking place, notice should at once be sent to the Sanitary Department. Frequent lime-washing of the walls of the closet is recommended."

But by far the most common cause of stoppage is bad workmanship—careless construction in the first instance, and the connection of the outlet drain with a drain only intended to carry slop-water, and which was probably laid in a very indifferent manner many years ago. The foreman of a very large firm informed me that he had only one man among all his workmen whom he could trust to put down the apparatus of these closets, and that this man had constructed 40 or 50 during the past four or five years, and not one had yet required unblocking. It is most essential to the satisfactory working of slop-closets that the drains should be laid with a suitable fall, that due regard should be had to the condition of the soil in which they are embedded, and to the possibility of subsidence; that the outlet drain, if already existing, should be exposed and, if necessary, re-laid right up to the main drain, and that it should be laid as much as possible in a straight line. Wherever a group of houses are being provided with slop-closets, I always urge that an inspection chamber should be constructed, so that if a block should occur, it can very readily be remedied. The manufacturers of one form of closet at one time made—but I believe they have now abandoned its use—a pan having a constriction some two feet below the seat. This certainly prevents any large articles being thrown down, but it also stops paper from falling to the bottom of the pan. Consequently, unless water is frequently swilled down from above, the pan speedily becomes full of filth.

I have almost exhausted the dangers I would warn you against with slop-closets, but there is one last which came to my knowledge within the past few days. A large quantity of water—some 15 or 16 gallons—was sent down the yard gully connected with one of the closets. The tipper tipped with the first three gallons, but the water came upon it so rapidly that the tipper box became full and floated the tipper off its hinges.

The difficulty of dealing with the concentrated sewage resulting from the use of slop-closets has been reported upon by Dr. Reid, the medical officer of health to the County Council of Staffordshire, who made some very exhaustive experiments with the sewage from 59 houses in Stafford, the results showing that a very concentrated sewage is difficult to precipitate; but as the households he had under observation only produced an average of 7 gallons of sewage per head daily, his conclusions are not of much service to those towns where the amount of sewage to be dealt with is double or treble that amount.

It is not infrequently stated that although theoretically slop-closets do not increase the consumption of water in a town, as a fact, a considerable quantity of clean water is allowed to pass down the drain in addition to the waste water;

indeed, the medical officer of health to a large northern town, for whose opinion I have the highest regard, has told me that he considers there is little if any saving of water over wash-down closets. He maintains, for instance, that the children of the household wilfully let the water-tap run, in order that they may have the pleasure of hearing the tipper bump.

I should be glad to hear of any actual figures which have been got out on this point. One definite statement bearing on the matter is quoted in Baldwin Latham's work on Sanitary Engineering, published in 1878, and has reference to some experiments made at Salford on two similar blocks of houses, one of which was fitted with the Fowler closet, and the other on the midden system. "It was found that in 18 houses in Ford Street, inhabited by 74 persons, fitted with the Fowler closet, that in 241 days they consumed 53,527 gallons of water, being at the rate of 3 gallons per head per day, and with this quantity of water used for all purposes, the closets worked perfectly. In the other block of 18 houses in Brunswick Street, inhabited by 73 persons, using the midden system, in the same period they consumed 52,000 gallons of water, being at the rate of 2.95 gallons per head per day. In the case of both these blocks of houses, none of them had water-taps in them; there was but one standpipe to each block."

At Blackburn it was observed by the Borough engineer that in houses with slop-closets the average consumption was 7.27 gallons per head daily, though it should be stated that the information was obtained during a prolonged frost. Still, in Dr. Reid's Stafford experiments the amount per head was found to be only 7 gallons daily.

There are several Corporations who have become so impressed with the advantages of the water-carriage system and of slop-closets, both upon sanitary grounds, and as a means of effecting a considerable saving of the expense now incurred in the emptying of privy middens or pail closets, that they have obtained powers either by Act of Parliament, or by provisional order, to enable them to replace privies with water-closets, the whole or part of the cost entailed being defrayed out of the rates. A short time ago I addressed a circular inquiry upon this subject to the medical officers of health of 24 large towns, and through their courtesy I am able to put before you the following information:—The Corporation of Burslem pays one-half the cost of reconstruction; of Sheffield, one-third; of Stafford, the entire cost where the existing accommodation is good, and if the privy is dilapidated the owner pays an amount equal to the cost of putting it in good repair. At Accrington the Corporation pays half the cost up to £2, of conversion from pails only; at Wolverhampton the owner provides the apparatus only;

and at Hanley he pays £1 towards the cost of reconstruction. The Corporations of Bolton, Birmingham, Huddersfield, and Stockton-on-Tees have the matter under consideration.

