THE DIPHTHERIA CARRIER.

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It is with diffidence that I tackle this subject, because I feel I am about to offend the majority. There are so many people who, if they possess any clinical sense, shamefully abandon their heavenly gift on the steps of the laboratory; and who, if they are endowed with any common sense, strangle their priceless portion with red tape and bury it beneath a mass of regulations.

I own 'twas rash, an' rather hardy,
That I, a simple country bardie,
Show'd meddle wi' a pack so sturdy,
Wha, if they ken me,
Can easy, wi' a single wordie,
Louse hell upon me.

Nevertheless, and like Robert Burns, I propose to carry on.

In the Journal of the Royal Army Medical Corps, November, 1930, there is an excellent article entitled "Diphtheria and its Sequelae in the North-West of India," by Major S. Smith, R.A.M.C.

The minority will read, mark, learn and inwardly digest.

The majority—those who mistrust their clinical powers and have forsaken common sense—will shiver in their shoes.

"Imagination is the mightiest despot," and Major Smith has conjured up the tyrant in a number of pronouncements of which the following is as typical as it is striking.

"If every case of sore throat, however mild, be regarded as potential diphtheria, at least in districts and during the seasons in which this disease is prevalent, we shall see fewer cases of post-diphtheritic paralysis than is now, unfortunately, the case."

There are other statements of the same kind, backed up by a number of dramatic illustrations, and the net result is that the reader (i.e., nearly everybody, except you and me) forms a picture something like that on the opposite page.

What is the genesis of this picture?

Here one is tempted to revert to a well-worn theme; and the temptation is so strong that it cannot be resisted.

The Great War was brutalized by science and so deprived of practically all military glamour. The Great Peace is dominated by mechanics and clinical romance languishes unto death.
This is the age of countless "specimens," of rationalized methods, of standardized results and of mass-production diagnoses which are turned out by a medical factory: the laboratory. That is the amusing part of it all, because the rôle which is now being played by the laboratory in this huge business concern is a visitation for past misdeeds: a Nemesis—and an American one at that.

One is old enough to remember the rise of "laboratory methods": with what scepticism they were received by the old-fashioned clinician: with what ardour they were pushed by the enthusiastic scientist: how the clinician fought against depreciation of the power of his five senses, and how the scientist urged the unquestioned recognition of his demonstrable facts.

The mysterious finesse of the human was pitted against the measurable accuracy of the machine.

Then followed a period of balance, when the clinician discovered that the scientist could render valuable help, and the scientist realized that his machines were neither infallible nor omnipotent in the war against disease. This period was marked by such watchwords as "co-operation" and "co-ordination."

It did not last long.

Soon the medical schools poured out an unending stream of individuals who found the rôle of rapporteur much to their liking; and these individuals are still with us.

The clinician of the pre-War type is dead, buried, and almost forgotten. He is lucky, for had he survived a little longer, he (or many portions of him) would have gone to swell the ever-increasing mass of specimens which are being dumped in that capacious repository, the laboratory.

In face of this, what attitude is being adopted by the laboratory workers? These gentlemen are now in the front rank of those who declare that
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an ounce of informed, intuitive clinical observation is worth a ton of negative swabs, of guinea-pigs, of colonies like unto the breasts of a virgin. However, the scientists, having started the snowball rolling, now find that the thing has developed into an avalanche in which they themselves are engulfed and swept along.

That is the general aspect of the trouble. The narrower view may be obtained by looking once again at our picture. Note its big, heavy superstructure: very imposing. See the small, delicate base: very safe. Very safe, that is to say, for the doctor; but terribly unsafe for the patient. A light touch and the whole thing goes over, crashes on the unfortunate patient and pins him to the isolation ward for weeks and even for months.

If the picture is so finely balanced and so easily thrown over, why does it never fall in the opposite direction and knock the specimen-producing doctor on the head?

For this there are several reasons.

(1) Observe that, in the picture, there is a gap between the words "Laboratory" and "Districts."

This represents the period during which the medical attendant is pondering over—

MILD SORE THROAT.
POTENTIAL DIPHTHERIA.
PARALYSIS.

and is collecting serum and testing his syringe, pending the arrival of a report from the laboratory.

Soon the report comes in, and this is how it runs:—

"K.L.B., or organisms morphologically identical with K.L.B."

When you or I receive this report we administer serum, do some clear, hard thinking, communicate with the bacteriologist—verbally, if possible—and perhaps consult our colleagues.

Not so the majority of folk: they inject the serum, enter "Diphtheria" in the A. and D. Book, and broadcast infectious disease reports all in one breath. The patient is docketed and damned, and his services are lost to His Majesty for an indefinite, and often lengthy, spell.

A false step has been taken, and it cannot be retraced.

