

An Inquiry into the Possible Diagnosis of Enteric-Group
"Carriers" by Means of a Cutaneous Reaction.

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The following pages give a record of some work which I undertook during a period of fourteen months, while I acted as an assistant medical officer at the City of Glasgow Fever Hospital.

I am indebted to Dr. Archibald, the medical superintendent who gave me access to any patient that might be of use in my enquiry and who gave every assistance with regard to the provision of material such as culture media and reagents for the laboratory.

Two cases - one a Typhoid carrier and the other a Paratyphoid B carrier - had been sent to my ward to be observed and experimented upon by Professor Browning of the University for the Scottish Board of Health. He wished to study the phases of infectivity and attempt to elaborate a treatment. The stools were sent to him by me, twice a week, and the blood was sent at intervals to observe possible changes in titre. By way of increasing the scope of the enquiry, Professor Browning gave me Captain Thompson's (1) article in the Royal Army Medical Journal on a skin reaction for carriers. He suggested that I might modify the test by giving the typhoid group of organisms separately and that I might work out a technique for the giving of the vaccines intradermally by injection instead of by scarification. I gave these injections first to the cases mentioned, then to the acute cases in the ward, and found a definite reaction which differed from the reaction in controls. I reported my finding to Dr. Browning who encouraged me to "go on with other cases" and to collect a large number of control cases. I now express my gratitude to him for his suggestions and help.

This test appears to me to be original. Apart from Thompson's article, I have failed to discover any record of a test to differentiate convalescent and recovered cases from carrier cases.

The introduction intradermally of vaccines and toxins is no new thing in medicine. Jenner was probably the first person to notice its value diagnostically. He found that cases which were immune or actually suffering from small-pox gave a local reaction within 24 hours of the introduction of small-pox or cow-pox exudate, whereas cases which were not immune did not give any reaction for several days when the usual vesicle developed. The local reaction was an area of congestion. This test is now used to distinguish small-pox from chickenpox. A reaction within 24 hours in this case denotes the presence of antibodies in the blood.

Koch when giving his tuberculin noted a general reaction and also a local reaction: but it was left for Von Pirquet and Calmette in 1907 to recognise the value of the local reaction, as a sign of the presence of antibodies in the blood. Von Pirquet resorted to Jenner's technique of introducing the tuberculin into the skin by scarification. This test resembles the small-pox reaction by giving a congested, oedematous area within a few hours and within 48 hours a distinct inflammatory papule about $\frac{1}{2}$ " in diameter with a paler centre like urticaria. Such a reaction denotes that the person has suffered or is suffering from the disease.

Noguchi injected intradermally 0.05cc of a killed culture of *spirochaeta pallida* by the same method as I have adopted. He got papular and pustular reactions after a primary inflammatory reaction. The intradermal injection was an advance on the scarification previously advocated. This test would only appear to be of value in late cases - especially the tertiary when the Wasserman had been rendered negative by active antisyphilitic treatment. Noguchi considers it indicates that the disease is quiescent while the Wasserman indicates activity.

The Shick test consists in the intradermal injection of diphtheria toxin. The protein constituents of the toxin give a reaction known as the pseudo reaction, in 24 hours which is common to practically all cases. This fades and the real reaction develops on the 3rd day. This test is said to give an indication of susceptibility (a negative result denoting immunity from the diphtheria toxin) but positive tests have been got amongst diphtheria convalescents and people who a few days previously had received 8,000 to 10,000 units of antitoxic serum. This result was observed during a series of cases done in my wards by Sproul.

Gay & Claypole (2) state that they have come to the conclusion that the estimation of the agglutinins in the blood of patients gives no indication of the extent of immunity from typhoid fever. This conclusion was tested by a technique evolved by Gay and Force (3) & (4). The original technique consisted of the application to the slightly abraded surface of the arm of a concentrated old glycerine broth culture of *B. Typhosus* which had been killed by being heated to 65°C for 30 minutes. A positive reaction was distinguished from a negative by the quantitative difference in millimetres between the diameters of the areola appearing round the scarified surface after 24 hours in positive and negative cases. Later the method of scarification was given up and intradermal injections were substituted. The vaccine that was injected intradermally was

specially prepared. First an emulsion was made of the organisms and a vaccine prepared. This vaccine was washed with alcohol and the alcoholic extracts removed. The vaccine was then dried and ground. This powder was made up with carbolated saline so that 0.05cc of the saline contained 0.00002 gm. of the dried vaccine. Gay and Force claimed that this technique in a series of cases that had, shortly before the test was done, recovered from enteric fever, gave 97% positive results, while in a series of persons who had not any history of enteric fever or typhoid inoculations, 86% gave negative results. They attempt to explain the remaining 14% of positive results amongst the so-called "negative" cases by stating that these persons had possibly suffered at some time from enteric fever which had not been diagnosed. Positive results were also got in inoculated persons up to 18 months after inoculation with Typhosus vaccine. Force and Stevens lengthened the period from 24 to 48 hours before noting the result as they recognised that the intradermal injection of a vaccine entails at the same time the introduction of a foreign proteid into the body and this, in many cases, may lead to an extensive reaction. They report that in positive cases there was after 48 hours a maculo-papule with a definite erythema at least 5mm in diameter. Negative results were recorded when there was an absence of both after 48 hours. In 18 normal cases there were 17 negative results. In 26 cases with a definite enteric history, 19 had positive reactions. They deduced from the latter statement that typhoid immunity is less stable than was formerly supposed. They go so far as to state that 50% of the inoculated persons have quite lost their immunity within 3 years.

Gay and Lamb (5) felt justified in deducing that the test gave a true indication of immunity since (a) They never found a case that had given a positive reaction to develop enteric fever at a later date.

(b) On inoculation, persons with a positive result had a violent reaction compared with those with a negative result and such inoculated cases resembled, in this respect, the reaction got when persons who had recovered from Typhoid Fever were inoculated, was simulated.

(c) Persons who gave a negative result before being inoculated gave a definitely positive test after inoculation.

Capt. T.O. Thompson (1) records a series of 48 cases studied by himself. He used for his test the technique evolved by Von Pirquet for the tuberculin cutaneous reaction. He scarified the arm in 3 places and introduced:-

- (a) At the 1st scarification - a control of sterile saline.
- (b) " " 2nd " - high titre antityphoid serum.
- & (c) " " 3rd " - a vaccine prepared from cultures of Typhoid, Paratyphoid A & Paratyphoid B organisms.

He failed to obtain any reaction at the 2nd scarification but there was, in most cases, a significant reaction at the 3rd. He noted his result after 24 hours and if the redness and oedema lasted at the full extent for 4 days the test was regarded as positive. If the full reaction lasted only 3 days the test was regarded as suspicious. He noted however that a fair skin frequently gave a red reaction at the third scarification even when enteric could be definitely excluded.

He recognised four grades of result:-

- (a) A full red reaction with a raised surface and oedema of the surrounding area;
- (b) A full red reaction extending beyond the area of scarification;
- (c) A red area at the scarification;
- & (d) No reaction beyond the scratches.

He records several results of the group (a) order in which the stools were negative for 25 consecutive tests or even 3 months before the organism was recovered from the stools.

He concluded that this test gave an easy, rapid and perfectly reliable method of detecting Enteric carriers. He suggested, but did not demonstrate, that the test might be employed in the diagnosis of the disease in its later stages and also that it might prove to be useful in the differentiation of Typhoid, Paratyphoid A and Paratyphoid B cases from one another.

It is to be noted that Gay's test is one that denotes immunity from enteric fever just as the Shick Test denotes immunity from diphtheria or the luetin reaction denotes immunity from syphilis. The test described in this paper gives an indication of the potential infectivity of the patient.

Technique of the test.

The test consists of the introduction into the skin of vaccines prepared from strains of the following organisms:-

- (1) Bacillus Typhosus,
- (2) Bacillus Paratyphosus A,
- & (3) Bacillus Paratyphosus B,

prepared and Standardized at the Department of Pathology, University of Oxford, on behalf of the Medical Research Committee.

- (1) For convenience I put each vaccine into a sterile glass bottle fitted with a rubber cap sealed to the neck of the bottle with wax. This allowed the needle of syringe to be plunged through the rubber into the vaccine without exposing the stopper &c.,

to contamination. It also helped to render the time taken in doing many tests reasonably short.

- (2) Sterile normal saline was used as a control. This I prepared each day.
- (3) I obtained best results when using a glass syringe with a metal plunger and a metal collar. Some considerable pressure was required to introduce the vaccine into the skin and "all-glass" syringes, in my hands, were not satisfactory. Ordinary fine hypodermic needles were quite satisfactory. The barrel of the syringe was divided into 1cc divisions. Each 1cc division into 10 parts (i.e. 0.1cc) and each 0.1cc into 5 parts (i.e. 0.02cc).
- (4) Before introducing the needle into the skin the arm was swabbed with methylated spirit and then dried. (If the skin is not dry it is not so easily controlled).
- (5) The needles and syringe were invariably boiled before and after use but it was not practicable to sterilise by boiling between each injection or for each case. The needle and syringe were washed several times with spirit between each injection. This proved satisfactory as I never had any suspicion of inflammation at any of my injections - at least no suspicion of inflammation over and above what might be expected from the injection of a vaccine. It further ensured that the B. Typhosus vaccine was thoroughly cleared out before the next vaccine was taken into the syringe. Before taking any vaccine into the syringe, however, care was taken to wash out any remaining spirit by sucking in some sterile saline several times.
- (6) The injections were invariably given in the following order:-
 - 1st. B. Typhosus vaccine.
 - 2nd. B. Paratyphosus A. vaccine.
 - 3rd. B. Paratyphosus B. vaccine.
 - 4th. Sterile normal saline.

The B. Typhosus vaccine I always injected about 1" distal to the elbow joint of either arm. Then at 1" intervals I gave the other 3 - all in line, with saline nearest the wrist joint. This rigid sequence prevented any possible confusion as to the area involved and are recorded as 1st. 2nd. 3rd. and 4th areas hereafter in this order. In one or two adult cases, however, where there was much hair on the forearm the injections were given above the elbow joint - starting in the same order about 4" proximal to the elbow.

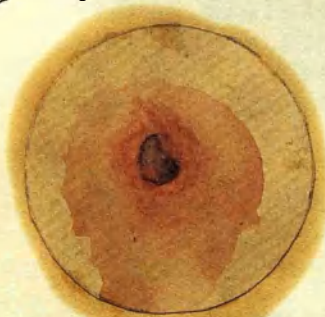
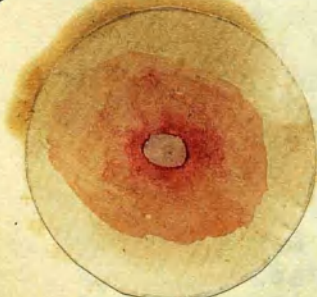
- (7) I found that I had most control of the needle and could give the injection quickest and with least haemorrhage when holding the shoulder of the needle between the thumb and forefinger and having the handle of the piston lying in the palm of the hand. The long edge of the needle should be downwards and the opening look upwards - Thus:-



The barrel lay at right angles to the arm and as nearly parallel to the plane of the skin at the site of injection as possible. As the needle point must not penetrate the true skin, it was found best to grip the forearm with the left hand and tighten the skin over the area to be injected. This also served to control the arm.

- (8) When the needle entered, it caused a distinctly palpable ridge which was black in colour and clearly defined. There was a considerable resistance to its introduction. If this resistance was suddenly overcome the needle had gone too deeply. As the needle advanced a definite but fine wrinkling of the cutis immediately in front of the advancing point was characteristic. The needle should only pass once through the cutis. I aimed at having the entire point entered and then advanced about 0.1" further. This ensured that all the fluid that left the syringe entered the skin. It also tended to prevent the passage of blood into the bleb. In a fairly large number of cases - especially the earlier ones - some blood was drawn at the site where the penetration of the skin took place, probably due to the needle being introduced too forcibly and acutely at that point. If the bleb was less than 0.25" from this point the blood made its way along the needle tract into the bleb and interfered with the test. The longer the course of the tract, the less was the risk, and to introduce the needle 0.1" beyond the shoulder of the point usually sufficed.

- (9) Having got the needle safely into the skin the next point was to get the fluid introduced without causing the needle to move. Such a movement occurred if the operator required to change his grip before he was able to press home the piston, or if the patient jerked his arm as the fluid was injected. The former was prevented by holding the syringe as described since all that required to be done was to tighten the hand. Since I adopted this hold I have had 3 cases of haemorrhage in 360 cases, while in the previous 40 I had 15 cases of haemorrhage. There was a sharp nipping pain as the fluid caused the bleb to rise, and the patient was quite justified

A Positive3rd Day4th Day5th Day.B Negative.2nd Day.3rd Day3rd or 4th Day.C Negative with Haemorrhage.3rd Day5th Day.D White area - negative.2nd or 3rd Day.

in a slight jerk. The same grip allowed the entire action of injection to be sudden and the reflex of the patient jerked the arm away from the needle which was just what the operator wished. After becoming expert the needle was usually withdrawn by the time the jerk occurred. If there was any haemorrhage I gave the same injection about 1" to the side of the failure.

- (10) The injected vaccine caused a pure white bleb - not transparent like varicella. When 0.04 to 0.06cc had been injected the bleb was slightly raised and about $\frac{1}{4}$ " in diameter, and rounded in shape. If more had been injected it escaped through the needle tract and the bleb was larger, more swollen, and more irregular in shape. Sometimes - especially if the needle had been too deep - I found that the fluid appeared to "shoot" in lines radiating from the point of the needle. There was no bleb formed and the white radiating lines soon gave place to pink and, in many cases, definitely red areas. Such a result was quite unsatisfactory and required a fresh test. When large doses (0.08cc to 0.1cc) were injected haemorrhage often appeared in the blebs.

- (11) A point worthy of note is that a nurse may attempt to rub away the swelling, as she does in dealing with a hypodermic injection. This pressure no doubt leads to the escape of much of the fluid through the needle tract or into the sub-cutaneous tissues with the result that haemorrhage may occur or an air space induced under the skin and resulting in what I have described as a "white area". These white areas usually became visible on the 2nd day and were very definite. They were often sharply limited by a thin red haemorrhagic line and then a slighter haemorrhagic infiltration might occur. White areas were noticed to develop on the 3rd day.

Interpretation of Results.

When I began this series of observation there was no standard as to either the reaction or to the dosage likely to give a satisfactory difference between positive and negative, but basing the quantity given intradermally on the dose of toxin given in the Shick reaction, I gave 0.1cc at each injection. With doses of this size my results were very unreliable and many have, in the light of further experience with smaller doses, been rejected. Many faulty results no doubt must also be attributed to faulty technique but I am certain many haemorrhages were due to the injection of the large dose and especially such as developed the haemorrhagic area on the second day. Some of my later tests were large doses. These were done after several hundred satisfactory injections, and they also gave the haemorrhagic areas developing some hours after the injections.

I have done a number of tests with doses of 0.08cc, 0.06cc, 0.04cc, and a few with 0.02cc. The last mentioned dose was far from reliable but the best results were got with doses of 0.04cc to 0.06cc. It is however to be noted that the type of skin on the patient's forearm is important in considering the dose. Two of my carrier cases exemplify this point -

M.D. was a farm worker with freckled skin which was coarse from exposure. In her case 0.04cc only gave a faint reaction and 0.08cc gave a good reaction. K.O. had a very soft, tender skin and 0.04cc gave a marked reaction on every occasion. I found it most convenient to work with children for my control tests. These cases were very unlikely to have suffered from enteric fever and I did not feel called upon to make frequent examinations of their stools especially when their bowels were normal. Whereas in the cases of adult controls a careful examination of the history was necessary; Widal tests, and stool examinations had often to be done. In cases with positive Widal's several stool examinations had to be made before the cases were regarded as negative. This was by far the heaviest part of the work. Probably the using of children had made me regard 0.04cc as the optimum dose whereas had the large majority of my cases been adult I might have made the dose slightly higher; but I am satisfied that as a rule 0.06cc is the highest dose for adults which will give reliable results.

A. Criterion of Negative Results.

On injection a small white bleb developed at each site. The margins were raised and definite. The outlines were usually circular. The white bleb stood out distinctly for a few minutes then a pink diffuse area developed round it. This was probably a sympathetic reaction. However within 6 hours the white had usually disappeared leaving a slightly swollen area which was not painful but which when pressed gave rise to a tingling sensation. The colour gradually deepened over the actual bleb and became paler as the distance from the injection increased till it merged into normal about $\frac{1}{2}$ " away.

If the injection gave rise to haemorrhage the bleb was seen, rapidly after the withdrawal of the needle to become flat and sodden and of a reddish tint. This colour persisted. When a haemorrhage was made at the site of entrance the blood was occasionally observed to make its way along the needle tract, after the needle was withdrawn. The blood did not, in some cases, reach the bleb (if the tract was long). In such cases, the needle tract became unduly prominent for a few days, owing to the resolving blood, but did not interfere with the reaction.

2nd Day. By the end of 24 hours there was usually a pink area round the site of the bleb - the colour resembled that of an ordinary irritation. Over the actual area of the bleb the colour was scarlet rather than pink and there was often a slightly raised area which could be felt on passing the finger gently over the skin. In many cases however, there was an urticarial region extending for a variable distance round each site of injection. The margin of the raised area was either defined or gradually merged into normal. The colour always disappeared on pressure. Usually the four areas were separate but when the urticarial areas resulted the four frequently coalesced. Each injection was then indicated by a bright crimson area. The area of each reaction was usually $\frac{1}{2}$ " to $\frac{3}{4}$ " in diameter.

In a few cases there was a very faint brownish discolouration on the second day. In such cases the injections were correctly given. No special reason for this "immunity" was found as I could never fore-tell the extent of the reaction on the 2nd day. In other cases - usually very young children - small red papules developed. Such a reaction I ignored - it never occurred in an adult.

If haemorrhage had occurred into the bleb, there was usually a white area marking the bleb with a purplish background. There was a definite swelling and a pink areola fading gradually into normal. The colour was not lost on pressure over the white area but the areola was readily lost as in ordinary cases.

3rd Day. When the injection was given satisfactorily the pink colour had usually disappeared by the 3rd day and the sites only marked by a brownish discolouration. The area was soft, not tender, swollen, or indurated. Occasionally a faint pinkish brown colour remained, but, the pink readily disappeared on pressure. When at the time of injection the fluid was seen to "shoot" the brownish discolouration was marked, together with slight induration.

The extent and depth of the brown discolouration varied in different cases to a deep purplish - brown colour with yellow margin. The latter denoted haemorrhage into the bleb. The presence of the purple areola on the 2nd and occasionally on the 3rd day and the failure to disappear under pressure rendered the condition easily distinguishable from a positive reaction. This condition was quite unsatisfactory.

4th Day. By the 4th day all trace of a properly given injection had usually gone. There might be a faint yellowish-brown discolouration at one or other of the sites but each area was soft and not indurated or swollen.

The reaction sometimes remained as a brownish discolouration in cases of "shooting" or haemorrhage. "White" areas due to escape of the fluid &c., had usually disappeared also by this time.

5th Day. All normal negative reactions had gone by the 5th day.

B. Criterion of positive results.

The reaction on the first day was exactly similar to that of negative cases and had the same variations. I have not been able to distinguish negative from positive results on the first or even on the second day although by the second day the colour at the positive macule was just a shade deeper than at the other areas.

3rd Day. By 72 hours after the injection differences could be noted between the negative and positive reactions. The area of the reaction was usually more extensive where the vaccine corresponded to the organism in the patient's body. The colour was maroon - very deep at the actual bleb and becoming weaker till it merged into normal. But at all parts the colour was different from the bright pink or crimson of the other three areas and of corresponding areas in other patients. The other areas behaved exactly like normal negative cases and disappeared in the usual time. The colour of the positive area became deeply cyanotic, similar to the appearance of an abscess on the point of bursting. There was a slight degree of swelling but no fluctuation. This colour was absolutely typical and became even more evident by the fourth day when the swelling was enforced by a well marked induration. The colour occurred in every case I considered positive - that is, those in which symptoms of enteric fever were found or more especially in which Bacilli of the typhoid group were recovered from the stools. The colour was lost entirely on pressure. If slight haemorrhage occurred into the original bleb, the reaction was often sufficient to cause the cutis to give way, leaving a small ulcer. This occurred in the cases of S.L & K.O. but the dusky plum coloured areola which disappeared on pressure and which persisted for 4 or 5 days was always sufficient to make a positive distinguishable from a negative reaction.

The area of the reaction was readily felt on passing the finger gently over the surface of the skin. It was invariably raised above the level of the surrounding skin and was hard and indurated but not markedly tender. The induration extended for a considerable distance beyond the original bleb covering the entire area of the dusky purplish colour. It was usually $\frac{1}{2}$ " to $\frac{5}{4}$ " in diameter. This extent distinguished it from a haemorrhagic area. White areas did not appear to modify the result in any way as they permitted the typical purple areola. But here again the cutis tended to give way leaving a small ulcer.

4th Day. By the fourth day the reaction was most typical.

The induration had developed; the swelling made the bleb prominent; the colour was purple; and the areola extensive. This contrasted with the other areas which had by this time disappeared. Otherwise there was no change to record from the 3rd day.

5th Day. If 0.06cc had been given, the areola began to creep in and a comparatively narrow purplish ring remained. This had almost disappeared by the following day leaving a brownish discolouration. If more than 0.06cc had been given the reaction usually remained at its height for another day and then gradually faded, but such a reaction was usually prolonged by some haemorrhage on the 3rd day. The purple colour had invariably given place to a brownish discolouration by the 6th day. But induration usually persisted for a day or two after the characteristic colour had gone.

From the foregoing it will be observed that the 4th day is the time of election for determining results.

General. The local reaction was not accompanied by any general symptoms. Only in three of my 400 cases was there any rise of temperature. In one - a child suffering from diphtheria (J.J.) - the child was very excitable and in terror of another "jag" and subsequent pain (denoting the giving of 8,000 units of serum). His temperature shot up to 101°F that night but he was normal on the following day. 0.04cc had been given of each vaccine and the result was a typical negative. Another case was an adult pneumonia (Mrs.G) who had a rise of temperature on the evening following the injection; she also had a rigor. Her chart, however showed that she had had similar attacks a week before the injection. The third was a convalescent scarlet fever case (M.McP.) who had a rise of temperature and had some urticarial eruption on the arms and trunk far removed from and not anatomically connected with the reaction at the actual sites of injection.

A repetition of the injections in the case of J.J. failed to give any reaction.

Acute Cases - Temporary Carriers of Bacillus Typhosus.

ase
(1)

W. McG. Age 15 yrs.

Patient was admitted on the 9th day of illness. The illness began with headache, shivering, and feeling of coldness. There was persistent diarrhoea and the stools were light-brown in colour. On admission he was found to be moderately nourished. He was very ill. Pulse was slow - 68 - and full. Temperature was 102°F. He complained of pain in the right ileum. There were 4 rose spots on the abdomen and others appeared later. The spleen was large and easily palpable. Tongue was furred and very dry. There was a sudaminous rash over the trunk and a considerable number of rales in the chest. Heart and urine were normal.

Bowels were loose and motions "pea-soup" in character.
B. Typhosi were recovered from stools later.
Widal test - positive on admission.

- (1) Typhoid, Paratyphoid A, Paratyphoid B vaccines and saline injections were given intradermally. 0.06cc of each were given producing typical white blebs at each injection. No. B Typhosus were then (i.e. 13th day of disease) recovered from the stools when grown on litmus agar.

2nd Day. There was an oedematous, pink, swollen area about $\frac{3}{4}$ " in diameter at each site. The swelling was most marked at the centre where the colour was crimson. The colour was entirely lost on pressure and gradually merged into normal. All areas were alike in colour, extent, and swelling.

3rd Day. All macules, except the 1st (Typhosus) had now settled down. There was no swelling or induration. The colour was pinkish-brown and became brown on pressure.

The pink at the 1st area had given place to purple. The swelling was more marked and the area was indurated. The colour was entirely lost on pressure. The area was $\frac{1}{2}$ " in diameter.

4th Day. There was still a purple, swollen and indurated area at the 1st site. This still disappeared on pressure. The other areas were normal.

5th Day. The purple colour had a brownish tint and was weaker. Swelling had disappeared but induration was well marked. There was no trace of the other injections.

6th Day. Only an indurated area remained. There was no discolouration.

- (2) 0.04cc of each vaccine and of saline were given on the 29th day of illness and typical blebs were formed. The temperature fell and convalescence apparently began on the 26th day.

2nd Day. There was a faint pink, oedematous area at each site. There was practically no swelling but the colour was lost on pressure. The pink area was deepest at the centre. The 1st area was more extensive than the others, $\frac{3}{4}$ " in diameter.

3rd Day. The colour was deeper and tending to purple at the 1st mark. The area was tender and swelling greater. The colour was lost on pressure. The area was slightly indurated. The other areas were soft, not swollen or indurated, and pinkish-brown in colour.

4th Day. There was a well marked purple area at the 1st mark. This was slightly under $\frac{1}{2}$ " in diameter. It was lost on

pressure. Induration was well marked. The other areas could not be found, except for the pin prick.

5th Day. The mark was similar to that found on the previous day.

6th Day. The mark was beginning to fade - a brownish tint creeping into the purple colour. There was no swelling but the induration was pronounced.

7th Day. The mark was now brown. There was no swelling but the induration was well marked still.

8th Day. The arm was perfectly normal.

- (3) 0.06cc of each vaccine and of saline were injected intradermally on the 50th day. It was then 14 days since the stools were first found to be negative for B. Typhosus. Several examinations gave a similar result. The Widal test was still positive. All the marks during the first two days were exactly similar to those of corresponding days during the previous tests, but, on the third day, the redness was fading at all marks and did not tend to become purple at the 1st mark. The 1st mark was slightly more extensive but there was no swelling or induration.

4th Day. There was a slight brownish discolouration at each site of injection but no swelling or induration.

5th Day. No trace of any mark could be found.

Convalescence was unimpeded and the patient dismissed well.

Mrs. M.T. 44 yrs.

The patient was admitted on the 14th day of illness. The condition began with sickness, vomiting, headache, loss of appetite &c. The stools were noted to be loose, brownish, and yellow in colour. The blood was tested and agglutinated B. Typhosi. The patient was a large flabby woman. She had many moist rales at the apices of the lungs and old tubercular sinuses in the neck. Percussion was impaired at the apices. There were rose spots on the abdomen and more appeared in crops. The spleen was large and tender. The abdomen felt boggy. The patient was sick soon after admission and unable to retain any food - even milk was returned. 8 days after admission, there was haemorrhage from the large bowel and two days later she became semi-conscious and died. The usual 4 injections (Typhoid, Paratyphosus A & B vaccines and saline) were given on the 16th day of the disease. The stools were then infected with B. Typhosus. The blood was markedly

positive for Typhoid Fever. Each injection caused a typical white bleb.

2nd Day. There was an extensive pink, oedematous area $3\frac{1}{2}$ " by 2". This was soft and tender and disappeared under pressure. The oedema gradually faded and the colour merged into the normal tissue colour. The colour was deeper at the site of each injection. The swelling was not marked. All the areas seemed to be alike.

3rd Day. The first area was $\frac{1}{2}$ " in diameter, soft and more swollen than on the previous day. The colour was deep purple, and disappeared on pressure. The mark was purple and contrasted with the pinkish-brown at the other sites. None of the areas was tender. The 1st mark was slightly indurated.

4th Day. The first area was markedly swollen and indurated. The purple was still definite and disappeared on pressure. The other areas had faint brown marks which were soft but not swollen or indurated.

5th Day. The colour was fading at the 1st mark (purplish-brown and becoming brown on pressure). Swelling had gone but induration persisted. There was no trace of the other marks.

6th Day. The colour had by the 6th day completely gone. There remained a faint induration but no swelling.

The patient died 2 days later.

J.Y. Age 16 yrs.

The patient was admitted after an illness of 2 weeks. She complained of abdominal pain. Her bowels were normal. There was pain in and fixation of the left hip joint. On admission she was found to be emaciated and pale. The abdomen was flaccid and there were no rose spots visible. The spleen was palpable. On abdominal palpation a mass was felt in the right iliac fossa, but this was distinct from the bone. A diagnosis of appendix abscess was made and lactose-fermenting, gram-negative bacilli got from the pus evacuated. There were rales in the lungs. The heart was normal. The stools were loose after a few days and B. Typhosus found both in the stools and in the urine. The blood serum agglutinated B. Typhosi in dilutions up to 1:200.

- (1) B. Typhoid, B. Paratyphosus A & B vaccines, and saline were injected intradermally in 0.06cc doses on the 23rd day of illness. Each vaccine caused a typical white bleb.

2nd Day. There was a pink area at each injection, deeper in colour at the centre and gradually merging into normal. There

was a very slight oedema. The colour was lost on pressure. Each area was discrete and all were alike in extent, colour, pain &c.

3rd Day. The first area had a whitish centre with a purplish-red areola gradually fading into normal. The area was swollen and indurated. The colour was lost on pressure. The other areas had a faint brown discolouration, but no swelling or induration.

4th Day. The purple areola still persisted round the white area at the 1st mark. This area was $\frac{1}{2}$ " in diameter and indurated and swollen. The colour was lost on pressure. There was no trace of the other marks.

5th Day. The areola was shrinking and the white area purplish-white. The areola was brownish-purple. Induration was well marked.

6th Day. Arm was perfectly normal.

- (2) The 4 injections were repeated in 0.04cc doses on the 40th day of illness. Each injection produced a typical white bleb. The stools and urine were normal. The temperature was fairly well settled although there was a persistent swing about the 99°F mark and there was discharge through the abdominal wound.

2nd Day. There was a large red area, 4" by $1\frac{1}{2}$ ", involving the volar surface of the forearm. The colour was slightly darker at the actual site of each injection. The part was tender, oedematous, slightly swollen, and the colour was lost on pressure.

3rd Day. All marks were discrete and the colour at each was a pinkish-brown. There was no swelling and no induration. All the areas were alike in extent and in colour.

4th Day. All marks had by this time disappeared except for a slight brown discolouration at the 1st site.

5th Day. There was no evidence of any of the injections.

- (3) 0.04cc of the 3 vaccines and of saline were injected on the 55th day of illness. The Widal test was still positive but no Typhoid organism had been recovered from either urine or faeces on 3 further tests being made. The blebs were typical in appearance.

2nd Day. There was a slight pink colour at each site with slight oedema, but very little swelling. The colour was lost on

pressure. All areas were alike in size and colour. They were $\frac{3}{4}$ " in area.

3rd Day. There was a brownish colour at each area - slightly deeper and more extensive at the 1st area. No swelling or induration remained at any area.

4th Day. The arm was normal.

- (4) 0.04cc of each of the vaccines and of the saline were injected on 70th day. Wound was still discharging. Stools had been persistently negative for B. Typhosus. All the blebs were typical.

