SOLUBILITY OF LEAD IN WATER UNDER DIFFERENT CONDITIONS.

U. Antony and T. Benelli (*Gazz. Chem. Ital.* 1896, No. 25, and *Ch. Zt. Zahrg.*, xx. p. 207) conducted three series of experiments, using coils of lead wire (two mm. in diameter), with a surface of 285 square centims, and (I) distilled water, (II) water containing common salt (NaCl) 0.049 grm. per litre, and (III) water with sodium sulphate (Na_2SO_4), 0.4 gr. SO_3 per litre. Each of these waters was used (1) boiled so as to expel the dissolved air, (2) agitated with air, (3) with a current air passed through it continuously at the rate of one litre per hour, and (4) with a current of CO_2 at the rate of 400 ccms. per hour. The quantity of lead dissolved in five days ranged from 0.68 grms. to 12.98 grms. per 100 litres, steadily increasing during that period, but not in proportion to the erosion of the metal; it was greatest when the water was aerated when charged with CO_2 , and least when distilled water was used most, less in the series in which the water was charged with chlorides, and least with the sulphate, the presence of the salts hindering the solution of the lead.

PUBLIC HEALTH AND THE CARE OF THE SICK IN LONDON.*

Dr. Meyer spent some time last year in inquiring into various public health questions in the metropolis, and it is therefore of interest to see what points in its sanitary administration especially struck him.

His visit to the Public Health Section at the Earl's Court Exhibition causes him to say that the comprehension of sanitary matters by the general public here is quite different from that in Germany, because in England the knowledge of nursing and of sanitary arrangements generally has penetrated far more into the consciousness of the nation than in Germany, and the subject excites far more interest in different circles of society than is the case in any other country. And he cites as the best example of this the amount subscribed voluntarily every year for the support of hospitals, which has no parallel in any other country. One of the chief reasons which Dr. Meyer assigns for the present unsatisfactory state of nursing in Germany is the miserable provision which is made for them in case of illness or old age.

In describing the arrangements for giving first aid to the wounded in London, he regards with satisfaction that there are 5,879 doctors, that is, one to 750 inhabitants, and notices that several of them have "surgeries," which he describes as shops with a red lamp and the name of the proprietor. He points out that the word ambulance in England has not the same meaning as in Germany, because in the former it is synonymous with the transit of

the individual, and in Germany has in addition the meaning of treatment as well. The distribution of the hospitals in London renders the German method of subsidiary ambulance stations unnecessary.

In speaking of the Metropolitan Asylums Board hospitals he takes the opportunity to say that in the matter of comfort for the inmates they are an example to those of other countries. The organisation of the Metropolitan Asylums Board seems to have impressed him perhaps more than anything else and excited his admiration.

Notwithstanding the fact that Berlin, when compared with most large cities in regard to its mortality statistics, occupies a respectable position, its death-rate from infectious diseases is 1.12 per 1,000 living as compared with 0.86 in London, and is 6.03 per cent of the total causes of deaths as compared with 4.41 in London.

FURTHER CONTRIBUTIONS TO THE HISTORY OF CASES OF MEAT POISONING.

By Fritz Basenau.

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SINCE Bollinger in 1876 pointed out that the cause of certain illnesses affecting a number of persons, which frequently were set down to enteric fever, were in reality due to the use of meat from diseased animals, the subject of meat poisoning has grown in interest from year to year. Bollinger designated this kind of affection as septic or pyæmic gastro-enteritis, and he expressed himself as convinced that the injurious effects were to be ascribed to a combination of chemical intoxication from mycotic infection. He also believed that the potency of the "poison" might increase *post mortem*, a view which subsequent investigations has shown to be correct.

Most of the meat-poisoning cases are traceable to the flesh of animals that have been killed *in extremis* (*nothgeschlachtet*). Further, it has been shown that a particular class of diseases in the slaughtered animals is prone to render the flesh injurious to the health of the consumer. The principal of these are polyarthritis septicæ of calves, hæmorrhagic enteritis of calves, septic metritis of cows, peculiar intestinal affections in oxen, and udder diseases of cows of a febrile character. Associated with these diseases are septic and pyæmic affections between which no clear line separating the one from the other can be drawn.

The following figures show the much greater proportion of cases of injurious meat obtained from animals slaughtered *in extremis*, as compared with those killed in the ordinary way of business during the years 1888-91 in Baden:—

	1,000 slaughtered in ordinary way.	1,000 slaughtered <i>in extremis</i> .
Cattle	1.6 cases	128 cases.
Calves	0.4 "	4.9 "
Sheep	0.2 "	20.2 "
Pigs	0.3 "	63.4 "

* A paper read before the Berlin Medical Society by Dr. G. Meyer.

