

your period of infection with any then known typhoid case?" Why? Because such association, especially if intimate, makes it more than probable that the case under examination received his infection from the preceding case, rather than from any general route, and that he is therefore a "secondary" case. If he had such associations, this is noted for further reference, and the investigator passes on to another bedside. If not, the questions continue, and now, at last, take up milk, water, food, etc., but of course only so far as to determine those used by the patient during his infection period.

Then the investigator passes to the next patient. What has he learned so far? Nothing much yet. But he has narrowed the possible routes of infection to certain water supplies, certain milk supplies, certain food supplies, etc., i. e.,

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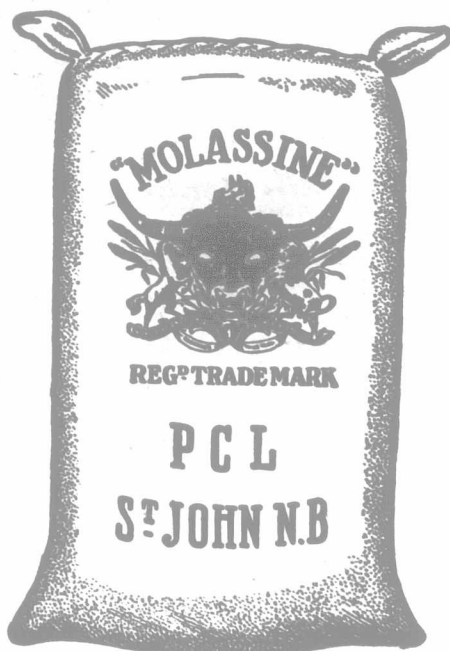
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those used by the first patient during a certain period, and he has done this in thirty minutes—in scarcely the time it takes for the old style investigator to get his bottles ready to collect his first water sample!

At the bedside of the second patient, the same inquiries in the same order are made. If this second patient be an imported case, or a secondary case, he also is merely noted for future reference. If he be a primary, however, the origins of his drinking water, milk, food, etc., during his infection period are also ascertained. Perhaps he coincides with the first patient in every detail of alimentary supplies, in history and associations. If so, nothing much has been added to the detective's knowledge. But more than likely, dissimilarities have developed. Since the responsible water supply, milk supply, etc., must be one of those water supplies, milk supplies, etc., used in common by primary cases, all those not common to both of these primary cases may be dropped from consideration (except in rare instances of multiple routes). Thus, if both have used the same water, water from that origin remains as a possibility. But if the water supplies have been different, water is eliminated from the question entirely. If the milk supplies are identical, milk remains as a possible route of infection; if not, milk is eliminated from the question entirely.

In brief, provided the information obtained be reliable, and it is a part of the public-health detective's training to distinguish at a glance truth from falsehood, the honestly mistaken, or forgetful, or stupid replies from the reliable ones—and above all never to believe anything (to the extent of recording it) unless it is checked, confirmed, and established as a fact, the modern investigator has in one hour narrowed his investigation to a point which the old-style investigator often would not reach for weeks.

And so from patient to patient the inquiry proceeds. In the course of the day the investigator has seen perhaps thirty patients. The tabulation (probably already made in his own mind) shows, say, three imported cases, five secondaries, two uncertain or indefinite. The remaining primary cases show in common, say, one water supply only, the milk, etc., varying; or one milk supply only, the water, etc., varying; or no connection except attendance at some one social function.

Going straight to the route thus indicated, the public-health detective quickly confirms the indications of his results. He knows that the route indicated must be the guilty one, for only that route can account for all the cases. He concentrates on that route until the evidence is complete—when and how that route became infected, when and by what sub-routes the infection was distributed, why it infected the patients found and not others, etc.

In this illustration I have assumed complete ignorance on the part of the epidemiologist as to everything connected with the community he is investigating, except what he finds by cross-examining the patients. As a matter of fact, every epidemiologist, however much a stranger to the particular community he enters, begins to learn about it from the moment he enters it.

Thus, almost unconsciously, he notes the size of the community or rural district, and compares it with the number of cases reported as existing; if it is summer-time, he almost automatically notes the presence or absence of open toilets in the back yards, of manure-piles, and of garbage-cans—all bearing upon fly infection. If it is winter-time, or the community be well sewered, he does not even consider flies. If the cases are grouped in one quarter of the community, while the public water supply extends all over it, he tentatively eliminates the water supply, before he asks a question. If good surface drainage and a sandy soil exists, or driven wells are chiefly in vogue, he tentatively eliminates well water—even before he visits the health officer.

This is not and cannot be a complete synopsis of all the combinations of circumstances which the epidemiologist meets. It is intended to illustrate his methods, and to show why they are incredibly rapid and incredibly accurate—how they eliminate speculation and guarantee a correct solution—which