I have purposely dwelt upon the drawbacks to the use of slop-closets, hoping that this course would be of the most practical service to you, as it is much easier to ascertain advantages than defects. I will conclude therefore with quoting from Dr. Parsons' admirable report upon the subject, published in 1890. He sums up the advantages claimed for slop-closets as follows:—

1. Less prime cost.
2. Economy of water.
3. Diminution in the volume of sewage to be treated.
4. Non-liability to be affected by frost.
5. Less liability to get out of order through rough usage.

My experience is that the initial cost of a slop-closet is about the same as that of a wash-down water-closet; with that exception, I quite agree that the remaining advantages stated are fully realised.

THE INTRODUCTION AND WORKING OF SLOP-WATER CLOSETS.

BY

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IN addition to the information contained in Dr. Ballard's work on slop-water closets, the merits and demerits of the system have recently been fully discussed in reports published by the health officers of Staffordshire, Nottingham, and Oldham, the Borough Engineer of Wolverhampton, &c., &c. I shall therefore content myself with submitting the results of a series of inquiries addressed in January, 1895, to 25 large towns having experience of the application of water carriage to workmen's dwellings.

QUERY 1.—“What (if any) portion of the cost of conversion to water carriage is borne by the rates in regard to privies or pail-closets: (a) when dilapidated and very offensive, (b) when in fair structural condition?” In only about six towns is any contribution whatever made. In Accrington £2, and in Hanley £1 per closet is allowed for conversion of structurally good *pail-closets* only, the pail being returned to the Corporation; in Burslem one-half, and in Leeds and Sheffield one-third of the total cost in all cases; in Stafford it is proposed to allow from 45s. to 60s. per closet of an estimated total cost of 82s. 6d., and I have since learned that Ashton-under-Lyne has obtained parliamentary powers to convert any privy at the Corporation's expense.

QUERY 2.—“Have slop-closets been substituted for privies to any extent, and if so what pattern is

generally used?” Waste-water closets have been extensively adopted in Burnley, Nelson, Accrington, Southport, Birmingham, and Crewe, and a smaller number are in use in Newcastle-on-Tyne, Barnsley, Burslem, and Fenton. In Stockport there are about 500. The patterns most generally favoured are Duckett's “B” and the “Stafford.” Allen's type prevails in Birmingham, whilst in Southport the closet used is a modification of the Bristol eject, which works well.

QUERY 3.—“Have slop-closets in low-class property been a continual source of expense to owners owing to carelessness of tenants?” The general experience appears to be that when first fixed such closets are liable to be blocked by the introduction of unsuitable solid bodies, but that when the users become accustomed to these conveniences such occurrences are comparatively rare. Obviously a manhole or inspection shaft on the closet side of the intercepting trap between drain and sewer tends to still further prevent them. Some makers, it is stated, undertake to keep their closets in repair for 1s. 6d. per annum. At Burnley and Nelson importance appears to be attached to the employment of 6-inch or 9-inch drain connections, as stoppage has not been nearly so frequent when 4-inch drains have been replaced by the larger sizes. From observations covering a period of a year or more, it was found in Burnley that 6·5 per cent. of slop-water closets were blocked, as compared with 37·4 per cent. clean-water closets; in Nelson 4·5 per cent. of *all* the slop-closets were stopped, whereas 6·5 per cent. of fresh-water closets were cleared by the sanitary authorities alone, in addition to a large number remedied by private plumbers. Eccles showed 13 per cent. of stoppages of slop-closets, or 10 per cent. excluding those due to sewer obstructions.

QUERY 4 related to the prosecution of careless tenants under the Public Health Acts Amendment Act, 1890—(a) for throwing into a drain anything that would injure it, or obstruct the free flow of sewage; (b) for not keeping sanitary conveniences in a cleanly condition. In Sheffield and Warrington proceedings have been taken for both offences; in Preston and Nottingham for (a) only, and in Blackburn, Bradford, Birmingham, Halifax, and Manchester for (b) only. In Newcastle-on-Tyne similar action is said to have been taken under Public Health Act, 1875, s. 25 (which seems somewhat incomprehensible), and at South Shields under the nuisance byelaws. In Burslem and Nelson cautionary notices threatening prosecution were posted in each closet. On the whole, therefore, these provisions of the Amendment Act have not been largely availed of, but the effect has been salutary where they have been enforced.

QUERY 5 had reference to the employment of men by the Sanitary authority specially to see that slop-closets and w.c.'s in cottage property are kept in proper condition. In Accrington, Barnsley,