2nd Day. There was a pink oedematous area at each site - each about $\frac{3}{4}$ " in diameter. The colour was slightly deeper at the centre. The areas were raised very little and were tender. The colour was completely lost on pressure. All areas were alike in size and colour.

3rd Day. There was a soft brownish-pink area at each site of injection, but no induration or swelling. The 1st area was more extensive than the others.

4th Day. The arm was normal.

ase
IV. Mrs.B. Age 30 yrs.

The patient had complained of being out of sorts for 10 days prior to admission. She was compelled to take to bed on the day before admission. She had a headache, pain in the back and limbs. There was some abdominal pain. Epistaxis occurred on the day before admission. Stools were loose and yellow. On admission - Temperature 100°F, Pulse 72, and Respirations 20. The patient was neurotic. She was well nourished. Her abdomen was not rigid but there was a slight rigidity over the rightiliac region. The abdomen was doughy and there was gurgling on palpation. The spleen was not enlarged to any great extent. The liver was slightly enlarged. Her eyes were bright and her cheeks flushed. Heart, lungs and urine normal. Widal test was strongly positive. The stools were positive for Bacillus Typhosus.

- (1) B. Typhoid, B. Paratyphoid A, ~~& B~~ Paratyphoid B. vaccines and saline were injected in 0.08cc doses on the 18th day of illness by which time the temperature had settled although the stools were still positive for B. Typhosus. Each injection gave a white rounded bleb.

2nd Day. There was an extensive oedematous area, 4" by 2", on

the volar aspect of the arm. This was soft, tender, and lost on pressure. The colour was slightly deeper at the sites of the blebs. The colour at the 1st area was slightly deeper than at the others.

3rd Day. There were discrete pink areas, soft, not swollen, but slightly tender, and completely lost on pressure at the 2nd and 3rd. At the 1st there was a swollen area with a reddish-purple or maroon colour which was $\frac{1}{2}$ " across and at the edges gradually merged into normal. The colour completely disappeared on pressure. There was slight induration.

4th Day. The 2nd and 3rd areas had become brown and soft but no induration or swelling. The 1st was purple, swollen, and indurated but the colour was entirely lost on pressure.

5th Day. The colour had begun to fade at the 1st area but there was induration. The other areas were normal.

6th Day. The arm was ~~not~~ normal.

- (2) The 4 injections were repeated on the 36th day of illness using 0.04cc of each fluid. The stools had been twice examined and found negative for Bacillus Typhosus.

2nd Day. There were $\frac{3}{4}$ " pink oedematous areas at each injection. Each was soft, tender and lost on pressure. The colour gradually merged at the periphery into normal. All areas were alike in size and colour.

3rd Day. There were pinkish-brown areas at each injection - soft and not swollen or indurated. All areas were alike and $\frac{1}{2}$ " in diameter.

4th Day. The arm was normal.

Case.

I. E.S. 21 yrs.

The patient was admitted on the 9th day of illness. The condition had begun with malaise, cough, and diarrhoea. Rose spots had first been noticed two days before admission. Blood serum was found to agglutinate B. Typhosus in dilutions up to 1:250. On admission her temperature was 101°F and pulse 68. She was moderately nourished. Her eyes were bright and suffused. Her cheeks were flushed and her tongue was dry and raw. Abdominal palpation revealed a boggy abdomen but the spleen was not large. The stools were "pea-soup" in character, and from them B. Typhosus was cultured.

- (1) Typhoid, Paratyphoid A, Paratyphoid B, and saline were injected in doses of 0.08cc on the 10th day of illness.

A slight haemorrhage occurred into the 3rd bleb but the others were quite typical.

2nd Day. There was a pink area at the 2nd & 4th injection. These were soft, tender, and lost on pressure. The 3rd area was purplish-white with a bright pink areola. On being pressed with a glass spatula the pink areola disappeared but the purple of the bleb did not. This mark was swollen and indurated. The 1st area was more extensive than the others and pink in colour. It was slightly swollen but the colour was entirely lost on pressure.

3rd Day. The 2nd & 4th areas were now practically gone - there being faint brownish discolouration at each. There was no swelling or induration. The purplish area at the 3rd was turning brown and had no areola. The 1st area was plum coloured and swollen and differed from the 3rd area in that the colour was completely lost on pressure.

4th Day. There was a small, soft brownish area at the 3rd mark. There was no trace of the 2nd or 4th marks. There was a swollen, indurated purple area - lost on pressure at the 1st mark.

5th Day. The colour was fading from the 1st mark and the swelling had gone but the induration persisted. The other areas had now gone completely.

6th Day. Only induration and a faint brownish discolouration at the 1st mark, remained.

7th Day. The arm was normal.

(2) 0.04cc of each injection was repeated on the 28th day of illness. The temperature reached normal on the 28th day and the stools were formed but B. Typhosus was still recoverable. All the blebs were typical.

2nd Day. There was a pinkish colour at each site, about $\frac{3}{4}$ " in diameter, fading gradually into normal at the margins. There was a slight degree of swelling at each. The colour was lost on pressure. Each area was tender and all were alike.

3rd Day. The colour was pinkish-brown at the 2nd, 3rd & 4th marks, where the area was soft and not indurated or swollen. The colour at the 1st area was purple and this area was swollen and slightly indurated. The colour was lost on pressure.

4th Day. The colour was fading at the 1st mark and swelling had gone, but induration was well marked. The other marks could not be traced.

5th Day. Only induration remained. Colour was normal.

- (3) 0.04cc of each injection were given on the 35th day of illness. The stools were first found negative on the 30th day and again on the 35th day. The patient was now well on the way to recovery. Each injection gave a typical white bleb.

2nd Day. There were brownish-pink areas not swollen or indurated. All the areas were alike in colour and size. Pressure only modified the pink tint.

3rd Day. Each area had faint brownish discolouration but no swelling or induration. The 1st area was slightly more extensive than the others.

4th Day. Arm normal.

Stools were examined several times later but always with a negative result. Patient was ultimately dismissed well.

ase VI. Wm.M. 25 yrs.

The patient was admitted on the 19th day of illness. He complained of cough, exhaustion, vomiting, and diarrhoea. There was also considerable abdominal pain. On admission - Pulse 80 : Temperature 102°F : Respirations 32. He was very drowsy. His tongue was dry and raw. His spleen extended 4" and his liver 2" below the costal margin. The abdomen felt boggy. His stools were loose and B. Typhosus was cultured from them. His lungs were normal on admission, but a few days after he developed pneumonia which advanced into an empyema. Resection of a rib was done and pneumococci were recovered from the pus. The Widal was strongly positive.

- (1) 0.06cc of each of the vaccines and of saline were injected on the 29th day of illness. All the blebs were typical.

2nd Day. There was a slight reaction at the 1st & 2nd areas. There the colour was pink, with deeper centres, ~~and~~ about $\frac{1}{2}$ " in diameter. The other areas were smaller and fainter in colour. Pressure rendered the areas brown. There was slight swelling.

3rd Day. A white area limited by a thin red line and then a typical purple areola had developed at the 1st area. The areola was lost on pressure. There was some induration and swelling. The 2nd mark was still pink but fainter than on the previous day. The other areas were lost.

4th Day. There was still the indurated purple areola round a purplish-white area but the thin red line had disappeared. The area was swollen and indurated. The other marks were lost.

5th Day. The purple areola remained unchanged.

6th Day. The purple ring was smaller and the central area was purplish-brown. Induration was well marked.

7th Day. Colour was faded and only induration remained.

- (2) The vaccines and the saline were injected in 0.04cc doses on the 43rd day of illness when the patient was convalescent. The stools had been normal since the 36th day. There was still some discharge from the wound in the chest. Each bleb was typical in form and colour.

2nd Day. There was a pink, oedematous area at each injection - about $\frac{5}{4}$ " in diameter. The colour was deeper at the centre and lost on pressure. All areas were alike.

3rd Day. The colour was brownish-pink at all the areas but was deeper and more extensive at the 1st than at the others. There was at the 1st some swelling and induration. The colour became brownish on pressure.

4th Day. The colour was purplish brown at the 1st area. Swelling had gone but induration was well marked. All the other areas had disappeared.

5th Day. Only induration remained.

6th Day. Arm normal.

- (3) The test was done again on the 65th day of illness. The wound had closed and the patient was allowed up. Stools had been constantly examined (every 4th day) during the previous 20 days and always with negative result. 0.04cc of each vaccine and of saline were given and each injection gave rise to a typical bleb.

2nd Day. There was a pinkish colour at each area. There was no swelling and very little oedema. Each area was $\frac{1}{2}$ " in diameter and slightly tender. The colour disappeared on pressure. All the areas were alike in size and colour.

3rd Day. There was a brownish colour at each site, but no swelling or induration.

4th Day. The arm was normal.

Case
VII.

M.M. 10 yrs.

Patient was admitted to hospital on the 10th day of illness.

The first symptom of disease noted was haemorrhage from the bowel—blood escaped in large quantity. On admission she was semicomatose and emaciated. Pulse was slow - 68: respirations 22: temperature 100°F. The abdomen was retracted and boggy. The spleen was not palpable. Her bowels were loose and the stools yellow. B. Typhosus was recovered from the stools. Heart, lungs, urine &c., were apparently normal. Widal test was done on admission and found strongly positive.

- (1) 0.04cc of Typhoid, Paratyphoid A and Paratyphoid B vaccines, and saline were injected intradermally on the 15th day and in each case a typical white bleb was formed.

2nd Day. There was a slight pinkish colour at each area, more marked at the 1st & 2nd than at the others. There was slight oedema and swelling. The colour was removed on pressure.

3rd Day. There was a plum coloured area about $\frac{1}{2}$ " in diameter at the 1st mark. The colour was removed by pressure. The edge was quite sharply defined. There was swelling and some induration. The other areas were brownish and soft but not indurated.

4th Day. The 1st mark was unchanged but the other marks had disappeared.

5th Day. The colour was brownish-purple. The swelling had gone but induration was well marked.

6th Day. Colour was normal but induration persisted.

- (2) The 4 injections were repeated in 0.04cc doses on the 29th day of illness. Her temperature reached normal on the 28th day. She still had the "peevish" symptoms and the nose-picking of a young victim of enteric. Abdomen and stools failed to give any evidence of enteric on the 29th day (not examined bacteriologically). Each injection gave a typical bleb.

2nd Day. There was a pinkish area at each site of injection. There was slight oedema and swelling. The colour was lost at all points under pressure. The 1st mark was more extensive than the others.

3rd Day. There was a purplish area at the 1st mark which was swollen and slightly indurated. The colour was entirely lost on pressure. The other areas were brownish in colour and not swollen or indurated.—Colour was not modified by pressure.

4th Day. The colour was becoming purplish-brown at the 1st site of injection and it had ceased to be swollen. The area of the reaction was shrinking. Induration was marked. The other areas were normal.

5th Day. Only a slight purplish-brown colour remained. There was no swelling but induration was marked.

6th Day. All trace of the reactions had gone.

- (3) The 4 injections were repeated on the 45th day of illness, using 0.04cc doses. The stools had been examined bacteriologically on the 40th day and no B. Typhosus was found. Further tests during the following 15 days were also negative. Each injection caused a typical white bleb.

2nd Day. There was a reddish-pink oedematous mark at each area which was lost on pressure. Each mark was tender. All marks were alike in colour and extent except the 4th which had practically disappeared. The red colour gradually merged into normal, about $\frac{1}{4}$ " from the site of injection. The 1st area was $\frac{3}{4}$ " in area - others $\frac{1}{2}$ ".

3rd Day. There was a brownish area at each mark not affected by pressure, not indurated or swollen. The 1st area was most extensive.

4th Day. The arm was normal.

The patients mental appearance brightened and picking of nose and mouth stopped about the 30th day. She made an uneventful recovery.

Case. A.C. 19 yrs.
VIII

Patient was admitted to hospital on the 10th day of illness. He complained of headache, loss of appetite, and insomnia. He was sent in with a diagnosis of pneumonia but this was never found in hospital. He was delirious. On admission, temperature 103°F: Pulse 96: Respirations 24. He was well nourished. He was very drowsy and obviously ill. His tongue was dry, raw, and fissured. The cervical glands were large. Abdomen was tender and boggy, and gurgling occurred. His spleen was large and palpable. The liver was 1" below the costal margin. No rose spots were visible.

- (1) Typhoid, Paratyphoid A & Paratyphoid B vaccines, and sterile saline were injected in 0.1cc doses on the 30th day of illness when the temperature was beginning to fall. There was a typical white bleb at the 2nd & 4th marks but a haemorrhage at the 1st & 3rd. The 1st injection was repeated with success but the 3rd gave a second haemorrhage bleb.

2nd Day. There was a purple, hard swelling at the 3rd site of injection with a pink areola about $\frac{3}{4}$ " in diameter. There were pink oedematous areas at the other three. All areas were tender. The 3rd area lost its pink areola but was not otherwise modified by pressure. The others were entirely lost.

3rd Day. There was a purple indurated macule at the 3rd area which had a thin pink areola. The purple was not lost on pressure. There was a purple area at the 1st mark which was swollen and slightly indurated but which disappeared on pressure. This area was still tender. The other marks were brownish and soft and not indurated.

4th Day. The macule at the 1st area was unchanged. The third area had a brownish-purple area and was soft. The other areas were lost.

5th Day. The plum coloured area and induration was well marked at the 1st area. The 3rd area was dark-brown and soft.

6th Day. The colour at the 1st mark was now weaker and had a brownish tint. Induration persisted. The 3rd area was yellowish with a brown centre. There was no induration.

7th Day. There was a brownish-purple, indurated area at the 1st mark. The other marks had gone.

8th Day. The arm was normal.

(2) The 4 injections were repeated on the 50th day. The patient was then convalescent. Stools and urine had been 4 times examined for B. Typhosus with negative result. 0.06cc of each were given on this occasion.

2nd Day. All areas had uniform pink, oedematous marks, All were lost on pressure. All were alike in colour and extent.

3rd Day. The 1st mark was slightly darker and more extensive than the others but all were brownish in colour and there was no swelling or induration.

4th Day. All marks were still slightly brownish but soft and not indurated.

5th Day. Arm was normal.

Patient was dismissed well, a few days later.

A.L. 8 yrs.

Patient was sent into hospital on the 14th day of illness as a case of Cerebrospinal Fever. He complained of headache, Bachache, cough, & vomiting. On admission temperature was 102°F: Respirations 24: Pulse 100. He was poorly nourished. There was no evidence of neck rigidity nor strabismus &c. Lumbar puncture was done but the fluid was found to be normal. There was marked diarrhoea and the stools were yellowish and offensive. There were no rose spots. There were a few rales in the chest. The spleen was palpable. The eyes were bright and suffused. The tongue dry and fissured.

Widal test - strongly positive on admission.

B. Typhosus was cultured on litmus lactose agar from the stools.

15th Day - The patient was very weak and semicomatose. He was at times delirious. Bronchitis was more marked.

24th Day - Patient died.

The skin test was done on the 19th day of illness. 0.08cc of each of the vaccines and saline being injected. Each caused a typical white bleb.

2nd Day. There was a whitish macule at the 1st mark surrounded and delimited by a thin red line (very bright). There was a fairly broad pink areola gradually merging with the normal colour about $\frac{1}{2}$ " from the centre. There were pink macules at the other marks. The colour was lost from each on pressure. There was swelling at all the areas.

3rd Day. There was a purple areola round the white area at the 1st mark. The red line had disappeared. There was slight induration and swelling and the purple colour was lost on pressure. The other areas were soft, not swollen or indurated, and of a brownish colour.

4th Day. There was a purplish-white area at the 1st with a plum-coloured areola. The whole was swollen and indurated, and the areola lost on pressure but the other part was not entirely lost. The other areas had disappeared.

5th Day. There was still a dusky-purple areola round the whitish macule. The colour was fading. Induration was well marked. The patient died on the evening of the 5th day.

Case X. G.L. 9 yrs.

Patient was admitted on the 4th day of illness. The condition began with headache, vomiting, abdominal pain, sore throat, and cough. On admission, pulse was 104: Respirations 36 : Temperature 103°F. She had well marked consolidated areas over both lungs and many rales. The respiratory murmur was tubular at the right axilla. Her bowels were loose and "pea-soup" motions were got in which B. Typhosus abounded and from which this organism was cultured. Rose spots were present on the abdomen 2 days after admission. The tongue was dry and raw. There was a haze of albumin in the urine. Heart was good. Widal test was positive.

(1) 0.04cc of vaccines of B Typhosus, Paratyphosus A & Paratyphosus B, and of saline were each injected separately on the 9th day of illness and each gave rise to a small white bleb.

2nd Day. There was a pink area at each site of injection except the 4th. The colour was more extensive and slightly deeper at the 1st than at the others. All the colour was lost on pressure. Each area was tender and slightly swollen.

There was no reaction at the 4th mark.

3rd Day. There was a purple, swollen, and slightly indurated area at the 1st. ~~area~~. This was deepest in colour at the centre and gradually merged into normal about $\frac{1}{4}$ " from the centre. There was a slightly brownish area at the 2nd and 3rd, but no swelling or induration.

4th Day. No change was noted at the 1st area. The others could not be traced.

5th Day. There was a brownish tint in the 1st area but induration was well marked.

6th Day. All trace of a reaction had gone.

- 2) The test was repeated on the 23rd day using 0.04cc of each fluid. The temperature was falling and reached normal on the 26th day. The stools were then formed but were not tested bacteriologically. Each area gave a typical white bleb.

2nd Day. There was a pink oedematous area at each injection. Each was $\frac{3}{4}$ " in diameter. The colour was slightly darker at the centre of each area and at the periphery gradually merged into normal. The colour disappeared completely under pressure. All the areas were alike in colour and in extent.

3rd Day. The 1st mark was purple and contrasted with the pinkish-brown of the other areas. There was swelling and induration at the 1st but not at any of the others.

4th Day. The 1st area was still purple and indurated but only slightly swollen. The other marks were brown and soft.

5th Day. The colour had by this day gone entirely but induration was still well marked.

- (3) 0.04cc of each vaccine and of saline were injected on the 38th day of illness and each bleb resembled those formed on the previous occasions. The stools were negative for B. Typhosus on the 34th day, while the temperature was normal on the 31st day.

2nd Day. The marks were very faint and there was a faint brownish discolouration at each. There was no swelling or induration.

3rd Day. The marks had disappeared, leaving no swelling or induration.

Case
XI.

M.E. 6 yrs.

This patient was admitted on the 5th day of illness. There

were symptoms of headache and vomiting. The bowels were constipated. Her eyes were bright and suffused. The pupils slightly enlarged. There was abdominal pain and tenderness with slight distention. No rose spots were visible. The tongue was dry and brown and the liver and spleen enlarged. The blood serum agglutinated B. Typhosus in 1:200 dilutions. The stools became loose and "pea-soup" colour, and B. Typhosi were recovered on the 10th day of illness.

- (1) Typhoid, Paratyphosus A and Paratyphosus B vaccines, and saline were each injected in 0.06cc doses on the 23rd day of illness. Each injection gave a typical white rounded bleb.

2nd Day. There was an extensive general oedematous area (4" by 3") over the front of the forearm. The reaction was pink. The colour was removed by pressure. The swelling was sharply defined and tender. At each area of injection, the swelling was slightly more pronounced and the colour deeper. All areas were alike.

3rd Day. At the 1st area the colour was deeper red and the swelling more marked than at the others. The colour was removed from each on pressure.

4th Day. There was a well marked swollen indurated area at the 1st mark which was deep red in colour and $\frac{1}{2}$ " in diameter. The colour was removed on pressure. The colour and swelling had disappeared entirely from each of the other marks.

5th Day. The deep red colour at the 1st mark was fading but the induration remained. The other areas were normal.

6th Day. The arm was normal in colour but there was a faint induration at the 1st area.

- (2) 0.04cc of each vaccine and of saline were injected on the 34th day. The temperature had been normal for 4 days and the symptoms abated by the 34th day but on the 36th day a relapse occurred. The stools however had remained positive throughout.

2nd Day. There was a pink oedematous area at each site about $\frac{3}{4}$ " in diameter. Each area was soft and tender. The colour at each was slightly deeper in colour at the centre and faded to normal at the margin. The colour disappeared on pressure. All areas were alike in colour and extent.

3rd Day. The 2nd and 3rd marks were soft and brownish and there was neither swelling nor induration. The 1st mark was purple, swollen, and indurated. The colour disappeared on pressure.

4th Day. The reaction at the 1st area was unchanged while the others had disappeared.

5th Day. The colour was now brownish. The swelling had gone but the induration was well marked.

6th Day. There was no discolouration and only a slight induration.

- (3) 0.04cc of each vaccine and of saline were given on the 55th day of illness. The urine and faeces were negative for B. Typhosi. Temperature and symptoms had been normal for 10 days. The blood had still fairly high agglutinating qualities.

2nd Day. There was an extensive area of congestion and swelling on the front of the forearm - 3" by 1½". The colour was pink but deepening to red as each site of injection was approached. The colour was removed by pressure. The part was swollen and tender.

3rd Day. There was only a brownish colour remaining at each site, but no swelling or induration. All areas were alike, but the first area was slightly more extensive - ½" in diameter.

4th Day. There was a faint brownish discolouration at each area - soft and not indurated.

5th Day. The arm was normal.

The patient was dismissed well 18 days later and remained in good condition.

G.B. 8 yrs.

ase
II.
This patient was admitted on the 13th day of illness after a very vague history of abdominal trouble for which he had been treated with purges. He was sick and vomited 12 days before admission. On admission his abdomen was tender but not rigid. His spleen was 2" and his liver 1" below the costal margin. There was no meteorism. The eyes were bright and watery. The tongue was dry and raw. Bronchitis was well marked. The Widal test was strongly positive. The stools were loose and "pea-soup" like in colour. Bacillus Typhosus was got on culture of the stools.

- (1) Typhoid, Paratyphoid A & Paratyphoid B vaccines and saline were injected intradermally on the 13th day of illness in 0.04cc doses. Each bleb gave a typical appearance.

2nd Day. There was a dark-purplish colour at the 1st site with a whitish central area. The colour gradually weakened and merged into normal at the periphery. The colour completely disappeared on pressure. There was a slight tenderness and swelling. The other marks were pink and slightly oedematous. They were about 1/3" in diameter. Each mark was quite discrete.

3rd Day. There was a well marked bright purple area, slightly

swollen and indurated at each mark. The colour was lost on pressure. The other marks were a faint brown colour and not indurated.

4th Day. The 1st area was a purplish-brown colour, indurated but not swollen. The other marks were completely lost.

5th Day. There was a purplish-brown swelling which was indurated.

6th Day. There was only induration remaining at the 1st mark.

- (2) 0.04cc of each of the above mentioned injections were given on the 36th day. The temperature had been normal since 2 days after admission - the condition ran an apyretical course. The stools became negative on the 34th day and two days later the patient was allowed to sit up.

2nd Day. There was a slightly oedematous area of congestion about $\frac{3}{4}$ " in diameter. The centre of each was red while the rest was pink. Each area was tender. The colour was lost on pressure.

3rd Day. There was a brownish area at each mark, soft and not swollen or indurated. All areas were alike.

4th Day. There was no trace of any of the reactions. The patient remained well till dismissed.

Case E. McL. 8 yrs.
XIII.

The patient was diagnosed and operated on for an appendicitis. While on the table she was diagnosed enteric. On admission there was marked meteorism causing the bowels to protrude through the abdominal incision which had been made in the middle line. The spleen could not be palpated. The tongue was dry and raw. The eyes were bright and suffused. The patient was "peevish" and picked her lips and nose till they bled. There was bacilluria, B Typhosi being grown from the urine. The stools were typical of enteric and contained B. Typhosi.

- (1) Typhoid, Paratyphosus A, & Paratyphosus B vaccines and sterile saline (0.06cc) were injected on the 30th (?) day of illness. Each bleb was typical.

2nd Day. There was a dull red macule with a pink areola at each injection. The total breadth was $\frac{3}{4}$ ". Each mark was tender and was lost on pressure. All areas were alike in extent and colour.

3rd Day. There was a purple indurated area at the 1st mark which was swollen and slightly indurated. It was about $\frac{3}{4}$ " in diameter. The other areas were pink and $\frac{1}{3}$ " in diameter. All areas were lost on pressure.

4th Day. The 1st area was unchanged. The other areas were faint brown in colour, soft and not indurated.

5th Day. The colour of the 1st area was weaker and brownish but the induration was marked. The other areas had completely disappeared.

6th Day. The colour had gone but induration remained.

- (2) 0.04cc doses of the aforementioned fluids were reinjected on the 75th day of illness. Stools had been normal since the 40th day. The wound was closed and the symptoms abated. Each area gave a typical white bleb as on the previous occasion.

2nd Day. There was a red macule with a pink areola at each area. There was slight oedema but no induration. The marks were all lost on pressure. The 1st area was most extensive ($\frac{3}{4}$).

3rd Day. All the marks were pinkish-brown but not swollen or indurated. All areas were alike in colour and 1st was $\frac{1}{2}$ " - others $\frac{1}{3}$ ".

4th Day. There was a brownish colour at each area, but no induration.

5th Day. Arm was normal.

Patient was dismissed well.

Case
XIV. W.C. 16 yrs.

Patient was admitted on the 8th day of illness. He had a tumid abdomen with gurgling over the colon on pressure. Rose spots were present in crops. The spleen was just palpable. The stools were typical of enteric fever. The tongue was furred but not dry. The eyes were bright and suffused. Temperature on admission, 101°F : Pulse 80 : respirations 20. Stools were examined and B. Typhosi found.

- (1) Typhoid, Paratyphosus A & Paratyphosus B vaccines, and saline were each injected in 0.04cc doses on the 9th day of illness. Each bleb was typical in colour and shape.

2nd Day. There was a pink oedematous area at each mark. Each was swollen and tender. The colour was lost on pressure. The 1st mark was slightly deeper in tint than the others and more extensive. The Widal test done this day was negative.

3rd Day. There was a dull red colour at the 1st mark but not so purple as usual on the 3rd day. The area was swollen and slightly indurated. The colour was lost on pressure. The other marks were reddish-brown in colour.

4th Day. The colour was still dark red and slightly

indurated and swollen. The colour was lost on pressure. All the other marks had gone.

5th Day. The 1st area was brownish and indurated.

6th Day. Only induration remained at the site of the reaction.

- (2) 0.04cc were injected on the 11th day of each of the above fluids. By this time the blood agglutinated B. Typhosus in dilutions up to 1;250.

2nd Day. There were $\frac{1}{2}$ " pink oedematous areas, soft, tender, and slightly swollen. The colour was lost on pressure. The 1st was slightly deeper in colour than the others.

3rd Day. There was a purple, swollen, indurated area at the 1st mark which was lost on pressure. The other areas were gone.

4th Day. Arm was unchanged.

5th Day. The purple colour was fading but still definite purple. The swelling had gone but the induration was well marked.

6th Day. The purple was replaced by brownish discolouration. There was no swelling but induration was well marked.

7th Day. Only induration remained.

- (3) The 4 injections were repeated on the 26th day of illness. Each bleb was typical, 0.04cc of each were given. The temperature had fallen to normal and the stools were negative for B. Typhosi.

2nd Day. There was a pink oedematous area at each - $\frac{1}{2}$ " in diameter. Each was tender, swollen, and lost on pressure. The colour was slightly deeper at the centre. All areas were alike in size and colour.

3rd Day. There was a brownish area at each site - soft and not swollen or indurated. The 1st was ^{not} ~~not~~ extensive.

4th Day. The arm was normal.

Cases proved to be carriers at the time of the test by the recovery of the organism from the stools or urine.

Case I. K.O. 27 yrs.

This patient had enteric fever 5 years before admission. She was employed on a farm and during her stay there a number of cases of enteric fever occurred. She had been under observation for 6 months before admission and the stools were reported to be intermittently positive for B. Typhosus. There was no obvious pathological condition on examination of the abdomen. The spleen was barely palpable. The gall bladder was enlarged and could be palpated on deep pressure. She was sick and vomited on the 7th day after admission. She stated that this was "Just a bilious attack" to which she was accustomed. The condition lasted for 3 days, and then cleared up. During the following 4 months there was no repetition of the "bilious attack". During the attack there was diarrhoea and pain over the fundus of the stomach. There was hyperaesthesia in the area of the skin overlying this organ. The stools and urine were not (at this time) found to contain B. Typhosus. The widal test, however, was positive.

On the 21st. day after admission, there was a sharp pain in the upper abdomen, shooting to the right shoulder. There was some sickness and the temperature was elevated. Next day the stools were, for the first time since admission, found to contain B. Typhosus.

- (1) Typhosus, Paratyphosus A & Paratyphosus B vaccines and saline were introduced into the skin at different places on the forearm by a process of scarification. There was a dull red oedematous area round the B Typhosus scratch till the 4th day.

The stools were negative from the 23rd to 33rd days inclusive.

- (2) The vaccines & saline were introduced intradermally on the 29th day after admission, 0.08cc being injected. The blebs were large and there was a slight haemorrhage into the 3rd.

2nd Day. There was an extensive area of inflammation covering the entire volar aspect of the forearm. The colour was deep red at the 1st. injection and purple at the 3rd. At the others the colour was slightly deeper than the pink ground. There was oedema & swelling and tenderness. The colour was lost on pressure at all areas except the 3rd.

3rd Day. There was a dull red, raised area at the 1st mark with a dull red areola - the total breadth being $\frac{3}{4}$ ".

The colour was removed by pressure. There was slight swelling and induration. A purplish-white macule was got at the 3rd mark which was slightly indurated. There was a bright pink areola which was lost on pressure. The 2nd mark was pinkish-brown and soft. The 4th mark was lost.

4th Day. There was a purplish colour at the 1st area which was swollen and indurated. The macule was $1/3$ " in diameter with the purple gradually fading into normal. The 2nd and 4th marks were lost. The 3rd area was white without any areola, and was soft and not indurated.

5th Day. There was a deep purple colour still at the 1st area which was not swollen but was indurated. The colour was lost on pressure. There was a whitish-brown colour at the 3rd but no induration. There was no trace of the other marks.

6th Day. The 1st area was brownish-purple and indurated. There was no trace of the other marks.

7th Day. The colour had gone and a slight induration remained which lasted a few days.

- (3) 0.06cc of the fluids were injected on the 44th day after admission. The stools had been constantly positive. The urine was positive intermittently (after catheter specimens ceased to be taken but catheter specimens were invariably negative); no signs or symptoms were noted during this interval.

All the injections gave a typical white bleb.

2nd Day. There was an extensive inflammatory area (4" by 2") including all the areas of injection. All were tender and oedematous. All colour was lost on pressure.

3rd Day. All the sites of injection had a small area of redness. This area was more extensive at the 1st than at the others. There was a whitish bleb in the centre of the 1st area with a red line limiting it and then a pink areola. All were soft and tender, and lost on pressure.

