

If we can produce a branch of the Irish race which will be as immune against the bacillus of tuberculosis as are the Jews, will that race be specially liable to diabetes or cancer?

As all men must die, the effect of stamping out one particular form of disease must be to increase the number of deaths from other causes, and in this sense it is true that vaccination has increased the number of deaths from accidents, from suicide, and from phthisis, because it has preserved children from small-pox to die at a later period from these other causes; but we have not a particle of evidence that the immunity against small-pox produced by vaccination is the cause of, or is accompanied by, a less immunity against some other disease. Here it should be remembered that, for all diseases of which one attack produces immunity, the tendency is, in the course of many generations, to make the whole population subjected to such an influence immune.

Perhaps some of you may think that such questions as I have suggested are purely theoretical, unanswerable, and, therefore, of no practical interest; but it is not so. Some of them, if not all, can be answered, and they ought to be answered. To do this, new lines of investigation must be opened—partly experimental, in well-appointed laboratories; partly by collective investigations by medical men and in hospitals; and partly by new methods of statistical research based on disease as well as on death registration and the census. And the universities should train some men to understand the importance of this work—the men who are to become legislators and heads of departments, and some other men who can do the work if means and opportunities are afforded them. It is now generally admitted that biology is a branch of science for which universities should provide the means of increase and of diffusion of knowledge; but it has not yet been generally understood that morphology and physiology, as ordinarily provided for in university work, do not cover the most important part of biology—that part to which they are merely necessary preliminaries, that part which is the main reason for their existence, and without which they rest on narrow scientific foundations—namely, pathology. We cannot be said to understand the structure and functions of an organ until we know what these are in its abnormal as well as in its normal condition. It is to experimental pathology in its broadest sense—including not only the study of lesions specially produced for the purpose, but also the study of the lesions produced in man and animals by disease, each case being one of nature's experiments—that we must look for the most valuable explanations of peculiarities of structure and function, for explanations of the mode of action of physical, chemical, and vital agencies in the production of disease, for means to counteract the abnormal conditions and actions of organs and tissues—in short, for the scientific foundations of hygiene. It appears to me that at the present time the majority of the English and American universities are in urgent need of a department of pathology properly equipped for original research and for teaching, not as a mere technological matter or as merely a branch of the medical department, but as a department of general biology; and the organisation of such a department should precede or accompany the organisation of a department for the promotion of scientific hygiene. It seems to me that a great university which is worthy of its name should provide for the training and equipment of a few men to consider these and similar questions, and for the training of many men who are to be the future legislators for, and the advisers of, the people, in such fashion that they can appreciate, and make practical applications of, the conclusions to which the special students shall arrive.

TREATMENT OF DIPHTHERIA BY THE SOLUBLE SALTS OF MERCURY.

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IN order to form a just estimate of the value of any treatment in diphtheria it is necessary that the particular treatment should have been practised for a lengthened period of time and during epidemics which were not characterised by the benign type of the disease. For the last eight years I

have constantly used perchloride of mercury, administered internally, in the treatment of diphtheria; and that during this period the disease prevalent in Buenos Ayres has not been of a benign type the following statistics will show:—

Mortality from Croup and Diphtheria in Buenos Ayres.

—	1887	1888	1889	1890	1891	1892	1893
Diphtheria	753	1113	646	802	480	441	433
Croup ...	242	272	259	235	143	168	225
Total ...	995	1385	905	1037	623	609	658

My personal experience of this treatment has been one of continued success, and in marked contrast to the results which I had obtained before I had begun to use the internal administration of perchloride of mercury. I have not kept statistics of all the cases I have treated during these eight years, but my experience during this period leads me confidently to affirm that, when cases of diphtheria are from the first treated by the internal administration of perchloride of mercury, the disease becomes divested of the terrific power it has acquired in so many countries, and its mortality may be reduced to that of any other of the contagious diseases. But in order that the above treatment may have the efficacy to which I bear testimony it is necessary that it be employed immediately after the detection of the disease and not delayed until the diphtheritic toxins have laid low the vital powers of the patient. The internal administration of mercury in the form of calomel was practised in diphtheria by Trousseau, Bretonneau, and other French physicians in the beginning of this century, but with only partial success.¹ The internal administration of the soluble salts of mercury is of more recent date and has been advocated chiefly in the United States, Sweden, and Russia. Dr. Pepper, in his inaugural address at the Section of Medicine at the annual meeting of the North American Medical Association, stated: "But recently remarkable results have been observed in diphtheria after the employment of large doses of perchloride of mercury." He then described a case, presenting conditions in which he had never seen recovery to follow before, but which was nevertheless saved by the internal administration of perchloride of mercury.

