

The Passing of Diphtheria

By JULIA HOUSTON RAILEY

AN earthquake gets plenty of publicity. The destructive forces of nature are dramatic and the whole world serves as breathless audience. Every one knows all the details within a few days: what the property losses are, how many people were killed or maimed.

But the constructive forces of science may perform a *coup* that affects the health of the race, that will save or safeguard more lives than have been lost in fifty earthquakes, that provides the means of stamping out one of the deadliest scourges of man. And, speaking generally, the great majority have still to learn about it after ten years.

Under the preoccupied noses of the people of New York City, chief theater for this particular scientific drama, a tremendous experiment, which is now an even more tremendous certainty, has been staged and enacted in the last decade. The public has yet to realize its magnitude and far-reaching implications.

To be sure, the mothers of thousands of school-children, not only in New York but in other cities, notably Boston and Chicago, know all about it, since they signed consent blanks permitting their youngsters to be Schick tested in the schools for susceptibility to diphtheria and, if found susceptible, vaccinated with the "new" serum, and thus immunized for life against the dread disease. Presumably all the doctors and health authorities in the country know about it by this time, as do multitudes of nurses and institution inmates who have been thus protected against diphtheria. Moreover, the instructed few who read medical journals and keep abreast of scientific discovery are doubtless aware of it. Yet the mass of the people and the mass of the news print remain unleavened by this especial batch of yeast from the laboratories of science.

Some echoes of the work have reached the press, it is true, though mostly in the form of routine accounts of medical gatherings, appropriations made and reports rendered by experts—the kind of inconspicuous news items skipped by readers pausing between the headlines and the sporting page or society column. So perhaps it is not surprising that the man and woman on the street, dodging in pursuit of their daily bread (or *hors d'œuvre*) raucous taxicabs or looming busses, harassed amid a bedlam of interests and duties by their immediate jobs, are vague

THE news that sixteen thousand children had died in the collapse of a convention hall would echo round the world. Yet the word that these same sixteen thousand children may be saved from death hardly gets into the headlines at all. That is one of the reasons why it gets into *The Outlook*.

on the subject of the struggle now being waged to eradicate diphtheria.

This effort, which is fairly recent, must not be confused with the discovery and common use since 1894 of antitoxin as a cure for the disease. People know the main facts about antitoxin: it is fluid drawn from the blood serum of horses which have been rendered immune to diphtheria by a series of mild, graduated inoculations or injections into them of diphtheria toxin, the poisonous product of the diphtheria germ or bacillus. The horses' blood gradually develops a natural substance resistant to the toxin injected in the mild doses described, and that substance is antitoxin, which may be painlessly extracted from the horse and harmlessly injected into human beings. Not a pretty-sounding process, but an eminently sensible, safe, and cleanly one as it is practiced. It is injected into persons subcutaneously or in the blood stream, and not into the spinal cord, like meningitis serum. It is used in two classes of cases—those having diphtheria and those directly exposed to it. The former it cures if used early enough in sufficient dosage, properly given; the latter it renders immune to the disease, but only for such time—two or three weeks—as the actual antitoxin serum remains in the body. After that the person may be as liable to infection as before.

