

When a single list contains the names of more than one hundred violators, the housekeeper realizes the inspecting body is active and vigilant.

Interstate commerce is pretty closely watched by government inspectors. But investigations have shown that punishment and fines have been very light, or none at all. What is a fine of ten dollars to a manufacturer who is making thousands?

A specific case is the United States investigation into the use of benzoate of soda in foods. The United States National Law requires that such investigations be conducted by the Bureau of Chemistry at Washington. Dr. Harvey W. Wiley took hold of the work with characteristic thoroughness; the final decision being arrived at that benzoate of soda was injurious to health. The manufacturers protested and

demanding that a special commission be appointed to investigate the matter further. The request was complied with by President Roosevelt; and after a very superficial investigation Dr. Wiley's decision was reversed. When these conditions can exist, the consumer thinks government regulation must be something of a farce.

The public school domestic science department is endeavoring to create a public demand for pure foods, through intelligent instruction of the girls, who, in turn, influence the homes. Such united efforts all over the country are already showing results. But the real influence in the community will be felt when the girl of to-day becomes the housekeeper of to-morrow, when she will use to her fullest power the law of supply and demand in pure foods and sanitary surroundings.

## A STUDY OF THE VENTILATION OF SLEEPING CARS

BY THOMAS R. CROWDER, M.D.,

SUPERINTENDENT OF SANITATION, THE PULMAN CO., CHICAGO.

For the purpose of securing a suitable exchange of air in railway cars many types of ventilators have been suggested and not a few have been given practical tests. About three years ago I was asked to report on the efficiency of one of these. It became evident that it would be necessary to establish some basis of comparison, since it does not seem to have been estimated in exact figures to what degree natural ventilation of railway car is effective. As the problem is of lasting importance and is likely to recur, it seemed advisable to make a fundamental study of the question and to place the results within reach of those who might have occasion to make use of them.

A very simple, if somewhat tedious, means of making this investigation was long ago established by Pettenkofer. It consists of estimating the vitiation of the atmosphere by determining the amount of carbon dioxide it contains, and from this computing the amount of air supplied for ventilation. All air contains carbon dioxide

as a normal constituent. The average amount in pure air is commonly stated to be 4 parts in 10,000. This is generally used in ventilation computations, though recent investigation has shown it to be a little too high.

The carbon dioxide in the expired breath averages more than 4 per cent. (400 in 10,000). The amount excreted hourly varies according to age, sex and the degree of bodily activity. In a mixed community of persons at rest it will average about 0.6 cubic feet per person per hour, and the variation will be small.

If there were no ventilation whatever the air of an ordinary railway coach, containing 4,000 cubic feet of space and occupied by 20 people, would have 34 parts of carbon dioxide per 10,000 of air at the end of one hour. This would continue to increase indefinitely in a direct ratio to the time, since carbon dioxide continues to be produced by the respiration of the occupants at a practically constant rate. But no car is air-tight, and the inside