

MICROBIOLOGY — A Cornerstone of Public Health

(Based on a talk to the members of the All-India Refresher Course for Sister Tutors at King George Hospital—Visakhapatnam)

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WHAT does microbiology mean to us—to nurses in general? The answer to this question is very important, especially to those of us who are involved in teaching this subject to student nurses. Some of us might answer, "It is an academic study with long name, dealing with many things with long names, none of which are very closely related to our daily lives"—in other words, a subject confined to the classroom. Or we might answer, "Microbiology is the study of matters urgently related to the daily lives of ourselves and our patients. In other words, a cornerstone of public health." I understand from the dictionary that a "cornerstone" is "an indispensable part of a building", and certainly it can be said that a study of the lives and habits of micro-organisms and the ways and means of destroying them, must be an indispensable part of the building of public health, for undoubtedly a tremendous amount of public ill-health is the result of invasion of the body by micro-organisms.

We are here now to discuss how best we can teach these truths to our students, and I think we should do well to take a look at a quotation from the preface to the well-known textbook on microbiology by Jean Broadhurst and Leila Given, which states: "A course in microbiology for the nurse must be broad enough to cover her own immediate needs as an individual, to supply the information necessary for the care and protection of her patients, and to enable her to interpret bacteriological principles and so ensure their intelligent application".

It is a good statement of the importance of microbiology in our nursing career, and it is worth-

while studying each part of it to see how it fits in with our conception of microbiology as a cornerstone of public health.

Obviously, before the study of microbiology can be of use to the nursing student in any of the three ways mentioned, she must first be made acquainted with these things called micro-organisms. Unless she really believes in their existence, she is unlikely to pay much heed to what we shall try to teach her later. We must, I think do our utmost to avoid pretence and the use of imagination when teaching this subject—if we tell a student micro-organisms are present in something we must show her that they are there, and if we say we have destroyed them in some way or other, we must prove it. The practice, sometimes met with in classrooms, of solemnly going through the motions of sterilization with non-functioning sterilizers or the use of articles in jars marked "St." is to be deplored. Unless we use real things and real situations, it is unlikely that our students will have more than a scant respect for the lessons we have tried, to teach, and they are, moreover, heading for an unpleasant shock when they reach the wards and departments. If we tell the student that an article must be boiled for 15 minutes, we must show just how long it takes a sterilizer to come to the boil, and let her prove for herself just how long 15 minutes can be when you stand and wait for the time to pass. You have no time for this in the classroom? Then it is evident that this cannot be taught in a classroom but can only be taught effectively in the real situation.

But let us return to the point: when our student is con-

vinced that micro-organisms exist, she can begin to understand how they can invade the body and cause disease, and in this context she must learn that some micro-organisms can be relied upon to produce exactly the same symptoms or disease in every person attacked, while others are less specific in their effect.

From this point onwards, this knowledge can begin to be useful to the nurse in the first of the three ways stated in our quotation, i.e. it can "cover her immediate needs as an individual". I suppose it is characteristic of young nurses at the beginning of their career in hospital to tend to identify themselves with their patients to the extent of imagining themselves in imminent danger of contracting their diseases. This is particularly true when they are dealing with infectious diseases. Later experience proves to them that the danger is not so great after all, and this leads to a certain carelessness of attitude towards their own protection. Therefore, I would say that one of our first obligations in teaching this subject to a student is to see that her knowledge is broad enough to prevent her being either over-anxious or unduly complacent with regard to the effects of micro-organisms on her own health.

Having understood the habits of micro-organisms, we must then see that she understands the rudiments of hygienic living. It is a good idea to let students see for themselves the various micro-organisms, on prepared slides, but it is infinitely more effective to let them culture and plate specimens they have themselves taken from various common places and when they have examined

these under the microscope, they will really believe in the need for the hygienic practices we have tried to teach.

They must know how the body protects itself by natural immunity, and this must lead to an understanding of the limitations of natural immunity, and the ways and means at our disposal for acquiring artificial immunity. In training schools where a student health service exists, a great deal can be done to make this a practical experience. From the P.T.S. period onwards, the student learns how the effects of pathogenic micro-organisms must be watched for and foiled in order to maintain her own health.

I repeat that we must at all costs guard against the real danger of allowing students to think of their microbiology lessons as an academic subject entirely confined to the classroom. They should emerge from our course of lectures on this subject with the feeling that micro-organisms are their familiar friends, or enemies, as the case may be, and in this way we shall have built microbiology into the essential fabric of our students' health.

From the P.T.S. period onwards, the student needs a knowledge of microbiology in order to fulfil the second part of the statement we quoted: She needs "the information necessary for the care and protection of her patients". Florence Nightingale's famous words "The hospital should do the patient no harm" are relevant here, for surely we can all agree that the effects of micro-organisms in hospital can do the patient infinite harm and contribute to a state of ill-health which may be very prolonged and may effect others also.

A thorough knowledge of microbiology will enable nurses to understand and appreciate such things as the importance of a healthy hospital environment, the dangers of cross-infection, the importance of good sterilizing and operating techniques etc. Such an understanding can surely make a great contribution to the health

of that section of the public inhabiting the hospital. But merely supplying the information is not enough. We must try, by example, as well as precept, to inculcate in our students the highest sense of personal responsibility.

I am sure you are all acquainted, as I am, with trained nurses who could pass a written examination in microbiology without the slightest difficulty but whose wards are anything but clean and who fail altogether to appreciate the significance of a sterilizer which does not boil. "But I have no other one to use", they will say, if you ask them why they do not send the broken one for repair? It is regrettable but true that many of the people who have been our students fail, as trained nurses, to appreciate their responsibility for the results of the techniques practised in their wards or departments when, for example, a wound breaks down, or a baby develops an infection of the eyes.