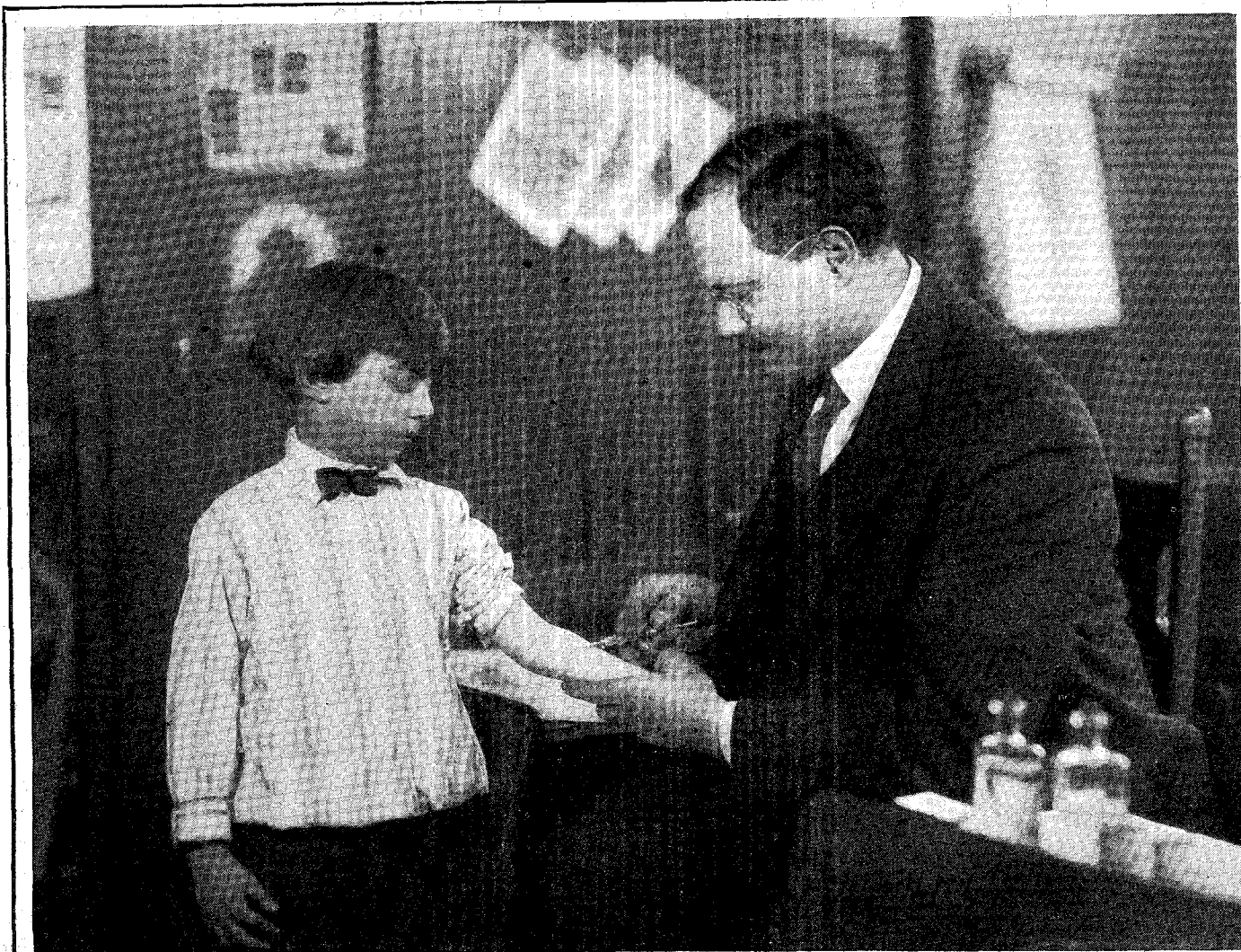
But the chief objection to antitoxin from the point of view of prevention is not so much that its immunizing effect is temporary as that it is too certain a cure! Doctors and laymen had come to bank on it too heavily, losing interest in prevention. "Don't be alarmed if you are exposed and catch diphtheria. Antitoxin will positively cure you." It is this attitude that has been partly responsible for a very disquieting fact: while the diphtheria death rate in America had dropped, owing to the use of antitoxin,

from 45 to 50 persons in 100 cases to 7 to 10 persons in 100, the number of cases had not dropped proportionately and the 10 per cent death rate had finally become stationary. Diphtheria still kills in the United States yearly about 20,000 people out of 150,000 to 200,000 stricken, 80 to 85 per cent of these being children under six years. For antitoxin is, after all, only a positive cure when given in the first stages of the disease. If people wait too long, in uncertainty as to what is the matter with a patient, before applying to a physician for serum treatment, or if the physician should not diagnose the case correctly once he takes charge of it and should fail to give the serum promptly, that patient will probably die. Yet he may recover because of receiving even a belated dosage, but very frequently he will recover only to be maimed by paralysis, heart or kidney trouble, or, unknown to him, perhaps, by such an impairment of the vitality of his organs that in middle life he is more than apt to be stricken down by one of the maladies of heart, lungs, kidneys, or blood-vessels common to that age.

Prior to 1913, then, when Dr. Béla Schick, of Vienna, published his test for susceptibility to diphtheria, and von Behring, the German discoverer of antitoxin, proposed a new method of vaccination or immunization with a new serum (a mild mixture of toxin and antitoxin, one almost neutralizing the effect of the other), the situation might be summarized as follows: A germ disease so easily carried that even healthy, unaffected school-children may take the bacilli home in their throats to infect little children, to whom the disease is most fatal; a large morbidity or case rate; a stationary death rate; no lasting protection against the menace or its terrible after effects; and a general, unjustified faith that antitoxin, the cure-all, would take care of it adequately.