(2) MILD SORE THROAT.
AN EQUIVOCAL REPORT FROM THE LABORATORY.
DIPHTHERIA DIAGNOSED.
THE BOGEY OF PARALYSIS.

The M.O. has now lost the initiative, and the patient has now lost his liberty, because the subsequent proceedings are governed by certain regulations.

The Home regulations are not too rigid: they permit of a certain amount of personal interpretation.
"Convalescents from this disease should not be discharged from hospital until they have clinically recovered, are free from nasal discharge, have normal throats, and are no longer carriers of virulent bacilli."

(Note: virulent bacilli.)

But the Indian regulations are different, and leave no loophole of escape for the timid or the obstinate. They start off with a paragraph similar to the one quoted above, and then continue thus:—

"3 negative swabs, taken at least 12 hours after any medication to the throat, at 3-day intervals are required before a case or a carrier can be considered 'free'."

(Note: presumably the regulation means "3 virulent-negative swabs.")

A trap has been entered and there is no escape.

(3) MILD SORE THROAT, POTENTIAL DIPHTHERIA, PARALYSIS.

Major Smith's lurid triumvirate hypnotizes the reader who, though bereft of sight to read, still retains sufficient strength to overcome his victim, the inoffensive patient.

Were the reader able to continue with eyes open and judgment unimpaired, he would find that Major Smith's next paragraph is worded as follows:—

"The presence or absence of K.L.B. in a throat swab is only one of the factors that should sway our judgment for or against diphtheria; other signs of almost equal importance being membrane on the tonsils, especially if involving the uvula, enlarged and painful tonsillar or cervical glands with sore throat, continued sore throat that persists in spite of treatment, a low continued pyrexia (although diphtheria with high temperature is common in this country [India]), a white face and small rapid pulse, albumin in the urine, etc."

Now, what is the significance of "K.L.B., or organisms morphologically identical with K.L.B."? What is the value of such a report?

Just this: BEWARE! ATTENTION!

You and I know this. We take the information for what it is worth, and weigh it in the scales with "other signs of almost equal importance." Not so the other fellow: by his actions one can almost hear him repeating—"Virulent? Yes—no—yes—No—YES!" and the mischief is done.

He is blind and has put himself—and his patient—beyond the reach of succour.
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(4) It behoves a blind man to be cautious: it is up to him to play for safety; and it is this fact (coupled, sometimes, with an erroneous appreciation of the factor of risk) which prevents the mischief from being undone.

You follow the sequence? A false step was taken. This step led to a trap which blurred vision failed to detect and moral weakness was powerless to avoid.

This brings us to grips with what is, to most people, a knotty problem: one which they find difficult, and regarding which they are not always as well informed as they might be.

The margin of safety or, if you like, the factor of risk: that is the problem, the bugbear, the fog which defies penetration.

As a rule it is avoided: in ignorance the margin of safety is reduced, the element of danger is exaggerated, the M.O. is covered and the patient continues to be an unproductive charge on the State.

Obviously, this is a problem worthy of discussion; but before saying something about it I would remind the reader that, of the total number of cases diagnosed diphtheria, very many are condemned by "K.L.B., or organisms morphologically similar to K.L.B." A few are labelled "Diphtheria—clinical," and still fewer bear the hall-mark "K.L.B. proved virulent by animal inoculation."

Why is this last class such a small one?

Firstly, because, for a number of technical reasons, it is not always easy to carry out the virulence test to a successful conclusion.

Secondly—and of more importance—because it is comparatively rare to find a patient of the MILD SORE THROAT—POTENTIAL DIPHTHERIA—PARALYSIS type who is actually harbouring virulent K.L.B. In other words, and unless due attention be paid to those "other signs of almost equal importance," M.O.'s will continue to throw patients into durance vile, and pile up the bill for carriers, when the majority of these patients and carriers are not, and never have been, sufferers from diphtheria. Any unprejudiced observer who cares to make a careful clinical study of such patients and carriers (sic) will soon convince himself of the truth of this assertion.

Although we cannot feel enthusiastic over trans-Atlantic, standardized, mass-production clinical methods in the laboratory, still we must be grateful for many careful and conscientious American investigations on the grand scale, and particularly in the field of vital statistics.

Several investigations of this kind have been carried out on the problem of diphtheria and the diphtheria carrier, and the results of one of the best of them were published in Circular No. 60, Chief Surgeon's Office, American Expeditionary Forces.

The facts and figures which follow are taken from this circular. They may differ a little from those reported by other investigators, but it is not thought that the divergencies are such as to vitiate the present argument.
I am aware of the danger of making quotations divorced from the context; but I have tried to make a fair paraphrase of the relevant parts of the circular; and if I succeed in inducing some to study this valuable document from beginning to end I shall be well content.

"Practically speaking, an avirulent strain of diphtheria bacilli never acquires virulence, and a virulent strain retains its virulence with great tenacity.