4th Day. The colour at all except the 1st area was brownish and these areas were soft and not indurated. The 1st area was purple, swollen, and indurated. The colour was lost on pressure.

5th Day. The cutis had been broken over the 1st bleb leaving a small ulcer surrounded by a purple areola. Induration was well marked. The breaking of the skin really occurred on the 4th day and was due to rubbing. It did not occur spontaneously although the cutis was so thin as to tend to be easily broken. The other areas were now entirely lost.

6th Day. The colour was gone from the areola and a crust formed over the sore.

- (4) The test was repeated 14 days later giving a typical positive result. The stools continued to be positive and there were no signs of disease. The patient had not menstruated since admission although she denied pregnancy.
- (5) The test was repeated again on the 72nd day after admission, using 0.06cc of each vaccine &c., and again the test was typical of the many other positives already described. There was no haemorrhage with either of the last two injections where 0.06cc were injected.
- (6) The test was repeated on the 85th day after admission. On this occasion 0.08cc were injected and at the third injection there was a sudden red area in place of the white raised bleb.

2nd Day. There was a pink inflammatory area extending 4" by 2" which was deeper in colour at each site of injection. There was a purple haemorrhagic area at the third site. The colour of all the marks was lost except at the 3rd where the pink areola was lost but not the bluish purple haemorrhagic area. There was some swelling and induration at the third.

3rd Day. At the 1st area the colour was dull red with a whitish bleb in the centre. This bleb had a thin bright red line surrounding it and then the dark red areola. There was swelling and slight induration. All the colour was removed by pressure. The 2nd area was soft and pink. The third area was purple at the site of haemorrhage with a bright pink areola corresponding to the colour at the 2nd mark. This areola was lost on pressure but not the central purple area. There was a slight degree of induration.

4th Day. The 1st area was deep purple and more indurated, while the 3rd area was brownish with a purple centre and no areola. The other marks were lost.

5th Day. Only a white central spot remains at the 3rd mark with a brownish areola. At the 1st mark the colour was still purple with the whitish purple centre and well marked induration.

6th Day. The colour was weaker at the 1st mark but induration remained.

7th Day. There was induration at the 1st mark but no discolouration.

- (7) A typical positive reaction was got on the 90th day when 0.04cc of each vaccine &c., were used.
- (8) A similar positive reaction resulted when 0.04cc were injected on the 102nd day after admission.
- (9) 0.04cc were injected of each vaccine and of saline on the 124th day after admission and again the result was definitely positive. Ever since the 22nd day after admission the stools had remained positive. The urine was only positive when catheter specimens were not taken. The patient did not during that time menstruate. She had no further attacks of pain.

2nd Day. There was a pink oedematous area 3" by 2" on the volar aspect of the arm. At each injection there was a deepening of the colour which was most extensive at the 1st. The colour disappeared at each area on pressure.

3rd Day. There was a purplish papule at the 1st and red papule at the other areas. The colour was lost on pressure. There was slight swelling and induration.

4th Day. There was a purplish swollen indurated area at the 1st. At the others there was practically no discolouration and no induration or swelling.

5th Day. The 1st area was brownish-purple in colour. The induration was more marked. Swelling had gone. There was no trace of the other marks.

6th Day. The colour had faded. There was no swelling but there was well marked induration.

Case 2 .

Mrs. M.G. Age 76 yrs.

Patient had 3 grandchildren in the hospital within a month of her admission. These 3 children all had enteric fever. She had suffered from enteric fever 25 years before being admitted. She was in good health and robust for her years. She had no evidence of disease. She was very constipated but her stools were swarming with B. Typhosus. Her urine was intermittently infected - probably a skin infection as she was not catheterised.

Widal test was positive.

- (1) Typhoid, Paratyphoid A, and Paratyphoid B vaccines, and saline were introduced into her skin by scarification soon after admission. There was a slight pink reaction in the immediate vicinity of the wounds but no satisfactory reaction.
- (2) Typhoid, Paratyphosus A, and Paratyphosus B, vaccines,

and saline were injected intradermally. Each formed a typical white bleb. 0.06cc were injected in each case.

2nd Day. There was a large pink oedematous area covering the front of the forearm. The arm was painful. At the actual site of injection the colour was darker. The colour was entirely lost on pressure. All the marks were alike.

3rd Day. Each area was discrete and pink in colour except the 1st which had a large dark red mark about 1" in diameter. This was raised, oedematous, and tender. The colour was removed by pressure.

The other marks were soft and not indurated.

4th Day. The 1st mark was purple in colour and $\frac{1}{2}$ " in diameter. It was swollen and indurated. The colour gradually merged into the surrounding tissues. The colour was removed by pressure. The other marks were brownish, soft, and not indurated.

5th Day. There was still a purple, swollen, indurated area at the 1st mark. The other areas had gone.

6th Day. There was a brownish discolouration at the 1st mark and some induration.

7th Day. There was no discolouration but a slight induration.

(3) 0.04 of the same vaccines and saline were injected intradermally on the 14th day after the last test. Each area had a typical white bleb.

2nd Day. There was an extensive area of oedema and swelling including all the areas of injection. The area was soft and tender to touch. The colour was deeper at each site of injection. The colour was lost on pressure.

3rd Day. Each area was discrete and pinkish brown without any swelling or induration except the 1st which was deep red and indurated. The colour was removed by pressure from the 1st area.

4th Day. There was a purple swelling at the 1st area. This area was indurated. The other marks were lost.

5th Day. There was still a purple indurated area at the 1st mark.

6th Day. The colour was now very faint and tended to be brown. Induration persisted.

7th Day. Only induration remained.

Case III. M.D. Age 39.

This patient had a paratyphoid B infection some 2 years before admission. Her stools had been intermittently positive for B. Paratyphosus B since then. She was well nourished and in good condition on admission. Physical examination revealed a slightly enlarged spleen and a palpable gall bladder but nothing else.

- (1) Typhoid, Paratyphoid A, and Paratyphoid B vaccines, and saline were injected in 0.06cc doses on the 29th day after admission. At this period the blood was positive but the stools and urine had been negative for any nonlactose-fermenting organisms for 6 consecutive tests.

The patient had a very dark coarse skin - the injections gave rise to 4 typical white blebs.

2nd Day. There was a slightly pink area round each injection with well defined edges like an urticarial bleb. The colour was uniform and lost on pressure. The third was most extensive. Swelling and tenderness were slight.

3rd Day. There was a dark red indurated swelling at the 3rd area. The colour was $\frac{3}{4}$ " in diameter and gradually faded into the surrounding tissue. The colour was at all points removed by pressure. The other marks were brown, soft, and not indurated or swollen.

4th Day. There was a purple, swollen, indurated area at the 3rd mark. The other marks were lost.

5th Day. The colour was now brownish-purple and fading. There was still a slight degree of induration but no swelling.

6th Day. Colour had gone but induration persisted.

- (2) The usual injections were given in 0.06cc doses on the 44th day after admission. The stools were found to contain B. Paratyphosus B on the 36th day. There was no noticable sign or symptom when the stools became positive. Each injection gave a typical white bleb.

2nd Day. There was a red swelling at the 3rd area $\frac{3}{4}$ " in diameter, gradually merging into normal colour at the margins. The colour was lost on pressure. The other areas were smaller and colour not so dark.

3rd Day. There was a purple, swollen, indurated area at the 3rd mark which was lost on pressure. The other areas were faint brownish in colour and soft but not indurated.

4th Day. The 3rd mark remained unchanged while the other 3 marks were lost completely.

5th Day. The 3rd mark was losing its colour and was brownish. There was no swelling and only a slight induration.

(3) 0.06cc of each vaccine and saline were injected on the 58th day after admission when a typical positive reaction was got at the 3rd mark which was best seen on the 4th day and had faded by the 6th day leaving some induration.

(4) The test was repeated on the 72nd day using 0.06cc. A typical purple reaction was obtained with swelling, and induration at the 3rd site which was lost on the 5th day.

(5) 0.1cc of each vaccine and saline were given on the 86th day after admission. The patient had a very dark and coarse skin. Each bleb was typical and no Haemorrhage was observed at the time of injection.

2nd Day. There was an extensive inflamed area at each mark, 1" in diameter. Each mark was separate from the others. The colour at the 3rd was more extensive than the others and also slightly darker. On pressure the colour was not entirely lost at either the 1st or 3rd marks. There was considerable swelling and tenderness at each mark.

3rd Day. There was a white area at the 1st mark, soft and not tender, with a pink areola which was lost on pressure. There was also a white area at the 3rd mark which had a bright red margin and a purple areola 1/3" in breadth. This areola was lost on pressure also. The other areas were soft and brownish-pink in colour.

4th Day. There was no areola round the 1st area whereas the purple areola at the 3rd mark remained. The 3rd area was indurated while the 1st was soft. The other areas were lost.

5th Day. The reactions were unchanged.

6th Day. The areola was fading at the 3rd but induration was well marked. The 1st mark was lost.

7th Day. All colour was gone and there was only a slight induration at the 3rd area.

(6) 0.04cc was injected on the 95th day. At each area there was a typical bleb. Practically no reaction developed at the 1st, 2nd, and 4th marks. But a typical purple, swollen area of induration developed on the 3rd day at the 3rd site of injection. The colour was lost on pressure and this

persisted till the 5th day when it disappeared leaving a slight induration.

(7) The test was repeated on the 102nd day using 0.04cc of each vaccine and a typical positive reaction was obtained on the 3rd to 5th days.

(8) 0.04cc was injected on the 124th day. The stools had been persistently positive up to the 124th day. The urine was usually clear although skin infection occurred in a few cases. Kaolin had been given in large doses to absorb toxins from the alimentary tract for 10 days before this test was given.

2nd Day. There was a $\frac{1}{2}$ " area at each injection, pinkish in colour, and slightly oedematous. The colour was best at the 3rd mark. The others were similar but smaller and weaker.

3rd Day. There was a slightly purplish tint with induration but no oedema or swelling at the 3rd area. The other areas were a faint brown colour and not indurated.

4th Day. There was still a faint purple colour at the 3rd area which was indurated. The other areas were quite lost.

5th Day. The colour was completely gone and induration very slight. This reaction was only suspicious. The colouring throughout was very weak compared with normal. During this test the stools were just as abundantly infected with Paratyphosus B as ever.

Case IV. J.H. 29 yrs.

Patient was admitted on the 5th day of illness. He had been diagnosed pneumonia. The condition began with headache, sickness, and vomiting with pain on the left side of the abdomen. He was well nourished. His spleen was just palpable. His urine and heart were normal. There was a well marked left sided bronchopneumonia. He had a history of suffering from enteric fever while with his ship (he was a sailor) in America 8 months prior to admission. After he was dismissed, several of his mates on board ship developed enteric fever, one was in the ward under my care two months previously. J.H.'s blood was strongly positive when tested for typhoid agglutination. His stools contained B. Typhosus.

(1)

He was injected with typhoid, Paratyphoid A, and Paratyphoid B, vaccines and saline, of each 0.06cc, on the 11th day of his illness and each injection gave rise to a typical bleb.

2nd Day. There was a $\frac{1}{2}$ " pink area at each mark. All were alike oedematous, swollen, and lost on pressure. They were tender.

3rd Day. The reaction was better marked at the 1st than at the other areas. The colour at the 1st mark was deep red which disappeared on pressure. There was swelling and slight induration. The other areas were brownish, and not swollen or indurated.

4th Day. There was a purple swollen area at the 1st mark with some induration. The colour was lost on pressure. The other marks had disappeared.

5th Day. The colour had begun to fade and was brownish white. The induration was well marked.

6th Day. Only induration remained.

(2)

The 4 injections were repeated in 0.04cc doses on the 27th day of illness. The chest condition had been normal for 8 days but the stools were still typical of enteric carriers. Each bleb was typical.

2nd Day. There was a slight pink colour at each site, $\frac{1}{2}$ " in area. At the 1st area the colour was slightly deeper. All the areas were swollen and the colour was lost on pressure. There was a slightly increased swelling at the 2nd mark but the colour was pink and removed on pressure.

3rd Day. There was a well marked purple, indurated swelling at the 1st mark but the other areas had a faint brown colour and was not indurated.

4th Day. The 1st mark was unchanged but the others were quite lost.

5th Day. Only induration remained at the 1st mark.

(3)

The 4 injections were given on the 54th day of illness in 0.04cc doses. The stools had meantime been examined for B Typhosus on 3 occasions - each time with negative result.

2nd Day. There was a pink area at each site of injection. Each area was oedematous and tender. All areas were alike in area and colour and were lost on pressure.

3rd Day. All the areas faded uniformly. There was a brownish colour at each. None was indurated or swollen.

4th Day. The colour was gone from all areas except the 1st where a faint brownish discolouration persisted. There was no induration.

5th Day. The arm was normal.

The stools were further examined but no more living typhoid organisms were found and the patient was dismissed, well.

Case V

S.S. age 10½ yrs.

This patient was admitted to hospital as a case of Cerebro-Spinal fever. She had had a headache of 7 days duration of which 4 days were spent in bed. There was also pain in the back and along the neck. There was a noisy and restless delirium. Kernig's sign was present but there was not any other evidence of meningeal mischief. The bowels were loose and the stools yellow. There was a haze of albumin in the urine. There were some rales in the chest. On the 8th day her abdomen was boggy, her tongue was becoming dry and fissured. The blood was tested and a Widal test was found to be markedly positive. The stools were found to contain B Typhosus.

(1) Typhoid, Paratyphoid A and Paratyphoid B vaccines, and saline were injected in 0.08cc doses on the 24th day of illness. The patient's temperature had fallen to 99°F. The stools were formed and when examined on one occasion for B Typhosus were found to be negative. Typical blebs were got at the 1st, 2nd, and 4th areas. But a slight haemorrhage was got at the 3rd site of injection.

2nd Day. There was a large inflamed area, 4" by 2", over the front of the forearm. The colour was pink except at the sites of injection where it was red. The colour was lost on pressure except the 3rd. All areas were alike in colour.

3rd Day. Each mark was separate. The 2nd and 4th were pale-pink, soft, and not swollen or indurated. There was a whitish bleb at the 1st and 3rd. The 1st had a thin red line round its margin and then a dull red areola - lost on pressure. The 3rd had a bluish purple areola which

was very narrow and was not affected by pressure and then an outer and broader pink areola which disappeared on pressure.

4th Day. There was a purple areola round the 1st white area. There was here some swelling and induration. There was no pink areola round the 3rd and the purple areola was now soft and brownish-yellow. The other marks had faded. The 1st mark was lost on pressure while the 3rd was not modified.

5th Day. The purple areola persisted round the 1st mark. Induration was well marked. There was no areola and no induration at the 3rd mark.

6th Day. The colour had gone from the typhoid site, leaving a brownish discolouration and induration. There was no evidence of the other marks.

7th Day. There was induration but no colour.

(2) 0.06cc of each vaccine and of saline were injected on the 34th day of illness. The patient was much improved. The temperature was normal for 10 days and the stools had been normal since the 26th day of illness. The Widal test was not so strongly agglutinating. All the marks gave a typical white, rounded bleb.

2nd Day. There was a general pink oedematous area - 3" x 1½", with deeper coloured areas at the sites of injection. All were lost on pressure and all were alike in colour.

3rd Day. The 1st area was purple in colour which was lost on pressure. There was slight induration. The other areas were lost.

4th Day. The 1st area was unchanged and there was no trace of the other marks.

5th Day. The colour was purplish-brown in colour but induration was well marked.

6th Day. Only induration remained at the 1st area. A relapse occurred 12 days after this series of observation was made.

(3) 0.06cc of each vaccine and of saline were injected on the 44th day of illness (i.e. 1st day of relapse). Each injection gave a typical white rounded bleb.

2nd Day. There was a general pink, oedematous reaction over the forearm involving all the sites of injection. The colour was darker at the sites of injection and was lost on pressure. The area was swollen and tender.

3rd Day. There was a slight pink colour without swelling, about $\frac{1}{2}$ " in diameter at all areas except the 1st where the area involved was 1" in diameter and a yellowish white bleb with a deep red areola round it was found. The "bleb" was limited by a thin red line. The area was swollen, hard, tender, and lost on pressure except for the thin red line.

4th Day. There was a purple areola round a purplish-white bleb at the 1st. The induration and swelling was marked. The other areas were faint brown in colour but not swollen or indurated.

5th Day. The 1st area was not changed from the previous day while the other areas were lost.

6th Day. The colour was brownish-purple at the 1st area. Induration was well marked.

7th Day. Only induration was found. The patient recovered from this relapse and the stools appeared to be negative. The blood was strongly positive.

- (4) The 4 injections were repeated on the 10th day during convalescence from the relapse. The result was a positive reaction similar to the 2nd test described above.

8 days after this 4th test the patient had a second relapse during which all the symptoms of Enteric Fever returned and the patient was for several days in a critical condition. The stools were swarming with B Typhosus.

- (5) 0.04cc of each vaccine and of saline were injected 10 days after recovery from the 2nd relapse - 78th day of illness. Each bleb was perfectly typical.

2nd Day. There was a general reaction - a pink and oedematous area measuring 3" x $1\frac{1}{2}$ " which was tender. The colour was lost on pressure. There was a darker area at each injection.

3rd Day. All the areas were fading uniformly and were brownish-pink, not swollen or indurated.

4th Day. There was a brownish discolouration at each area which was slightly more marked at the 1st than at the others. There was a slight suggestion of induration.

5th Day. Arm was normal.

- (6) 0.04cc of each vaccine and saline were injected 110 days after the onset. (i.e. 6 weeks after the last relapse). The stools had been persistently negative for B. Typhosus. The urine was also negative.

There was a typical white round bleb at each injection.

2nd Day. There were 4 uniform pink, oedematous macules. All were lost on pressure.

3rd Day. There was a very faint brownish discolouration at the 1st site but no induration or swelling. There was no evidence of the other sites.

4th Day. Arm was normal in all respects.

The patient was dismissed well 10 weeks after the last relapse - all stool tests were negative.

Cases which were inoculated within the last
5 years or had suffered from enteric fever.

Case I

W.A. 37 years.

This patient claimed to have been inoculated 7 times while in the army. The last occasion was 4 years ago. He was suffering from diphtheria. His blood was slightly positive for Widal's test. His stools were normal. Each bleb was typical in colour and form - 0.04cc injected.

2nd Day. There was a pink oedematous area $\frac{3}{4}$ " in diameter at each bleb, which was slightly deeper in colour at the centre of the macule. The part was tender and slightly swollen. The colour was lost on pressure. All areas were alike.

3rd Day. There was a brownish-pink area $\frac{1}{2}$ " in diameter at each mark. All were alike in colour and extent. There was no swelling or induration.

4th Day. There was brownish discolouration at each area but no induration. All areas were exactly alike.

5th Day. There was no swelling, induration or discolouration at any of the injected areas.

Case II.

D.S. 27 years.

This patient was inoculated 8 times while in the army - the last occasion was in Germany 18 months ago. His blood was weakly positive to Widal's test. His stools were negative. Each bleb was typical when 0.04cc of each vaccine and saline were injected.

2nd Day. There was a pink swollen oedematous area at each mark, $\frac{3}{4}$ " in diameter. The colour was red at the centre and gradually faded to normal at the edges. Each area was soft and tender, and the colour was lost on pressure. All areas were alike.

3rd Day. There was a brownish-red, slightly swollen area at each mark, soft and not indurated. All areas were alike.

4th Day. There was no trace of reaction.

Case III. W. M'K. 24 yrs.

Inoculated while in the army 4 yrs. ago. Blood weakly positive for Widal's test. Stools persistently negative. 0.06cc of each vaccine and of saline were injected intradermally. Each mark was typically white.

2nd Day. There was a pink, oedematous area, slightly tender, $\frac{3}{4}$ " in diameter. The colour was entirely lost on pressure. All areas were alike.

3rd Day. There were pinkish-brown areas, soft and not swollen or indurated. All the areas were alike in size and colour.

4th Day. There were brownish areas $\frac{1}{8}$ " in diameter, soft and not indurated. All the areas were similar.

5th Day. The arm was perfectly normal.

Case IV. J.K. 33 yrs.

Patient was inoculated 5 times while in the army—4 yrs before admission. His blood was faintly positive to Widal's test. His stools were negative. He was sent into hospital suffering from Diphtheria. 0.04cc of each of the vaccines - Typhoid, Paratyphosus A, and Paratyphosus B, and of saline were injected intradermally.

2nd Day. There was a pink oedematous, tender area, $\frac{3}{4}$ " in diameter. The colour was lost on pressure. All the areas were alike.

3rd Day. There was a faint brownish discolouration at each area but no swelling or induration. All the areas were alike in size and shape.

4th Day. The arm was normal.

Case V. G.E. 23 yrs.

This patient was inoculated 3 years before, while in the army.

His blood was very faintly positive to Widal's test. His stools were normal. He suffered from diphtheria and erysipelas when the test was done. 0.06cc of each vaccine and of saline were injected intradermally.

2nd Day. There was an extensive pink, oedematous area, (4" x 3") on the volar aspect of the arm. This area was tender and swollen. The colour was deeper at the sites of injection than at the margins. The colour was lost on pressure. All the areas were alike in colour.

3rd Day. There was a brownish-red area, $\frac{1}{2}$ " in diameter at each site. There was no swelling or induration. All the areas were alike. They became brown on pressure.

4th Day. There was a faint brown discoloured area at each mark but no swelling or induration.

5th Day. The arm was normal.

Case VI. M.E. 8 yrs.

This patient was admitted to hospital as an "enteric carrier". She had suffered from enteric fever 5 years previously. A Widal test was done and the blood was weakly positive. There was no sign of disease. An ear discharge developed but was a staphylococcal infection. 0.06cc of Typhoid, Paratyphoid A, and Paratyphoid B, vaccines, and saline were injected and gave rise to a typical white bleb at each injection.

2nd Day. There was a swollen, red, oedematous papule at each site with a pink areola - the total diameter of which was 1". All areas were alike in size and colour. The colour was lost on pressure and was deeper at the centre of the papule.

3rd Day. The papules had a brownish-pink tint and were soft and not indurated. The 1st area was slightly more extensive than the others.

4th Day. The arm was normal.

Specimens of urine and faeces were examined 10 times at intervals of 5 days but the result was invariably negative.

Case VII. Mrs.W. 29 yrs.

This patient was admitted as a case of puerperal fever. She had enteric fever 9 years previously. Her blood did not agglutinate B Typhosi in dilutions.

exceeding 120. Her stools were perfectly normal - no organisms of the typhoid group being found. 0.04cc of each of the vaccines and of saline were injected and gave rise in each to a typical white bleb.

2nd Day. There was a $\frac{1}{2}$ " area of pinkish colour at each site of injection. There was a slight oedema but no induration. All the areas were alike. The colour was lost on pressure.

3rd Day. There was a faint brownish colour at each area. This was soft and not indurated.

4th Day. All trace of reaction had gone.

Case VIII.

J.S. 26 yrs.

This patient was inoculated 1 year ago, when joining the mercantile marine. His Widal test was weakly positive. His stools were persistently negative for B. Typhosus.

- (1) 0.06cc of each vaccine and of saline were injected intradermally and gave rise to a typical white bleb at each injection site.

2nd Day. There was a pink area at each site but no swelling or induration. The colour was lost on pressure. Each area was $\frac{3}{4}$ " in diameter. All were alike in area and colour.

3rd Day. There was a brownish discolouration at each area slightly more marked at the 1st, but there was no induration.

4th Day. All trace of the injections were quite gone.

- (2) 0.1cc of each vaccine and of saline were given 10 days after the 1st test. Large white blebs, $\frac{1}{2}$ " in diameter, were formed but there was no apparent haemorrhage.

2nd Day. There was a white bleb at the 1st and 2nd areas with a faint pink areola around. There was a pink macule at the others. Swelling was not marked. The colour was lost on pressure.

3rd Day. The white was still prominent at the 1st and 2nd areas and the pink areola persisted. There was a slight degree of induration at each. The colour became slightly brownish on pressure being applied. The other marks were brownish and soft but not indurated.

4th Day. There was a brownish-pink areola round the 1st and 2nd "white" areas but induration was absent. The other areas were slightly brown but also soft and not indurated.

5th Day. Only whitish areas remained. These were soft and not indurated.

6th Day. The arm was normal.

Case IX.

A. M'L. 22 yrs.

This patient was inoculated twice - second time 3 years ago. His Widal reaction was weakly positive. Stools were negative. 0.04cc were injected of each vaccine and of saline. Each bleb was typical.

2nd Day. There was a pink oedematous area (3" x 2"), soft and tender with deeper red marks at each site of injection. The colour was lost on pressure. All the marks were alike in colour.

3rd Day. There was a brownish area - $\frac{1}{2}$ " in diameter-at each mark. There was no swelling or induration. All the areas were alike.

4th Day. The arm was perfectly normal.

Case X.

A.C. 19 yrs.

This patient had been inoculated a year before admission. He was suffering from measles. A Widal test was done with his blood and the result was positive. His stools were persistently negative.

(1) 0.08cc were injected of each vaccine and of saline. On injection some "shooting" was noted at the 1st mark and here there was some slight haemorrhage. The other areas had typical white blebs.

2nd Day. There was a whitish bleb with a pink areola at the 1st area. The other areas were typically pink in colour. The pink was lost on pressure.

3rd Day. There was a purplish-white area without any areola at the 1st mark. There was no swelling and only a slight induration. The other areas were of a brown colour, not swollen or indurated.

4th Day. There was a yellowish soft area without swelling or induration at the 1st mark. The other marks were lost.

(2) 0.04cc were injected of each vaccine and of saline a few days later. Each area had a typical white rounded bleb.

2nd Day. There was a pink, swollen oedematous area at each site of injection. All the areas were about $\frac{3}{4}$ " in diameter. They were all alike in colour. The colour was lost on pressure.

3rd Day. The colour was brownish at each area. There was no swelling or induration. All were alike.

4th Day. The arm was normal.

Case XI. M.L. 28 yrs.

This patient was inoculated 5 times while on military service. His blood was positive for Widal's test. His stools were normal. 0.04cc of Typhoid, Paratyphoid A, and Paratyphoid B, and of saline were injected, and caused in each case a typical white bleb.

2nd Day. There was a large oedematous area 4" by 3" on the volar aspect of the arm. The area was pink with red papules at the sites of injection. The area was tender. The colour was lost on pressure. All the areas were alike.

3rd Day. There was a pinkish-brown mark at each injection but no swelling or induration. All the areas were alike,

4th Day. There was no trace of any of the injections.

Case XII. N. M'C. 30 yrs.

This patient was inoculated 5 years ago while in the army. His blood was positive for Widal's test. His stools were negative. Typhoid, Paratyphoid A, and Paratyphoid B vaccines and saline were injected in 0.06cc doses and gave rise to typical white blebs.

2nd Day. There was a slight pink oedematous area round the site of injection. The colour was slightly darker at the centre. Each was tender and slightly swollen and the colour was lost on pressure.

3rd Day. The colour was now brownish. There was no swelling or induration. All the areas were alike in colour and extent.

4th Day. The arm was perfectly normal in colour and not indurated.

Case XIII. J.A. 35 yrs.

This patient had been inoculated every second year for 12 years. Her blood was positive for B. Typhosus agglutination. Her stools were negative.

0.06cc of Typhosus, Paratyphosus A, and Paratyphosus B, vaccines and saline were injected and in each case gave a typical white bleb.

2nd Day. There was a pink, oedematous area (4" by 2") at the site of each injection the colour was deeper. The colour was lost under pressure. There was slight swelling and tenderness. All the areas were alike.

3rd Day. There was a pink, soft area at each mark - $\frac{1}{2}$ " in diameter. There was no swelling or induration. All were alike.

4th Day. There was a brownish, soft, non-indurated area at each mark.

5th Day. The arm was normal.

Case XIV. J.B. 34 yrs.

This patient was inoculated while in the army - the last inoculation being 4 years ago. His blood was not able to agglutinate B Typhosus to any extent. His stools were negative.

0.04cc of each vaccine and saline were injected and in each case a typical, white rounded bleb was formed.

2nd Day. There was a red papule with a pink areola at each injection. The marks were soft and tender and the colour was lost on pressure. All the areas were alike.

3rd Day. The colour was now brownish-pink in colour. Each was soft and not indurated. All areas were alike.

4th Day. The arm was normal.

Case XV. W. McL. 26 yrs.

This patient was inoculated several times - the last occasion being 2 years ago. Widal test was very weakly positive. The stools were negative for any of the enteric group of organisms.

0.04cc of each vaccine and saline were injected and caused a typical white bleb.

2nd Day. There was a bright pink area at each injection - about $\frac{3}{4}$ " in diameter. The area tended to be white at the centre of the 1st mark. The colour was lost on pressure. Each area was soft and swollen.

3rd Day. There was a purplish-brown colour round the white bleb at the 1st area. The area was soft and not swollen. The colour was ^{not} lost on pressure. The other areas had gone.

4th Day. There was still a purplish areola round the white central area at the 1st mark. There was a slight induration. The colour was ^{not} lost under pressure. The other areas were lost.

5th Day. There was fading of the ~~purple~~ colour which was now brownish. Induration was slightly ~~better~~ marked.

6th Day. There was no trace of any reaction - no colour or induration.

Case XVI. W.W. 34 yrs.

This patient was inoculated while in the army. The last inoculation was 4 years before admission. His Widal reaction was negative. His stools were free of B. Typhosus.

0.04cc of each vaccine and of saline were injected and each bleb was typical.

2nd Day. There was a pinkish-brown colour at each mark - $\frac{1}{2}$ " in diameter. Each was lost on pressure. All were alike. There was round each a general, diffuse pinkish area, 3" x 2". The part was swollen and tender.

3rd Day. There was no discolouration or induration at any of the marks.

Case XVII. G.M. 27 yrs.

Patient was inoculated 2 years ago. A Widal test was done with his blood and was weakly positive. His stools were examined but no B. Typhosi were found.

0.04cc of each vaccine and saline were injected and typical white blebs were formed.

2nd Day. There was a pinkish area $\frac{3}{4}$ " in diameter tending to be redder at the centre of each injection. The area was slightly swollen and tender. It was brownish-pink at the extreme edges. The areas were lost on pressure. All the areas were alike.

3rd Day. There was a brownish-red papule $1/3$ " in diameter at each mark. It did not entirely disappear on pressure. It was slightly hard. When pressed on, it became brown in colour. There was slight induration.

4th Day. There was a brown area at each mark which was soft and not swollen or indurated. The 1st area was deepest and most extensive.

5th Day. The arm was normal.

Case XVIII. J.M. 37 yrs.

This patient was inoculated at frequent intervals during military service. The last inoculation was 4 years ago. His blood was slightly positive when tested by Widal's method. The stools were negative for B. Typhosus.

0.04cc of Typhoid, Paratyphoid A and Paratyphoid B vaccines and saline were injected and each caused a typical white bleb.