That is the situation no longer.

At a New York Baby Health Station the other afternoon it was possible to observe a few small and vociferous proofs of this statement. One of them was a little Negro baby, eight months old, whimpering, more from a desire for attention than from any great physical anguish, for the mosquito bite of the Schick test which she had just extended her tiny arm to receive could not have hurt her especially. It is not a blood but a skin test. The visiting doctor, a lanky, intelligent young man on the diphtheria



(C) Underwood

Dr. Zingher at work in a New York clinic

"We immunize these little fellows with three doses of vaccine. . . . Then they're safe—for life, we believe"

control staff of the New York City Health Department, had exercised the greatest care to insert his single drop of fluid, much-diluted toxin between the layers of the baby's skin, for to slip under the skin would simply mean no test. The test fluid would be lost. This baby was not receiving the ordinary first Schick test to determine whether she was immune or susceptible. It was a retest being given her six months after she had been vaccinated with the three injections to determine whether she had become immune.

"We don't bother to give the preliminary Schick test to babies under two," he stated. "They're all susceptible after they're about six months old. Up to six months they carry what's called passive immunity over from their mothers—when the mothers are 'negative;' but from six months to six years is the danger period. More than half die at that age if they catch it, you know, unless they're given antitoxin in a hurry. So we immunize these little fellows right off with the three doses of vaccine, and then Schick test them after six months' time to find out if it's successful. It always is. Oh, in

about five per cent of cases they need two extra doses of vaccine, maybe. Then they're safe—for life, we believe."

"Just as safe as those whom your Schick test shows to be naturally immune to diphtheria?"

"Exactly. You see, Dr. Zingher, my chief" (Dr. Abraham Zingher is the man who has done the job in Manhattan and the Bronx. He is assistant to Dr. William H. Park, Director of Research Laboratories of the New York City Health Department and chief pioneer in this country in the study and control of diphtheria)—"Dr. Zingher has been Schicking twice a year for over seven years the inmates of a lot of New York State institutions whom he immunized years ago. And every time he tests them he finds them still immune. New inmates enter and may come down with diphtheria, if they are exposed to infection at any time, but these immunized people don't catch it from them. Not a single undoubted clinical case of diphtheria has developed in all these years among the 35,000 institution inmates in New York State who have been immunized. There's proof for you! It's been just the same with the

thousands of school-children we've done. And the supposition that they're safe for life is pretty strong, isn't it?"

There seemed to be white magic, no less, in those miraculous, death-destroying, life-insuring fluids in their mysterious glass tubes, with the shining needles. A swift prick, now in the arm of this child, now of that, and the work of human salvage went on, quietly, in everyday, commonplace fashion. It was fascinating to watch the precision and deftness of the process in its various stages. There was an older child, a nonchalant young lady, by name Grace, in for observation four days after her preliminary Schick test.

"Positive," declared the doctor decidedly, studying a reddish spot about the size of a five-cent piece on her right forearm. It was the reaction. Two days ago, and again to-day, he had scrutinized her left arm with quite as much care because of the so-called control test given on that arm. This is a safety device invented and perfected by Dr. Zingher to enable one to distinguish with accuracy between the true, positive reaction and false or pseudo-reactions sometimes

shown by older children and adults, due to slight irritation caused by protein substance in the test fluid. Failing of any guidance or formulas from von Behring, Drs. Zingher and Park have had to work out their own methods of vaccination and testing, to say nothing of devising and preparing their own immunizing vaccine and of altering the dilute toxin formula for the Schick test.

After more than ten years of research and experiment in perfecting a method and after its application in literally hundreds of thousands of cases, a technique as nearly infallible as the human equation will permit has been developed, which classifies cases with lightning rapidity. A whole school, say, with 2,400 pupils, can be Schicked in a school day, and four days later as swiftly be re-examined. The "negatives," who show false or no reactions, are safe for life and dismissed with a blessing; the "positives" are given within a week their first of three injections of vaccine, administered a week apart. Six months later they are, as previously stated, given a final Schick test and almost without exception found immune. The few exceptions are given more vaccine and made immune.

