

Interim report of the Committee on Synthetic Detergents.

Contributors

Great Britain. Committee on Synthetic Detergents.
Jephcott, Harry, Sir, 1891-1978.
Great Britain. Ministry of Housing and Local Government.

Publication/Creation

London : H.M.S.O., 1954.

Persistent URL

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MINISTRY OF HOUSING AND
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Interim Report of the Committee on Synthetic Detergents

LONDON : HER MAJESTY'S STATIONERY OFFICE
1954

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CANCELLED

The Committee on Synthetic Detergents was appointed by the Rt. Hon. Harold Macmillan, M.P., Minister of Housing and Local Government, on the 12th May, 1953, with the following terms of reference:

“To examine and report on the effects of the increasing use of synthetic detergents and to make any recommendations that seem desirable with particular reference to the functioning of the public health services.”

The Committee consists as follows:—

Sir Harry Jephcott, M.Sc., Ph.C., F.R.I.C. (*Chairman*).

Dr. N. R. Beattie, M.D., D.P.H.

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C. B. Townend, Esq., C.B.E., B.Sc., M.I.C.E.

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Dr. E. A. B. Birse, B.Sc., Ph.D., A.R.I.C.

Lt.-Col. F. G. Hill, C.B.E., M.C., M.I.C.E. } (*Technical Officers*)

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A. R. Isserlis, Esq. (*Secretary*)

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INTERIM REPORT OF THE COMMITTEE ON SYNTHETIC DETERGENTS

To the RT. HON. HAROLD MACMILLAN, M.P.

Minister of Housing and Local Government.

SIR,

1. We were appointed by you on 12th May, 1953, as a Committee "to examine and report on the effects of the increasing use of synthetic detergents and to make any recommendations that seem desirable with particular reference to the functioning of the public health services." The full Committee has met six times—certain groups of members and technical officers meeting more frequently to deal with special aspects of the work. Our conclusion so far is that a full report within our terms of reference can usefully be made only after extensive further investigations which are bound to take a considerable time—perhaps twelve months or more. In view, however, of public interest in the matter, we think it proper to advise you of the position as we see it at present, and the lines on which we are working. We have the honour of presenting the following interim report.

2. Our information is that the use of synthetic detergents of various types has been increasing during the last few years both here and abroad, and that this increase is likely to go on for some time to come. There is no doubt about their usefulness, and wide popularity, as cleansing agents for domestic, industrial and other purposes. Nevertheless, there is considerable concern about their known or possible effects—in four different ways. First, fears have been expressed that synthetic detergents may cause dermatitis on the hands of users and may have other dangers to health. Secondly, they have been said to cause corrosion of domestic equipment and plumbing. Thirdly, there are reports of excessive foaming, and anxieties about reduced operational efficiency, at a number of sewage works, in circumstances suggesting that synthetic detergents in the sewage may be responsible. Fourthly, reports of excessive foam on certain rivers into which sewage effluents are discharged have given rise to concern for the purity of river waters.

3. We have ascertained the views of a number of organisations and individuals specially concerned with these matters, and are collating their evidence with the results of several investigations already carried out in this country and abroad into various aspects of synthetic detergent use. Our own members have made it possible to draw directly on the information and experience of the Water Pollution Research Laboratory of the Department of Scientific and Industrial Research, the Ministry of Housing and Local Government, the Ministry of Health, the Department of Health for Scotland, the Government Chemist, the Ministry of Agriculture and Fisheries, the Metropolitan Water Board, two of the larger sewage disposal authorities, and firms producing and using synthetic detergents on a large scale. Among others consulted have been the British Association of Dermatology, as well as medical committees and specialists working in this field; building and plumbing trade organisations, domestic equipment manufacturers, and persons and bodies conducting

research into the use of metals; and organisations representing local authorities, sewage disposal authorities, river conservancy authorities, water undertakers, municipal engineers and anglers. We have also consulted certain individuals, in the public health services and elsewhere, who have themselves made investigations into the effects of synthetic detergents.