In Sweden Dr. Selldén,² medical officer of the Government, relates that in the district of Norberg 564 persons were attacked with diphtheria between the years 1879 and 1882. Of these, 523 died, the mortality being 92·7 per cent. During that period cyanide of mercury was not used in the treatment of the disease. During the following three years, between 1883 and 1886, there occurred in the same district 160 cases of diphtheria. Of these, 132 were treated by the internal administration of cyanide of mercury, with only one death, while of the remaining 28 who did not take the cyanide not one survived. Dr. Selldén and his colleagues have treated 1400 cases of diphtheria with cyanide of mercury, with a mortality of 4·9 per cent. Dr. Selldén uses no local application save, where practicable, gargle of cyanide of mercury, 1 in 10,000 of peppermint water. In Russia Dr. Werner,³ medical officer of a district near Narwa, in the Gulf of Finland, gives his testimony to the good effects produced by the internal administration of perchloride of mercury coupled with frictions of ichthyol. He states that diphtheria is very frequent and fatal in his district, having treated 90 cases during six years, with a mortality of between 60 to 70 per cent. Last year, he states, the disease took an exceptionally severe type. In July, August, and September 11 cases occurred, of which 9 died. Since the end of September until now 17 cases have occurred, all of which were treated with perchloride of mercury, and several of them were of great severity. All recovered, with the exception of two, who were only seen a few hours before death. In the Argentine Republic several physicians now treat diphtheria by the internal administration of perchloride of mercury with the best results. Dr. Fornos, residing in one of the towns in the interior, writes to me stating his experience of the treatment. In the town where he practises diphtheria has been very prevalent. In his practice the majority of severe cases had succumbed until,

¹ Mémoires on Diphtheria, Bretonneau, Trousseau, and others, New Sydenham Society.

² THE LANCET, March 24th, 1888.

³ THE LANCET, April 3rd, 1886.

led by a monograph which I had published on the subject, he adopted the internal treatment by perchloride of mercury, and since then all his cases have recovered. He mentions one case specially where, in a child suffering from pharyngeal diphtheria, the disease extended to the larynx and tracheotomy had to be performed. After several days the membranes in the larynx began to spread again, when the internal administration of perchloride was exhibited, with the result that on the very next day the membranes were seen to diminish, as also the albumen which was present in the urine. Six days later the albumen and membranes had completely disappeared. Dr. Gie of Buenos Ayres had a remarkable case some years ago, in which the value of mercury in diphtheria was clearly demonstrated. He was called to see a child seven years of age suffering from this disease. The quantity of membranes in the throat and mouth was so enormous that he gave up all idea of local treatment and injected daily one centigramme of cyanide of mercury hypodermically. In about a week's time the throat and mouth were clear of all membranes. Unfortunately in this case the child died a few days later from cardiac paralysis. This result, however, does not invalidate the undoubted action which the cyanide had on the disease.

One of the earliest cases I treated by the internal administration of perchloride impressed me deeply with the beneficial action of the drug. I was called to see a child six years of age who had her fauces covered with membranes and who was in a very weak condition. I ordered her internally perchloride of mercury, tincture of iron, and chlorate of potash, and externally the insufflation of iodoform over the membranes. In three days her throat became clean, but the child became extremely pale and greatly prostrated. It was then a question to me whether I had to deal with an intoxication of the disease or of the drug I was using. I stopped the mercury, continuing with the rest of the treatment as before. In twenty-four hours the pharynx filled again with false membranes. The situation was critical, and I decided to readminister the mercury, with the result that the membranes disappeared, not to return again. Since I treated this case some years ago I have had an uninterrupted success in the treatment of diphtheria by the internal administration of perchloride of mercury *provided* that the cases have been seen at an early date. I have sometimes been called in consultation to see cases where the internal administration of the soluble salts of mercury was only commenced at the last stage, when the system was thoroughly poisoned with diphtheritic toxins. In these cases death has been the usual result.