Children came and went in this health station, in company with their mothers. Most of them were in for their third and last injection of vaccine. They took it casually, as veterans should. All except one fat little boy, who clung to "mommer" and wailed. His "mommer" queried, with some anxiety: "But, doctor, do you suppose it took, with him? He hasn't been a bit sick."

The doctor's answer was: "Of course not. He's not supposed to get sick. They never do with this mild vaccine."

She broke into a relieved smile: "Ain't that fine?"

It was, indeed! Particularly when one knew that some 25,000 of these younger children have been tested and, if found susceptible, immunized in the 88 clinics and baby health stations operated by the Health Department, the New York Diet Kitchen, and a number of other organizations in the city. It is the young child, in fact, at whom the Health Department's diphtheria control campaign, begun on a large scale in 1921, has been aimed. That being true, it may seem strange that the big job has been done in the schools—almost all the public and parochial schools of Greater New York. But every school-child, of all the 500,000 so far tested and treated, who went home with a circular and later with a certificate of immunity was a missionary to parents. And their little brothers and sisters profited by the spread of that gospel of

security. Else how account for the numberless voluntary applications of mothers for treatment for their babies at clinics and stations? How else account for a drop of twenty per cent in the case rate and twenty-five per cent in the death rate from diphtheria in New York City in 1922?

Dr. Zingher, however, makes the appallingly ambitious statement that all this is "a mere beginning." Diphtheria is to be wiped out everywhere! Seeing him—a most simple, quiet, unhurried man, not yet forty, deeply browned, serious, but with a laugh and a flash of white teeth now and then, betraying wholesome humor—it is impossible to realize that his placid, folded hands have themselves performed more than 170,000 tests and retests, and that he and Dr. Schroeder, of Brooklyn, with a staff of only eight to twelve doctors on part-time duty and as many full-time nurses, have safeguarded the lives of more than 500,000 children and adults in the city and State of New York. When he talks, with an accent, for he was born in Rumania, he makes the most difficult of research and experiment comprehensible by the power of his simplicity in thought and speech.

"What is next on your programme?" he was asked.

"Education of all the people," he smiled. But this, it developed, was not a vague plan, but a fairly detailed prospectus. The mothers came first. Whenever, from now on, a birth is registered in New York City, a card is to be mailed the mother telling her why and when to have her baby Schicked. Later, follow-up cards will be sent.

The physician is next. "The private physician must adopt Schick testing and immunization into his daily practice. But it is hard to bring that about. If the physician shows an active interest in converting his patients to the doctrine of diphtheria control, at once the cry of 'unprofessionalism' is raised against the poor fellow. He is 'out to drum up trade for himself,' and such foolishness. No, the health officer and his Department must take the lead in enlightening the people and in sending them to their private physicians, who must then be ready to serve them. New York City furnishes free test toxin and vaccine, with instructions, to doctors applying. All other cities and towns should do the same."

Next the schools. The work in schools is regarded as a temporary expedient only, a demonstration needed in any community to start an anti-diphtheria crusade, but eventually to be rendered unnecessary. "The problem of diph-

theria control would be much nearer solution," he declared, "if ordinances could be passed making it compulsory that children *on entering school* should be given the Schick test, and if they give a positive reaction immunized with toxin-antitoxin. If this seemed wise to health departments and boards of education and could be brought about, no doubt most of the children would be Schick tested and immunized against diphtheria *long before the time for entering school*. This has proved true in the case of smallpox vaccination."

The hardest class to reach, according to Dr. Zingher, is—the poor? Not a bit of it. "The well-to-do, whose children do not attend free clinics, whose private physicians do not drum up trade for themselves, whose schools are sheltered, exclusive, private ones outside the public school campaigns. It would startle these 'fortunati' to learn that their supposedly sheltered children have a far lower percentage of natural immunity to diphtheria than the children of the poor in congested sections, frequently exposed to the disease, having numerous mild attacks, hardly recognizable as diphtheria but causing natural, resistant antitoxins to develop in the blood, bringing about a high rate of natural immunity. Not only children in sheltered schools and homes, but children and adults of small towns and rural districts, have been found to be far more susceptible than those in crowded cities who have this compensating 'contact immunity.'"