It is especially noticeable that in purely septic disease of rapid progress the *post-mortem* appearances are often very slight or even negative, and without an exact knowledge of the symptoms of the disease, such dangerous meat might easily be passed. A curious fact about septic-pyæmic affections in animals is that the bacteria giving rise to them are not, as is the case in man, cocci, but bacilli in most cases. The mode of infection, however, in animals and man is usually the same, namely by inflammatory affections of the umbilicus in the newly-born, from the uterus *post partum*, by the intestinal and respiratory tract in certain affections, and after injuries to or changes in the skin. In the large group of diseases usually classed as "hæmorrhagic septicæmia" which affect animals, not a single one is transmissible from them to man, and they are all due to bacilli. The explanation, therefore, is to be found, probably, in the different disposition and power of resistance of the human and animal organisms to the two groups of disease exciters.

It would appear that there is a difference to be noted between meat poisoning and sausage poisoning cases. In the former it is not the ptomaines already developed in the meat which set up disease, but the growth and development in the tissues of the body of particular bacilli; in the latter, it is due chiefly to the poisonous chemical substances already formed in the sausages. The author cites a remarkable experiment carried out at the slaughterhouse of Rotterdam. An ox was inoculated in the jugular vein from a culture containing bacilli which had been obtained from a meat-poisoning case, and was slaughtered after twenty minutes. Only a few bacilli could be found *post-mortem* in the blood, spleen, and liver, but their number increased considerably after a lapse of some hours. The experimenters having explained to the *personnel* of the slaughterhouse that, in their opinion, owing to the small number of bacilli in the muscular tissue the danger from eating the meat was slight, 53 persons resolved to risk it. Of these 53 persons, 15 became ill with headache and diarrhoea after a lapse of 12-18 hours, but all recovered.

The author narrates in detail the result of various experiments made by him with portions of diseased meat. Mice were in all cases fed by him with the meat, and with cultures of bacteria obtained from it. He holds that the feeding of mice enables one to give an answer speedily to the question whether cooking destroys the poisonous quality of the meat, since by heat the pathogenic bacteria are certainly killed, and such a treatment determines whether toxic substances are present which are not killed by a temperature of 100°C. He found that the raw flesh when eaten was always more injurious than the cooked, that on one occasion bacteria were found, the toxic products of which were entirely destroyed by cooking, and on

another, bacteria, the poisonous quality of which remained unimpaired after cooking. Mice are peculiarly susceptible to the organisms giving rise to meat poisoning. He recommends in suitable cases the following bacteriological examination of the meat:—

It should be undertaken 24 hours after slaughter, because the bacteria undergo an increase in the meat *post mortem* which facilitates the investigation. It is assumed that after the slaughter the offal has been removed in the ordinary way. If this is done one can be certain that the bacteria eventually found in the muscular tissue have not reached there from the intestinal tract after death. The flesh of animals contains usually no bacteria for a long time after slaughter. Plates and cultures are then made from a spot in the interior of the meat where the connective tissue is loose. At the same time two mice are fed on the raw flesh, and other two on the flesh after it has been kept at a temperature of 100°C. for an hour. If no bacteria are found on the plates or in the cultures after 24 hours the meat is to be handed over for consumption. If bacteria are found present the meat must be kept until the result of the feeding experiments are ascertained, which at the outside is not more than three days. If the mice fed on the raw flesh die, but not those fed on the cooked meat, it is evident that the poisonous quality of the meat has been removed by the cooking, and experience shows that such meat can be handed over for human consumption after it has been sterilised in a proper steam apparatus. If there is no steam sterilisation possible it should be condemned. If the mice fed on both raw and cooked flesh die, then the meat must be condemned or utilised only for trade purposes.

AËRATED BUTTER.

THE rancidity of butter, so repulsive to the taste, if not so injurious to health as putridity in flesh, is due to the liberation of butyric and other volatile acids and their derivatives, through the action of microbes, and is favoured by the retention of the casein and other constituents of the milk. The more completely these are "worked out" in the process of making the butter the less its tendency to spoil, and a pure dry fat, such as the best Danish, remains fresh for weeks or months with a very small addition of salt. Irish butter is, as a rule, manufactured with little skill, and in the same barrel butters of very different qualities may often be seen in alternate layers, the value of the whole mass being that of the worst. It has, however, been found possible, by a process patented by Mr. R. Andrews four years ago for the purification of other commercial fats, to remove all the offending matters and products, leaving a residue of pure