2nd Day. There was an extensive pink, oedematous area on the forearm (4" by 2") which was tender and slightly swollen. The colour was deeper at the actual site of injection and was lost on pressure.

3rd Day. There was a brownish area at each site of injection but no swelling or induration.

4th Day. The arm was normal.

Case XIX. A. McP. 30 yrs.

This patient was inoculated while in the army - last inoculation was 4 years ago. He had a slightly positive Widal and his stools were negative.

0.04cc of each vaccine and of saline were injected. In each case there was a typical white bleb.

2nd Day. There was a pink soft area, $\frac{1}{2}$ " in diameter, at each injection. There was no oedema or swelling and the colour disappeared under pressure. All the areas were alike.

3rd Day. There was a reddish-brown soft area at each injection. There was no swelling or induration. All the areas were alike.

4th Day. The arm was normal.

Case XX. P.G. 23 yrs.

This patient was inoculated 1 year ago. His Widal test was slightly positive. His stools were

negative for B. Typhosus.

0.04cc of each vaccine and of saline were injected and a typical white bleb resulted at each area.

2nd Day. There were 4 pinkish, oedematous areas - $\frac{1}{2}$ " in diameter. There was no swelling. The colour disappeared on pressure.

3rd Day. There was a soft, pinkish-brown, non-indurated area at the marks. All the areas were alike except the 1st which was most extensive.

4th Day. The arm was normal.

Case XXI. W.W. 24 yrs.

This patient was inoculated 4 years ago. His blood was positive to Widal's test. His stools were negative.

0.04cc of each vaccine and of saline were injected and typical blebs were formed.

2nd Day. There was a $\frac{1}{2}$ " brownish-red area at each site. These were soft, but not swollen or indurated. They were slightly tender and were all alike in size and colour. The colour was mostly lost on pressure.

3rd Day. There was a brownish colour at each area. The areas were soft and not swollen or indurated. All were alike.

4th Day. The arm was now normal.

Control Cases.

These cases were taken from patients in wards other than the enteric fever wards. For brevity "T.A.B.&S" has been used to denote that a certain dose of Typhoid Vaccine, and Paratyphoid A vaccine and Paratyphoid B vaccine and saline were injected in order.

(1) W.G. 6 yrs. Certified Scarlet Fever.

The rash was visible 2 days before the test. T.A.B.&S-0.06cc was injected intradermally. Each injection caused a typical white rounded bleb.

2nd Day. There was a pinkish area at each mark slightly darker at the 1st than at the others. All the marks were masked by the rash. There was slight swelling and oedema. The marks were lost on pressure. All the marks were alike.

3rd Day. There was a brownish colour at each area which was soft and not swollen or indurated.

4th Day. The arm was normal.

- (2) J.W. 12 yrs. Certified Scarlet Fever.

The rash was very bright when the test was done. T.A.B.&.S-0.06cc-were injected intradermally. Each injection gave a typical white bleb.

2nd Day. The rash masked all evidence of a reaction.

3rd Day. There was a white area at the 1st mark with a pinkish - brown areola gradually merging into normal at the edges. The mark was soft and not swollen. The colour was lost on pressure. The other marks were pinkish-brown and not swollen or indurated.

4th Day. There was a white area at the 1st injection but no areola, swelling, or induration. The other marks had disappeared.

5th Day. The arm was normal.

- (3) E.C. 3 yrs. Scarlet Fever.

The rash was visible the day before the test was done. T.A.B.&.S-0.04cc-were injected intradermally and typical white blebs were got at each injection.

2nd Day. The rash was beginning to fade and $\frac{1}{2}$ " areas of pink colour, swollen, and oedematous, but not lost on pressure, were visible. These were all alike in colour and size.

3rd Day. There was a pinkish-brown macule at each area not hard, swollen, or indurated, and all alike.

4th Day. There was a faint brownish discolouration, but no swelling or induration at each mark.

5th Day. The arm was normal.

- (4) M. McM. 9 yrs. Scarlet Fever.

The rash appeared on the day before the test was done. T.A.B.&.S.-0.04cc-was injected and typical white blebs formed.

2nd Day. The area of reaction could not be distinguished from the rash at any point. Both were lost on pressure.

3rd Day. The rash had faded and pinkish-brown areas could be distinguished. These were not swollen or indurated.

All the areas were alike in size and colour.

4th Day. The arm was normal.

(5) A.J. 8 yrs. Scarlet Fever.

The rash appeared on the same day as the test was done. T.A.B.&.S.-0.06cc-were injected and typical white blebs were formed.

2nd Day. There was no evidence of the reaction. The injections were entirely masked by the bright scarlet rash.

3rd Day. There was a pinkish-brown area at each site which was visible through the red rash at the region of the 1st mark but there was no evidence of the other marks. There was no swelling or induration.

4th Day. All trace of the injections had gone.

(6) The rash had faded before the test was done. T.A.B.&.S.-0.04cc-were injected intradermally. Each injection gave a typical bleb.

2nd Day. There was a pink oedematous macule, $\frac{1}{2}$ " in diameter, at each area. There was slight tenderness and swelling. The colour was lost on pressure. All the areas were alike.

3rd Day. Only a slight brownish discolouration remained. There was no swelling or induration. All the areas were alike.

4th Day. There was no trace of a reaction.

(7) E.S. 6 yrs. Scarlet Fever.

The rash appeared two days before the test was done. T.A.B.&.S - 0.06cc-were injected and caused typical white blebs.

2nd Day. There was a crimson, oedematous macule at the 1st, 2nd & 3rd areas with a pink areola merging gradually into normal. The colour was lost on pressure. There was no swelling. The 4th mark was brownish and very weak.

3rd Day. There was a brownish discolouration at each area which was slightly more marked at the 1st than at the others. There was no swelling or induration.

4th Day. The brownish discolouration still persisted.

5th Day. The arm was normal - no discolouration or induration.

(8) E.J. 7 yrs. Scarlet Fever.

The rash was fading when the test was done. T.A.B.&.S-0.04cc-were injected and at each injection there was a typical white bleb.

2nd Day. There was a pink area at each injection about $\frac{1}{2}$ " in diameter. The colour was slightly darker in the centre of each mark. There was a slight swelling and the colour was lost under pressure. All the areas were alike.

3rd Day. There was a brownish staining at each mark which was more extensive at the 1st than at the others. There was no swelling or induration at any of the areas.

4th Day. There was no trace of any of the reaction.

(9) A.W. 13 yrs. Scarlet Fever.

The rash was very bright when the test was done. T.A.B.&.S - 0.04cc-were injected and typical white blebs resulted.

2nd Day. The rash was fading and typical pink, oedematous areas, about $\frac{1}{2}$ " in diameter, appeared at each mark. The colour was lost on pressure. There was slight swelling. All the areas were alike.

3rd Day. There was a faint brownish staining at each area but no induration or swelling. All the areas were alike.

4th Day. All trace of the reaction had gone.

(10) G.C. 8 yrs. Scarlet Fever.

The rash was bright when the test was done. T.A.B.&.S - 0.04cc-were injected and each injection caused a typical white bleb to be formed.

2nd Day. There was a pink area at each site of injection which could be seen through the now fading scarlet rash. There was no swelling or induration. The colour was lost under pressure.

3rd Day. There was a brownish discolouration at each area, but no induration. All the areas were alike.

4th Day. The arm was normal.

(11) M.S. 10 yrs. Scarlet Fever.

The rash had disappeared before the test was done. T.A.B.&.S - 0.04cc-were injected. Each bleb was typical.

2nd Day. There was a pink, oedematous area $\frac{1}{2}$ " in diameter at each mark. There was slight swelling and no induration. All the areas were alike in colour and extent. The colour was lost on pressure.

3rd Day. There was brownish discolouration at each area but no swelling or induration. All the marks were alike.

4th Day. There was a faint discolouration at each mark but no induration.

5th Day. The arm was normal.

(12) A.B. 19 yrs. Measles.

The rash was fading when the injections were given T.A.B.&.S - 0.06cc-were given and typical blebs were found.

2nd Day. There was a pink colour at each mark, $\frac{1}{2}$ " in diameter. There was a slight degree of swelling and no induration. The colour was lost under pressure. All the areas were alike.

3rd Day. There was a pinkish-brown area at each mark but no swelling or induration. All the areas were alike in colour and size.

4th Day. No trace of the reactions could be found.

(13) M.T. 3 yrs. Measles.

The rash was bright when the test was done. T.A.B.&.S - 0.04cc-were injected and typical blebs were formed.

2nd Day. The rash was still bright but the pinkish area could be seen through the rash. The macules were darker in colour. There was tenderness and slight oedema.

3rd Day. There was a brownish area at each mark which was confused with the fading measles rash. There was no swelling or induration and all the areas were alike.

4th Day. The injections could not be traced.

(14) L.R. 6 yrs. Measles.

There were bright blotchey areas on various parts of the arm and trunk when the test was done but the forearm was comparatively free. T.A.B.&.S - 0.04cc-were injected and each bleb was typical.

2nd Day. There was a pink, oedematous area at each mark. There was tenderness and swelling but the colour was lost

under pressure. All the areas were alike in size and colour.

3rd Day. There was a dull brownish area at each mark but no swelling or induration and all the areas were alike.

4th Day. There was no trace of any of the marks.

(15) D.B. 3 yrs. measles.

The rash was fading when the injections were given. The T.A.B.&.S - 0.04cc-were injected. There was some haemorrhage at both the 1st and 2nd marks owing to the child struggling.

2nd Day. There was some purplish discolouration where the haemorrhage occurred. There was a pink areola. This areola was lost on pressure but the haemorrhagic area at both the 1st and 2nd areas was unchanged by pressure. The other areas were pink and oedematous and were lost on pressure.

3rd Day. There were brownish-pink marks at the 3rd and 4th areas and deep brownish-purple marks at the 1st and 2nd areas. There was no areola at the 1st or 2nd.

4th Day. There was a yellow area at the 1st and 2nd injections which was soft and not modified by pressure. The other areas were normal.

(16) J.C. 1½ yrs. Measles.

There was a bright measly rash over the entire body when the test was done. T.A.B.&.S - 0.04cc-were injected intradermally and typical blebs were got at each area.

2nd Day. There was a bright pink oedematous area at each site. Swelling and tenderness occurred. The colour was lost on pressure. All the areas were alike in colour and size.

3rd Day. The colour was brownish-pink. There was no swelling or induration.

4th Day. The arm was normal.

(17) J.B. 5 yrs. Measles.

The rash was fading when the test was done. T.A.B.&.S - 0.04cc-were injected and typical white blebs resulted.

2nd Day. There was a pink area at each site, slightly raised and oedematous. The colour was deeper at the

centre of the macule. The colour was lost on pressure. All the areas were alike.

3rd Day. There was a pinkish-brown area at each injection not swollen or indurated and all were alike.

4th Day. All trace of the marks had gone.

(18) C.B. 4 yrs. Measles.

The rash was just out and was very bright T.A.B.&.S 0.04cc-were injected. Each bleb was white and typical.

2nd Day. There was a pink area about $\frac{3}{4}$ " in diameter which could be traced through the darker measles macules. The areas were tender but not noticeably swollen. All were alike. The colour disappeared under pressure.

3rd Day. The areas were now brownish and confused with the fading measles rash. There was no swelling or induration.

4th Day. All the areas had been lost.

(19) E.R. 4 yrs. Measles.

There was a bright measles rash on the day of the test, T.A.B.&.S -0.04cc-were injected. Each bleb was typical.

2nd Day. There were bright areas not so dark as the measles blotches on the trunk. The areas of injection were deeper in colour at the centre and gradually merged into normal in contrast to the sharply defined measles macules. The colour was lost on pressure. The areas were tender.

3rd Day. The colour was brownish but not indurated or swollen. All the areas were alike.

4th Day. The arm was normal.

(20) K.R. 2 yrs. Measles & Pneumonia.

The test was done 4 weeks after the rash while the pneumonia was well marked. T.A.B.&.S -0.04cc-were injected and each bleb typical, except the 1st where there was a slight haemorrhage.

2nd Day. There was a slight purplish discolouration at the 1st site which was not modified by pressure and was slightly indurated. There was a pink areola which was lost on pressure. The other areas were pink and

oedematous and lost under pressure.

3rd Day. The purple area was brownish without swelling or induration. There was no areola. The other areas were lost. The child died on the 4th day.

(21) H. McG. 1 yr. Measles, Pneumonia & Enteritis.

T.A.B.&.S - 0.04cc-were injected and each bleb was typical except the 3rd which had a slight haemorrhage.

2nd Day. There was a purplish-white area at the 3rd injection with a pink areola around it. The colour of the blebs was not lost on pressure but that of the areola was. The other reactions were faint pink. There was no swelling or induration and the colour was lost on pressure.

3rd Day. There was a white area with a thin brown margin at the 3rd injection. There was slight induration. The other marks were lost.

4th Day. The arm was normal.

(22) J.T. 1 yr. Measles & Enteritis.

T.A.B.&.S - 0.04cc-were injected and typical blebs resulted.

2nd Day. There was a faint pink colour at each area. The colour was lost on pressure. There was no swelling or induration.

3rd Day. There was no trace of any reaction.

The child died on the 4th day.

(23) W. McK. 34 yrs. Pneumonia & Empyema.

T.A.B.&.S - 0.04cc-were injected. Each bleb was typical.

2nd Day. There was a pinkish-brown, oedematous area at each injection. There was tenderness and slight swelling. The colour was lost on pressure. All the areas were alike.

3rd Day. There was a brownish discolouration at each mark. There was no swelling or induration. All the areas were alike.

4th Day. The arm was normal.

(24) Mrs. W. 29 yrs. Pneumonia.

T.A.B.&.S - 0.04cc-were injected. Each bleb was typical.

2nd Day. There was a faint pink, oedematous area $\frac{1}{3}$ " in diameter at each injection. There was tenderness and slight swelling. The colour was lost on pressure. All the areas were alike.

3rd Day. There was a pinkish-brown area but no swelling or induration at each injection. All the areas were alike.

4th Day. The arm was normal.

(25) T.R. 3 yrs. Measles & Pneumonia.

T.A.B.&.S - 0.04cc-were injected. The 2nd & 4th bleb was typical. There was "shooting" observed at the 1st and 3rd marks.

2nd Day. There was a pale area with a purplish areola at the 1st & 3rd marks. The child was very ill and cyanosed. The other areas were dark-red in colour and were lost on pressure.

3rd Day. There was a pale area with no areola at the 1st & 3rd marks. There was no swelling or induration. The 2nd & 4th marks were lost.

4th Day. Only a white spot remained at the 1st & 3rd injections.

5th Day. The arm was normal.

(26) J.R. 8 yrs. Measles & Pneumonia.

The rash was in its 2nd day when the test was done. T.A.B.&.S - 0.04cc-were injected. Each bleb was typical.

2nd Day. There was a pink oedematous area at each injection. The 1st area was the most extensive. Each area was $\frac{1}{2}$ " to $\frac{3}{4}$ " in diameter. There was swelling but the colour was lost on pressure.

3rd Day. There was brownish discolouration at each area, soft and not swollen or indurated. All the areas were alike.

4th Day. The arm was normal.

(27) M.P. 10 yrs. Measles & Broncho-pneumonia.

T.A.B.&.S 0.04cc were injected. Each bleb was typical.

2nd Day. There was a pink oedematous area at each injection. There was swelling and induration. The colour was lost on pressure. All the areas were alike.

3rd Day. The marks were brown and there was no swelling.

or induration. All the areas were alike.

4th Day. The arm was normal.

(28) M.L. 16 yrs. Broncho-pneumonia.

Patient was in her 6th day of illness. T.A.B.&.S-0.04cc-were injected. Each bleb was typical.

2nd Day. There was a pink area $1/3$ " in diameter at each site. Colour was uniform and was lost on pressure. There was no swelling or oedema.

3rd Day. Faint brownish areas, soft, and not swollen or indurated. All the areas were alike.

4th Day. The arm was normal.

(29) W.S. 28 yrs. Influenza & Broncho-pneumonia (7th day)

T.A.B.&.S - 0.06cc-were injected. Each gave a typical white bleb.

2nd Day. There was a pink, oedematous area about $1/2$ " in diameter at each mark. The marks were lost on pressure. All were alike.

3rd Day. A brownish area was got at each site of injection. There was no swelling or induration. All the areas were alike.

4th Day. The reactions were lost.

(30) C.W. 32 yrs. Influenza & Lobar Pneumonia (6th day)

T.A.B.&.S - 0.06cc-were injected. Each bleb was typical.

2nd Day. There was a slight pink, oedematous area at each injection about $1/2$ " in diameter. The colour was lost under pressure. All the areas were alike in colour and extent.

3rd Day. Brownish areas were got. They were not swollen or indurated. All were alike.

4th Day. The discolouration still existed.

5th Day. The arm was normal.

(31) J.J. 24 yrs. Lobar pneumonia (6th day)

T.A.B.&.S - 0.08cc-were injected. There was a slight haemorrhage at the 3rd bleb. The others were typical.

2nd Day. There was a pink area at each site of injection.

There was a purplish papule with a pink areola at the 3rd site of injection. This papule was not lost on pressure whereas the other marks did lose their colour.

3rd Day. There was a small whitish patch without any areola or induration at the 3rd area. The other marks were pinkish brown and not indurated.

4th Day. There was still a whitish patch at the 1st mark. The other areas were normal.

5th Day. The arm was normal.

(32) J.B. 18 yrs. Lobar Pneumonia (convalescent)

T.A.B.&.S - 0.04cc-were injected and typical blebs were formed.

2nd Day. There was a pinkish area at each injection about $\frac{1}{2}$ " in diameter, which were lost on pressure. Each mark was tender and not swollen. All were alike.

3rd Day. There was a brownish area at each mark but no swelling or induration.

4th Day. The arm was normal.

(33) J.B. 24 yrs. Lobar Pneumonia (convalescent)

T.A.B.&.S - 0.04cc-were injected. Each bleb was typical.

2nd Day. There was a pinkish-brown area, $\frac{1}{2}$ " in diameter at each site. There was no swelling or induration. The colour was brown on pressure. All the areas were alike.

3rd Day. There was a brownish area at each mark without either swelling or induration. All the areas were alike.

4th Day. There was no trace of a reaction.

(34) M.M. 11 yrs. Diphtheria & Chorea.

8000 units of antitoxic serum were given.
T.A.B.&.S - 0.04cc-were injected on the 3rd day of illness and gave rise to a typical white bleb at each injection.

2nd Day. There was a slight pink colour $\frac{1}{3}$ " in diameter at all the injections. Each mark was darker red at the centre. The 1st mark was darker than the others. There was a slight swelling. The colour was lost on pressure.

3rd Day. There was a brownish, soft, non-indurated area at each mark which was more prominent at the 1st than at the others.

4th Day. The arm was normal.

(35)

D.M. 9 yrs.

Diphtheria.

8000 units of antitoxic serum were given.
T.A.B.&.S - 0.04cc-were injected on the 3rd day of illness
and a well defined bleb was formed at each injection.

2nd Day. There was a large inflamed area 4" by $1\frac{1}{2}$ " including all the marks. There was whitish areas in this patch which represented the 1st & 3rd areas but these were quite soft. The colour was lost when pressure was applied.

3rd Day. There was a brown patch about $1\frac{1}{3}$ " in diameter at each injection. There was no swelling or induration. The white spots at 1st & 3rd marks were still evident with brownish areolae.

4th Day. The arm was normal.

(36)

J.J. $4\frac{1}{2}$ yrs.

Diphtheria.

This patient had large tonsils and cervical glands. There was membrane on each tonsil. 8000 units of antitoxic serum was given.

(a)

T.A.B.&.S - 0.06cc-were injected on the 4th day of illness and typical white blebs were formed. "Shooting" in radiating lines was noticed when the 1st vaccine was given. The other areas had normal blebs.

2nd Day. There was a pink area at each site of injection about $\frac{1}{2}$ " in diameter. There was no haemorrhagic or white area but the pink colour at the 1st mark was very extensive. During the following night the patient's temperature rose to 101°F but he was well next day. Nothing could be found to account for the pyrexia.

3rd Day. A purplish area was got at the 1st site of injection which was not lost under pressure. This was surrounded by a pink areola. The other areas were pinkish-brown. There was no swelling or induration at these latter. The pink colour disappeared on pressure.

4th Day. There was still some brownish discolouration at the 1st mark but there was no induration or swelling. There was no trace of the other marks.

5th Day. The arm was normal.

(b)

T.A.B.&.S - 0.04cc-were injected a few days later and typical white blebs got at each mark.

2nd Day. There was no rise of temperature. Locally there was a general pink, oedematous area, with deeper red areas at the sites of injection. The colour disappeared on pressure. There was swelling and tenderness. All the red areas were alike.

3rd Day. There was no general reaction. There were, locally, pinkish-brown, soft non-indurated areas.

4th Day. The arm was normal.

(37) A.D. 8½ yrs. Diphtheria.

There was membrane on either tonsil and on the soft palate. The cervical glands were enlarged. 12,000 units of serum were given. T.A.B.&.S - 0.04cc-were injected on the 6th day of illness. There was a slight degree of shooting at the 1st & 2nd marks. The others were typical.

2nd Day. There was a pink, oedematous area, $\frac{1}{2}$ " in diameter at each site. The colour was not entirely lost at the 1st & 2nd areas on pressure.

3rd Day. There was a pinkish-brown area at each mark. The brownish area was more extensive at the 1st & 2nd than at the others. At those two areas there was some induration.

4th Day. There was no evidence of the injections.

(38) W.W. 9 yrs. Diphtheria.

Serum was given in 2 doses- 8,000 and then 6,000 units. T.A.B.&.S - 0.04cc-were injected on the 2nd day of illness between the two doses of antitoxic serum. Each mark gave a typical bleb.

2nd Day. There were four pale pink areas - $\frac{1}{2}$ " in diameter. Each was tender and slightly oedematous. The colour was lost on pressure. All the areas were alike.

3rd Day. The areas were brown and soft and not swollen or indurated. All the areas were alike.

4th Day. The marks were completely gone.

(39) J.T. 16 yrs. Diphtheria.

10,000 units of antitoxic serum were given. T.A.B.&.S - 0.06cc-were injected on the 7th day of illness. The 1st injection "shot" when being given, and some blood escaped into the resulting bleb. The other areas were white and typical.

2nd Day. There was a pink oedematous area at each site of injection but in the centre of the 1st there was a purple area not affected by pressure and slightly indurated. The others lost their colour on pressure.

3rd Day. The 1st mark was purple and $\frac{1}{4}$ " in diameter. It had no areola. The other areas were brown, soft, and not indurated.

4th Day. There was a brownish area at the 1st mark which was soft and slightly indurated. The other areas were normal.

5th Day. The 1st area was brownish-yellow, soft, and not indurated.

6th Day. The arm was normal.

(40) J. McP. 11 yrs.

This patient had membrane extending from the pharynx to the hard palate and up to the nose. 26,000 units of antitoxic serum were injected - some intravenously and some subcutaneously.

T.A.B.&.S ~ 0.04cc-were injected and typical blebs were formed on the 20th day of illness when optic paralysis and cardiac sickness were marked symptoms.

2nd Day. There was a slight pink area, $\frac{1}{4}$ " in diameter, round each site. There was no swelling or induration. The colour was lost on pressure. All the areas were alike.

3rd Day. All trace of the reaction had disappeared.

(41) J.H. 12 yrs. Diphtheria.

6,000 units of anti-diphtheritic serum were given. T.A.B.&.S. - 0.08cc-were injected on the 10th day of illness. There were blebs $\frac{1}{2}$ " in diameter at all sites but no haemorrhages or "shooting".

2nd Day. Pink oedematous areas $\frac{3}{4}$ " in diameter were got. These had red centres and gradually faded to normal. They were slightly swollen and tender. The colour was lost on pressure. All the areas were alike.

3rd Day. There was a pink area enclosing a smaller white area at the 1st & 3rd sites of injection. There was no induration or swelling. The colour was lost on pressure. The other areas were pinkish-brown and soft.

4th Day. The whitish areas were without any areola. The other areas were lost.

5th Day. The arm was normal.

(42) M. McN. 4 yrs. Laryngeal Diphtheria.

8,000 units of anti-diphtheritic serum was given. T.A.B.&.S - 0.04cc-were injected on the 8th day of illness. At each injection there was a typical white bleb.

2nd Day. There was an extensive pink colour over the forearm. At the site of each injection there was a darker, oedematous area which was tender. The colour was lost on pressure.

3rd Day. Brownish-pink areas, $\frac{1}{2}$ " in diameter, persisted at each site of injection. They were not swollen or indurated. All the areas were alike.

4th Day. There was no trace of the marks.

(43) J.B. 9 yrs. Diphtheria.

4,000 units of antitoxic serum were given. T.A.B.&.S - 0.04cc-were injected on the 16th day of illness. Each bleb was white and typical.

2nd Day. There was a pink, oedematous area at each site of injection. These areas were red at the centres. The colour was lost on pressure. There was slight swelling and tenderness. All the areas were alike.

3rd Day. There were brown areas, soft, and not swollen or indurated. All the areas were alike.

4th Day. The arm was normal.

(43) J.M. 5 yrs. Diphtheria.

8,000 units of antitoxic serum were given. T.A.B.&.S - 0.04cc-were given on the 3rd day of illness and typical white blebs were formed.

2nd Day. There was a pink area, 4" by 2", on the volar aspect of the forearm. The colour was slightly deeper at the actual site of injection. The part was oedematous and tender. The colour was lost when subjected to pressure.

3rd Day. Each area was discrete and pinkish-brown in colour. There was no swelling or induration. All the areas were alike.

4th Day. The arm was normal.

(44) Wm.M. 11 yrs. Diphtheria.

8,000 units of anti-diphtheritic serum was given
T.A.B.&.S - 0.04cc-were injected on the 10th day of illness
and typical white blebs were formed.

2nd Day. There was an oedematous pink area, $\frac{5}{4}$ " in diameter,
at each site of injection. Each area was swollen and tender.
The colour was lost on pressure. The 1st & 4th areas were
more deeply coloured than the others.

3rd Day. There was a uniform colour at all areas pinkish-
brown. There was no swelling or induration.

4th Day. The arm was normal.

(45) H.L. 8 yrs. Diphtheria.

10,000 units of anti-diphtheritic serum was given.
This was followed by a serum rash 13 days later.
T.A.B.&.S - 0.08cc-were injected on the 3rd day after the
serum rash. Each injection caused a typical bleb.

2nd Day. There was no visible result of the injection
except a slight pink areola round a whitish area at the 1st.
There was no swelling, or induration. The other areas
could just be seen as faint pink areas.

3rd Day. There was a uniform pink area at the 1st site of
injection. There was no swelling or induration.

4th Day. The arm was normal.

(46) C. McG. 9 yrs. Scarlet Fever. (convalescent)

T.A.B.&.S - 0.04cc-were injected and typical white blebs
resulted.

2nd Day. There was a pink area $\frac{1}{2}$ " in diameter at each
site of injection. There was no swelling or induration.
The colour was lost on pressure. All the areas were alike.

3rd Day. There were brownish areas, soft and not in-
durated or swollen. All the areas were alike.

4th Day. The arm was normal.

(47) C.C. 50 yrs. Scarlet Fever & Erysipelas.

T.A.B.&.S - 0.06cc-were injected and typical
white blebs developed.

2nd Day. There were faint pink oedematous areas. The
colour was more marked at the 1st than at the others. There
was no swelling. The colour was lost on pressure.

3rd Day. There was a faint brownish discolouration at each mark but no swelling or induration.

4th Day. The arm was normal.

(48) A.J. 11 yrs. Scarlet Fever.

T.A.B.&.S - 0.04cc-were injected and typical blebs developed.

2nd Day. There was a faint pink area at each bleb. There was swelling. Each area was $\frac{1}{2}$ " in diameter. The colour was lost on pressure. All the areas were alike.

3rd Day. There was a slight brownish discolouration but no swelling or induration.

4th Day. The arm was normal.

(49) H. M'K. 6 yrs. Scarlet Fever.

T.A.B.&.S - 0.04cc-were injected and each bleb was typical.

2nd Day. There was a pink oedematous area (4" by $1\frac{1}{2}$ ") over the forearm. There was swelling and tenderness. The colour was deeper at the actual blebs. The colour was lost on pressure. All the areas were alike.

3rd Day. There was a brownish area at each site. There was no swelling or induration. All the areas were alike.

4th Day. The arm was normal.

(50) M.A. 7 yrs. Scarlet Fever.

T.A.B.&.S - 0.04cc-were injected and each bleb was typical.

2nd Day. There was a pink oedematous area, 4" by 2", on the forearm. The area was swollen and oedematous and tender. There were darker areas at each injection. The colour was lost on pressure. All the areas were alike.

3rd Day. There was a brownish mark without swelling or induration at each area.

4th Day. The arm was normal.

(51) T.H. 2 yrs. Scarlet Fever.

T.A.B.&.S - 0.06cc-were injected. Each site had a typical bleb.

2nd Day. There was a pink papule ($1/3$ " in diameter) at

each bleb, with a slight areola. There was no induration. The colour was removed by pressure. All the areas were alike.

3rd Day. There was a white papule at the 1st mark with a pinkish-brown areola. The other marks were soft and brown. There was no induration.

4th Day. The whitish papule still persisted. The other areas were normal.

5th Day. The arm was normal.

(52) J.W. 3½ yrs. Scarlet Fever (convalescent)

T.A.B.&.S - 0.06cc-were injected. Each bleb was typical.

2nd Day. There was a pink area $\frac{1}{2}$ " in diameter at each injection. The areas were tender and oedematous and the colour was lost on pressure. All the areas were alike.

3rd Day. There were pinkish-brown areas each slightly swollen and hard.

4th Day. The arm was normal.

(53) A.K. 3 yrs. Scarlet Fever.

T.A.B.&.S - 0.04cc-were injected and typical blebs resulted.

2nd Day. There was a 4" by 2" pink oedematous area with red papules at the sites of injection. The area was tender. The colour was lost under pressure.

3rd Day. Brown, soft, non-indurated areas, all alike, were found.

4th Day. The brown discolouration still persisted.

5th Day. The arm was normal.

(54) J.J. 9 yrs. Scarlet Fever.

T.A.B.&.S - 0.04cc-were injected. Each bleb was typical.

2nd Day. There was a $\frac{1}{2}$ " area of pink colour at each injection. Each was tender and swollen and the colour was lost on pressure. All the areas were alike.

3rd Day. The marks were soft and brown. There was no swelling or induration. All the areas were alike.

4th Day. The arm was normal.

(55) J.A. 14 yrs. Scarlet Fever.

T.A.B.&.S - 0.04cc-were injected and each bleb was typical.

2nd Day. There were $\frac{1}{2}$ " red areas. Each was oedematous and tender. There was loss of colour on pressure. All the areas were alike.

