

Besides dysentery and septic sores, there was a good deal of fever, the cause of which was never exactly discovered, though no doubt some of it was due to paratyphoid and in the later months there was an epidemic of jaundice which appeared to be infectious and was very debilitating in its result. With the onset of colder weather at the end of October and the disappearance of flies, the health of the men began to improve and continued fair until the terrible setback which occurred as the result of the storm on November 26.

At the end of October, the whole of the remaining troops of the original Division, about one thousand men, were sent away to rest at Mudros where a camp had been prepared for them by our D.A.D.M.S., Major Taylor, who went over there a week in advance to get things ready. Half the number left on October 31 and the remainder on November 2. Rest and recuperation was the object in view, but owing to subsequent change of plans they never came back. The London Field Ambulance went at the same time and with them disappeared all that was left of the original five thousand, except one field ambulance and a few members of the Headquarters Staff, who had by no means escaped their toll of sickness during the two and a half months at Suvla.

To make up the strength of the Division, a brigade of the 53rd Welsh Territorial Division was lent to us, which took its turn of duty in the trenches at the right of the line, and on November 16 we were joined by the South Western Yeomanry Brigade, consisting of the Somerset and Devonshire Yeomanry. Their field ambulance which came with them to Suvla was never transferred to the 2nd Mounted Division, but was used in connexion with Number 26 Casualty Clearing Station at Suvla Point.

(To be continued.)

Current Literature.

- (i) WILLIAMS, C. L., AND DREESSEN, W. C. Sur la destruction des moustiques à bord des aéronefs. [**Destruction of Mosquitoes in Aircraft.**] *Bull. Office Internat. d'Hyg. Pub.* 1935, v. 27, 1350-9.
- (ii) JITTA, N. M. J. Sur la destruction des moustiques à bord des aéronefs, d'après les expériences des Drs. N. H. Swellengrebel et J. A. Nykamp. *Ibid.* 1360-1.

(i) The existence of mosquitoes, particularly *Aedes aegypti*, in aircraft having been demonstrated, appropriate methods of destruction must be discovered. This apparently simple problem is complicated by the necessity for fumigation at ports of call, immediately before departure, or during flight. Hydrogen-cyanide cannot be considered in the face of these

requirements. Experiments were made with carboxide and with concentrated extract of pyrethrum.

Carboxide is a mixture of one part of ethylene oxide with nine parts of CO₂ under high pressure in steel cylinders. The gas is led into the compartment through pressure tubing from the cylinder, which is placed on scales so that the amount discharged can be measured by the loss of weight.

Fumigation can be carried out without danger to the fumigators owing to the low concentration of and short period of exposure to the gas. Experiments with guinea-pigs have, however, shown that carboxide is a respiratory irritant. The investigation showed that mosquitoes are very resistant to carboxide, from 15 to 20 pounds per 1,000 cubic feet with exposure for half an hour being required to ensure the death of all mosquitoes in twenty-four hours.

Pyrethrum is usually applied in the form of a fine spray of a liquid containing 0.1 gramme of pyrethrum in 100 cubic centimetres of refined kerosene. The principal toxic agent being pyrethrine and weight being an important factor in aircraft, a concentrated extract containing the pyrethrine from 20 pounds of pyrethrum flowers in a gallon of light mineral oil was prepared. When this solution was sprayed in a fine mist in the proportion of 2 to 4 grammes per 1,000 cubic feet with exposure for five minutes, all mosquitoes died within twenty-four hours. Neither carboxide nor pyrethrum kills mosquitoes immediately and further experiments will be carried out to ascertain whether they are capable of biting in the period between fumigation and death.

Since neither pyrethrum nor the solvent used is dangerous to man and such a small dose is effective in the destruction of mosquitoes it appears that it should be practicable to spray aeroplanes with a solution of the concentrated extract of pyrethrum during flight.

(ii) An efficient culicide is the following solution employed as a spray : Petrol, 1,000 cubic centimetres ; concentrated extract of pyrethrum, 5 grammes ; oil of sassafras, 5 cubic centimetres ; methyl salicylate 20 cubic centimetres.

The concentrated extract is prepared by extracting powdered pyrethrum flowers with petrol-ether in a Soxhlet apparatus, the extract being then concentrated to the consistence of treacle. Oil of sassafras makes the mosquitoes come out of their hiding places and so increases the efficiency of spraying. Methyl salicylate has no action on mosquitoes but gives the solution a definite odour. The quantity of the spray required is from 4.8 cubic centimetres per cubic metre in small spaces to 2.5 cubic centimetres per cubic metre in large spaces.