4. Besides this study of the evidence of others, we have made a detailed assessment of conditions at over a hundred selected sewage works. We have also encouraged a number of experiments in the suppression of foam, and have set on foot investigations into methods for reliably determining small quantities of synthetic detergents in sewage. In addition we have had a survey made of the various effects of the widespread use of synthetic detergents in the U.S.A., and the measures adopted to deal with them, and are at present arranging for two representatives of the Committee to visit the U.S.A. and study these matters on the spot. Other work which is being put in hand includes an extension of some experimental work already being carried out on the toxicity of synthetic detergents to fish, continued sampling of certain river waters, and further chemical examination of the nature and properties of synthetic detergents, including a detailed study, both in the laboratory and at selected sewage works, of their effects on the various processes of sewage purification.

5. Our information is that washing products based on synthetic detergents may, like those based on soaps, lead to dermatitis on the hands of some users. Some physicians think that in a few instances the degree and type of dermatitis so caused are more acute than any known to be due to—for example—soap powders, but experiments on man and animals indicate that irritation of the skin under conditions of normal use is relatively slight. Although it is possible that the long-term effects of daily exposure may be more serious, the evidence so far shows that despite the widespread use of synthetic detergents throughout the country the incidence of dermatitis is not significantly greater than it was when soaps and alkalis, or preparations based on them, were the only common washing products. Judging by reports from general practitioners, hospitals, the British Launderers' Research Association, textile firms, and local authority officials concerned with the running of institutions, laundries, and canteens, this appears to be equally true both in industry and in the home, although in the home the synthetic detergents used are normally compounded with other substances. It is known that often the housewife has learnt by a process of elimination to select the particular washing product that suits her best, with due regard to the effect on her skin. Many housewives in any event use hand-creams after housework, and this may help to reduce the risk of skin trouble. It is important, in our view, that whatever type of washing product is used the hands should afterwards be thoroughly rinsed in fresh water and dried; it would be helpful if the manufacturers stressed the advantages of this in the instructions on the containers. It would also be helpful if some better means could be found of educating housewives as to the quantities of synthetic detergent preparations necessary for particular purposes, for it is probable that the slight existing risks of dermatitis arise less from merely using them than from their excessive use.

6. It is possible that minute traces of synthetic detergents remaining on crockery, etc., after washing up might get into food or drink, and that traces might also be ingested in other ways. We are examining the implications of this possibility, but there is no evidence so far for ascribing any ill-effects to it.

7. Complaints have been made about corrosion, by synthetic detergents, of domestic plumbing systems and the metal of various household appliances. There have been few complaints of the former, and complaints of the latter have

been made mainly to the manufacturers of the appliances. Corrosion of a metal surface cannot occur when it is completely covered with a protective film. Thus the excellent cleansing properties of synthetic detergents may, by removing films of grease or soap curd, either open up the possibility of corrosion where it did not exist before, or expose to view corrosion previously hidden. In domestic plumbing the items most likely to be involved are sink and wash basin outlets, the traps underneath, and the waste pipes. In many households these have been exposed for years to the action of chemicals, such as soda, and various bleaches containing chlorine, all of which are corrosive in certain circumstances. Yet no general corrosion problem has arisen. Our tentative view is that this will be found true also for synthetic detergents, particularly if, as is in any event desirable for reasons of hygiene, the sink is rinsed after each washing process. It is acknowledged to be good practice to avoid as far as possible both the use of metals known to be easily corroded and also the use, in the same system, of electro-chemically dissimilar metals. With the increasing use of synthetic detergents it may be that these precautions will become more important. There is great variety among the household appliances about which complaints are made; they are constructed of various materials, and some contain moving parts needing lubrication. It is our present opinion that the problems relating to them are best left to the manufacturers of appliances and detergents to study and solve by experience.

8. Probably the most serious of the problems before us are in respect of sewage treatment and the disposal of the resulting effluents.