3rd Day. The colour was now brown. There was no swelling or induration.

4th Day. The arm was normal.

(56)

B.G. 5 $\frac{1}{2}$ yrs.

Scarlet Fever.

T.A.B.&.S - 0.04cc-were injected and each bleb was typical.

2nd Day. There was a pink oedematous area, $\frac{1}{2}$ " in diameter, at each injection. There was swelling and tenderness. The colour was lost on pressure. All the areas were alike.

3rd Day. The marks were brown and soft and not indurated or swollen.

4th Day. The arm was normal.

(57)

A.S. 2 yrs.

Scarlet Fever.

T.A.B.&.S - 0.04cc-were injected and typical blebs were formed.

2nd Day. There was a papule of bright red colour at each area. All were slightly hard. There was no tenderness. The colour was lost on pressure. All the areas were alike.

3rd Day. The papules were each $\frac{1}{4}$ " in diameter. They were reddish-brown in colour. They were soft and not indurated. All were alike.

4th Day. The arm was normal.

(58)

A.M. 5 yrs.

Scarlet Fever.

T.A.B.&.S - 0.04cc-were injected. Each bleb was typical.

2nd Day. There was a slightly swollen pink area at each injection. There was tenderness. The colour was lost on pressure. Each area was $\frac{1}{2}$ " in diameter. All were alike in colour.

3rd Day. The 1st area was still pink and swollen but not indurated. The others were brown and soft and not indurated.

4th Day. The 1st area was brownish and soft. The other areas were normal.

5th Day. The arm was normal.

(59) J.W. 2 yrs. Scarlet Fever.

T.A.B.&.S - 0.04cc-were injected and typical white blebs were formed.

2nd Day. There was a papule ($1/3$ " in diameter) at each injection. Each was bright-red at the centre and gradually merged into normal at the edges. The colour was lost on pressure. All the areas were alike.

3rd Day. There was a pinkish-brown area at each site of injection, but no swelling or induration. All the marks were alike.

4th Day. The arm was normal.

(60) J.S. 7 yrs. Scarlet Fever.

T.A.B.&.S - 0.04cc-were injected and typical blebs were formed.

2nd Day. There was a small pink area ($1/3$ " in diameter) at the 1st and 3rd sites of injection. These papules were soft and tender and the colour was lost on pressure. The other sites had soft pink areas which were not swollen and were lost on pressure.

3rd Day. There was a $1/4$ " pinkish-brown area at each mark but no swelling or induration. All the areas were alike.

4th Day. The arm was normal.

(61) W.C. 6 yrs. Septic Scarlet Fever.

T.A.B.&.S - 0.04cc-were injected and each bleb was typical.

2nd Day. There was a pink oedematous area $1/2$ " in diameter, at each injection. There was swelling and tenderness. The colour was lost on pressure. All the areas were alike.

3rd Day. There were brownish-pink areas but no swelling or induration at any of them.

4th Day. The brownish discolouration was faint.

5th Day. The arm was normal.

(62) M.M. 5 yrs. Scarlet Fever.

T.A.B.&.S - 0.04cc-were injected and typical blebs formed.

2nd Day. There was a large pink oedematous area, 4" by 2", which was deeper at the centre than at the periphery. There was a slight swelling and tenderness. The colour was lost on pressure.

3rd Day. There was a pinkish-brown area at each mark but no swelling or induration. All the areas were alike.

4th Day. The arm was normal.

(63) J.P. 35 yrs. Diphtheria.

8,000 units of anti-diphtheritic serum were injected T.A.B.&.S - 0.04cc-were injected during convalescence and typical white blebs were formed.

2nd Day. There was a pink, oedematous area at each site of injection which was slightly swollen and tender. The colour was lost on pressure. All the areas were alike.

3rd Day. There were pinkish-brown areas not swollen or indurated. All the areas were alike.

4th Day. The arm was normal.

(64) J.H. 6 yrs. Faucial Diphtheria.

6,000 units of anti-diphtheritic serum was given subcutaneously. T.A.B.&.S - 0.04cc-were injected and typical white blebs were developed.

2nd Day. There was a pinkish-brown area at each injection. Each was oedematous and tender. The colour became brown on pressure. All the areas were alike.

3rd Day. There was no trace of the reaction.

(65) C.M. 10 yrs. Faucial Diphtheria.

6,000 units of antitoxic serum were injected. T.A.B.&.S - 0.04cc-were injected during convalescence and typical white blebs developed.

2nd Day. There was a pink oedematous area (4" by 2") on the forearm. At each injection there was a dull red area. The colour was lost on pressure. There was swelling and tenderness. All the areas were alike.

3rd Day. There was a pinkish-brown area at each site of injection. Each was soft and not indurated or swollen. All were alike.

4th Day. The arm was normal.

(66) H. McK. 5 yrs. Faucial Diphtheria.

8,000 units of antitoxic serum were given subcutaneously. T.A.B.&.S - 0.04cc-were injected during convalescence and typical white blebs were developed.

2nd Day. There was a pink, oedematous area, 4" by 3", with deeper coloured areas at each injection. The area was soft and tender and slightly swollen. The colour was lost on pressure. All the areas were alike.

3rd Day. There was a reddish-brown area at each site of injection, most prominent at the 1st. The marks became brown on pressure. There was no swelling or induration.

4th Day. The discolouration was brown and very faint.

5th Day. The arm was normal.

(67) D.C. 3 yrs. Faucial Diphtheria.

8,000 units of anti-diphtheritic serum were given. T.A.B.&.S - 0.04cc-were injected and gave rise to typical white blebs.

2nd Day. There was a small (1/3") red papule at each injection with a pink areola. There was swelling and tenderness. The colour was lost on pressure. All the areas were alike.

3rd Day. There were soft brownish areas, not indurated and slightly swollen. All the areas were alike.

4th Day. There were brownish areas but no swelling or induration.

5th Day. The arm was normal.

(68) C.W. 1½ yrs. Laryngeal Diphtheria.

10,000 units of serum were injected. T.A.B.&.S - 0.04cc-were injected and caused typical white blebs

2nd Day. There were pink oedematous areas about ½" in diameter at the 1st & 2nd marks. The other areas were very faint. There was slight swelling and tenderness. The colour was lost on pressure.

3rd Day. The arm was normal.

(69) J.S. 5 yrs. Faucial Diphtheria.

10,000 units of antitoxic serum were given subcutaneously. T.A.B.&.S - 0.04cc-were injected and each bleb was typical.

2nd Day. There was a dull brownish-red area at each injection. Each was soft, tender and swollen. The colour

was lost on pressure. All the areas were alike.

3rd Day. There was a dark brown, soft area at each site of injection. Each was soft and not swollen or indurated. All were alike.

4th Day. The arm was normal.

(70) E.B. 9 yrs. Laryngeal Diphtheria.

12,000 units of antitoxic serum were given subcutaneously. T.A.B.&.S. - 0.04cc-were injected and caused typical white blebs.

2nd Day. There were pink, oedematous areas which were soft and swollen. The colour was lost on pressure. All the areas were alike.

3rd Day. The colour was brownish. Each area was $\frac{1}{2}$ " in diameter. There was no swelling or induration.

4th Day. There was still a slight discolouration but no swelling or induration.

5th Day. The arm was normal.

(71) B.S. 17 yrs. Faucial Diphtheria.

10,000 units of antitoxic serum were injected. T.A.B.&.S - 0.04cc-were injected and each area gave a typical white bleb.

2nd Day. There were discrete pink areas, $\frac{1}{2}$ " in diameter. There was swelling and tenderness. All the areas were alike. The colour was lost on pressure.

3rd Day. There were reddish-brown areas, soft and not swollen or indurated. All the areas were alike.

4th Day. There was still some discolouration but no swelling or induration.

5th Day. All the marks had completely disappeared.

(72) J.F. $3\frac{1}{2}$ yrs. Laryngeal Diphtheria.

This case required tracheotomy. 8,000 units of antitoxic serum were given. T.A.B.&.S - 0.04cc-were injected and caused typical white blebs.

2nd Day. There was a pink area $\frac{1}{2}$ " in diameter at each bleb. The colour was deepest at the centre. There was slight swelling and tenderness. All the blebs were alike. The colour was lost on pressure.

3rd Day. There was still some pinkish swelling at each site of injection. Each was soft and not indurated. All the areas were alike.

4th Day. There was brownish discolouration at each site of injection. There was no swelling or induration.

5th Day. The arm was normal.

(73) J.W. 3 yrs. Faucial Diphtheria.

8,000 units of antitoxic serum were injected. T.A.B.&.S - 0.04cc - were injected and each bleb was typical.

2nd Day. There was an extensive pink, oedematous area (4" by 2"). The colour was deeper at the sites of injection. There was slight swelling and tenderness. The colour was lost on pressure.

3rd Day. There were brownish areas at each injection but no swelling or induration.

4th Day. There was still a slight brownish discolouration.

5th Day. The arm was normal.

(74) M.I. 6 yrs. Laryngeal Diphtheria.

10,000 units of antitoxic serum were given sub-cutaneously. T.A.B.&.S - 0.04cc - were injected and typical blebs resulted.

2nd Day. A pinkish brown area was got at each site of injection. This was only well marked at the 1st area. There was no swelling or induration.

3rd Day. The arm was normal.

(75) B.K. 10 yrs. Laryngeal Diphtheria.

8,000 units of antitoxic serum were given sub-cutaneously. T.A.B.&.S - 0.04cc - were injected and typical blebs were formed.

2nd Day. There was a pink area ($\frac{3}{4}$ " in diameter) at each injection. There was swelling and tenderness. The colour was lost on pressure. All the areas were alike.

3rd Day. There was a soft brownish-pink area at each injection but no swelling or induration. All the areas were alike.

4th Day. There was still slight brownish discolouration.

5th Day. The arm was normal.

(76)

M.M. 4 yrs.

Faucial Diphtheria.

10,000 units of antitoxic serum were injected subcutaneously. T.A.B.&.S - 0.04cc-were injected intradermally and typical blebs were formed.

2nd Day. There was a large pink, oedematous area (4" by 2") deep-ening to red at each site of injection. There was swelling and tenderness. The colour was lost on pressure. All the areas were alike.

3rd Day. There were soft, non-indurated brownish areas. All were alike.

4th Day. The arm was normal.

(77)

M.G. 8½ yrs.

Faucial Diphtheria.

8,000 units of antitoxic serum were given subcutaneously. T.A.B.&.S - 0.04cc-were injected and typical blebs resulted.

2nd Day. There was a pink area (4" by 2"). The colour was fairly uniform. There was a slight oedema and tenderness. The colour was lost under pressure.

3rd Day. There were pink papules $\frac{1}{4}$ " in diameter, which were slightly raised and hard. There was no swelling or induration. All were alike.

4th Day. The arm was normal.

(78)

J.M. 13 yrs.

Faucial Diphtheria.

8,000 units of antitoxic serum were injected subcutaneously. T.A.B.&.S - 0.04cc-were injected and typical blebs resulted.

2nd Day. There was a pinkish, oedematous area at each site of injection about 1" in diameter. They were deepest at the centre and fused at their margins. The areas were swollen and tender. They were all alike.

3rd Day. There was a brownish discolouration at each mark which was about $\frac{1}{3}$ " in diameter. There was no swelling or induration.

4th Day. The arm was normal.

(79) E.H. 10 yrs. Faucial Diphtheria.

8,000 units of antitoxic serum were injected subcutaneously. T.A.B.&.S - 0.04cc-were injected and typical blebs resulted.

2nd Day. There was a pink, oedematous area (4" by 2") which was soft, tender, and swollen. The colour was deeper at each injection. The colour was lost on pressure.

3rd Day. There were soft, pinkish-brown areas, not swollen or indurated. All the areas were alike.

4th Day. There was still a slight discolouration. All the areas were alike.

5th Day. The arm was normal.

(80) G.M. 4 yrs. Faucial Diphtheria.

8,000 units of antitoxic serum were injected subcutaneously. T.A.B.&.S - 0.04cc-were injected and each bleb typical.

2nd Day. There was a pink, oedematous area (4" by 2") on the arm with a pinkish-brown area at each injection. There was swelling and tenderness. All the areas were alike.

3rd Day. There were soft brownish-pink papules, raised and slightly hard. All the areas were alike.

4th Day. There was a soft, not swollen or indurated area at each mark. Each was brownish in colour.

5th Day. The arm was normal.

(81) J.M. 6 yrs. Faucial Diphtheria.

12,000 units of antitoxic serum were injected subcutaneously. T.A.B.&.S - 0.04cc-were injected and each bleb was typical.

2nd Day. Each area was swollen and tender and pink. Each was about $\frac{1}{2}$ " in diameter. All were alike. The colour was lost on pressure.

3rd Day. There was a bright pink area at each site of injection with a pale area at the centre of the 1st and 3rd. There was no swelling or induration. All the areas were alike.

4th Day. There was a pinkish-brown area at each site. There was no swelling or induration. All the areas were alike.

5th Day. The arm was normal.

(82) J.L. 2 yrs. Measles.

T.A.B.&.S - 0.04cc-were injected and each bleb was typical.

2nd Day. There were only pin pricks and no evidence of a reaction.

3rd Day. The arm was normal.

(83) J.S. 2 yrs. Measles & Pneumonia.

T.A.B.&.S - 0.04cc-were injected, and each bleb was typical.

2nd Day. The patient had no evidence of a local reaction but during that night the temperature rose to 103.0°F (2°F higher than the usual for this patient.)

3rd Day. The arm was normal.

(84) J.S. 2 yrs. Measles.

T.A.B.&.S - 0.04cc-were injected and typical blebs formed. There was no reaction at any of the sites.

(85) A. McR. 3 yrs. Measles.

T.A.B.&.S. - 0.04cc-were injected and each bleb was typical.

2nd Day. There was a pinkish-brown mark at each site of injection. Each was swollen and tender. The colour was lost on pressure. All the areas were alike.

3rd Day. There was a brownish red area at the 1st site of injection. The other marks were fading. The 1st mark was lost on pressure. There was no swelling or induration.

4th Day. There were faint brown, non-swollen and non-indurated areas.

5th Day. The arm was normal.

(86) A.B. 3 yrs. Measles & Diphtheria.

T.A.B.&.S - 0.04cc-were injected and each bleb typical.

2nd Day. There was a red swollen and oedematous area $\frac{1}{2}$ " in diameter at each site of injection. The colour faded at each margin. The colour was lost on pressure. All the areas were alike.

3rd Day. There was a pinkish-brown area at each site of injection, soft and not indurated or swollen. The 1st was more marked than the others.

4th Day. There was a faint brownish area at each site of injection not swollen or indurated. All were alike.

5th Day. The arm was normal.

(87) J.C. 1 yr. Measles & Diphtheria.

T.A.B.&.S - 0.04cc-were injected and each bleb was typical.

2nd Day. There was a very faint pink area (3" by $1\frac{1}{8}$ ") The colour was slightly deeper at the sites of injection. There was no swelling or tenderness. The colour was lost on pressure. All the areas were alike.

3rd Day. There was a faint brownish discolouration.

4th Day. The arm was normal.

(88) E.C. 3 yrs. Measles & Diphtheria.

T.A.B.&.S - 0.04cc-were injected and each bleb was typical.

2nd Day. There was a swollen pink area, $\frac{5}{4}$ " in diameter, at each site of injection. The colour was deeper at the centre. The colour was lost on pressure. There was swelling and tenderness. All the areas were alike.

3rd Day. There was a pinkish-brown, soft not swollen or indurated area at each site of injection.

4th Day. The arm was normal.

(89) J.G. 2 yrs. Measles.

T.A.B.&.S - 0.04cc-were injected and typical blebs were formed.

2nd Day. There was a pink, oedematous mark ($\frac{1}{2}$ " in diameter) at each site of injection. There was swelling and tenderness and each area was lost on pressure. All the areas were alike.

3rd Day. There was a reddish-brown colour at each site of injection. The mark was not swollen or indurated. All the areas were alike.

4th Day. There was a faint discolouration at the 2nd site of injection. The others were normal.

5th Day. The arm was normal.

(90) M.H. 8 yrs. Measles.

T.A.B.&.S - 0.04cc-were injected and typical blebs formed.

2nd Day. There was a red swollen area, $\frac{3}{4}$ " in diameter, at each injection. The colour was deeper in the centre. The colour was removed by pressure. All the areas were alike.

3rd Day. There was a brownish-red area ($\frac{1}{2}$ " in diameter) at each bleb. There was no swelling or induration.

4th Day. There was brownish discolouration at each area. The colour was not lost on pressure. There was no swelling or induration.

5th Day. The arm was normal.

(91) Mrs. H. 29 yrs. Measles.

T.A.B.&.S - 0.04cc-were injected and typical blebs resulted.

2nd Day. There was a brownish pink area ($\frac{1}{2}$ " in diameter) at each injection. There was no swelling or induration.

3rd Day. Brownish discoloured areas were got which had no swelling or induration. All the areas were alike.

4th Day. The arm was now normal.

(92) R. McD. $1\frac{1}{2}$ yrs. Measles.

T.A.B.&.S - 0.04cc-were injected and typical blebs resulted.

2nd Day. There was a pinkish area ($\frac{1}{2}$ " in diameter) at each site. There was no swelling or induration. All the areas were alike. The colour was lost on pressure.

3rd Day. There was a brownish area at each injection. There was no swelling or induration.

4th Day. The arm was normal.

(93) G.I. 2 yrs. Measles.

T.A.B.&.S - 0.04cc-were injected and each bleb was typical.

2nd Day. There was a large pink oedematous area, 3" by $1\frac{1}{2}$ " on which the injections were not defined. The part was tender and the colour was lost when pressure was made.

3rd Day. There was a faint brownish pink discolouration but no swelling or induration at each site of injection. All were alike.

4th Day. The arm was normal.

(94) T.S. 6 yrs. Measles.

T.A.B.&.S - 0.04cc-were injected and typical blebs were formed.

2nd Day. There was a large tender, pink oedematous area (4" by 2") over the front of the forearm. In this area pinkish-brown marks could be distinguished which were not swollen or indurated. All were alike.

3rd Day. There was a pinkish brown area at each site of injection. There was no swelling or induration. All were alike

4th Day. There were still brownish areas.

5th Day. The arm was normal.

(95) J.B. 2 yrs. Measles.

T.A.B.&.S. - 0.04cc-were injected and typical blebs were formed.

2nd Day. There was a small pink papule, swollen and tender at each site of injection. All were alike. The colour was lost on pressure.

3rd Day. Pinkish-brown areas remained at each. Each was soft but not swollen or indurated.

4th Day. The arm was normal.

(96) J.C. 3 yrs. Measles.

T.A.B.&.S - 0.04cc-were injected and typical marks resulted.

2nd Day. There was a general pink, oedematous area (3" by 2"). This area had darker marks at each site of injection. There was slight swelling and tenderness at each dark mark. The colour was lost under pressure. All the marks were alike.

3rd Day. There was a reddish-brown area at each site of injection. Each was 1/3" in diameter. There was no swelling or induration. All were alike.

4th Day. There was still a faint brownish discolouration but no swelling or induration.

5th Day. The arm was normal.

S.S. 6 yrs.

Measles.

(97) T.A.B.&.S - 0.04cc-were injected and a typical bleb formed at each injection.

2nd Day. There was a bright oedematous area (4" by 2") on the forearm. There was tenderness and swelling. There was a brownish-pink tint at each site of injection. The colour was lost on pressure. All were alike.

3rd Day. There was a faint brownish tint at each mark but no swelling or induration.

4th Day. The arm was normal.

(98) M.B. 6 months. Measles.

T.A.B.&.S - 0.04cc-were injected and each injection gave a typical bleb.

2nd Day. There was a slight reaction at the 1st site of injection. There was a pale centre with a pink areola. The other sites were very faint pink colour. There was at the 1st area a slight swelling and tenderness but no induration. The colour was lost on pressure.

3rd Day. There was a brownish-pink area at the 1st site which was not swollen or indurated. The other areas were lost.

4th Day. The arm was normal.

(99) A.B. 1½ yrs, Measles.

T.A.B.&.S - 0.04cc-were injected and typical blebs were formed.

2nd Day. There was a large pink, oedematous area (4" by 2") on the forearm which was tender and oedematous. There was a darker colour at each area of injection. The colour was lost on pressure. All were alike in colour.

3rd Day. There was a soft, brownish discolouration at each mark, but no swelling or induration.

4th Day. The arm was normal.

(100) H.M. 1 yr. Measles.

T.A.B.&.S - 0.04cc-were injected and typical blebs formed.

2nd Day. There were ½" areas of pink colour which were full at the centre and gradually merged into normal at the margin. The marks were tender, swollen, and lost on pressure. All were alike.

3rd Day. There was a brownish-pink, soft, non-indurated area at each mark. All were alike.

4th Day. The arm was normal.

(101) W.B. 2 yrs. Measles.

T.A.B.&.S - 0.04cc-were injected and typical blebs were formed.

2nd Day. At the 1st site of injection there was a dull reddish mark which was swollen and tender but was lost on pressure. The other marks were very faint and pinkish-brown in colour.

3rd Day. The 1st mark was purplish-brown. There was no swelling or induration.

4th Day. There was a purplish-brown discolouration at the 1st mark.

5th Day. There was a faint brownish discolouration.

6th Day, The arm was normal.

(102) R.D. $1\frac{1}{2}$ yrs, Measles.

T.A.B.&.S - 0.04cc-were injected and each bleb was typical.

2nd Day. There was a swollen tender pink macule slightly darker in colour at the centre, at each site of injection. The colour was lost on pressure. All the areas were alike.

3rd Day. The arm was normal.

(103) J.H. $2\frac{1}{2}$ yrs. Measles.

T.A.B.&.S - 0.04cc-were injected and typical blebs resulted.

2nd Day. There were $\frac{1}{2}$ " pink oedematous areas with no swelling but tenderness. The colour was lost on pressure and gradually merged into normal at the margin. All the areas were alike.

3rd Day. There was a brownish-pink, slightly indurated area at each mark but no swelling.

4th Day. There was a brown mark at each site of injection but no induration.

5th Day. The arm was normal.

(104) D.W. 10 yrs. Measles.

T.A.B.&.S - 0.04cc-were injected and typical

blebs resulted.

2nd Day. There was a pink oedematous area at each site of injection. There was slight swelling and tenderness. The colour was deepest at the centres. The colour was lost under pressure. All the areas were alike.

3rd Day. There was a pinkish-brown area at each site not swollen or indurated.

4th Day. The arm was normal.

(105) A.K. 24 yrs. Measles.

T.A.B.&.S - 0.04cc-were injected and typical blebs formed.

2nd Day. There were 4 pinkish areas, $\frac{1}{2}$ " in diameter. Each was slightly oedematous and tender. The colour was lost on pressure. All were alike.

3rd Day. The arm was now normal.

(106) E.M. $1\frac{1}{2}$ yrs. Measles & Diphtheria.

T.A.B.&.S - 0.04cc-were injected and typical blebs formed.

2nd Day. There were pink oedematous areas, $\frac{1}{2}$ " in diameter, swollen and tender. Each was lost on pressure. All were alike.

3rd Day. The arm was normal.

(107) A.M. 1 yr. Measles & Diphtheria.

T.A.B.&.S - 0.04cc-were injected and typical blebs resulted.

2nd Day. There was a pinkish-brown area at each site of injection. There was slight swelling and tenderness. The colour mostly disappeared on pressure. All the areas were alike.

3rd Day. The colour was brownish at each site of injection but was more marked at the 1st than at the others. All were soft and none was indurated.

4th Day. The arm was normal.

- (108) D.A. 6 yrs. Measles & Diphtheritic Paralysis.
T.A.B.&.S - 0.04cc-were injected and typical blebs were formed.
2nd Day. There were reddish-brown areas, $\frac{1}{2}$ " in diameter, at each injection. These were oedematous and tender. They were not swollen or indurated. The colour was lost on pressure. All were alike.
3rd Day. There was brownish discolouration at each mark but no swelling or induration.
4th Day. The arm was normal.
- (109) E.D. 4 yrs. Measles & Diphtheria.
T.A.B.&.S - 0.04cc-were injected and typical blebs resulted.
2nd Day. There were faint pink areas, $\frac{1}{3}$ " in diameter, which were not swollen or indurated. The colour was lost on pressure. All the areas were alike.
3rd Day. There were brownish areas not swollen or indurated.
4th Day. The arm was normal.
- (110) A.C. 10 yrs. Measles & Diphtheria.
T.A.B.&.S - 0.04cc-were injected and typical blebs were formed.
2nd Day. There were brownish-pink areas, about $\frac{1}{3}$ " in diameter. These were soft and not swollen or tender. The colour became brown on pressure. All the areas were alike.
3rd Day. There ^{was a} ~~were~~ brownish areas at each injection.
4th Day. The arm was normal.
- (111) N.B. 7 yrs. Measles & Diphtheria.
T.A.B.&.S - 0.04cc-were injected and each bleb was typical.
2nd Day. There was a general pink oedematous area (3" by $1\frac{1}{2}$ ") on the forearm. The colour was slightly deeper over the injections than elsewhere. There was slight swelling and tenderness. All the areas were alike.
3rd Day. There was a soft brownish-pink area at each injection. There was no swelling or induration. All were alike.

4th Day. The arm was normal.

(112)

Wm.F. 17 yrs.

Pneumonia & Empyema.

T.A.B.&.S - 0.04cc-were injected and each bleb typical.

2nd Day. There was a pink oedematous area, (3" by 2") over the forearm. The colour was deeper over the 1st and 3rd injections. There was slight swelling and tenderness.

3rd Day. There was a brownish area, $\frac{1}{2}$ " in diameter, at each mark. There was no swelling or induration. All were alike.

4th Day. The arm was normal.

(113)

H.C. 42 yrs.

Pneumonia & Empyema.

T.A.B.&.S - 0.04cc-were injected and typical blebs resulted.

2nd Day. There was a whitish bleb with a pink areola at the 1st site of injection. The other marks were brownish-pink. There was a slight swelling but no induration.

3rd Day. There was still a whitish area at the 1st site of injection but no areola. The other areas were soft and brownish. There was no swelling or induration at any of the marks.

4th Day. The arm was normal.

(114)

G.M. 10 yrs.

Pneumonia.

T.A.B.&.S - 0.04cc-were injected and each bleb was typical.

2nd Day. There was a faint pinkish-brown area ($\frac{1}{2}$ " in diameter) at each injection. There was slight tenderness but no swelling or induration. All the areas were alike.

3rd Day. There was a faint brownish discoloured area at each injection. Each was soft and not swollen or indurated.

4th Day. The arm was normal.

(115)

J. M'D. 53 yrs.

Pneumonia.

T.A.B.&.S - 0.04cc-were injected and each bleb was typical.

2nd Day. There was a slight brownish-pink area about $\frac{1}{2}$ " in diameter at each injection. There was no swelling or induration.

3rd Day. There was a faint brownish discolouration at each area but no swelling or induration.

(116)

W. O'H. 19 yrs.

Pneumonia.

T.A.B.&.S - 0.04cc-were injected and each bleb was typical.

2nd Day. There were red areas at the 1st & 3rd injections. These were soft and tender and faded gradually at the margins. They were lost on pressure. There was a slight swelling. The other marks were soft and brownish,

3rd Day. There was a pinkish-brown area at each site of injection. There was no swelling or induration.

4th Day. All trace of the injections had now gone.

(117)

P.R. 11 yrs.

Pneumonia.

This patient was acutely ill. - 0.04cc of T.A.B.&.S were injected and typical blebs formed.

2nd Day. There was a very faint pink area at each injection which was not swollen or indurated.

3rd Day. All trace of the reaction had now gone.

(118)

J. M'C. 12 yrs.

Pneumonia.

T.A.B.&.S - 0.04cc-were injected and typical blebs formed.

2nd Day. There was a swollen tender area, $\frac{1}{2}$ " in diameter, at each site of injection. Each was bright pink with a whitish area at the centre. There was tenderness and slight swelling. The colour was lost on pressure. All were alike.

3rd Day. There was a brownish-yellow area at each mark. Each was soft and not indurated.

4th Day. The arm was normal.

(119)

L.L. 7 yrs.

This patient was admitted as a case of enteric fever. Stools were normal to repeated examination. The Widal remained negative throughout. The temperature was persistently normal.

T.A.B.&.S - 0.04cc-were injected and typical blebs were formed.

2nd Day. There was a pink area around each site. Each was $\frac{3}{4}$ " in diameter. Each was oedematous and tender. There was no induration. The centre was deeper in colour. The colour was lost on pressure.

3rd Day. There was brownish discolouration at each site, but no swelling or induration. All the areas were alike.

4th Day. The arm was normal.

(120)

E.E. 10 yrs.

This patient was admitted as a typhoid case but stools and temperature were persistently normal. The blood never agglutinated B. Typhosus.

T.A.B.&.S - 0.06cc-were injected and typical blebs were developed.

2nd Day. Each area was oedematous and pink. All were about 1" in diameter. The colour was lost on pressure.

3rd Day. There was a brownish area at each, neither swollen nor indurated.

4th Day. The arm was normal.

(121)

J.E. 45 yrs.

Dysentery.

This patient had pain in the abdomen, blood and mucus in the stools from which Flexner's bacillus was cultured.

T.A.B.&.S - 0.06cc-were injected intradermally and typical blebs were formed.

2nd Day. There was a pink, oedematous area, 1" in diameter, at each injection. All were soft, tender and swollen but were lost on pressure. All the areas were alike.

3rd Day. There was a pink swelling at each area. None was indurated. All were lost on pressure.

4th Day. There was a brownish area not swollen or indurated at each mark.

5th Day. The arm was normal.

(122) A. M'F. 2½ yrs. Measles.

T.A.B.&.S - 0.04cc-were injected and typical blebs resulted.

2nd Day. There were four pink, oedematous areas, soft and swollen and tender. They were deeper in colour at the centre of each area. The colour was lost on pressure. All the areas were alike.

3rd Day. There was a faint brownish discolouration at each area, soft and not swollen or indurated.

4th Day. There was still a slight discolouration at all the areas.

5th Day. The arm was normal.

(123) R.D. 2½ yrs. Measles.

T.A.B.&.S - 0.04cc-were injected and each bleb was typical.

2nd Day. There was a faint brownish area, 1/3" in diameter, at each injection. All were soft and swollen but not indurated. The colour was lost on pressure. All were alike.

3rd Day. The arm was normal.

(124) J. M'C. 2 yrs. Measles.

T.A.B.&.S - 0.04cc-were injected and each gave a typical bleb.

2nd Day. Each area had a bright pink colour. It was 1/8" in diameter and tender and swollen. The colour was lost on pressure. The colour was deeper at each site of injection.

3rd Day. There was a pinkish-brown area at each injection, soft and not swollen or indurated. All the areas were alike.

4th Day. The arm was normal.

(125) G.G. 2 yrs. Measles.

