

THURSDAY, JULY 8, 1886

THE ETIOLOGY OF SCARLET FEVER

A REPORT has just been issued by the Medical Officer of the Local Government Board, the importance of which, as regards the etiology and prevention of a widespread infectious disease, deserves the most careful attention of sanitary officers and the general public alike. Hitherto the general assumption prevailed that infection with scarlet fever has always had its origin from the human subject, that is to say, that scarlet fever is always transmitted to the human subject from a human being affected with the malady, either by direct contagion in its wider sense, or through milk, cream, &c., previously contaminated with the contagium derived from a human source. In the present Report we have an account of an extensive outbreak of scarlet fever in the north of London at the end of last and the beginning of the present year amongst the consumers of milk derived from a particular farm at Hendon. The first part of the Report of the Medical Officer contains an account by Mr. W. H. Power, Inspector to the Medical Department of the Local Government Board, of an investigation into this outbreak, and the evidence brought forward by Mr. Power is absolute and conclusive: it proves by a chain of circumstantial evidence as complete as can be wished, that this particular outbreak of scarlatina was transmitted by milk which could not have been previously contaminated from a human source.

Moreover, Mr. Power proves that certain milch cows recently added to the dairy and affected with a particular malady were the source from which the contagium had been derived; further, that as this malady once introduced by a few cows into the dairy spread to other milch cows, so the amount of milk containing the contagium, and also the number of cases of scarlatina amongst the consumers, increased, and as the milk-supply was discontinued so the spread of scarlet fever abated.

The malady with which the cows were affected consisted chiefly in a particular kind of ulceration of the teats and udder, and perhaps some slight cutaneous disorder. As regards the general health, the feeding and milking capacity, the cows seemed to present very little alteration.

The second part of the Report contains an account, by Dr. Klein, of the minute pathology and etiology of this cow disease. In the first place, Dr. Klein ascertained that the local disease on the teats and udder is inoculable in its specific characters into healthy calves; secondly, that the cows affected with the local disease of the udder and teats were at the same time affected with a disease of the viscera, as proved by the *post-mortem* examination, in many respects similar to a mild form of scarlet fever in the human subject.

From the ulcers of the cow Dr. Klein isolated by cultivation a streptococcus or chain-micrococcus, possessed of distinct and special characters, both as to morphology and mode of growth in various nutritive media, particularly in milk: in this latter it grows in a peculiar manner, and very luxuriantly. With artificial cultures of this streptococcus a disease was produced in calves by subcutaneous inoculation which bears a striking

resemblance to scarlet fever in man. The conclusion is thus forced on us that this streptococcus is identical with the *materies morbi*; further, that the scarlatina produced in the human subject by the consumption of milk from the Hendon farm was an experiment, carried out on a large scale, of infection with a cultivation in milk of the above streptococcus; and lastly, that the milk of the cows affected with the specific ulcers of the teats and udders became charged with the contagium by the hands of the milker during the act of milking. Although there are many details still wanting to complete the research, particularly those regarding the transmissibility of scarlatina from the human subject to the cow, there is sufficient evidence at hand already to warrant the hope that by a proper and effectual mode of superintending milk-farms it will be possible to considerably limit this dire scourge. A suggestion that at once presents itself is this: granted that the above-mentioned streptococcus is the real cause of the malady, there is no reason to doubt that boiling the milk would effectually destroy its life and infective power, just as is the case with all micrococci. True, the danger to contract scarlatina would hereby not be altogether annihilated, since cream cannot thus be disinfected, and since scarlet fever can unquestionably be contracted from a human source, but it must be obvious from this conclusive Report that milk *per se* coming from an infected cow plays a considerable rôle in conveying scarlatina from the cow to the human subject.

OILS AND VARNISHES

Oils, Resins, and Varnishes. Edited by James Cameron, F.I.C. (London: J. and A. Churchill, 1886)

THIS work, according to the preface, is intended to be "a hand-book useful to all interested in oils and varnishes, and especially to analysts, pharmacists, manufacturers, and technological students." The editor further states that in preparing this volume he used the information in Cooley's "Cyclopædia," which he has "supplemented from the latest publications." The modern literature of oils and varnishes exists chiefly in the form of workshop recipes, in trade journals, technological dictionaries and pharmaceutical publications, and if anybody ever wanted to know anything about the useful and heterogeneous products comprised under these terms he not unfrequently found it necessary to waste a good deal of time in hunting up the required information. This last addition to Messrs. Churchill's Technological Hand-books will therefore be valuable to those engaged in several distinct branches of industry, and the editor has certainly displayed considerable judgment in the selection and arrangement of the scattered materials which he has brought together in this little volume of some 370 pages in length.

Chemically speaking the word "oil" has no precise meaning. It seems in fact that an oil may be anything that is not water, since we have oils among such distinct families of organic compounds as the alcohols, acids, aldehydes, hydrocarbons, &c. Thus in Chapter I., on the "Chemistry of Oils," these compounds are in the first place classed under the usual heads of "fixed" and "volatile." Animal and vegetable fixed oils being generally ethereal salts of glycerol and acids of the fatty and

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