TABLE I.—Showing the Result of Treatment in the Various Types of Laryngeal Lesions

Type	Clinically Cured	Improved	Stationary	Worse
Extrinsic	1	7	10	13
Intrinsic	6	11	11	6
Localized	8	20	12	2
Lupoid	1	1	1	0

TABLE II.—Showing the Type of Laryngeal Lesion Compared with the Pulmonary Lesion

Type of Lung Lesion	Extrinsic	Intrinsic	Localized	Lupoid
Caseo-fibrotic... ..	20	14	10	0
Fibro-caseous... ..	7	10	16	2
Fibrotic... ..	4	10	16	1

TABLE III.—Showing the Response of the Laryngeal Lesion to Treatment compared with the Type of Pulmonary Lesion

Type of Lung Lesion	Clinically Cured	Improved	Stationary	Worse
Caseo-fibrotic... ..	2	11	17	14
Fibro-caseous... ..	7	15	7	5
Fibrotic... ..	7	13	9	2

TABLE IV.—Showing the Incidence of the Different Types of Laryngeal Lesion at Various Ages

Age	Extrinsic	Intrinsic	Localized	Lupoid
15-20 years	2	4	2	0
20-30 years	4	11	15	1
30-40 years	12	6	7	2
40-50 years	5	7	15	0
50-60 years	5	6	3	0
Over 60 years... ..	3	0	0	0

TABLE V.—Showing the Response of Larynx to Treatment at Various Ages

Age	Clinically Cured	Improved	Stationary	Worse
15-20 years	1	2	2	3
20-30 years	2	12	10	7
30-40 years	3	12	8	4
40-50 years	9	8	7	3
50-60 years	1	4	6	3
Over 60 years	0	1	1	1

TABLE VI.—Showing the Influence of Dysphagia on the Result of Treatment

	Cured	Improved	Stationary	Worse
Suffering from dysphagia ...	3	6	5	13
Not suffering from dysphagia...	19	37	21	6

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THE DURATION OF PASSIVE IMMUNITY TO DIPHTHERIA

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Probably owing to the development of methods of producing active immunity to diphtheria, little investigation has been carried out in recent years on the question of passive immunity. While there is no gainsaying the fact that active immunity is preferable to passive, there is no doubt that, in certain circumstances, passive immunization, when its virtues and limitations are accurately known, may be of considerable value. Apart from its tendency to produce serum sensitivity, the chief disadvantage of passive immunity is its short duration. Investigation of the results obtained and of the opinions held by previous workers showed that, while all were agreed that this immunity only lasted for a short time, the actual duration had been variously estimated by them at from two weeks to two months. It was with the object of obtaining further information on this point that the present investigation was undertaken.

PREVIOUS INVESTIGATIONS

The literature of diphtheria contains little record of previous work on the question, and only three experiments can be traced which bear resemblance to the present study. Kolmer and Moshage¹ investigated the duration of passive immunity to diphtheria as measured by the Schick test. They tested 108 children, aged from 2 months to 3 years, all of whom had received 1,250 units of antitoxin subcutaneously at periods of from one to five days before the test. It appeared that all the twenty-eight tested between five and ten days were Schick-negative, five out of twelve at ten to twenty days, ten out of fourteen at twenty to thirty days, twenty-three out of thirty-six at thirty to fifty days, and nine out of sixteen at over seven weeks.

Apart from the smallness of the numbers in some of these groups, there are two points to which criticism may be directed. First, one expects most children under 6 months to be immune to diphtheria, and such children appear to be included in those under investigation, without any statement as to the proportion they formed of the total. Secondly, no attempt seems to have been made to determine the Schick reaction of the subjects who received antitoxin. It follows that a number of the children injected were, in all probability, already immune; the results, therefore, will tend to exaggerate the duration of immunity. A second investigation carried out by Kolmer and Moshage on 362 scarlet fever patients is subject to criticism on the same grounds. These patients received 2,500 units of antitoxin; 10 per cent. were Schick-positive after one to ten days, 13.9 per cent. after ten to twenty days, 22 per cent. after twenty to thirty days, 34 per cent. in thirty to forty days, 66.7 per cent. after forty to fifty days, and 67.8 per cent. after fifty days.

Zuckerman² carried out a preliminary Schick test, and also repeated his antitoxin dose after the return of the Schick-positive condition. All his patients were tested on alternate days until they gave a positive reaction. Of his twenty-seven cases nineteen received 1,000 units of

antitoxin and eight 500 units. His conclusion was as follows:

"A few children showed a positive reaction as early as the seventh day. Most of them, however, did not react positively till eighteen to twenty-eight days after the injection, one reacting negatively for forty-six days. No difference was noticed in this respect between those receiving 500 units and those receiving twice that amount."