T.A.B.&.S - 0.04cc-were injected and each bleb was typical.

2nd Day. There was a small pink swelling at each site of injection. These were tender. The colour was lost on pressure. All areas were alike.

3rd Day. There was a yellowish-brown mark at each injection. This was soft and not swollen or indurated,
4th Day. All the areas were alike.

(126) A.T. 2 yrs. Measles.
T.A.B.&.S- 0.04cc-were injected and typical blebs resulted.

2nd Day. There was a pink oedematous area at each site of injection. Each was soft and tender. The colour gradually faded at the margins, and was deeper at the centre; it was lost on pressure. All the areas were alike and $\frac{1}{2}$ " in diameter.

3rd Day. There was a faint brownish discolouration at each mark. There was no swelling or induration.

4th Day. The arm was normal.

(127) G.T. 6 yrs. Measles.
T.A.B.&.S- 0.04cc-were injected and each bleb was typical.

2nd Day. There was a brownish-pink, oedematous area at each injection. Each was swollen and tender and the colour was lost on pressure. The colour was deepest at the centre of each area.

3rd Day. There was brownish discolouration at each area. There was no swelling or induration. All the areas were alike.

4th Day. The arm was normal.

(128) C.W. 2 yrs. Measles.
T.A.B.&.S- 0.04cc-were injected and each bleb was typical.

2nd Day. There was a faint pinkish-brown area at each injection. Each was soft, tender, swollen, and lost on pressure. All the areas were alike.

3rd Day. There was a faint brownish discolouration- $\frac{1}{3}$ " in diameter - but no swelling or induration.

4th Day. The arm was normal.

(129) P.N. 3 yrs. Measles.
T.A.B.&.S- 0.04cc-were injected and each bleb was typical.

2nd Day. There was a pink, oedematous area at each site of injection. Each was swollen and tender. The colour was deeper at the centre of each macule. It was lost under pressure. All the areas were alike.

3rd Day. There was brownish discolouration at each mark. There was no swelling or induration. All the areas were alike.

4th Day. The arm was normal.

(130)

M.N. 4½ yrs.

Measles.

T.A.B.&.S - 0.04cc-were injected and 4 typical blebs resulted.

2nd Day. There was a faint brownish-pink area at each site of injection about ½" in diameter. Each area was soft and tender. There was no swelling. The colour was uniform and lost on pressure. All the areas were alike.

3rd Day. There was a slight brownish discolouration at each mark. There was no swelling or induration.

4th Day. The arm was normal.

(131)

M.B. 6 yrs.

Measles.

T.A.B.&.S - 0.04cc-were injected and typical blebs resulted.

2nd Day. There was a pink, oedematous area, ½" in diameter, at each injection. There was swelling and tenderness. The colour was deepest at the centre of each area and was lost on pressure. All the areas were alike.

3rd Day. There was a pinkish-brown area at each injection. There was no swelling or induration.

4th Day. The arm was normal.

(132)

A. M'C. 4 yrs.

Measles.

T.A.B.&.S - 0.04cc-were injected and typical blebs resulted.

2nd Day. There was a typical pinkish-brown oedematous area at each injection. Each was soft and swollen and tender. The colour was uniform at each mark, and was lost on pressure. All were alike.

3rd Day. There was a faint brownish discolouration. There was no swelling or induration. All the areas were alike.

4th Day. All the marks had gone.

133) M.K. $2\frac{1}{2}$ yrs. Measles.

T.A.B.&.S - 0.04cc-were injected and each bleb was typical.

2nd Day. There were four faint pink slightly swollen areas, which had deeper colour at their centre. The colour was lost on pressure. Each area was $\frac{1}{2}$ " in diameter.

3rd Day. There was a faint brown discolouration at each mark but no swelling or induration. All the areas were alike.

4th Day. The arm was normal.

134) R. MⁱN. 5 yrs. Measles.

T.A.B.&.S - 0.04cc-were injected and typical blebs formed.

2nd Day. There were tender, pink areas which were slightly swollen and were $\frac{1}{2}$ " in diameter. The colour was lost on pressure. All the areas were alike.

3rd Day. There was a slight brownish discolouration which was not modified by pressure. There was no swelling or induration. All the areas were alike.

4th Day. The arm was normal.

135) C.H. 1 $\frac{7}{12}$ yrs. Measles.

T.A.B.&.S - 0.04cc-were injected and typical blebs resulted.

2nd Day. Each injection was represented by a macule, $\frac{1}{4}$ " in diameter, of pink colour which was deeper at the centre. There was tenderness but no swelling. All the areas were alike.

3rd Day. There were slightly brown areas, $\frac{1}{4}$ " in diameter. There was no swelling or induration.

4th Day. The arm was normal.

(136) J.H. 4 yrs. Measles.

T.A.B.&.S - 0.04cc-were injected and typical blebs resulted.

2nd Day. There was a pink oedematous, tender area, $\frac{1}{2}$ " in diameter, at each injection. All were alike.

The colour was deeper at the centre of each macule. It was lost on pressure.

3rd Day. There were pinkish-brown areas soft, and not swollen or indurated.

4th Day. The arm was normal.

(137) S.C. $2\frac{1}{2}$ yrs.

Measles.

T.A.B.&.S - 0.04cc-were injected and each bleb was typical.

2nd Day. There was a large pink, oedematous area (3" by $1\frac{1}{2}$ ") which was slightly swollen and tender. The colour was deeper at each injection and was lost on pressure.

3rd Day. There were $\frac{1}{2}$ " brownish areas which were not swollen or indurated.

4th Day. The arm was normal.

(138) H. McW. 2 yrs.

Measles.

T.A.B.&.S - 0.04cc-were injected and typical blebs formed.

2nd Day. There were $1/3$ " pink, oedematous areas, soft and tender and lost on pressure. The edges were well defined. The areas were all alike.

3rd Day. There was a brownish-pink area at each injection. The colour was lost on pressure. There was no swelling or induration. All the areas were alike.

4th Day. There was a brownish discolouration at each mark.

5th Day. The arm was normal.

(139) M.D. 1 yr.

Measles.

T.A.B.&.S - 0.04cc-were injected and typical white blebs resulted.

2nd Day. There were four pink, oedematous areas, $1/3$ " in diameter. Each was soft and tender and deeper in colour at the centre of each macule. The colour was lost on pressure. All the areas were alike.

3rd Day. There was a pinkish-brown area, soft and slightly swollen, but no induration. All the areas were alike.

4th Day. There was a slight brownish discolouration at each area.

5th Day. The arm was normal.

(140)

M.D. $1\frac{1}{2}$ yrs.

Measles.

T.A.B.&.S - 0.04cc-were injected and each bleb was typical.

2nd Day. There was a pink area - $\frac{1}{2}$ " in diameter-at each bleb. Each was slightly swollen and tender. The colour was in each case deeper at the centre of the macule and was lost on pressure. All macules were alike.

3rd Day. There were faint brownish marks not swollen or indurated.

4th Day. The arm was normal.

(141)

B. O'B, 2 yrs.

Measles.

T.A.B.&.S - 0.04cc-were injected and each bleb was typical.

2nd Day. There was a pink, soft, oedematous area at each injection. Each was $\frac{1}{2}$ " in diameter. The colour was deeper in the centre and lost on pressure. All the areas were alike.

3rd Day. There was a brownish area, not swollen, or indurated at each mark.

4th Day. The arm was normal.

(142)

W.D. $3\frac{1}{2}$ yrs.

Measles.

T.A.B.&.S - 0.04cc-were injected and each bleb was typical.

2nd Day. There was a pink, oedematous area (3" by $1\frac{1}{2}$ ") on the forearm. This was soft and tender. There were deeper areas at the injections. The colour was lost on pressure.

3rd Day. There was a brownish mark at each injection, not swollen or indurated. All the areas were alike.

4th Day. The arm was normal.

(143)

I.S. 4 yrs.

Measles.

T.A.B.&.S. - 0.04cc-were injected and each bleb was typical.

2nd Day. There was a soft, pinkish-brown area ($\frac{1}{2}$ " in diameter) at each injection. There was slight tenderness and swelling. The colour was lost on pressure. All the areas were alike.

3rd Day. There was brownish discolouration. There was no swelling or induration.

4th Day. The arm was normal.

(144)

W.B. 6 yrs.

Measles.

T.A.B.&.S - 0.04cc-were injected and each bleb was typical.

2nd Day. There was a soft pinkish-brown area at each injection, about $\frac{1}{2}$ " in diameter. Each was tender and swollen and the colour was lost on pressure. All the areas were alike.

3rd Day. There was a slight discolouration but no swelling or induration.

4th Day. The arm was normal.

(145)

P.D. 1 yr.

Measles.

T.A.B.&.S - 0.04cc-were injected and each bleb was typical.

2nd Day. There were four swollen oedematous areas ($\frac{1}{2}$ " in diameter). Each was tender. The colour was pink with a deeper red at centre and was lost when pressure was applied. All the areas were alike.

3rd Day. There was a slight brownish discolouration without swelling or induration at each mark.

4th Day. The arm was normal.

(146)

A.T. $2\frac{1}{2}$ yrs.

Measles.

T.A.B.&.S - 0.04cc-were injected and each bleb was typical.

2nd Day. There were areas $\frac{3}{4}$ " in diameter. Each was pink with a brownish centre. The colour was lost on pressure. There was swelling and tenderness. All the areas were alike.

3rd Day. There was a brownish-pink area at each injection with no swelling or induration.

4th Day. The arm was normal.

(147) A.R. 3 yrs.

Measles.

T.A.B.&S. - 0.04cc-were injected and each bleb was typical.

2nd Day. There was a pink, oedematous area ($\frac{1}{2}$ " in diameter) at each injection. There was slight swelling and tenderness. The colour was deepest at the centre of each area and was lost on pressure. All the areas were alike.

3rd Day. There were $\frac{1}{2}$ " areas, soft and brown in colour. None was swollen or indurated.

4th Day. The arm was normal.

(148) J.T. 6 yrs.

Measles.

T.A.B.&S - 0.04cc-were injected and each bleb was typical.

2nd Day. There was a pinkish-brown area which was not swollen or indurated. All were alike in colour but the 1st was the most extensive. The colour became brown on pressure.

3rd Day. There was slight brownish discolouration with no swelling or induration. All were alike in colour and extent.

4th Day. The arm was normal.

(149) C.C. 2 yrs.

Measles.

T.A.B.&S - 0.04cc-were injected and each bleb was normal.

2nd Day. There was a pinkish-brown area at each injection which was tender and turned brown under pressure. All the areas were alike.

3rd Day. There was brownish discolouration, but no swelling or induration at each area.

4th Day. The arm was normal.

(150) R.M. 3 yrs.

Measles.

T.A.B.&S - 0.04cc-were injected and each bleb was typical.

2nd Day. Around each site of injection there was a pinkish-brown area, soft and tender and oedematous. Each was $\frac{1}{2}$ " in diameter. The colour was deeper at the centre and was lost on pressure. All the areas were alike.

3rd Day. There was a pinkish-brown area at each injection without induration but slightly swollen.

4th Day. There were whitish papules but no induration or colouration at each mark.

5th Day. The arm was normal.

(151) J.C. 4 yrs. Measles.

T.A.B.&.S - 0.04cc-were injected and each bleb was typical.

2nd Day. There was a pinkish-brown area at each injection which was soft, tender and slightly swollen. The colour was lost on pressure. All the areas were alike and were $\frac{1}{2}$ " in diameter.

3rd Day. The arm was only faintly discoloured at each injection. There was no swelling or induration.

4th Day. The arm was normal.

(152) J.F. 2 yrs. Measles.

T.A.B.&.S - 0.04cc-were injected and each bleb was typical.

2nd Day. There was a pinkish-brown area at each injection but no swelling or induration. The colour was not affected by pressure. All the areas were alike.

3rd Day. The arm was normal.

(153) H. McG. 1 yr. Measles.

T.A.B.&.S - 0.04cc-were injected and each bleb was typical.

2nd Day. There was a pinkish, swollen area at each bleb which was soft and tender. The colour was lost on pressure. All areas were alike.

3rd Day. There was a whitish papule at the 1st injection with a pinkish areola which was lost on pressure. The other areas were pinkish-brown. There was no swelling or induration.

4th Day. There was still a white papule at the 1st area. This had a brown areole. The other areas were normal.

5th Day. The arm was normal.

(154) P.B. 6 yrs. Measles.

T.A.B.&.S - 0.04cc-were injected and each bleb was typical.

2nd Day. There was a pink area 3" by $1\frac{1}{2}$ " which was soft and faded at the margin to the normal colour of the arm. The colour was lost on pressure. There was slight swelling. All the areas were alike.

3rd Day. There was a faint brownish colour at each injection. There was no swelling or induration. All were alike.

4th Day. The arm was normal.

(155)

H.F. 2 yrs.

Measles.

T.A.B.&.S - 0.04cc-were injected and each bleb was typical.

2nd Day. There were four $\frac{1}{2}$ " areas soft and pink in colour with deeper centres. The colour was lost when pressure was applied. All the areas were alike.

3rd Day. There was a brownish discolouration at each area. There was no swelling or induration. All were alike.

4th Day. The arm was normal.

(156)

D. McF. $1\frac{1}{2}$ yrs.

Measles.

T.A.B.&.S - 0.04cc-were injected and caused four typical blebs.

2nd Day. There were 4 faint pink, tender areas about $\frac{1}{2}$ " in diameter. Each had a deeper part at its centre. The colour was lost on pressure. All the areas were alike.

3rd Day. There was a faint brownish area at each injection but no swelling or induration.

4th Day. The arm was normal.

(157)

J.F. 2 yrs.

Measles.

T.A.B.&.S- 0.04cc-were injected and each bleb was typical.

2nd Day. There was a faint pinkish-brown area at each injection. Each was $\frac{1}{2}$ " in diameter and swollen and tender. The colour was lost on pressure. All the areas were alike.

3rd Day. There was a soft brownish mark at each injection but no swelling or induration.

4th Day. The arm was normal.

(158) M. McK. 3½ yrs. Measles.

T.A.B.&.S - 0.04cc-were injected and each bleb was typical.

2nd Day. There was a pink, oedematous area, ½" in diameter, at each bleb. There was swelling and tenderness. The colour was darkest at the centre of each area. All the areas lost their colour under pressure.

3rd Day. Each area was brown and soft and not indurated or swollen and all the areas were alike.

4th Day. The arm was normal.

(159) J. McP. 5 yrs. Measles.

T.A.B.&.S - 0.04cc-were injected and each bleb was typical.

2nd Day. There was a pink, oedematous area (3" by 1½") which was soft and tender and the colour was lost on pressure. The colour was slightly deeper at each injection. All the areas were alike.

3rd Day. There was a brownish area at each mark. There was no swelling or induration.

4th Day. The arm was normal.

(160) J.M. 5 yrs. Measles.

T.A.B.&.S - 0.04cc-were injected and each bleb was typical.

2nd Day. There was a large pink, oedematous area with deeper areas at each injection. The colour was lost on pressure. There was a slight swelling and tenderness. All the areas were alike.

3rd Day. There was a pale pink papule, swollen, but not indurated, at each injection. All the areas were alike. The colour was lost on pressure.

4th Day. There was a brownish area at each injection, soft and not affected by pressure. There was no swelling or induration.

5th Day. The arm was normal.

(161) A.L. 5 yrs. Measles.

T.A.B.&.S - 0.04cc-were injected and each bleb was typical.

2nd Day. There was a pink, oedematous area (3" by 1½") over the forearm with deeper marks at each injection. There was a slight swelling and tenderness. The colour was lost under pressure.

3rd Day. There was a brown discolouration but no swelling or induration at each injection.

4th Day. The arm was normal.

(162)

N.C. 48 yrs.

Pneumonia.

T.A.B.&.S - 0.04cc-were injected and typical blebs were formed.

2nd Day. There was a soft pink area, 1/3" in diameter, at each injection which was slightly oedematous and tender. The colour was lost on pressure. All the areas were alike.

3rd Day. A brownish-pink macule persisted, but no swelling or induration at each injection.

4th Day. The arm was normal.

(163)

J.F. 29 yrs.

Pneumonia.

T.A.B.&.S - 0.04cc-were injected and typical blebs formed.

2nd Day. There was a reddish-brown area at each injection. Each was soft but not oedematous. There was a white bleb at the 2nd mark which had a pink areola but no swelling. The colour was lost on pressure.

3rd Day. There was a yellowish-brown colour at each area which was soft and not swollen or indurated. The white bleb at the 2nd mark persisted but had no areola.

4th Day. The arm was normal.

(164)

A.H. 28 yrs.

Pneumonia.

T.A.B.&.S - 0.04cc-were injected and each bleb was typical.

2nd Day. There was an extensive, pink, oedematous area (4" by 2") which was tender and had a pinkish-brown area at each injection. The colour was lost on pressure.

3rd Day. There were 1/3" pinkish-brown areas which were not tender or indurated. All the areas were alike.

4th Day. A brownish colour perisited at each area.

5th Day. The arm was normal.

(165) J.C. 45 yrs. Pneumonia.

T.A.B.&.S - 0.04cc-were injected and each bleb was typical.

2nd Day. There was a brownish area $\frac{1}{2}$ " in diameter at each injection. All were not swollen or indurated and were slightly tender.

3rd Day. There was a yellowish area of discolouration at each injection but no swelling or induration. All were alike.

4th Day. The arm was normal.

(166) G.W. 28 yrs. Pneumonia.

T.A.B.&.S - 0.04cc-were injected and typical blebs were formed.

2nd Day. There was a pinkish-brown area, $\frac{1}{2}$ " in diameter at each injection. There was no swelling or oedema. The colour became browner on pressure. All the areas were alike.

3rd Day. There was a brownish discolouration at each injection but no swelling or induration.

4th Day. The arm was normal.

(167) J.H. 8 yrs. Pneumonia.

T.A.B.&.S - 0.04cc-were injected and each bleb was typical.

2nd Day. There was a dark red soft area at the 1st site of injection which was deeper than the other areas. There was swelling and tenderness at all the areas. The colour was lost on pressure.

3rd Day. There was a purplish area at the 1st injection with slight swelling and no induration. The other areas were represented by a brownish discolouration.

4th Day. There was a brownish-red area at the 1st injection. There was slight swelling but no induration.

5th Day. The arm was normal.

(168) A.F. 19 yrs. Pneumonia.

T.A.B.&.S - 0.04cc-were injected and each bleb was typical.

2nd Day. There was a soft brownish-pink area, $\frac{1}{3}$ " in diameter, at each injection. There was no swelling or induration. The colour was lost on pressure. All the areas were alike.

3rd Day. There was a slight brownish discolouration at each area but no swelling or induration.

4th Day. The arm was normal.

(169) G.B. 39 yrs. Pneumonia.

T.A.B.&S - 0.04cc-were injected and each bleb was typical.

2nd Day. There was a large pink, oedematous area with darker reddish areas at each injection. These were soft and tender and slightly indurated.

3rd Day. There was a soft, non-indurated, brownish-pink area at each site. All the areas were alike.

4th Day. The arm was normal.

(170) P.R. 16 yrs. Pneumonia.

T.A.B.&S - 0.04cc-were injected and typical blebs resulted.

2nd Day. There was a pinkish-brown area $\frac{1}{4}$ " in diameter, at each area which was swollen and tender and was lost under pressure. All the areas were alike.

3rd Day. There was a faint brownish discolouration at each injection, but no swelling or induration.

4th Day. The arm was normal.

(171) C.G. 55 yrs. Pneumonia.

T.A.B.&S - 0.04cc-were injected and typical white blebs formed.

2nd Day. There was a pale pink area ($\frac{1}{2}$ " in diameter) at each injection surrounded by a common pink oedematous area (4" by 2"). There was tenderness and swelling. The colour was lost on pressure.

3rd Day. There was a brownish-pink area at each injection but no swelling or induration. All were alike.

4th Day. The arm was normal.

(172) C. McD. 10 yrs. Pneumonia.

T.A.B.&.S - 0.04cc-were injected and typical blebs formed.

2nd Day. There was an extensive pink area (4" by 3"). There were reddish areas in this at the sites of injection. There was swelling and tenderness. The colour was lost on pressure.

3rd Day. There was brownish discolouration at each injection but no swelling or induration.

4th Day. The arm was normal.

(173) W.K. 12 yrs. Pneumonia.

T.A.B.&.S - 0.04cc-were injected and typical blebs resulted, except at the 1st, where there was a slight amount of "shooting" before the blebs formed.

2nd Day. There was a red swelling at the 1st injection which was not entirely lost on pressure. The other areas were soft and lost on pressure.

3rd Day. The 1st area was brownish with a yellow margin and soft without swelling or induration. The others had only a slight brownish discolouration.

4th Day. The arm was normal.

(174) J.A. 19 yrs. Pneumonia.

T.A.B.&.S - 0.04cc-were injected and typical blebs resulted.

2nd Day. There was a pink area 3" by 1" which was soft and oedematous and tender. The colour was deeper at each injection. There were well defined edges to the large area. The colour was lost on pressure.

3rd Day. There were pinkish-brown areas ($\frac{1}{2}$ " in diameter) which were slightly swollen and not indurated. All were alike. The colour was lost on pressure.

4th Day. There was brownish discolouration at each mark soft and not swollen or indurated.

5th Day. The arm was normal.

(175) P.C. 15 yrs. Pneumonia.

T.A.B.&.S - 0.04cc-were injected and typical blebs were formed.

2nd Day. There was a pinkish-brown area, $\frac{1}{2}$ " in diameter, at each mark. There was no swelling or induration. All were alike. The colour was lost on pressure.

3rd Day. There was a brownish discolouration, but no swelling or induration, at each mark.

4th Day. The arm was normal.

(176) J.W. 19 yrs. Pneumonia.

T.A.B.&.S - 0.04cc-were injected and each bleb was typical.

2nd Day. There was a pink area, $\frac{1}{2}$ " in diameter, at each injection. Each was soft and tender and oedematous. All were lost on pressure. All were alike.

3rd Day. There was a slightly indurated area at each injection but no swelling or induration.

4th Day. The arm was normal.

(177) J.R. 19 yrs. Pneumonia.

T.A.B.&.S - 0.04cc-were injected and each bleb was typical.

2nd Day. There was an extensive area (5" by 3") which was pink and tender and oedematous, over the forearm. There were red marks at the actual injections. The colour was lost on pressure.

3rd Day. There was a brownish-red area at each injection with no swelling or induration. All were alike, $\frac{1}{2}$ " in diameter.

4th Day. The arm was normal.

(178) J.K. 22 yrs. Pneumonia.

T.A.B.&.S - 0.04cc-were injected and typical blebs were formed.

2nd Day. There were four bright red areas ($\frac{1}{2}$ " in diameter) which had a deeper colour at the centre of each. They were swollen and tender. The colour was lost on pressure. All the areas were alike.

3rd Day. There were areas of brownish discolouration but no swelling or induration.

4th Day. The arm was normal.

- (179) Mrs. McD. 30 yrs. Puerperal Fever.
T.A.B.&.S - 0.04cc-were injected and typical blebs resulted.
2nd Day. There was a pink oedematous area (4" by 2") on the forearm with deeper areas at each injection. There was slight swelling and tenderness. The colour was lost on pressure.
3rd Day. There was brownish discolouration at each area but no swelling or induration.
4th Day. The arm was normal.
- (180) Mrs. D. 30 yrs. Puerperal Fever.
T.A.B.&.S - 0.04cc-were injected and typical blebs resulted,
2nd Day. There was a pink, oedematous area (2" in diameter) round the 1st and 2nd injections and pink areas $\frac{1}{2}$ " in diameter round the others. The areas were all darkest in colour at the centre. All were swollen and tender and lost on pressure.
3rd Day. There was a brownish area of discolouration at each injection soft and not swollen or indurated.
4th Day. The arm was normal.
- (181) Mrs. T. 23 Puerperal Fever.
T.A.B.&.S - 0.04cc-were injected and typical blebs were formed.
2nd Day. There was a pink, oedematous area (4" by 2") on the forearm. The colour was uniform like urticaria and was lost on pressure.
3rd Day. There was a faint brownish discolouration.
4th Day. The arm was normal.
- (182) Mrs. C. 35 Puerperal Fever.
T.A.B.&.S - 0.04cc-were injected and typical blebs resulted.
2nd Day. There was a pinkish-red area ($\frac{1}{2}$ " in diameter) at each site of injection. Each was swollen and tender. The colour gradually faded into normal and was lost on pressure. All the areas were alike.
3rd Day. There was still pinkish-brown papules at each but no induration and the colour was mostly lost on pressure.

4th Day. The arm was normal.

- (183) Mrs. S. Puerperal Fever.
T.A.B.&.S - 0.04cc-were injected and each bleb was typical.
2nd Day. There was a large oedematous area (3" by $1\frac{1}{2}$ ") soft and tender. The colour was deeper at the injections. It was lost on pressure.
3rd Day. There was a pinkish-brown area at each site. The colour was rendered brown by pressure. There was no swelling or induration. All were alike.
4th Day. There was still some brownish discolouration.
5th Day. The arm was normal.

- (184) Mrs. A. 32 yrs. Puerperal Fever.
T.A.B.&.S - 0.04cc-were injected and each bleb was typical.
2nd Day. There was at each injection a pink swollen area ($\frac{1}{2}$ " in diameter) which was tender. The colour was lost on pressure. All the areas were alike.
3rd Day. There was a brownish-pink area at each injection but no swelling or induration.
4th Day. The arm was normal.

- (185) Mrs. McL. 36 yrs. Puerperal Fever.
T.A.B.&.S - 0.04cc-were injected and typical blebs resulted.
2nd Day. There was a pinkish-brown, oedematous area ($\frac{1}{2}$ " in diameter) at each injection. Each was soft, tender and swollen and lost on pressure. All the areas were alike.
3rd Day. There was a brownish area but no swelling or induration at each injection.
4th Day. The arm was normal.

- (186) Mrs. S. 28 yrs. Puerperal Fever.
T.A.B.&.S - 0.04cc-were injected and typical blebs resulted.
2nd Day. There was a general pink, oedematous area over the forearm (4" by $1\frac{1}{2}$ "). The colour was deeper at each

injection. There was swelling and tenderness, and the colour disappeared under pressure.

3rd Day. There was a brownish-pink soft area at each injection, but no swelling or induration. All areas were alike.

4th Day. There was a faint brownish discolouration at each area.

5th Day. The arm was normal.

(187) Mrs. S. 37 yrs. Puerperal Fever.

T.A.B.&.S - 0.04cc-were injected and typical blebs were formed.

2nd Day. There was a dull pink, oedematous area (4" by 2") on the forearm. The colour was deeper at each injection. There was swelling and tenderness. The colour was lost on pressure.

3rd Day. There was brownish discolouration at each area but no swelling or induration. All the areas were alike.

4th Day. The arm was normal.

(188) E.B. 21 yrs. Puerperal Fever.

T.A.B.&.S - 0.04cc-were injected and typical blebs resulted.

2nd Day. There was a soft, pale-pink, oedematous area, $\frac{1}{2}$ " in diameter, at each injection. There was tenderness but no swelling. The colour was lost on pressure.

3rd Day. There was no swelling or induration. All the areas were alike.

4th Day. The arm was normal.

(189) I.P. 19 yrs. Puerperal Fever.

T.A.B.&.S - 0.04cc-were injected and each bleb was typical.

2nd Day. There was an extensive pink oedematous area (4" by 2") which was brighter at the injections. The area was tender and swollen. The colour disappeared on pressure.

3rd Day. There was a slight brownish discolouration but no swelling or induration. All the areas were alike.

4th Day. The arm was normal.

(190) Mr.B. 32 yrs. Puerperal Fever.

T.A.B.&.S - 0.04cc-were injected and typical blebs resulted.

2nd Day. There was a brownish-red area at each injection which was slightly swollen and tender. The colour was lost on pressure. All the areas were alike.

3rd Day. There was brownish discolouration at each area, but no swelling or induration.

4th Day. The arm was normal.

(191) Mr. W. 29 yrs. Puerperal Fever.

T.A.B.&.S - 0.04cc-were injected and each bleb was typical.

2nd Day. Each injection was pinkish-brown in colour and soft and tender but not swollen or indurated. All the areas were alike. The colour was lost on pressure.

3rd Day. There was a faint brownish colour at each area, not swollen or indurated.

4th Day. The arm was normal.

(192) M.P. 10 yrs. Measles.

T.A.B.&.S - 0.04cc-were injected and each bleb was typical.

2nd Day. There was a faint pink oedematous area at each injection. This was slightly swollen and indurated. The colour was lost on pressure. All the areas were alike.

3rd Day. The arm was normal.

(193) T.S. $2\frac{1}{2}$ yrs. Measles.

T.A.B.&.S - 0.04cc-were injected and each bleb was typical.

2nd Day. There was a dark-red area ($\frac{3}{4}$ " in diameter) fading to normal at the margins at each injection. There was slight swelling and tenderness. The colour was only partly lost on pressure. All the areas were alike.

3rd Day. There was a brown, soft area at each injection but no swelling or induration.

4th Day. The arm was normal.

(194) D.W. $3\frac{1}{2}$ yrs. Measles.

T.A.B.&.S - 0.04cc-were injected and each bleb was typical.

2nd Day. There was a pink, oedematous area, ($\frac{1}{2}$ " in diameter at each site of injection. There was swelling and tenderness. The colour was lost on pressure. All the areas were alike.

3rd Day. There were brownish-pink papules ($\frac{1}{4}$ " in diameter), soft and not swollen or indurated.

4th Day. The arm was normal.

(195)

M. M'M. 5 yrs.

Measles.

T.A.B.&.S - 0.04cc-were injected and each bleb was typical.

2nd Day. There was a brownish area ($\frac{1}{2}$ " in diameter) at each injection. There were embedded in a pink oedematous area 3" by 1 $\frac{1}{2}$ ". The area was tender and the colour lost on pressure.

3rd Day. There was a brownish-pink area, soft and not swollen or indurated at each mark. All were alike.

4th Day. The arm was normal.

(196)

R.C. 6 yrs.

Measles.

T.A.B.&.S - 0.04cc-were injected and each bleb was typical.

2nd Day. There was a pinkish papule at each area. Each was raised and tender and oedematous. The colour was not entirely lost on pressure. All the areas were alike.

3rd Day. There was a brownish area at each injection.

4th Day. The arm was normal.

(197)

A.S. 6 yrs.

Measles.

T.A.B.&.S - 0.04cc-were injected and typical blebs were formed.

2nd Day. There was a pinkish-brown area, ($\frac{1}{2}$ " in diameter) at each injection. There was no swelling or induration. All were alike. The colour was lost on pressure.

3rd Day. There was a soft brownish area at each injection but no swelling or induration.

4th Day. The reaction was gone.

(198)

I. M'P. 4 yrs.

Measles.

T.A.B.&.S - 0.04cc-were injected and typical blebs formed.