Most certainly, then, microbiology is a cornerstone of the health of the public in hospital, and it is up to us, the senior members of the profession, to make every student aware, not only of the importance of simple everyday cleanliness of environment, but also the special dangers to health which attend the congregating of many people in one place, especially if they are sick people. I mean, for example, the importance of isolation and barrier nursing, and the problems of controlling dust and droplet infections in special places such as operating rooms and maternity wards. We could profitably spend an hour discussing mask technique at this point, but we will defer that until later.

Then what of the domiciliary field? Here the dangers are different. In some ways they are greater, and in some ways lesser, but here, too, a practical knowledge of microbiology can help the nurse to adapt her hospital technique intelligently to the home setting, in such a way as to promote health while preventing harm.

We have said enough to illustrate the fact that theory must be closely related to practice if microbiology, is to be the cornerstone of public health, and our example, both in hospital and in the home can do much towards educating the public healthful living.

Which brings us to the third part of the statement quoted at the beginning. "The course in microbiology must.....enable the nurse to interpret bacteriologic principles and so ensure their intelligent application." This means not only in her own nursing practice but also in the lives of her patients and their families, for whom, after all, she must be the interpreter.

This concept of "interpreting bacteriologic principles" for patients and their families has been, I think, neglected in the past and is only now being universally accepted as an essential part of a nurse's work and therefore an essential part of the training we give her.

How can this interpretation of bacteriologic principles for the public be made? The simplest example I can think of takes me back to my own junior school days. I remember a number of attractive posters pinned up in various places all over the school premises which said, simply and directly "Where there's dirt, there's danger". Understandable to every child who read it, and unforgettable. An equally simple example can be seen anywhere in my country at the present time. It is a reminder, printed in bold arresting type and commonly pinned up on the backs of doors in public lavatories, including those in hospitals, which says "Now wash your hands". Each of these very simple posters interprets for the public an elementary bacteriologic principle. The first that dirt and dust lying around, especially in dark corners, harbours micro-organisms injurious to health, and the second that human excreta, also often harbouring pathogenic organisms, may contaminate the hands of one

individual and, if not promptly and thoroughly washed off, may be passed on by him to others and become a danger to health.

An example of a more advanced form of interpretation is that of explaining to relatives how to look after a tuberculous patient in his own home, in such a way that the disease does not endanger others.

Higher still up the scale is the education of the public to an understanding of the reasons for inoculation and vaccination. This is to interpret the principles of acquired immunity in such a way as to catch the imagination of the ordinary members of the public and make them *want* to seek this protection voluntarily. Particularly urgent now-a-days is the need to convince the public that such protection must be continued even though the incidence of the disease has declined, as, for example, in the case of diphtheria in England. The incidence of this disease had fallen

to negligible proportions as a result of widespread inoculation, but is beginning to rise again because people have become careless and complacent about it.

A further example of interpreting bacteriologic principles, and one increasingly met with now-a-days, is that of having to explain to a patient or his relatives why a course of "Miracle drugs", such as penicillin, cannot cure every disease, or even every kind of infection.

So much is published these days in the popular press concerning medical matters, particularly in relation to such drugs as the one mentioned, that the public can be forgiven for forming the idea that it is a simple matter to cure all ailments with such drugs. It often falls to the nurse's lot to explain that, in fact, the doctor is probably doing the patient a service by withholding the drug when the particular type of infection does not call for

its administration.

Our teaching must be combined with example to demonstrate clearly that we *believe* what we say. The nurse who runs for a dose of penicillin herself every time she has a cold in the head is not the one who can do this "interpreting" for the public, for she has not yet learnt the principles herself! Which brings us back to where we started from our teaching of microbiology to student.

It should be apparent to every tutor that in too many schools this most vital of subjects is taught with insufficient stress on its practical aspects and its significance in nursing practice, and we should work out a method whereby microbiology can be taught to student nurses within the framework of the Indian Nursing Council's recommendations, placing due emphasis on its significance as a "cornerstone of public health".

Education, The Best Shield Against Accidents — (Contd. from page 97)

fore be considered part of general education and should certainly be included in the school curriculum. It is also an essential part of that "savoir vivre" that the child acquires mainly from its parents.

The motorist or the cyclist driving in town traffic must have his eyes everywhere, right, left, in front, and, with the help of his mirrors, even behind. This kind of attention is exactly that of an animal, or a man for that matter, moving through a probably hostile forest. Schooling on the other hand tends to develop *concentrated* attention. A strong case can be made out for training this diffuse kind of attention and one of the best ways of doing

so is probably through team games and sports.

Practising how to fall

Sport indulged in reasonably may help young people to avoid traffic accidents, not only because it sharpens reflexes, but because it accustoms to the observance of rules, and encourages a well-balanced way of life, healthy food habits, and moderation in drinking.

There is no doubt, moreover, that the best way of substantially reducing the number of drowning accidents is to teach swimming at school.

As regards falls, an analysis of industrial and home accidents shows the usefulness of distin-

guishing two kinds: falls on the level and falls from a height. The large number of falls in all human activities and the statistical predominance of falls on the level suggest that one remedy might be to give young people the right kind of physical training—perhaps including elementary Japanese wrestling (judo) and simple acrobatic exercises on the ground.

There is no doubt that accidents are fewer following any efforts to make children realize the risks they are running and to teach them how to meet the dangers they encounter. Education offers the only hope of overcoming, little by little, this great malady of our times without sacrificing other human value.

Accidents are never the results of pure chance. They generally occur in certain environments and in well-defined circumstances with a more or less predictable frequency.