Proprietary preparations such as Flit and Shelltox are equally effective but more expensive.

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MONIER-WILLIAMS, G. W. **Aluminium in Food.** *Reports on Pub. Health and Med. Subjects: No. 78.* 34 pp., 1 pl. 1935. London: H.M.S.O. [9d.]

The following is taken from a memorandum issued by the Ministry of Health.

Statements appear from time to time that aluminium cooking utensils are dangerous to health and that the small amount of the metal which may be dissolved or corroded by food may give rise to various ailments and may even be a contributory cause of cancer. These statements have been opposed as being contrary to experience, and moreover have been declared by many scientific men to be devoid of any scientific foundation whatever. Nevertheless, these allegations have been repeatedly made and have induced many of the public to banish aluminium vessels from their kitchens.

The Ministry's Report entitled "Aluminium in Food," is an attempt to correlate all the known information on the subject, with the object of arriving at some definite conclusions as to whether or not aluminium is in any way injurious. Not only aluminium vessels, but alum baking powders have been brought under review, although the latter have been superseded in Britain for many years by phosphate baking powders.

The report, after giving details of the occurrence of aluminium naturally in plants, vegetables, foods, etc., and the methods of determining it, proceeds to a critical examination of the published scientific work on the subject.

The amount of aluminium which may gain access to food from aluminium vessels under different conditions is discussed, and shown to be very small. Many of the statements made as to large amounts being taken up by food must be ascribed to the use of faulty methods of analysis.

Common sense must be used in cooking in aluminium. Strongly alkaline materials such as soda will attack it, as also will strong acids, but the pure metal seems to be remarkably resistant to corrosion by acid foods. In general the amount taken up by foods in this way is far less than the amount which would be introduced into bread by the use of alum baking powder.

The report then proceeds to a critical survey of published work on the absorption of aluminium by the body and its effect on health. The most striking thing about this work is the extremely small amount of the metal which apparently finds its way through the walls of the digestive tract and into the blood and organs of the body. It is difficult to believe that quantities of the order of one or two parts per million in the body tissues can have any ill effect.

On the other hand it is an undoubted fact that moderately large doses of soluble aluminium salts may exert an astringent and irritating effect on

the stomach and may interfere with digestion. For this reason the use of alum baking powders, which introduce relatively large amounts of aluminium into bread, is not desirable.

The conclusion is reached that there is no convincing evidence that aluminium, in the amounts in which it is likely to be consumed as a result of using aluminium utensils, has a harmful effect upon the ordinary consumer, but that the use of alum baking powder is undesirable.

A reservation is made in certain cases where physicians and patients are firmly of opinion that aluminium has been a cause of illness and that benefit has resulted when it has been given up. It is possible that such cases are due to a genuine idiosyncrasy to aluminium on the part of certain people.

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WHITEHEAD, H. C., and O'SHAUGHNESSY, F. R. Factors in the Design of Sewage Disposal Works. *Surveyor*. 1935, v. 88, 403-7; 433-9, 12 figs.

It is not often that a paper is forthcoming in which the factors which influence the design of sewage disposal works are so ably dissected as in the present paper. The authors have had long experience in connexion with the Birmingham and other sewage disposal works and their views will find general acceptance.

The paper commences with a brief historical survey of the development of present-day methods of sewage purification, showing that these have been built up by a slow but sure method of selected construction. The Royal Commission on Sewage Disposal, appointed in 1898 and working until 1915, investigated existing methods and furnished authoritative pronouncements in regard to the various processes. It was upon the work of this Commission that the unofficial requirements which are used as a guide by the Ministry of Health were formulated. The importance of ascertaining the strength of the sewage which has to be treated was pointed out and the effect of trade refuse stressed. Sewages are becoming more complex in character so that a new situation has arisen calling for a review of present requirements. The paper offers valuable suggestions for such a review and attempts to place in proper perspective strength of sewage, chemical treatment, sedimentation, percolating filters, bio-flocculation, activated sludge, storm water and aerial nuisance.

It is contended that in some of the processes providing oxidative treatment for the organic matter in sewage the avidity of the sewage for oxygen is a deciding factor in the selection of the most suitable method.