He concluded: "All the social and benevolent organizations representing the community conscience ought to rouse and help. We were helped in the early days, before the city appropriations began, by the Manhattan Chapter of the Red Cross and the Commonwealth Fund. The medical profession, private and public, needs backing and the public needs educating. Diphtheria is conquered. That is a certainty. It can be reduced to the status of smallpox. Wiped out. We have only to do it."

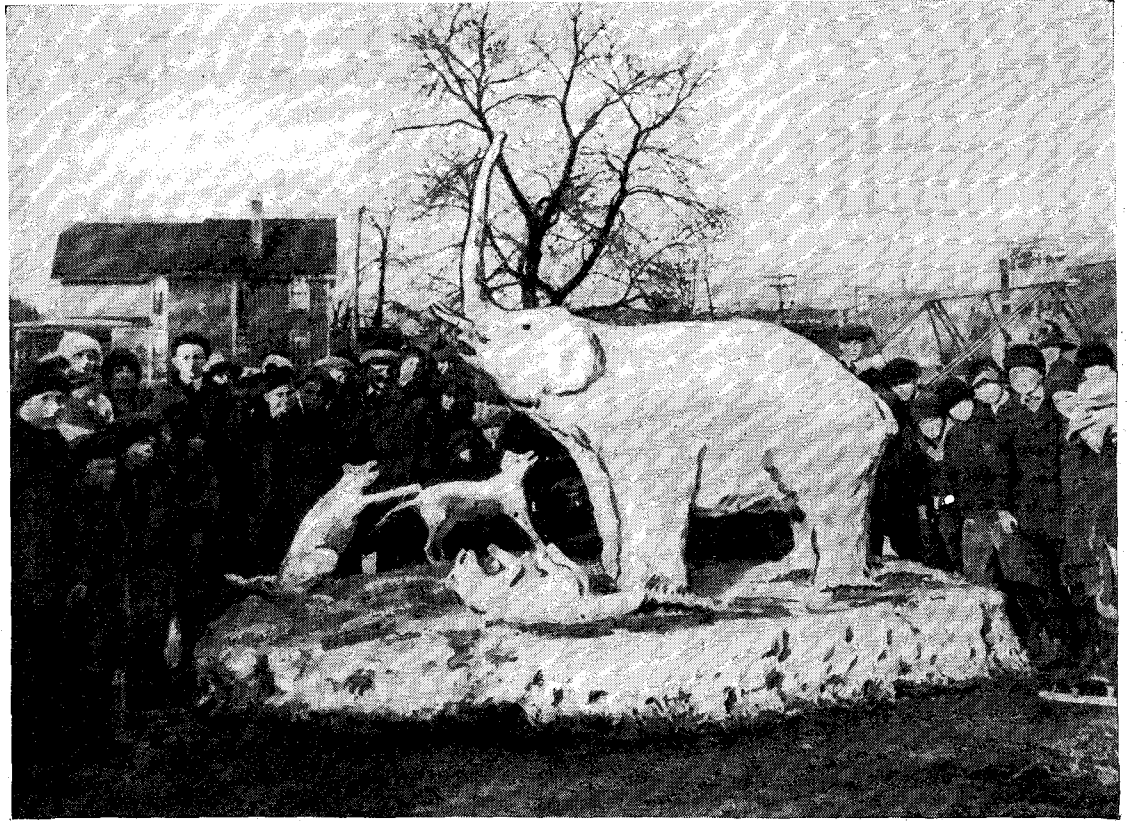
A remark of the young doctor at the Baby Health Station came to mind: "The superintendent of the New York City contagious diseases hospitals told me that he didn't get in more than twelve cases a year now of smallpox out of all New York."

Science has laid low that ancient enemy of man, destroyer of armies, bane of crusaders, kings, and peasants alike in the Middle Ages, and epidemic scourge in our own time. Its lance is now aimed at an even worse foe—diphtheria, strangler of childhood, nightmare of mothers. It is for all of us to determine the force of that blow.

Would that most park statuary were of the same stuff!

Chicago Children Stage a Snow-Modeling Contest

This is the prize-winning design, "Elephant Attacked by Wolves," the award being made by Lorado Taft, the well-known sculptor



P. & A. Photos



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The Father of His Country Realistically Rendered in Snow

These Chicago children have been more daring in their realism than most artists, for they show even the ravages of the smallpox which left its effects on Washington's face after his attack by that disease in 1751