The results of this investigation, as far as they go, correspond more nearly to those of the present study. Its value, however, is limited by the small number of patients tested.

PRESENT INVESTIGATION

This was carried out on scarlet fever patients in the L.C.C. North-Western Hospital, in whom the occurrence of sporadic cases of diphtheria had been giving rise to some anxiety. These were Schick-tested on admission, and, of those thus tested, 104 consecutive Schick-positives were included in this investigation. No patient in whom the reaction was in any way doubtful was taken. Of the 104, four were removed from the hospital or transferred to another ward after developing a cross-infection other than diphtheria before Schick-retesting, so that the records of exactly 100 cases form the basis of this report.

Each of these received 500 units of antitoxin subcutaneously, as soon as possible after it had been determined that the Schick test was positive, and generally about the fourth day after admission to hospital. On the fourteenth day after injection a Schick re-test was carried out, followed, on the twenty-first day, by a second re-test. Both re-tests were read on the third and on the tenth day in order that there might be no doubt about the readings. Assuming the Schick test to be an accurate criterion of immunity, this method would show the numbers immune at fourteen and at twenty-one days after the injection of antitoxin. Taking the 100 cases as a whole the following results were obtained:

Immune after fourteen days	...	...	...	89
Immune after fourteen days, but not re-tested at twenty-one days	...	...	...	9
Immune after twenty-one days	...	...	...	84
Not immune at fourteen days	...	...	...	2

Thus, of those fully tested, five who were immune after fourteen days lost their immunity before the twenty-first day. Of the nine cases where the final re-test was not, for various reasons, carried out, it may be assumed that they would have divided in somewhat the same proportion as those who were fully tested—that is, in the proportion of 84 to 5. Whether they are divided on this basis and introduced into the table or are ignored for statistical purposes the effect is the same. Immunity lasted for at least twenty-one days in 92.3 per cent., for at least fourteen days in a further 5.6 per cent. (a total of 97.9 per cent.), and only 2.1 per cent. were not immune after fourteen days.

If the results are analysed into age groups further interesting points appear.

Age	Immune at 14 days	Immune at 21 days	Not Immune at 14 days	Total
Under 5 years	39 (5)	33	0	39
5-10 years	47 (2)	42	0	47
10-15 years	10 (1)	8	1	11
Adult	2 (1)	2	1	3

The figures in parentheses in the first column are the numbers of those who were re-tested after fourteen days but not after twenty-one days. It will be noticed that all the patients under 10 years were immune after fourteen days, and, ignoring the incompletely tested, only four of these lost their immunity between the fourteenth and the twenty-first day. Of the 10 to 15 age group one out of eleven was not immune after fourteen days, and one other lost the immunity before the twenty-first day.

The effect of antitoxin on that ever-present annoyance in scarlet fever wards, the Klebs-Loeffler-bacillus-positive nasal discharge, is also worth recording. In the 100 cases under observation six developed this complication, but it is important to note that in none of them did it develop within four weeks from the date of immunization, the actual intervals being twenty-eight, twenty-nine, thirty, forty-three, forty-eight, and sixty-six days. Virulent strains of the organism were isolated from four of these cases after the intervals named.

CONCLUSIONS

Passive immunity to diphtheria was obtained in a highly satisfactory proportion (97.9 per cent. of all cases and 100 per cent. of those under 10 years) of Schick-positives by the injection of 500 units of diphtheria antitoxin. In adults and adolescents over 15 a larger dose is probably necessary. The duration of this immunity is at least fourteen days, and in the majority of cases (94.4 per cent.) extends to twenty-one days. The incidence of diphtheritic infection in passively immunized patients occurring at the times stated would suggest that it is unwise to regard this form of immunity as lasting longer than three weeks.

These results are published by the permission of Dr. A. Joe, medical superintendent of the hospital, to whom we are indebted for advice and assistance.

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HEARTBURN IN PREGNANCY

BY

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It is with considerable trepidation that I, a minnow among the tritons, venture to record some observations upon heartburn in pregnancy—a condition which is dismissed in the textbooks with a few words, but which is a frequent source of tribulation to the general practitioner, and may become a veritable nightmare to the patient.

My attention was first directed to this condition in the ante-natal department of the Royal Simpson Maternity Hospital, Edinburgh, where one was seeing a large number of patients suffering from very distressing heartburn which did not respond to the routine treatment with so-called anti-acid mixtures. It was while attempting to correlate the various symptoms associated with hypo-acidity in non-pregnant patients in another ward* that a clue to the solution of the problem appeared. The interesting and surprising fact emerged that a certain number of patients suffering from hypo-acidity com-

* I am indebted to Dr. John Eason of the Royal Infirmary, Edinburgh, for permission to scrutinize a series of case records where hyposecretion had been proved by test meal.