It has been objected that the internal administration of the soluble salts of mercury does not constitute a rational treatment, inasmuch as the bacillus of Loeffler, not penetrating beyond the mucous membrane of the pharynx &c., leaves the blood without microbes over which antiseptics might exercise their destroying action. But the experiments of Kitasato and Behring have destroyed the value of this objection, proving, as they have done, that the diphtheritic toxins in the blood can be neutralised and rendered innocuous by appropriate chemical substances. If, therefore, experience proves the beneficial action of the soluble salts of mercury in diphtheria, we are justified in believing that they act by neutralising the toxins with which the bacilli of Loeffler have invaded the circulation. But that the action of the soluble salts of mercury in diphtheria is not limited to their toxin-destroying power is evident from the manifest power which these salts possess in bringing about the disappearance of the false membranes; the alternate disappearance and reappearance of the membranes coinciding with the exhibition or interdiction of these salts has been a matter of observation in the treatment of diphtheria.⁴ Sir Joseph Lister has remarked on the difference that exists between antiseptics which kill microbes and antiseptics which prevent their growth and development in different media. There are antiseptics which are powerful in their inhibitory and weak in their microbicidal action, and *vice versa*. The undoubted fact that the internal administration of the soluble salts of mercury causes the false membranes to disappear (and that, as a rule, rapidly) presumes that their presence in the interstices of the mucous membrane, where the bacilli of Loeffler have laid a stronghold, will, if not sufficiently concentrated to kill these bacilli, be, at all events, sufficiently powerful to stop their development.

The treatment of diphtheria by mercurial inunction has

been tried at the hospital for infectious diseases in this city and has proved a failure. The calomel treatment, as employed early in the century in France, gave only partial results. What has given the best results, wherever it has been tried, has been the internal administration of the soluble salts of mercury; but if the action of these salts is to be explained in the manner described above it is evident that, in order to ensure success, these salts must be administered early in the disease before the bacilli have gained too great a stronghold, from which they must be dislodged, and, above all, before the quantity of toxins in the blood has laid too low the vital powers of the patient, and for these same reasons the doses of the salts administered must be large. My personal experience has been with perchloride of mercury, and I have been surprised to see how well children will tolerate this drug; children between twelve and four years of age can easily take half a drachm of the liquor Van Swieten every two hours at first, then every three, every four, and so on until the drug is omitted. The best way to administer the liquor Van Swieten is to give it in milk. In this way the disagreeable metallic taste of the mercury is obscured. It is necessary that the liquor be well diluted, otherwise it may easily give rise to diarrhoea. The advent of diarrhoea is not, however, an indication to stop the mercury; it is rather an indication to increase the dilution of the drug, to add laudanum, or in some cases to diminish the dose or augment the intervals between its administration. During an epidemic of diphtheria, or where this disease has become endemic, every case of sore-throat where false membranes are present, and I would venture to advise even where these membranes are not present, should undergo an energetic treatment of mercury. It has not been an uncommon observation in this city to find that children have been suffering for several days from apparently simple sore-throats, during which time they have not been submitted to any serious treatment, when suddenly the disease has assumed a virulent type and the patient has succumbed. The explanation of these cases is that for several days the natural defence of the organism has so advantageously withstood the attack of the bacilli that constitutional symptoms have been present only to a very slight extent, but after a time the lines of defence have given way and the invasion of toxins has destroyed the patient. That there are organisms whose resources of defence are so powerful that they, unaided, can triumph over the diphtheritic invasion is a matter of frequent observation, but it is not given to a physician to distinguish these organisms, and it is therefore his duty to come to the aid of every organism on the slightest indication of attack. I am convinced that the secret of success in the treatment of diphtheria is to treat all cases from the very first as if they were severe ones.

With regard to the administration of iron this may be continued with the mercury; but for fear of upsetting the stomach I have lately been in the habit of giving the liquor Van Swieten alone at first, and afterwards administering iron and strychnine, this latter to prevent the advent of paralysis. I do not omit the use of local applications, of which there are so many, but the warning of Dr. Jacobi must be borne in mind when he states that children who are obstinately refractory to these applications may be much injured if they are insisted on. I believe firmly that local applications, prudently used, are a help to the internal administration of the soluble salts of mercury, but the sheet-anchor of practice must lie in the internal administration. I have never yet used hypodermic injections of mercury, but believe that in urgent cases or where the stomach will not tolerate the drug they are indicated, and I further believe that in desperate cases the intra-venous injection of mercury, such as has been recently recommended lately in Italy in malignant malaria, is likewise indicated.

Buenos Ayres.

PULMONEA.

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"PULMONEA" is a name given by the native Peruvian miners to an affection of the chest simulating acute pneumonia in the consolidation stage, and might easily be mistaken for it. In these altitudes (15,600 ft.) the sudden daily extremes of temperature (75° to 38° F. average) natural

⁴ THE LANCET, Nov. 9th, 1889.