The paper provides justification for the Ministry of Health requirement that settling tanks should be of relatively large capacity since they serve other purposes than sedimentation or the arresting of visible suspended solids. These tanks serve the purpose of mixing weaker sewage with the stronger sewage and also serve to mask the influence of trade waste on

the strength of the sewage. They can also act as balancing tanks for the purpose of equalizing the daily dry weather flow and affording time for a certain amount of self-purification. Such large tanks are not required for the separation of humus and activated sludge from the purified effluent, and important considerations regarding the maximum rate of upward flow in tanks are set out.

As regards storm water, owing to the increasing area of impermeable surfaces in urban districts the authors recommend that the recommendations of the Royal Commission on Sewage Disposal should be amended so as to provide a larger settling tank capacity.

The paper merits close study by engineers and chemists responsible for the design of sewage disposal works. H. T. CALVERT.

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ORENSTEIN, A. J. **Elementary Principles of Water-borne Sewage Disposal with Special Reference to Local Mine Requirements.**
Proc. Transvaal Mine M. Officers' Ass., 1935, v, 15, 23-7.

After a brief review of the methods available for the disposal of sewage the author proceeds to describe sewage disposal works which are successfully operating under South African conditions for: (a) Isolated single or small groups of dwellings; (b) a large compound or a large group of dwellings; (c) municipal or large private requirements.

In designing an installation for isolated dwellings the author uses as a basis an allowance of 30 gallons of water per European per day, allowing for each household five Europeans, and 30 gallons per day for each household in respect of natives. Where a suitable subsoil can be found the author recommends a tank and subsoil irrigation. The tank capacity should be from one to two days' total flow. The subsoil irrigation is carried out by constructing trenches with level bottoms about 5 feet wide and 5 to 6 feet deep. The length of the trench depends upon the absorbing power of the soil but, generally speaking, about 30 feet of trench is required for each household. The trenches are filled with rock to about 1 foot of the surface and the pipe carrying the effluent from the tank is carried about 5 or 6 feet into the trench on the top of the rock. The rock fill is covered with corrugated iron and the trench is then filled with soil to about 6 or 8 inches above surface level.

For a large compound or a large group of dwellings the type of plant recommended is the ordinary screen, grit chamber, sedimentation tank, percolating filter and humus tank, which is the normal practice in Great Britain. The sludge from the tanks is dried on underdrained drying beds, but an allowance of one-eighth square foot for each person seems rather low, English requirements being about 1 square yard of drying bed for 7 persons. The basis of the design of such works is 50 gallons per day for each European and 15 gallons per day for each

native, together with an allowance of 5 gallons per day for each non-resident worker in shops, offices, &c.

As an example of municipal works the author describes the latest developments in connexion with the disposal of the sewage of the Johannesburg Municipality, and Dr. E. J. Hamlin, the City Engineer of Johannesburg, afforded the members of the Association an opportunity of inspecting these works.

In the discussion which followed the reading of the paper, Dr. Hamlin drew attention to several features which distinguished South African conditions from those prevailing in Great Britain. For example, he pointed out that owing to the high altitude of Johannesburg water only dissolves 60 per cent of the amount of oxygen which it dissolves at sea-level, so that the operation of activated sludge processes is seriously affected. Again, he pointed out that where the diet consists largely of carbohydrates, as in South Africa, it is not so easy to apply the activated sludge method of treatment, and he pointed out that the sewage in South Africa generally has to traverse a longer length of sewer than in Great Britain, with the result that it arrives at the sewage disposal works in a septic condition.

The paper was read at a general meeting of the Association and gives an excellent pen picture of sewage disposal conditions in the Rand mines area.

H. T. CALVERT.

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Reviews.

THE BACTERIOLOGICAL GRADING OF MILK. By G. S. Wilson. Medical Research Council. Special Report Series No. 206. London: H.M. Stationery Office. Pp. 392. Price 7s. 6d. net.

This book is a record of attempts made by a team of research workers under the direction of Professor Wilson at the London School of Hygiene and Tropical Medicine to grade milk for commercial purposes on the basis of its bacterial content. Neither the dangers of dirty milk nor the problems of the chemical composition of raw and pasteurized milk are included in the work.

An immense amount of bacteriological data is incorporated in the work, and bacteriologists will find it a most fascinating book.

Like everyone else who has to determine the numbers of organisms in specimens of milk, the author is very dissatisfied with the results obtained; and it is shown that errors of 90 per cent may occur even when experts use empirical methods.

An exhaustive examination of the technique of counting the organisms has been made, much work has been carried out in investigating the