

born at Langues, in Lorraine, July 19, 1793. After completing a course of scientific study, he opened a pharmacy in Paris, where he soon attracted attention by his talent for investigation, as well as by his ability in scientific literary work. In 1825 he assumed the editorship of the *Journal de Chimie médicale*, and continued this labour until some years prior to his death, having as associates Payen, Pelouze, Robinet, Orfila, Péligot, Dumas, and other leading chemists of the day. Soon after entering upon his career as investigator, his merits were recognised by the government, and he gave up his business connections to accept the Chair of Chemistry at the *École supérieure de Pharmacie*, a position which he occupied up to the time of his death.

Among Chevallier's earlier researches should be mentioned his investigations on the absorptive capacities of living plants for various inorganic solutions, and especially his exhaustive studies in connection with Payne, on the hop and the potato, which attracted general attraction. In physiological chemistry notice should be taken of his detection of various poisonous metals, such as lead and copper, in normal organisms. The knowledge of French mineral waters is also greatly indebted to his numerous and exhaustive analyses, and the presence of arsenic in many springs was first signalled by him. The greater portion of Chevallier's life was devoted to the chemical phases of public hygiene, and in this connection he published a number of valuable papers on the detection and prevention of adulteration in a large variety of articles of food, methods of preserving food, disinfectants, &c. Of his devotion to the cause of scientific inquiry an interesting anecdote is related from the earlier part of his career. A case of poisoning was to be tried at Paris in which acetate of morphine had been used, and Chevallier, who had sold the salt to the murderer, was summoned as a witness. Anxious to have the full nature of this hitherto untried poison well established, and being limited as to time, he immediately undertook a thorough investigation of its toxic effects on his own system, and succeeded so well that at the trial he was able to give a detailed description of the symptoms attending the use of the drug in question.

As a scientific writer Chevallier was widely and deservedly known. His first work in 1824, in connection with Payen, "*Traité des réactifs chimiques*," reached a third edition in five years. In 1826-29 he published, with Richard and Guillemain, an extensive "*Dictionnaire des Drogues simples et composées*," in five volumes. In 1850 appeared his admirable "*Dictionnaire des Altérations et Falsifications des Substances alimentaires, médicaments, et commerciales*," which reached a third edition in 1858, and was translated into other languages. Other important works were "*Recherches sur les Moyens appliqués à la Conservation des Substances alimentaires*" (1858), "*Du Café, son Histoire, son Usage, etc.*" (1862); "*Traité des Désinfectants sous le Rapport de l'Hygiène publique*" (1862).

T. H. N.

THE SEWAGE OF LONDON

GENERAL SCOTT, in his recent paper at the Society of Arts, entitled "Suggestions for Dealing with the Sewage of London," deserves credit for having drawn attention to a subject which in itself must have especial interest for all residents in the metropolis, but which, from the manner in which he has dealt with it, possesses further attractions for those who have made the scientific aspects of the sewage question their study, in that he has really attacked this much-debated problem in an entirely new direction, and has in so far entered upon fresh ground. We do not remember that any previous investigator has set himself the task of examining into the com-

position and character of the suspended matters of water-carried sewage coupled with the possibility of the mechanical separation by simple subsidence (1) of the heavier mineral particles or the detritus, and (2) of the lighter flocculent particles, which latter, consisting as they do mainly of the fecal matters, possess a far higher manurial value than the heavier substances washed from the roads and pavements.

The sludge deposited from sewage by one or the other systems of precipitation has received hitherto the chief share of attention from scientific men, and even when the possibility of recovering the solid matters in sewage by some system of straining or rude filtration, or the retention of such solids in tanks, in which the sewage is brought to temporary quiescence, has been considered, it seems on all occasions to have been the practice to regard the entire bulk of such deposits as an inseparable compound of very low value from the manure point of view. It is of course the manurial value of the ingredients contained in suspension and in solution in sewage which has been so frequently inquired into by chemists; and, beginning with the report of Dr. Hoffman and Mr. Witt in 1857, down to that of Messrs. Rawlinson and Read in 1876, a vast mass of valuable information concerning the nature, composition, and value of the manurial elements of town sewage has been accumulated. It has remained for General Scott to point out that—

1. A very large proportion of the solid suspended matters may be removed from sewage by simple subsidence.
2. That such matters may roughly be separated, the more valuable from the valueless, by the method in which such subsidence is accomplished.
3. That after such preliminary treatment, any chemical process for the clarification and partial precipitation of the dissolved impurities of sewage may be carried out far more readily, and under conditions rendering their success in an economical point of view one of greatly increased probability.
4. General Scott has indicated various simple methods for dealing with the silt and detritus removed from the sewage at a relatively small expense; of deodorising and fitting the sludge obtained by subsidence for the manufacture of a manure; and lastly, a mode of further purifying the London sewage by a system of chemical treatment whereby it may be rendered suitable for discharge into a river of large volume.

Assuming the dissolved impurities to be incapable of recovery unless the sewage water can be utilised for irrigation, the first object of General Scott's paper was to show how large an amount of harm was done to rivers and the dwellers on their banks solely by the solid matters contained in sewage. By means of extracts from the reports of the various Royal Commissions who have examined into this question, and the information furnished to the Metropolitan Board of Works by their own advisers, Messrs. Bidder, Hawksley, and Bazalgette, he proved that the deposits in the river, the mud banks, the foul emanations from which were most unhealthy, and the dangers to navigation were all due to the discharge of the solid ingredients of raw sewage into rivers and into the Thames.

General Scott next entered very minutely into the composition of the suspended matters of sewage. An estimate of the total weight of solid matters due to a mixed population of 3,500,000 persons, with a proportionate allowance for the fertilisers existing in the excreta of animals, together with the *débris* of the animal and vegetable substances which might find their way into the sewers, would manifestly represent the sum total of the organic matters in London sewage.

Concerning the gross annual amount of organic matters different estimates appear to vary very slightly, and in assuming them in the case of London at 50,000 tons per