ARSENICAL POISONING BY WALL-PAPERS.

I.

REPORT ON EVIDENCE REGARDING THE INJURIOUS EFFECTS ON HEALTH ARISING FROM ARSENICAL WALL-PAPERS AND OTHER ARTICLES CONTAINING ARSENIC.

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THE evidence on this subject consists partly of articles published in various journals, and partly of answers to a circular on the subject sent out by the Medical Society of London (see *BRITISH MEDICAL JOURNAL*, February 21st, 1880). The nature of the evidence is, first, that certain symptoms have occurred in persons exposed to the influence of certain conditions; secondly, that, on attempting to analyse these conditions with the object of finding out the cause of injury, none could be discovered at all likely to produce the symptoms, except arsenic; thirdly, that the symptoms coincided in many respects with those produced by arsenic when administered internally; fourthly, that the symptoms disappeared when the arsenic was removed, although, as far as could be ascertained, the other conditions remained unaltered. The number of cases on which the report of the Committee of the Medical Society of London was based was a little over one hundred; and, besides these, numerous cases have been reported in medical journals. Considering the extensive use of arsenic in wall-papers and articles of clothing and furniture, the number of cases may appear very small, and quite insufficient to prove the necessity for any form of legislative interference. This objection, we believe, however, to be invalid. It is exactly the same in kind as that which may be brought against interference with systems of drainage which contaminate drinking-water with typhoid excreta, or against the free distribution of milk supplied from dairies where typhoid or scarlet fever exists. The comparative smallness of the number of cases of poisoning by arsenical wall-papers is, we believe, simply due to ignorance of the injurious action of arsenic in papers, dress, or furniture, and consequent failure to perceive the connection between the illness and its cause. One circumstance which renders this connection more easily overlooked, is the fact that all persons are not equally susceptible to the injurious action of arsenic. It is well known that, in Styria, many persons are accustomed to take quantities of arsenic which would be fatal to others unaccustomed to it. It seems possible that the same may occur with arsenical papers; for, in a house at Hampstead, where the former occupants had enjoyed good health, another family, shortly after their entrance, began to suffer from symptoms of arsenical poisoning. The wall-paper was examined, and found to be arsenical. On its removal, all the symptoms ceased. The immunity which the first of these families enjoyed, although exposed to the action of the arsenical paper, may have been due to their having become gradually inured to the presence of arsenic; but it may also have been due to a less degree of sensitiveness; and this is all the more probable, because the second family have suffered three several times in the same way. Should one member of a family be more sensitive than others, he or she may suffer while the rest escape. In such a case, suspicion will be averted from the arsenical paper, as all have been exposed to its influence. In one case reported to the Medical Society, two children of an eminent consulting surgeon died from enteritis, while the nurses escaped. The cause of the illness and death of the children was a mystery, until the nursery papers were examined and found to contain arsenic. Another cause of the failure to connect the symptoms due to arsenic with its presence in wall-papers is, that the symptoms are those of irritation of the intestinal or respiratory tracts, or of the conjunctiva; and these may frequently be attributed to other causes than the true one, especially if no suspicion of the presence of arsenic be entertained. Thus, in thirty-five cases reported to the Medical Society, nausea, diarrhoea, and digestive disturbance occurred; and these symptoms might be ascribed to errors in diet, to chills, to imperfect drainage, or to worry or overwork; or might be vaguely ascribed to constitutional disturbance by those who did not suspect, and therefore failed to discover, the true cause. The same may be said of the cough and asthma which occurred in nine cases, or of the conjunctivitis

which occurred in nineteen. In support of this view, it may be mentioned that one-fourth of the cases of poisoning reported to the Medical Society had occurred in the persons of the medical men themselves who reported them, or in members of their families; and that a large proportion of the cases reported had been observed by men qualified in an especial way, either by knowledge or by training, to discover the true cause of the symptoms which occurred.

Another reason why arsenic as a cause of disease is overlooked, is that, when given as a medicine, it produces no injurious action in quantities which are probably larger than those which enter the bodies of persons exposed to the action of arsenical papers. The reason of this may be twofold: either it may be that the arsenic given off from the paper is absorbed by the lungs instead of the stomach, or it may be that the arsenic is given off from the paper in a specially poisonous form. The difference between the effect of poisons taken by the mouth and introduced into the body in other ways, is shown by the fact that the venom of vipers, although very poisonous when applied to a wound, is quite innocuous when swallowed. That arsenic, in different combinations, has different poisonous powers, is shown by the fact that, in the form of cacodyl, although exceedingly offensive to the sense of smell, it is not poisonous; while, on the other hand, arsenic, in the form of arsenes, appears to be more poisonous than arsenious acid.

At all events, however, a considerable amount of positive evidence has already been obtained of the injurious action of arsenical papers and fabrics; and, whatever may be the reason why it is not greater, it is sufficient to justify vigorous action in the matter.

II.

NATIONAL HEALTH SOCIETY: COMMITTEE ON ARSENIC IN DOMESTIC FABRICS.

Chemical Report on the Test to be employed for the Detection of Arsenic.—It was found that, on the Continent, Acts or decrees exist, forbidding the sale of wall-papers, curtains, carpets, and textile fabrics generally, if they contain arsenic. We had before us the decrees in force in Germany and Sweden. In the former, the prohibition of the sale of goods containing arsenic is absolute; in Sweden, a concession is made to manufacturers to this extent, that a paper or textile fabric shall be considered practically free from arsenic if an opaque black or brown arsenical mirror cannot be obtained from 68 square inches of paper, or 34 inches of a textile fabric, in a tube of 2 mm. (.078 inch) internal diameter. In the printed certificates issued by the Government, to be filled up by the chemist making the analysis, it is stated that the method known as the Von Babo and Fresenius test should be employed. The process is then minutely described, so as to insure uniformity of results. We ascertained from the Government analyst, in Stockholm, that the fact of the mirror being opaque is determined by observing whether or not a black line on a white ground could be seen through it. The fact that the presence of arsenic in domestic fabrics is injurious to health having been already ascertained by the Committee, the question for our consideration is simply that of the mode of testing. The first point for consideration is whether the prohibition of arsenic must be absolute, extending to the most minute trace, or whether such minute quantities may be allowed as arise from accidental and unavoidable contamination. A very large proportion of fabrics of all kinds are found absolutely free from arsenic, no known test discovering the slightest trace; but, again, with regard to many fabrics, some traces are unavoidable in consequence of the very wide diffusion of small quantities of arsenic in natural products. The consideration consequently arises: first, as to what amount of arsenic it is requisite to allow as unavoidable and accidental contamination, in order that trade may not be hampered or interfered with to any undue extent; and next, whether that allowance may be permitted with due consideration to health. There are manufacturers of wall-papers (the principal articles in question) who have, on principle, abjured the use of all arsenical colours; the result of their work affords, therefore, an excellent guide for what may be demanded without unreasonable interference with the freedom of trade. An examination of a very large number of papers, supplied by these manufacturers, leads to the conclusion that an allowance of half a grain of arsenic per "piece of paper"—a piece being 12 yards in length and 21 inches wide—would be ample for accidental and unavoidable contamination; and this quantity, it is considered, would not be injurious to health. It is found that a suitable size for a sample to be tested is 16 square inches, to be cut from one part; or, if thought well, from several parts of the pattern, so as to include