2nd Day. There was a pinkish area ($\frac{1}{2}$ " in diameter) at each injection. Each was tender and oedematous. The colour disappeared on pressure. All the areas were alike.

3rd Day. There was a reddish-brown area at the 1st injection. The others were smaller and pinkish-brown. There was no swelling or induration.

4th Day. There was a slight brownish area at the 1st. The other areas were normal.

5th Day. The arm was normal.

(199) R.B. 2 yrs. Measles.

T.A.B.&.S - 0.04cc-were injected and typical blebs formed.

2nd Day. There was a pink area at 2nd, 3rd & 4th injections which was swollen and tender. The colour disappeared on pressure. There was a pinkish-white area at the 1st injection with a pink areola.

3rd Day. There was a yellowish colour with a brownish centre at each injection, soft and not swollen or indurated.

4th Day. The arm was normal.

(200) M.D. 2 yrs. Measles.

T.A.B.&.S - 0.04cc-were injected and typical blebs formed.

2nd Day. There was a dull red area ($\frac{1}{2}$ " in diameter) at each injection. Each was swollen and tender. The colour was, lost on pressure. And all the areas were alike.

3rd Day. There was a pinkish-brown area at each injection but no swelling or induration.

4th Day. The arm was normal.

(201) E.M. 5 yrs. Measles.

T.A.B.&.S - 0.04cc-were injected and each bleb was typical.

2nd Day. There was a pinkish-brown area at each mark, $\frac{1}{3}$ " in diameter. There was no swelling or induration. All the areas were alike.

3rd Day. The arm was normal.

(202) J.C. $4\frac{1}{2}$ yrs. Measles.

T.A.B.&. S - 0.04cc-were injected and typical blebs formed.

2nd Day. There was a pinkish, discrete, oedematous area

($\frac{1}{8}$ " in diameter.) at each injection. The colour was lost on pressure. All the areas were alike. There was no swelling.

3rd Day. There were dark-brownish areas but no swelling or induration. All the areas were alike.

4th Day. The brownish colour still persisted.

5th Day. The arm was normal.

(203) W.M. 2 yrs. Measles.

T.A.B.&S - 0.04cc-were injected and typical blebs formed.

2nd Day. There was a pale brownish pink oedematous area at each injection. The colour was slightly deeper at the centre of each macule. The swelling was slight. All the areas were alike. The colour was lost on pressure.

3rd Day. The arm was normal.

(204) A.A. $2\frac{1}{2}$ yrs. Measles.

T.A.B.&S - 0.04cc-were injected. There was a slight haemorrhage at each area.

2nd Day. There were four discrete, brownish area, slightly swollen and indurated. The colour was not lost on pressure. except at the areola round each mark.

3rd Day. There were soft brownish areas - slightly swollen and indurated. All the areas were alike.

4th Day. There was still a faint brownish discolouration, but no swelling or induration at each injection,

5th Day. The arm was normal.

(205) M.A. 5 yrs. Measles.

T.A.B.&S-0.04cc-were injected and typical blebs were formed.

2nd Day. There were four pink, oedematous areas ($\frac{1}{8}$ " in diameter) which were deeper at the centre. The colour was lost on pressure. All the areas were alike.

3rd Day. There was brownish discolouration at each mark but no swelling or induration. All the areas were alike.

4th Day. The arm was normal.

- (206) F.B. 3 yrs. Measles.
T.A.B.&.S - 0.04cc-were injected and typical blebs formed.
2nd Day. There were four brownish-pink, oedematous areas ($\frac{1}{2}$ " in diameter). Each was tender and swollen. The colour was lost on pressure. All the areas were alike.
3rd Day. There was a faint brownish discolouration at each injection.
4th Day. The arm was normal.
- (207) W.R. 2 yrs. Measles.
T.A.B.&.S - 0.04cc-were injected and each bleb was typical.
2nd Day. There was a brownish pink area at each injection but no swelling or induration. The colour was not lost on pressure. All the areas were alike.
3rd Day. The arm was normal.
- (208) J.M. $1\frac{1}{2}$ yrs. Measles.
T.A.B.&.S - 0.04cc-~~were~~ injected and each bleb was typical.
2nd Day. There was a brownish pink area at each injection. There was slight swelling and tenderness. The colour was partly lost on pressure. All the areas were alike.
3rd Day. There was a brownish area at each injection but no swelling or induration.
4th Day. The arm was normal.
- (209) L.M. $1\frac{1}{2}$ yrs. Measles.
T.A.B.&.S - 0.04cc-were injected and each bleb was typical.
2nd Day. There was a pink, oedematous area at each injection. Each was $\frac{3}{4}$ " in diameter and was deeper at the centre of each macule. The colour was lost on pressure. All the areas were alike.
3rd Day. There were pinkish-brown areas, slightly swollen but not indurated.
4th Day. The arm was normal.
- (210) T.C. 1 yr. Measles.

T.A.B.&.S - 0.04cc-were injected and each bleb was typical.

2nd Day. There was a pink, oedematous mark at each injection. At the centre of each the colour was red. The colour was not lost on pressure. All the areas were alike.

3rd Day. There was a brownish area, soft and not swollen or indurated at each mark.

4th Day. The arm was normal.

(211) M.M. 5 $\frac{1}{2}$ yrs. Measles.

T.A.B.&.S - 0.04cc-were injected and each bleb was typical.

2nd Day. There was a pink, oedematous area (3" by 1 $\frac{1}{2}$ ") which was uniform in colour. The colour was lost under pressure. There was slight tenderness and swelling.

3rd Day. The arm was normal.

(212) M.B. 4 yrs. Measles.

T.A.B.&.S - 0.04cc-were injected and each bleb was typical.

2nd Day. There was a dark red, oedematous area at each bleb which was not entirely lost on pressure. All the areas were alike. These were soft, swollen, and tender and only slightly indurated.

3rd Day. There was a reddish-brown area at each injection but no swelling and very slight induration.

4th Day. There was a yellowish brown, soft area, at each injection, but no swelling or induration.

5th Day. The arm was normal.

(213) W.B. 2 yrs. Measles.

T.A.B.&.S - 0.04cc-were injected and typical blebs resulted.

2nd Day. There were four brownish-red areas, with a pink areola round each. The colour disappeared on pressure. There was swelling and tenderness. All marks were alike.

3rd Day. There were four pinkish-brown areas soft and not swollen or indurated.

4th Day. The arm was normal.

(214) M. McC. 3 yrs. Measles.

T.A.B.&.S - 0.04cc-were injected and each bleb was typical.

2nd Day. There was a pink oedematous area (1" in diameter) at each injection. The colour was uniform and was lost on pressure. There was tenderness but no swelling. All the areas were alike.

3rd Day. The arm was normal.

(215) R. McG. 2 yrs. Measles.

T.A.B.&.S - 0.04cc-were injected and each bleb was typical.

2nd Day. There was a pinkish brown area ($\frac{1}{2}$ " in diameter) at each injection. The colour was lost on pressure. All the areas were alike. There was tenderness and slight swelling.

3rd Day. Each area was brownish and not swollen or tender or indurated.

4th Day. The arm was normal.

(216) R.G. 4 yrs. Measles.

T.A.B.&.S - 0.04cc-were injected and each bleb was typical.

2nd Day. There was a pinkish-brown, soft, tender area ($\frac{1}{2}$ " in diameter) at each area. The colour was lost on pressure. All areas were normal.

3rd Day. There was a pinkish-brown area at each injection but no swelling or induration.

4th Day. The arm was normal.

(217) A.G. 2 yrs. Measles.

T.A.B.&.S - 0.04cc-were injected and each bleb was typical except 1st injection which had a slight haemorrhage.

2nd Day. There was purplish area, swollen, hard and indurated at the 1st injection. This colour was not lost on pressure. The other areas were pink and oedematous and lost on pressure.

3rd Day. There was a brown area with a dark centre at the 1st mark, which was slightly swollen and indurated. The other areas were brownish and soft and not swollen or indurated.

4th Day. The arm was normal.

(218) W.G. 4 yrs. Measles.

T.A.B.&.S - 0.04cc-were injected and each bleb was typical.

2nd Day. There was a pinkish, tender, oedematous area at each injection. The colour was lost on pressure. All the areas were alike.

3rd Day. There was a pinkish area at each mark but no induration and very slight swelling.

4th Day. The arm was normal.

(219) A.G. 5 yrs. Measles.

T.A.B.&.S 0.04cc-were injected and typical blebs were formed.

2nd Day. There was a pink area ($\frac{1}{8}$ " in diameter) at each injection. The colour was lost on pressure. The areas were tender and slightly swollen. All the areas were alike.

3rd Day. There was a brown area at each mark but no swelling or induration.

4th Day. The arm was normal.

(220) I.B. $2\frac{1}{2}$ yrs. Measles & Whooping Cough
(convalescent)

T.A.B.&.S (& whooping-cough vaccine)-0.04cc-were injected and 5 typical blebs resulted.

2nd Day. There was a pinkish-brown swollen area at each injection. The colour was lost on pressure. All the areas were alike.

3rd Day. There were yellowish areas, soft and not swollen or indurated.

4th Day. The arm was normal.

(221) C. McK. 3 yrs. Measles & Whooping Cough
(convalescent)

T.A.B.&.S & whooping cough vaccine-0.04cc-were injected and 5 typical blebs resulted.

2nd Day. There were five red, soft, tender areas. The colour was weaker at the edges. It was lost on pressure. There

was no swelling. All the areas were alike.

3rd Day. The colour was still red but there was no swelling or induration and all areas were alike.

4th Day. There was brown discolouration at each mark.

5th Day. The arm was normal.

(222) J.R. 2 yrs. Measles & Whooping Cough (convalescent)

T.A.B.&.S & Bordet's vaccine - 0.04cc-were injected and 5 typical blebs resulted.

2nd Day. There was a pinkish papule (1/3" in diameter) at each injection. All the areas were alike. The colour was lost on pressure.

3rd Day. There were reddish-brown papules which were lost on pressure but were not swollen or indurated. All were alike.

4th Day. The arm was normal.

(223) J.M. 2 yrs. Measles & Whooping Cough.

T.A.B.&.S & Bordet's vaccine - 0.04cc-were injected and each bleb was typical.

2nd Day. There was a soft, pinkish area at each injection. Each was 1/3" in diameter. The colour was lost on pressure. All the areas were alike.

3rd Day. There was a brownish papule at each area but no induration.

4th Day. The arm was normal.

(224) J.D. 4 yrs. Measles, Whooping Cough & Cancrum Oris.

T.A.B.&.S & Bordet's Vaccine - 0.04cc-were injected and typical blebs were formed.

2nd Day. There was a soft pink, oedematous area at each injection. There was swelling and tenderness. The colour was lost on pressure. All the areas were alike.

3rd Day. The arm was normal.

- (225) G.B. 5 yrs. Diphtheria.
T.A.B.&.S - 0.04cc-were injected and typical blebs resulted.
2nd Day. There was a pink, oedematous area ($1\frac{1}{3}$ " in diameter) at each injection. Each area was tender. The colour was lost on pressure. All the areas were alike.
3rd Day. There was a pinkish-brown area at each injection. There was no swelling or induration.
4th Day. The arm was normal.
- (226) J.N. 5 yrs. Measles.
T.A.B.&.S - 0.04cc-were injected and each bleb was typical.
2nd Day. There was a diffuse pink area $\frac{3}{4}$ " in diameter, at each injection. There was tenderness and swelling. The colour was lost on pressure. The colour was deepest at the centre of each macule. All the areas were alike.
3rd Day. There was a brown area at each mark, not swollen or indurated.
4th Day. The arm was normal.
- (227) B.B. 7 yrs. Diphtheria.
T.A.B.&.S - 0.04cc-were injected and typical blebs formed.
2nd Day. There was a pink, oedematous area (4" by 2"). There was slight swelling and tenderness. The colour was slightly deeper at each injection. The colour was lost on pressure. All the areas were alike.
3rd Day. There was pinkish-brown area at each injection but no swelling or induration.
4th Day. The brownish swelling persisted.
5th Day. The arm was normal.
- (228) W.M. 7 yrs. Diphtheria.
T.A.B.&.S - 0.04cc-were injected and typical blebs were formed.
2nd Day. The 1st area had a pink oedematous mark about 1" in diameter. There was slight swelling and tenderness. The centre was darker in colour and was lost on pressure.

The other areas were smaller and brownish-pink but not swollen

3rd Day. All the areas were brownish in colour. There was no swelling or induration. The 1st injection was more extensive than the others.

4th Day. The arm was normal.

(229)

A.H. 5 yrs.

Diphtheria.

T.A.B.&.S - 0.04cc-were injected and typical blebs were formed.

2nd Day. There was a pink oedematous area (4" by 3") with darker areas at each injection. There was no swelling and the colour was lost on pressure. All the areas were alike

3rd Day. There was a pinkish brown area at each injection but no swelling or induration.

4th Day. There was still a faint brownish discolouration.

5th Day. The arm was normal.

(230)

B.T. 7 yrs.

Diphtheria.

T.A.B.&.S - 0.04cc-were injected and each bleb was typical.

2nd Day. There was a diffuse dark-red oedematous area at each injection. The colour gradually merged into normal. Each macule was $\frac{1}{2}$ " in diameter. The colour was lost on pressure.

3rd Day. There were brownish areas, soft and not swollen or indurated. All the areas were alike.

4th Day. There was still a faint brownish discolouration.

5th Day. The arm was normal.

(231)

G.H. 9 yrs.

Diphtheria.

T.A.B.&.S - 0.04cc-were injected and slightly haemorrhagic blebs resulted.

2nd Day. There was a pink area, oedematous, and tender at each injection. Each area had a centre which was purplish in colour. This colour was not lost on pressure. All the areas were alike.

3rd Day. There was a brownish-purple area at each injection about $\frac{1}{2}$ " in diameter. There was swelling and slight induration.

4th Day. There was still some brownish discolouration but

no swelling or induration.

5th Day. The arm was normal.

(232) W.C. 9 yrs. Diphtheria.

T.A.B.&.S - 0.04cc-were injected and typical blebs were formed.

2nd Day. There was a pink, oedematous area 1" in diameter at each injection. The colour was deepest at the centre of each. The colour was not entirely lost on pressure. There was swelling and tenderness.

3rd Day. There was a pink area, $\frac{1}{2}$ " in diameter, which was not entirely lost on pressure. All the marks were alike.

4th Day. There were brownish areas without swelling or
induration.

5th Day. The arm was normal.

(233) P.T. 8 yrs. Diphtheria.

T.A.B.&.S - 0.04cc-were injected and typical blebs formed.

2nd Day. There was a faint pinkish-brown area at each injection. There was slight oedema and tenderness. The colour became brown on pressure. All the areas were alike.

3rd Day. There was brownish discolouration at each mark but no swelling or induration.

4th Day. The arm was normal.

(234) F.S. 9 yrs. Diphtheria.

T.A.B.&.S - 0.04cc-were injected and each bleb was typical.

2nd Day. There was a dull red area (1" in diameter) at each injection. There was slight oedema and tenderness. The colour was lost on pressure. All the areas were alike.

3rd Day. There was brownish discolouration but no swelling or induration.

4th Day. The arm was normal.

(255) R.E. 10 yrs. Diphtheria.

T.A.B.&.S - 0.04cc-were injected. There was considerable haemorrhage from each bleb.

2nd Day. There was a small red papule ($\frac{1}{4}$ " in diameter) at each injection. The colour was not lost on pressure. The swelling was hard. There was a pink areola round these papules which disappeared on pressure. All the areas were alike.

3rd Day. There was a reddish papule at each area and a faint areola.

4th Day. There was a brownish-red papule at each area without any areola and with very slight induration.

5th Day. There were yellowish-brown areas, but no swelling or induration.

6th Day. The arm was normal.

(256) F.R. 8 yrs. Diphtheria.

T.A.B.&.S - 0.04cc-were injected and each bleb was typical.

2nd Day. There were red areas $\frac{1}{4}$ " in diameter, with a pink areola round each. There was some swelling and tenderness. The colour was lost on pressure. All the areas were alike.

3rd Day. There was brownish discolouration but no swelling or induration at each injection.

4th Day. The arm was normal.

(257) J.W. 14 yrs. Diphtheria.

T.A.B.&.S - 0.04cc-were injected and typical blebs were formed.

2nd Day. There were four red areas ($\frac{1}{4}$ " in diameter) with a pinkish areola round each. Each area was tender and swollen, but was lost on pressure. All the areas were alike.

3rd Day. There was pinkish-brown discolouration at each area but no swelling or induration.

4th Day. The arm was normal.

(238) J.G. 12 yrs. Diphtheria.

T.A.B.&.S - 0.04cc-were injected and typical blebs were formed.

2nd Day. There was a dull reddish-brown area at each injection. There was no swelling and slight tenderness. The colour became brown on pressure. All the areas were alike.

3rd Day. There was a brownish discolouration at each area but no swelling or induration.

4th Day. The arm was normal.

(239) R.C. 7 yrs. Diphtheria.

T.A.B.&.S - 0.04cc-were injected and each bleb was typical.

2nd Day. There was a diffuse area 1" in diameter at each injection. The colour was deepest at the centre. The colour was lost on pressure. There was slight swelling and tenderness. All the areas were alike.

3rd Day. There were brownish areas with no swelling or induration.

4th Day. The arm was normal.

(240) R.A. 7 yrs. Diphtheria.

T.A.B.&.S - 0.04cc-were injected and typical blebs were formed.

2nd Day. There were 1" areas of pink colour. Each was darkest at the centre of the area. There was slight swelling and induration. The colour was lost on pressure. All the areas were alike.

3rd Day. There was a pinkish-brown colour at each area but no swelling or induration.

4th Day. The arm was normal.

(241) T.G. 9 yrs. Diphtheria.

T.A.B.&.S - 0.04cc-were injected and typical blebs were formed.

2nd Day. There was a diffuse pink, oedematous area (1" in diameter) at each injection. The colour was deepest at the centre and was lost on pressure. All the areas were alike and

there was no swelling or induration.

3rd Day. There was a pinkish-brown colour at each injection but no swelling or induration. All the areas were alike.

4th Day. There was a brownish colour persisting at the injections. But no swelling or induration.

5th Day. The arm was normal.

(242)

B.D. 11 yrs.

Diphtheria.

T.A.B.&.S - 0.04cc-were injected and typical blebs were formed.

2nd Day. There was a diffuse, pink, oedematous area at each injection with a brownish central part. Each was slightly swollen and tender. The colour (except the central brownish-pink area) was lost on pressure. All the areas were alike.

3rd Day. There was a pinkish-brown area at each injection. All the areas were alike. The colour became brown on pressure. There was no swelling or induration.

4th Day. There was still a faint-brownish discolouration.

5th Day. The arm was normal.

(243)

W. McR. 14 yrs.

Diphtheria & Scabies.

T.A.B.&.S - 0.04cc-were injected and typical blebs resulted.

2nd Day. There was a faint brownish-pink area at each injection. Each was $\frac{1}{2}$ " in diameter. There was no swelling or oedema. The pink colour was lost on pressure. All the areas were alike.

3rd Day. There was a brownish coloured area at each injection but no swelling or induration.

4th Day. The arm was normal.

(244)

R.W. 9 yrs.

Diphtheria.

T.A.B.&.S - 0.04cc-were injected and typical blebs formed.

2nd Day. There was a red, oedematous area at each site. Each was tender and swollen. There was a white area at the centre of the 1st mark. Each mark was $\frac{1}{2}$ " in diameter. There was no induration and the colour was lost on pressure.

3rd Day. There was a pinkish-brown area at each injection but no swelling or induration. All the marks were alike.

4th Day. There was a brownish discolouration at each mark.

5th Day. The arm was normal.

(245)

W.C. 8 yrs.

Diphtheria.

T.A.B.&.S - 0.04cc-were injected and typical blebs resulted.

2nd Day. There was a pink oedematous area (1" in diameter) at each injection. The colour gradually faded into normal. The colour was deeper at the centre of each mark and it was lost on pressure. There was slight swelling and tenderness, at each.

3rd Day. There was a slight brownish discolouration at each mark but no swelling or induration.

4th Day. The arm was normal.

(246)

F.M. 1 yr.

Diphtheria.

T.A.B.&.S - 0.04cc-were injected and typical blebs resulted.

2nd Day. Each bleb had a pinkish-brown area, soft and not swollen or tender. There was no induration. The colour was not entirely removed by pressure. All the areas were alike.

3rd Day. There was a slight brownish discolouration at each mark but no swelling or induration.

4th Day. The arm was normal.

(247)

C.J. 5 yrs.

Measles.

T.A.B.&.S - 0.04cc-were injected and typical blebs formed.

2nd Day. There was a pink area ($\frac{1}{2}$ " in diameter) at each injection. There was slight swelling and tenderness. The colour was lost on pressure. All the areas were alike.

3rd Day. There was a faint brownish discolouration at each injection but no swelling or induration.

4th Day. The arm was normal.

(248) J.M. 4 yrs. Diphtheria.

T.A.B.&.S - 0.04cc-were injected and typical blebs were formed.

2nd Day. There was a pinkish-brown area ($\frac{1}{2}$ " in diameter) at each injection. Each area was soft and tender and was lost on pressure. All the areas were alike. There was slight swelling.

3rd Day. There was slight brownish colour but no swelling or induration.

4th Day. The arm was normal.

(249) M.S. $1\frac{1}{2}$ yrs. Measles & Pneumonia.

T.A.B.&.S - 0.04cc-were injected and typical blebs were formed.

2nd Day. There was a soft, brownish pink area ($\frac{1}{2}$ " in diameter) at each injection. There was no swelling or induration. All the areas were alike. The colour became brown on pressure.

3rd Day. There was a faint brownish discolouration at each injection, but no swelling or induration.

4th Day. The arm was normal.

(250) R.T. 2 yrs. Measles.

T.A.B.&.S - 0.04cc-were injected and typical blebs formed.

2nd Day. There was a reddish brown area ($\frac{1}{2}$ " in diameter) at each injection. Each area consisted of a reddish brown centre, $\frac{1}{2}$ " in diameter, with a pink areola, 1" in diameter. There was a slight swelling and tenderness. The areola was lost on pressure. All the areas were alike.

3rd Day. There were brownish areas but no swelling or induration.

4th Day. The arm was normal.

(251) G.M. 6 yrs. Measles.

T.A.B.&.S - 0.04cc-were injected and typical blebs formed.

2nd Day. There was a pink, oedematous area (1" in diameter) at each injection. The colour was deeper at the centre of

each macule. There was slight swelling and tenderness. All the areas were alike. The colour was lost on pressure.

3rd Day. There was a reddish-brown area at each mark but no swelling or induration.

4th Day. There was a faint brownish discolouration at each mark.

5th Day. The arm was normal.

(252)

G.R. 7 yrs.

Measles.

T.A.B.&.S - 0.04cc-were injected and typical blebs were formed.

2nd Day. There was at each injection a diffuse pink area ($\frac{3}{4}$ " in diameter) which was deepest in colour at the centre. There was some oedema and tenderness. The colour was lost on pressure. All the areas were alike.

3rd Day. There was a faint brownish discolouration at each area, but no swelling or induration.

4th Day. The arm was normal.

(253)

R.S. 3 yrs.

Measles.

T.A.B.&.S - 0.04cc-were injected and each bleb was typical.

2nd Day. There was a diffuse pink, oedematous area at each injection. Each was $\frac{3}{4}$ " in diameter. The colour was deepest at the centre. The colour was lost on pressure. All the areas were alike.

3rd Day. Each area had a pinkish-brown colour but was not swollen or indurated.

4th Day. The arm was normal.

(254)

E.B. 4 yrs.

Measles.

T.A.B.&.S - 0.04cc-were injected and typical blebs formed.

2nd Day. There was a pinkish-brown area ($\frac{1}{2}$ " in diameter) at each injection. There was at each, swelling and tenderness. The colour was not entirely lost on pressure. All the areas were alike.

3rd Day. There was a slight brownish discolouration at each injection but no swelling or induration.

4th Day. The arm was normal.

(255) P.A. 2 yrs. Measles.

T.A.B.&.S - 0.04cc-were injected and each bleb was typical.

2nd Day. There was a pink area ($\frac{1}{2}$ " in diameter) at each injection. Each was pink and oedematous. The colour was lost on pressure. All the areas were uniform in colour.

3rd Day. There was a slight brownish discolouration at each area but no swelling or induration.

4th Day. The arm was normal.

(256) M.D. 2 yrs. Measles.

T.A.B.&.S - 0.04cc-were injected and typical blebs resulted.

2nd Day. There was a soft brownish-pink area at each injection which was not lost on pressure. All the areas were alike. There was no swelling or induration.

3rd Day. The arm was normal.

(257) T.A. 4 yrs. Measles.

T.A.B.&.S - 0.04cc-were injected and each bleb was typical.

2nd Day. There were four faint pinkish-brown areas, $\frac{1}{3}$ " in diameter. Each was oedematous and tender. The colour was lost on pressure. All the areas were alike.

3rd Day. The arm was normal.

(258) G.P. 2 yrs. Measles.

T.A.B.&.S - 0.04cc-were injected and typical blebs were formed.

2nd Day. There were four pinkish-brown areas - oedematous and tender. Each was soft. Each was $\frac{1}{2}$ " in diameter. The colour was partly lost on pressure. All the areas were alike.

3rd Day. The arm was normal.

(259) M.G. 2 yrs. Measles.

T.A.B.&S. - 0.04cc-were injected and each bleb was typical.

2nd Day. There were four inflamed areas, $\frac{1}{8}$ " in diameter. Each was pinkish-red in colour. There was swelling and tenderness. The colour was not entirely lost on pressure. All the areas were alike.

3rd Day. There was a brownish area at each injection, soft and not swollen or indurated.

4th Day. The arm was normal.

(260) H.G. 2 yrs. Measles.

T.A.B.&S - 0.04cc-were injected and typical blebs were formed.

2nd Day. There was a bright pink area, $\frac{1}{8}$ " in diameter around each injection. The colour was deepest at the centre. There was oedema and swelling. The colour was lost on pressure. All the areas were alike.

3rd Day. There was a pinkish-brown area at each injection, There was no swelling or induration.

4th Day. There was still some brownish discolouration.

5th Day. The arm was normal.

(261) H.J. 4 yrs. Measles.

T.A.B.&S - 0.04cc-were injected and a slight degree of haemorrhage at the 1st and 3rd injections.

2nd Day. There was a purplish area at the 1st & 3rd injections. Each was tender. The colour was not lost on pressure. There was a pink areola which was lost on pressure. There was some induration and swelling at each. The other areas had pink, oedematous macules which were lost on pressure.

3rd Day. There were raised papules $\frac{1}{8}$ " in diameter which were not affected by pressure. They were reddish-brown in colour and slightly indurated.

4th Day. There were smaller brownish papules, now soft and slightly indurated.

5th Day. The colour was fainter.

6th Day. The arm was normal.

- (262) M.R. 5 yrs. Scarlet Fever.
T.A.B.&.S - 0.04cc-were injected and each bleb was typical.
2nd Day. There was a general, diffuse, pink oedematous area, 4" by 2", with the colour deepest at each injection. There was swelling and induration. The colour was lost on pressure.
3rd Day. There was brownish discolouration at each area but no swelling or induration. All the areas were alike.
4th Day. The arm was normal.
- (263) H. McG. 32 yrs. Scarlet Fever.
T.A.B.&.S - 0.04cc-were injected and typical blebs formed.
2nd Day. There was a tender, pink, oedematous area about 1" in diameter at each injection. The colour was lost on pressure. All the areas were alike.
3rd Day. There was a brownish area at each injection but no swelling or induration.
4th Day. The arm was normal.
- (264) B.B. 4 yrs. Scarlet Fever.
T.A.B.&.S - 0.04cc-were injected and typical blebs were formed.
2nd Day. There was a large pink, oedematous area, 3" by 1½", with four brownish-pink papules in it. There was no swelling or induration. The colour was lost on pressure.
3rd Day. There was slight brownish discolouration but no swelling or induration.
4th Day. The arm was normal.
- (265) M.S. 9 yrs. Scarlet Fever.
T.A.B.&.S - 0.04cc-were injected and each bleb was typical.
2nd Day. There was a pink area ½" in diameter at each injection. These were deeper in colour at their centres. There was slight swelling and tenderness. All the areas were alike. The colour was lost on pressure.
3rd Day. There was a slight discolouration, but no

swelling or induration.

4th Day. The arm was normal.

(266)

M.H. 18 yrs.

Scarlet Fever.

T.A.B.&.S - 0.04cc-were injected and typical blebs formed.

2nd Day. There were four pink, oedematous areas, 1" in diameter, with brownish-pink central parts. There was slight swelling and tenderness. The colour was lost on pressure except at the brown, central area. All the marks were alike.

3rd Day. There were faint brown areas, soft and not swollen or indurated.

4th Day. The arm was normal.

(267)

M.P. 13 yrs.

Scarlet Fever.

T.A.B.&.S - 0.04cc-were injected and typical blebs were formed.

2nd Day. There was a pink, swollen area at each injection about $\frac{1}{2}$ " in diameter. The edges were sharply defined but the area was not tender. The colour was uniform and lost on pressure. All the areas were alike.

3rd Day. There was a brownish-pink area at each injection, not swollen or indurated.

4th Day. The arm was normal.

(268)

J. McN. 8 yrs.

Scarlet Fever.

T.A.B.&.S - 0.04cc-were injected and each bleb was typical.

2nd Day. There were four pink, oedematous areas, each was $\frac{3}{4}$ " in diameter. There was deeper colour at the centre of each which faded to normal at the periphery. The colour was lost on pressure. There was swelling and tenderness. All the areas are alike.

3rd Day. There were four pink, swollen areas which lost their colour on pressure. All the areas were alike. There was no induration.

4th Day. There was brownish induration but no swelling or induration.

5th Day. The arm was normal.

(269) B. McD. 3 yrs. Scarlet Fever.

T.A.B.&.S - 0.04cc-were injected and each bleb was typical.

2nd Day. There was a pink, oedematous area $\frac{1}{2}$ " in diameter at each injection. The colour faded on pressure. The periphery was fainter in colour than the centre. There was tenderness.

3rd Day. There was a soft brownish area at each injection ($\frac{1}{4}$ " in diameter). There was no swelling or induration.

4th Day. The arm was normal.

(270) J. McG. 4 yrs. Scarlet Fever.

T.A.B.&.S - 0.04cc-were injected and typical blebs resulted.

2nd Day. There was a pink, oedematous area (1" in area) at each bleb. The colour was slightly deeper at each centre. There was some swelling and tenderness. All the areas were alike. The colour was lost on pressure.

3rd Day. There was a slight brownish discolouration at each injection, but no swelling or induration.

4th Day. The arm was normal.

(271) M. McC. 3 yrs. Scarlet Fever.