Clinical diphtheria is produced only by virulent diphtheria bacilli.

Single throat cultures from healthy individuals of various ages reveal \textit{B. diphtheriae} in one per cent to thirty per cent. The average incidence appears to be three to four per cent.

Among the bacillus carriers the per cent of carriers of virulent bacilli varies greatly, but is commonly found to be ten to fifteen per cent of carriers.

Therefore, only 0.45 to 0.6 per cent of healthy individuals carry virulent \textit{B. diphtheriae}.

If daily cultures are taken from the throats of chronic carriers, very interesting and instructive results may be obtained:

(i) Positive cultures may be obtained for a number of consecutive days, extending perhaps over weeks.

(ii) A majority of the cultures may be positive, with occasional negatives interspersed among the positives.

(iii) A majority of the cultures may be negative, with occasional positives interspersed.

(iv) Regularly positive cultures may be obtained for a number of days, followed by a period in which the results may be irregular. After this, regularly negative cultures may be obtained—and then the whole sequence of events may be repeated as above, and repeated many times over.

This is probably to be explained by the successive coming to the surface of depth colonies of bacilli, when the superficial layers of the tonsils exfoliate.

Carriers who have not been in close contact with an active clinical case of diphtheria are of little importance in the spread of the disease, since more than eighty-five to ninety per cent harbour only non-virulent bacilli.

Infection does not readily occur from the remaining ten to fifteen per cent who constitute a possible source of infection for susceptible persons.

Isolation of healthy carriers is impracticable because:

(1) Of the labour involved in detection of all carriers.

(2) If all carriers in a large group were detected, their number would be too great.

(3) Many carriers remain carriers indefinitely. Wholesale radical sterilization (tonsillectomy) is impossible.

(4) They do not constitute a menace serious enough to justify any of the above procedures.
(5) If, for any reason, an attempt is made to detect and isolate carriers, virulence tests should be performed, and the carriers of avirulent bacilli should be disregarded; while the healthy carrier of even virulent bacilli does not constitute a serious danger to persons in contact with him.

Experience has shown that approximately fifty per cent of mankind are naturally immune against diphtheria. This immunity is due to the presence, naturally, of a small amount of diphtheria antitoxin circulating in the blood.

To prevent the spread of diphtheria the most important measures are: (a) the prompt recognition and effective isolation of cases; and (b) when diphtheria is prevalent, frequent throat inspections of all likely contacts, with isolation of all suspicious cases until negative cultures prove that suspicion is unfounded.

There are certain measures that have become so well established in dealing with epidemics of diphtheria, that to question them is sure to arouse the antagonism of those whose ideas have become fixed by tradition: for instance, the wholesale taking of throat cultures. A knowledge of the practical limitations of the practical application of wholesale culturing to organizations or groups among which diphtheria has appeared, and the poverty of actual results in detecting the insignificant incidence of carriers of virulent *B. diphtheriae* should suffice to forbid the practice.

During an outbreak of diphtheria: —

1. Among adults there is a seventy-five per cent factor of safety to start with, represented by natural immunity. This is further increased by the chance that, of the twenty-five per cent of susceptible adults, not all of them will have diphtheria bacilli implanted in their throats.

2. There is no danger from the carrier of non-virulent bacilli; and the danger from the ordinary healthy carriers of virulent bacilli is so slight that it does not seem practical to take any measures against it.

3. It is probable that unrecognized cases of diphtheria are the most potent agents in giving rise to the spread of the disease.”

Reference has been made above to the rigidity of the Indian regulations which deal with this matter. The disabilities attendant on this rigidity must have been realized at Army Headquarters, Simla, because Circular Letter No. Z 6671/1 (D.M.S. India, 5) dated August 6, 1928, after referring to Regs. M.S.A. (T), goes on to say that: —

“Difficulty in some cases is experienced in dealing with contacts from whom *B. diphtheriae* (K.L.B.) is reported from the laboratory as having been isolated, without information as to the virulence of the isolated organism. I am to say that laboratory reports should invariably state whether or not the organism has been proved virulent by means of animal inoculation, although a *preliminary* report should be sent immediately the organism has been found.”

But that is not all: there is a concluding sentence; and it is this
sentence which, in my opinion, should render Circular No. Z 6671/1 (D.M.S. India, 5) of August 6, 1928, one of the most popular and most famous circulars ever issued by D.M.S. India.

Ours is a progressive Corps, willing to learn, eager to advance. I suggest that we incorporate the sentence referred to, in our next Christmas card: something like this:

"A HAPPY CHRISTMAS! AND IF YOU REMEMBER THAT, in all cases, laboratory reports should be taken as a guide only, the ultimate responsibility resting with the officer in medical charge, YOU WILL ENSURE TO YOURSELF A BRIGHT AND PROSPEROUS NEW YEAR."