9. The types of synthetic detergents most widely sold at present produce foam. The manufacturers of these types state that the only synthetic detergents which are both efficient and acceptable to general users are those which have this property. The materials used are chemically stable and retain their foam-producing power even when, on completion of washing operations, they pass via sewers into sewage disposal works. Foam is to-day being produced at many sewage works—sometimes to a height of several feet—during the stages of purification at which aeration occurs. It is most marked at works where the activated sludge method is used. There are some 60 sizable works of this kind in Great Britain, serving about 7 million people, and further similar works are already planned to serve some 7 million more. At some sewage works this foam causes not merely serious inconvenience, but danger to the operators. When it drifts off from the works it is offensive to the neighbourhood, especially as it usually contains particles of unpurified sewage matter, so that its suppression is essential in the interests of public health. A number of methods for suppressing it have been suggested and some have been tried out, with a fair measure of success—notably in the U.S.A. But further research is needed before any one of them can be recommended as generally practicable, economic and safe under conditions in this country, bearing in mind the need both to maintain the efficiency of sewage purification processes and to avoid harming the rivers into which sewage effluents are discharged. Meanwhile this problem of foam at sewage works, though it may become more acute with increasing use of synthetic detergents of the present types, and calls for speedy remedy, is not at present sufficiently serious to justify alarm.

10. Then there are the possible effects of synthetic detergents on the sewage purification processes themselves, whether at works where foaming occurs or elsewhere. In a district where the sewage contains a preponderance of wastes from a particular industry, and very special processes have been adopted in consequence at the sewage treatment works, the growing use of synthetic detergents in partial replacement of soaps may have important and peculiar implications. But there are few such districts, and any problems they may have

will need special solutions. What we are concentrating on at present is the possible effects of synthetic detergents on sewage purification generally. It is known that, at a large number of sewage works throughout the country, for various reasons unconnected with the use of detergents, efficient operation and production of an effluent up to the required standard are being maintained only with difficulty. If the presence of synthetic detergents in the sewage is adding to the difficulties and causing a worsening in the quality of the effluents discharged, there is cause for serious concern—particularly since many sewage works' effluents are discharged to rivers where there are not only the normal obligations to river authorities, and rights of riparian owners, to be considered, but also the interests of statutory water undertakers who draw water from the rivers for public supply. We are therefore giving special attention to this question.

11. Apart from the question of deterioration in the general quality of sewage effluents, it is clear that some of the constituents in the more widely sold synthetic detergent preparations are only partially destroyed or removed during normal sewage treatment, so that substantial proportions of them are being discharged, in sewage works' effluents, to rivers—as is shown by chemical examination of the water in a number of rivers below sewage works' outfalls, where foam has been noted. The foam itself is objectionable, but there is also the question whether concentrations of these materials are likely to be such as directly or indirectly to harm river life or river-drawn water supplies. This is another matter to which we are giving special attention.

12. As already stated, our investigations will necessarily be lengthy. Some of the complicating factors involved are mentioned below; they make it particularly desirable that all generalisations about the effects of synthetic detergents should be treated with great caution.

- (a) The several types of synthetic detergent preparations have different properties. If a particular type has any significant effect on sewage purification it may be gradual and cumulative; its assessment is the more difficult in that, at any particular sewage works over a given period, and apart from changes in the nature and amount of the detergents present, changes in the quantity and nature of the sewage or in the capacity and operation of the works may mask or falsify any effects of the detergents.
- (b) The active detergent materials used as a basis for the marketed preparations are not single chemical compounds capable of exact definition and analysis.
- (c) In marketed preparations the active detergent materials are accompanied by other substances that may extend or modify their properties and may themselves have properties relevant to this enquiry.
- (d) Accurate methods of determining small concentrations of synthetic detergents in sewage and trade effluents have still to be devised.
- (e) The scope for large-scale experimental work on synthetic detergents in relation to sewage and water treatment is limited by statutory and common law restrictions on river pollution and by the need to safeguard at all times the sewage purification and water supply services.

13. To sum up: Available evidence about the effects of the growing use of synthetic detergents does not justify any immediate alarm in users or the public health services. There is definitely nuisance at some sewage works, however,

and there are other and more serious possibilities in relation to the efficiency of sewage treatment, the condition of rivers, and the purity of water supplies. All these matters require and will receive most careful examination.

We have the honour to be, Sir,

Your obedient Servants,

H. JEPHCOTT, *Chairman*

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Secretary,

16th February, 1954.

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1954

Price 4d. net

Printed in Great Britain under the authority of Her Majesty's Stationery Office
by The Whitefriars Press Ltd., London and Tonbridge