T.A.B.&.S - 0.04cc-were injected and typical blebs resulted.

2nd Day. There were four soft, tender, pink, oedematous areas, 1" in diameter, with darker colour at the centre than at the margin. The colour was lost on pressure. All the areas were alike.

3rd Day. There were soft, brown areas, but no swelling or induration.

4th Day. The arm was normal.

(272) A. McL. 4 yrs. Scarlet Fever.

T.A.B.&.S - 0.04cc-were injected and typical blebs resulted.

2nd Day. There was a pink area ($\frac{1}{2}$ " in diameter) at each injection. Each was tender and swollen. The colour was weakest at the periphery and was lost on pressure. All the areas were alike.

3rd Day. There was a soft, brownish area at each injection but no swelling or induration. All the areas were alike.

4th Day. The arm was normal.

(273) I.H. 6 yrs. Scarlet Fever.

T.A.B.&.S - 0.04cc - were injected and typical blebs resulted.

2nd Day. There was a brownish pink area at each injection with sharply defined edges. There was no swelling or induration. All the areas were uniform in colour and $\frac{1}{2}$ " in diameter.

3rd Day. There was a faint brownish discolouration at each mark but no swelling or induration.

4th Day. The arm was normal.

(274) J.W. 6 yrs. Scarlet Fever.

T.A.B.&.S - 0.04cc - were injected and typical blebs resulted.

2nd Day. There was a pink, oedematous area, $\frac{1}{2}$ " in diameter at each bleb. Each area was soft and tender. The colour was reddish at the centre and was lost on pressure. All the areas were alike.

3rd Day. There was brownish discolouration at each area but no swelling or induration.

4th. Day. The arm was normal.

(275) J.M. 9 yrs. Scarlet Fever.

T.A.B.&.S - 0.04cc - were injected and typical blebs resulted.

2nd. Day. There were four oedematous areas - $\frac{1}{4}$ " in diameter. There was swelling and tenderness with a surrounding areola of pink. All the areas were alike and were lost under pressure.

3rd. Day. There were pinkish-brown areas, soft and neither swollen nor indurated.

4th. Day. The arm was normal.

(276) J.G. $3\frac{1}{2}$ yrs. Scarlet Fever.

T.A.B.&.S - 0.04cc - were injected and typical blebs were formed.

2nd. Day. There was a pink, oedematous area, deeper in colour at each centre. Each area was slightly swollen and tender. The colour was lost on pressure. All the areas were alike.

3rd. Day. There were four pinkish-brown areas, soft and not swollen or indurated, which became brown on pressure.

4th. Day. There was still a slight brownish area at each injection.

5th. Day. The arm was normal.

(277) J. McL. 2 yrs.

Scarlet Fever.

T.A.B.&.S - 0.04cc - were injected and typical blebs were formed.

2nd. Day. There were four pink, oedematous areas $\frac{3}{4}$ " in diameter. Each was soft and tender. There was slight swelling. The colour was darkest at each centre and was lost on pressure. All the areas were alike.

3rd. Day. There were pinkish areas, swollen and with whitish centres at the 1st & 3rd injections. The colour was lost on pressure. There was no induration. The other areas were gone.

4th. Day. There was a faint brownish discolouration, but no swelling or induration at either the 1st or 2nd.

5th. Day. The arm was normal.

(278) E.F. 10yrs.

Scarlet Fever.

T.A.B.&.S - 0.04cc - were injected and typical blebs resulted.

2nd. Day. There were 4 soft, pink areas but no swelling. The colour gradually merged into normal at each periphery. The colour was lost on pressure. All the areas were alike.

3rd. Day. There were pinkish-brown areas - $\frac{1}{2}$ " in diameter which were soft and not indurated or tender or swollen.

4th. Day. The arm was normal.

279) L.McL. 9 yrs.

Scarlet Fever.

T.A.B.&.S - 0.04cc - were injected and each bleb was typical.

2nd. Day. There was a red oedematous area at each injection. Each was $\frac{1}{3}$ " in diameter with a pink areola. There was a slight swelling and tenderness. The colour was lost on pressure. All the areas were alike.

3rd. Day. There was a pinkish-brown area at each injection which was not swollen or indurated.

4th. Day. The arm was normal.

(280)

M.G. 8 yrs.

Scarlet Fever.

T.A.B.&.S - 0.04cc - were injected and typical blebs were formed.

2nd. Day. There was a pink. oedematous area ($4''$ by $1\frac{1}{2}''$) on the volar aspect of the forearm. There was slight swelling and tenderness. The colour was deepest at the actual injections. The colour was lost on pressure.

3rd. Day. There was a soft, pinkish-brown area at each injection but no tenderness or swelling or induration. All the areas were alike.

4th. Day. The arm was normal.

(281)

J.M. 15 yrs.

Scarlet Fever.

T.A.B.&.S - 0.04cc - were injected and typical blebs were formed.

2nd. Day. There was a pink, oedematous area, $\frac{1}{2}''$ in diameter, at each injection. The colour deepened at the centre. There was swelling and tenderness. The colour was lost on pressure. All the areas were alike.

3rd. Day. There was a pinkish-brown slightly swollen area at each injection, but no induration. All the areas were alike.

4th. Day. There were brownish areas, not swollen or indurated.

5th. Day. The arm was normal.

(282)

M.L. 6 yrs.

Scarlet Fever.

T.A.B.&.S - 0.04cc - were injected and typical blebs were formed.

2nd. Day. There was a red area ($\frac{1}{4}''$ in diameter) round the

needle tract. Each was tender and slightly swollen. The colour was lost on pressure. There was no pink areola. The areas were alike.

3rd. Day. The papules were reddish-brown, but not indurated.

4th. Day. There were areas of brownish discolouration but no swelling or induration.

5th. Day. The arm was normal.

(283)

M.W. 6 yrs.

Scarlet Fever.

T.A.B.&.S - 0.04cc - were injected and typical blebs were formed.

2nd. Day. There was a pink area (4" by 2") which was swollen and tender. The colour was red at the centres, and not entirely lost on pressure.

3rd. Day. There was a brownish area at each injection but no swelling or induration.

4th. Day. The arm was normal.

(284)

M.McK. 7 yrs.

Scarlet Fever.

T.A.B.&.S - 0.04cc - were injected and typical blebs were formed.

2nd. Day. There was a pink papule ($\frac{1}{8}$ " in diameter) at each bleb. They were tender and not completely lost on pressure. All the areas were alike.

3rd. Day. There was a pinkish-brown area, not swollen or indurated.

4th. Day. The arm was normal.

(285)

B.R. 5 yrs.

Scarlet Fever.

T.A.B.&.S - 0.04cc - were injected and each bleb was typical.

2nd. Day. There was a pink oedematous area (4" by 2") which was soft and tender and slightly swollen. The colour was duller at each injection. The colour was lost on pressure.

3rd. Day. There was a pinkish-brown area at each injection not swollen or indurated. All the areas were alike

5th Day. The arm was normal.

(286) A.C. 6 yrs. Scarlet Fever.

T.A.B.&.S - 0.04cc-were injected and there was a slight haemorrhage from each.

2nd Day. There was a dusky-red area of discolouration at each injection with swelling and induration. There was tenderness. The colour was not lost on pressure. All the areas were alike.

3rd Day. There was a reddish-brown area at each injection which was swollen and not lost on pressure.

4th Day. There was brownish discolouration with a yellow areola at each mark but no swelling or induration.

5th Day. The arm was normal.

(287) S.D. 4 yrs. Scarlet Fever.

T.A.B.&.S - 0.04cc-were injected and typical blebs formed.

2nd Day. There was a soft, pink, oedematous area, 1/3" in diameter, at each injection, but no swelling or induration. The colour was lost on pressure. All the areas were alike.

3rd Day. There was a brownish-pink area at each injection but no swelling or induration.

4th Day. The arm was normal.

(288) N.S. 7 yrs. Scarlet Fever.

T.A.B.&.S - 0.04cc-were injected and typical blebs were formed.

2nd Day. There were 4 pink, oedematous areas (1" in area). Each was soft and tender with a dull red area 1/3" in diameter at its centre. There was slight swelling. The colour was lost on pressure. All the areas were alike.

3rd Day. There were 4 pinkish brown areas which were slightly swollen but not indurated. All the areas were alike.

4th Day. There was a faint brownish discolouration but no swelling or induration.

5th Day. The arm was normal.

(289)

C.C. 4 yrs.

Scarlet Fever.

T.A.B.&.S - 0.04cc-were injected and typical blebs were formed.

2nd Day. There was a pink, oedematous area ($\frac{3}{4}$ " in diameter) at each injection, There was slight swelling and tenderness. The colour faded to normal at the periphery and was lost on pressure. All the areas were alike.

3rd Day. There were pink areas, still slightly deeper at the centre. There was no swelling or induration.

4th Day. There was a faint brownish discolouration but no swelling or induration.

5th Day. The arm was normal.

(290)

B.R. 5 yrs.

Scarlet Fever.

T.A.B.&.S - 0.04cc-were injected and typical blebs were formed.

2nd Day. There was a slightly pink, oedematous area at each injection about $\frac{1}{2}$ " in diameter. The colour was uniform in each. The colour was lost on pressure. There was slight swelling and tenderness. All the areas were alike.

3rd Day. The arm was normal.

(291)

C. McK. 3 yrs.

Scarlet Fever.

T.A.B.&.S - 0.04cc-were injected and typical blebs resulted.

2nd Day. There was a pink, oedematous area, $\frac{3}{4}$ " in diameter at each bleb. The colour was deeper at its centre. There was slight swelling and tenderness. The colour was lost on pressure. All the areas were alike.

3rd Day. There was a brownish area at each bleb but no swelling or induration. All the areas were alike.

4th Day. The arm was normal.

(292)

I.T. 10 yrs.

Scarlet Fever.

T.A.B.&.S - 0.04cc-were injected and typical blebs formed.

2nd Day. There was a pink, oedematous area (4" by 2") with slightly deeper colour at each injection. There was slight swelling and tenderness. The colour was lost on pressure.

All the areas were alike.

3rd Day. The arm was normal.

(293) E. McL. 10 yrs. Scarlet Fever.

T.A.B.&S. - 0.04cc-were injected and typical blebs were formed.

2nd Day. There were 4 pink, oedematous areas, $\frac{1}{2}$ " in diameter, with deeper colour at each centre. There was slight swelling and tenderness. The colour was lost on pressure.

3rd Day. There was a slight brownish discolouration at each area but no swelling or induration. All the areas were alike.

4th Day. The arm was normal.

(294) M. McA. 9 yrs. Scarlet Fever.

T.A.B.&S - 0.04cc were injected and typical blebs were formed.

2nd Day. There was a pale pink, oedematous area, $\frac{3}{4}$ " in diameter. Each was soft and tender and slightly swollen. Each area was deeper in colour at the centre, and faded at the periphery. The colour was lost on pressure. All the areas were alike.

3rd Day. There was a brownish, pink area at each injection. Each was soft and not swollen or indurated.

4th Day. The arm was normal.

(295) N.M. 9 yrs. Scarlet Fever.

T.A.B.&.S - 0.04cc-were injected. Each bleb was typical.

2nd Day. There was a pink, oedematous area 1" in diameter at each bleb. The colour was deeper at the centre of each. The colour was lost on pressure. There was swelling and tenderness. All the areas were alike.

3rd Day. There was a pinkish-brown area ($\frac{1}{4}$ " in diameter) at each area. There was a slight swelling. The colour disappeared on pressure. All the areas were alike.

4th Day. The arm was normal.

(296)

M. McP. 17 yrs.

Scarlet Fever.

T.A.B.&.S - 0.04cc-were injected and typical blebs were formed.

2nd Day. There was a large oedematous area like an urticarial rash (5" by 3") on the forearm. This was tender and had a brownish tint at each injection. The colour was lost on pressure. There was no general reaction.

3rd Day. There was a pinkish-brown area ($\frac{1}{4}$ " in diameter) at each injection. These were not swollen or indurated. Distally, at the wrist, there was an urticarial blotch, 3" in diameter, which was tender and lost on pressure.

4th Day. The arm was normal.

(297)

M.H. 11 yrs.

Scarlet Fever

T.A.B.&.S - 0.04cc-were injected and typical blebs were formed.

2nd Day. There was a pink, oedematous area (4" by $1\frac{1}{2}$ ") which was tender. The edge was not well defined. The colour was deepest at each centre and gradually merged into normal at the periphery. The colour was not entirely lost on pressure. There was slight swelling.

3rd Day. There was brownish discolouration at each injection but no swelling or induration.

4th Day. The arm was normal.

(298)

F.L. 8 yrs.

Scarlet Fever.

T.A.B.&.S - 0.04cc-were injected and each bleb was typical.

2nd Day. There was a pink, oedematous area (1" in diameter) at each injection. The colour was red at each centre and gradually faded to normal, at each edge. The area was soft and tender and its colour was lost on pressure. All the areas were alike.

3rd Day. There were reddish-brown areas, not swollen or indurated and becoming brown on pressure.

4th Day. The arm was normal.

(299)

J.C. 7 yrs.

Scarlet Fever.

T.A.B.&.S. - 0.04cc-were injected and typical blebs were formed.

2nd Day. There was a blotch of pink (4" by 2") with deeper marks at each injection. There was slight swelling. The colour was lost on pressure. There was slight swelling and tenderness. All the areas were alike.

3rd Day. There was a pink, slightly swollen area at each area, but no swelling or induration.

4th Day. The arm was normal.

(300)

N.L. 6 yrs.

Scarlet Fever.

T.A.B.&.S - 0.04cc-were injected and typical blebs resulted.

2nd Day. There was a pink, oedematous area (3" by 2") with slightly brownish areas at each injection. It was slightly tender and swollen. The colour was lost on pressure.

3rd Day. There was no swelling or induration or discolouration.

(301)

J.L. 5 yrs.

Scarlet Fever.

T.A.B.&.S - 0.04cc-were injected and typical blebs resulted.

2nd Day. There was a pink, oedematous area ($\frac{1}{2}$ " in diameter) at each injection. Each was swollen and tender and deeper in colour at its centre. All the areas were alike.

3rd Day. There was a soft brownish area at each injection. Each was soft and not swollen or indurated.

4th Day. The arm was normal.

(302)

R.K. 7 yrs.

Measles.

T.A.B.&.S - 0.04cc-were injected and typical blebs resulted.

2nd Day. There were four bright pink, oedematous areas ($\frac{3}{4}$ " in diameter). Each was swollen and tender and lost on pressure. All the areas were alike.

3rd Day. There was a pinkish-brown area, soft and not swollen or indurated. The colour was not entirely lost on pressure. All the areas were alike.

4th Day. The arm was normal.

(303)

S. MOL. 6 yrs.

Measles.

T.A.B.&.S - 0.04cc - were injected and typical blebs were formed.

2nd Day. There were four pink, oedematous area, ($\frac{1}{2}$ " in diameter) which were swollen and tender. The colour was deepest at the centre and was lost on pressure. All the areas were alike.

3rd Day. There were brownish pink areas ($\frac{1}{4}$ " in diameter). There was no swelling or induration.

4th Day. The arm was normal.

(304) A.B. 6 yrs. Cerebrospinal Fever (convalescent)

T.A.B.&.S - 0.04cc - were injected and typical blebs were formed.

2nd Day. There was a pink, oedematous area at each bleb. Each was $\frac{3}{4}$ " in diameter and was soft, tender and swollen. The colour was deepest at the centre of each and was lost on pressure. All the areas were alike.

3rd Day. There was a pinkish-brown area at each mark but no swelling or induration.

4th Day. The arm was normal.

(305) H. McK. 14 yrs. Cerebrospinal Fever (acutely fatal)

T.A.B.&.S - 0.04cc - were injected and typical blebs resulted.

2nd Day. There were 4 pink oedematous areas, each 1" in diameter. Each was deepest in colour at its centre. There was swelling and tenderness. The colour was lost on pressure. All the areas were alike.

3rd Day. There was a pinkish-brown area at each injection but no swelling or induration.

4th Day. The arm was normal.

(306) G.S. 7 yrs. Measles.

T.A.B.&.S - 0.04cc - were injected and each bleb was typical.

2nd Day. There was a pinkish-brown colour at each injection. Each was slightly oedematous and tender. The colour became brown on pressure. All the areas were alike.

3rd Day. There was a faint brownish discolouration at each mark.

4th Day. The arm was normal.

(307) J.L. 16 yrs.

Measles.

T.A.B.&.S -0.04cc-were injected and typical blebs were formed.

2nd Day. There was a pink, oedematous area at each injection 1" in diameter. The colour was deepest at each centre and was lost on pressure. There was swelling and tenderness.

3rd Day. There was a soft, brownish area at each injection. Each was soft and not swollen or indurated.

4th Day, The arm was normal.

(308) J.N. 18 yrs.

Measles.

T.A.B.&.S. -0.04cc-were injected and typical blebs were formed.

2nd Day. There was a pink, oedematous area (4" by 3") on the forearm. It was soft and tender with a deeper colour at each injection. The colour was lost on pressure.

3rd Day. There was a pinkish-brown area at each injection but no swelling or induration. All the areas were alike.

4th Day. The arm was normal.

(309) D.S. 26 yrs.

Measles.

T.A.B.&.S. -0.04cc-were injected and typical blebs were formed.

2nd Day. There was a pinkish-brown area ($\frac{1}{2}$ " in diameter) at each bleb. There was tenderness but no swelling or induration. The areas became brown on pressure.

3rd Day. There was a slight brownish discolouration at each injection.

4th Day. The arm was normal.

(310) S.H. 10 yrs.

Measles.

T.A.B.&.S -0.04cc-were injected and typical blebs were formed.

2nd Day. There was a soft, pink, oedematous area (4" by $1\frac{1}{2}$ ") which was slightly swollen and tender and had brownish areas at each injection. The colour was lost on pressure. All the areas were alike.

3rd Day. There was a dark, reddish-brown area at each injection, but no swelling or induration. The areas became brown on pressure. All the areas were alike.

4th Day. The arm was normal.

(311) J. McB. 11 yrs. Measles.

T.A.B.&.S -0.04cc-were injected and typical blebs were formed.

2nd Day. There was a pinkish-brown area ($\frac{1}{2}$ " in diameter) at each injection. Each was soft and tender. There was no swelling or induration. All the areas were alike and became brown on pressure.

3rd Day. There was a faint brownish discolouration at each area but no swelling or induration.

4th Day. The arm was normal.

(312) E.B. 14 yrs. Pneumonia & Influenza.

T.A.B.&.S -0.04cc-were injected and typical blebs were formed.

2nd Day. There was a pink, oedematous area ($\frac{1}{2}$ " in diameter) at each injection. The colour was deepest at each centre and was lost on pressure. There was swelling and induration. All the areas were alike.

3rd Day. There was a pinkish-brown, soft area at each injection not swollen or indurated. All the areas were alike.

4th Day. The arm was normal.

(313) M.B. 8 yrs. Pneumonia.

T.A.B.&.S -0.04cc-were injected and there was a haemorrhage at the 2nd area.

2nd Day. There was a whitish bleb at the centre of the 1st area which had a pink areola. The colour was lost on pressure. There was a purple, haemorrhage area at the 2nd injection which was hard and indurated. The other areas were soft and pink and the colour was lost on pressure.

3rd Day. There was a greenish centre with a brown areola at the 2nd mark. There was a whitish spot with no areola

at the 1st area. The other marks were brownish and not indurated. Only the 2nd area had any swelling or induration.

4th Day. There was yellowish discolouration at the 2nd area but no swelling or induration. All the areas were normal.

5th Day. There was still a slight discolouration at the 2nd mark.

6th Day. The arm was normal.

(314) M.D. 7 yrs. Measles, Pneumonia & Meningitis.

T.A.B.&.S -0.04cc-were injected and typical blebs were formed.

2nd Day. There was a pink, oedematous area at each bleb. Each was soft, tender and swollen and darker at its centre. The colour was lost on pressure. All the areas were alike.

3rd Day. There were brownish, soft areas which were not lost on pressure. All the areas were alike. There was no swelling or induration.

4th Day. The arm was normal.

(315) Mrs. E.B. 38 yrs. Pneumonia & Influenza.

T.A.B.&.S -0.04cc-were injected and typical blebs were formed.

2nd Day. There were 4 pink, oedematous areas ($\frac{1}{8}$ " in diameter) The colour was lost on pressure. There was no swelling. The colour was deepest at the centre of each bleb.

3rd Day. There were pinkish-brown areas but no swelling or induration. All the areas were alike.

4th Day. The arm was normal.

(316) A.B. 10 yrs. Influenza.

T.A.B.&.S -0.04cc-were injected and typical blebs were formed.

2nd Day. There was a pink, oedematous area, 4" by $1\frac{1}{2}$ " which was swollen and tender. The colour was deepest at

each centre and was lost on pressure.

3rd Day. There were still pinkish areas ($\frac{1}{2}$ " in diameter) but no swelling or induration.

4th Day. There was a pinkish-brown area at each area but no swelling or induration.

5th Day. The arm was normal.

(317) Mrs. H. 30 yrs. Influenza Pneumonia,

T.A.B.&.S - 0.04cc-were injected and each bleb was typical.

2nd Day. There was a pinkish brown area at each injection. Each was $\frac{1}{2}$ " in diameter and soft, tender and oedematous. The colour was deepest at the centre of each injection and was lost on pressure. All the areas were alike.

3rd Day. There was a brownish discolouration at each area but no swelling or induration.

4th Day. The arm was normal.

(318) Mrs. C. 43 yrs. Pneumonia.

T.A.B.&.S - 0.04cc-were injected and typical blebs were formed.

2nd Day. There was a pink oedematous area (4" by 3") with brownish areas at each injection. Each area was soft and swollen and tender. The colour was lost on pressure. All the areas were alike.

3rd Day. There was a dark-red area at each injection which was lost on pressure. There was no swelling or induration. All the areas were alike.

4th Day. The arm was normal.

(319) M.S. 20 yrs. Pneumonia.

T.A.B.&.S - 0.04cc-were injected and each bleb was typical.

2nd Day. There was a pink, oedematous area at each injection. Each area was 1" in diameter. The colour was deepest at each centre and was lost on pressure. There was slight swelling and induration. All the areas were alike.

3rd Day. There was a soft brownish area at each injection but no swelling or induration.

4th Day. The arm was normal.

(320)

Mrs. W. 28 yrs.

Pneumonia.

T.A.B.&.S - 0.04cc-were injected and typical blebs were formed.

2nd Day. There was a pink, oedematous area, soft, and slightly swollen and tender at each injection. The colour was lost on pressure. All the areas were alike. Each was 1" in diameter.

3rd Day. The arm was normal.

(321)

J.W. 6 yrs.

Pneumonia.

T.A.B.&.S - 0.04cc-were injected and typical blebs were formed.

2nd Day. There was a soft, tender, oedematous area which was not swollen or indurated. Each was $\frac{3}{4}$ " in diameter. The colour was deepest at its centre, and was lost on pressure.

3rd Day. There was a faint brownish discolouration but no swelling or induration. All the areas were alike.

4th Day. The arm was normal.

(322)

Mrs. G. 28 yrs.

Pneumonia.

T.A.B.&.S - 0.04cc-were injected and typical blebs were formed.

2nd Day. There was a brownish-pink area ($\frac{1}{3}$ " in diameter) at each injection, but no swelling or induration. The colour became brown on pressure.

3rd Day. There was no trace of the marks. This patient had a rigor on the morning of the 3rd day but this was the 4th she had had during 10 days - the 3rd being 2 days before the injection were given.

(323)

J.S. 13 yrs.

Pneumonia.

T.A.B.&.S - 0.04cc-were injected and each bleb was typical.

2nd Day. There was a soft, tender, pinkish area, which was oedematous and swollen, at each injection. The colour was lost on pressure. The 1st & 3rd areas were more deeply coloured and more extensive than the others.

3rd Day. There was a brownish-pink colour at each area but no swelling or induration. The 1st mark was the most extensive.

4th Day. The arm was normal.

(324)

A.Y. 17 yrs.

Pneumonia.

T.A.B.&.S - 0.04cc-were injected and typical blebs resulted.

2nd Day. There was a tender, soft, oedematous area at each injection. Each area was $\frac{5}{8}$ " in diameter. The colour was deepest at each centre. There was some swelling. The colour was lost on pressure.

3rd Day. There was a pinkish-brown area at each injection but there was no swelling or induration. All the areas were alike.

4th Day. The arm was normal.

(325)

J. McD. 27 yrs.

Pneumonia.

T.A.B.&.S - 0.04cc-were injected and typical blebs were formed.

2nd Day. There was a pink, oedematous area (4" by 2") which was soft, tender and swollen and had brownish areas in it, representing the injections. The colour was lost on pressure.

3rd Day. There was a pinkish-brown, soft area at each injection but there was no swelling or induration.

4th Day. The arm was normal.

(326)

S. McN. 13 yrs.

Pneumonia.

T.A.B.&.S - 0.04cc-were injected and typical blebs were formed.

2nd Day. There were 4 small pink, oedematous areas ($\frac{1}{4}$ " in diameter). These were slightly swollen and tender and were lost on pressure.

3rd Day. The arm was normal.

(327)

Mrs. C. 64 yrs.

Pneumonia.

T.A.B.&.S - 0.04cc-were injected and each bleb was typical.

The temperature rose to 101°F on the evening after the injection.

2nd Day. The temperature was normal. There was a pink, oedematous, swollen area which was tender and lost on pressure. Each area was 1" in diameter and was darker in colour at its centre.

3rd Day. There was a pink, soft, area with no swelling or induration. All the areas were alike.

4th Day. The arm was normal.

(328) W.T. 10 yrs. Pneumonia.

T.A.B.&.S - 0.04cc-were injected and each bleb was typical.

2nd Day. There was a pink, oedematous area $\frac{1}{2}$ " in diameter. Each was soft, tender and slightly swollen. The colour was lost on pressure. All the areas were alike.

3rd Day. There was a pinkish-brown area at each injection but no swelling or induration.

4th Day. The arm was normal.

(329) F.M. 8 yrs. Scarlet Fever.

T.A.B.&.S - 0.04cc-were injected and typical blebs resulted,

2nd Day. There was a red area with a pink areola about $\frac{1}{2}$ " in diameter at each injection. Each area was soft and swollen and tender. The colour was lost on pressure. All were alike.

3rd Day. There were pinkish-brown areas, soft and not swollen or indurated. All were alike.

4th Day. The arm was normal.

(330) E.M. 7 yrs. Scarlet Fever.

T.A.B.&.S - 0.04cc-were injected and each bleb was typical.

2nd Day. There was a pinkish-brown area, $\frac{1}{2}$ " in diameter, at each injection. The colour was uniform and became brown on pressure. All the areas were alike. There was no swelling or induration.

3rd Day. There was a slight brownish discolouration at each injection but no swelling or induration.

4th Day. The arm was normal.

(331) T.R. 8 yrs. Scarlet Fever.

T.A.B.&.S - 0.04cc-were injected and each bleb was typical.

2nd Day. There were four pink, oedematous areas ($\frac{1}{2}$ " in diameter). There was swelling and tenderness. The colour was darkest at the centre of each bleb, and was lost on pressure. All the areas were alike.

3rd Day. There was a slight discolouration at each bleb. There was no swelling or induration.

4th Day. The arm was normal.

(332) C.M. $4\frac{1}{2}$ yrs. Scarlet Fever & Epilepsy.

T.A.B.&.S - 0.04cc-were injected and each bleb was typical.

2nd Day. There was a pink oedematous area at each injection. Each was soft, tender and swollen. The areas were $\frac{1}{2}$ " in diameter. The colour was deepest at the centre and was lost on pressure. All the areas were alike.

3rd Day. There was a faint pinkish-brown area of discolouration at each injection but no swelling or induration.

4th Day. The arm was normal.

(333) J.N. 13 yrs. Cerebrospinal Fever? (Purpura)

T.A.B.&.S - 0.04cc-were injected and typical blebs were formed.

2nd Day. There was a feathery, purplish-red haemorrhagic area at each injection. These were not affected by pressure. They were swollen and slightly indurated. There were similar areas on the other arm and on the ankles. The temperature was normal.

3rd Day. There was a fresh crop of subcuticular haemorrhages over the body. The original marks were indurated and yellowish in colour.

4th Day. The original marks were faintly yellow and not indurated.

5th Day. The original marks were now lost.

(334) J.D. 18 yrs.

Measles.

T.A.B.&.S - 0.04cc-were injected and each bleb was typical.

2nd Day. There was a pink, oedematous area (1" in diameter) at each injection. Each area was swollen and tender. The colour was deepest at the centre of each area but lost on pressure. All the areas were alike.

3rd Day. There was a faint brownish discolouration at each injection but no swelling or induration.

4th Day. The arm was normal.

(335) A. McL. $2\frac{1}{2}$ yrs.

Measles.

T.A.B.&.S - 0.04cc-were injected and typical blebs resulted at each.

2nd Day. There were 4 pinkish-red oedematous areas which were soft and tender and not entirely lost on pressure. All the areas were alike.

3rd Day. There were brownish-red areas, not swollen or indurated. All were alike.

4th Day. There was slight brownish discolouration at each area. There was no swelling or induration.

5th Day. The arm was normal.

(336) J.R. 4 yrs.

Measles.

T.A.B.&.S - 0.04cc-were injected and each bleb was typical.

2nd Day. There was a pink, oedematous area (4" by $1\frac{1}{2}$ ") with brownish discolouration at each injection. The colour was lost on pressure. There was slight swelling and tenderness.

3rd Day. There were four brownish-pink areas, soft and not swollen or indurated. All were alike.

4th Day. The arm was normal.

(337) M.C. 3 yrs.

Measles.

T.A.B.&.S - 0.04cc-were injected and each bleb was typical.

2nd Day. There was a pink, oedematous area ($\frac{1}{2}$ " in diameter)

at each injection. Each was soft and tender. Each was darkest in colour at the centre of the macule, and the colour was lost on pressure. All the areas were alike.

3rd Day. There was brownish discolouration at each injection but no swelling or induration.

4th Day. The arm was normal.

(338)

C.C. 1 yr.

Measles.

T.A.B.&.S. - 0.04cc-were injected and typical blebs resulted.

2nd Day. There was a faint pinkish-brown, oedematous area ($\frac{1}{2}$ " in diameter) at each injection. The colour was deepest at the centre of each macule and was lost on pressure. There was tenderness and swelling. All the areas were alike.

3rd Day. The arm was normal.

(339)

J.D. 5 yrs.

Measles.

T.A.B.&.S - 0.04cc-were injected and each bleb was typical.

2nd Day. There was a faint, pink, oedematous area ($\frac{1}{2}$ " in diameter) at each bleb. The colour was deepest at the centre of each area and was lost on pressure. There was swelling and tenderness.

3rd Day. There was a faint pinkish-brown area at each injection but no swelling or oedema.

4th Day. The arm was normal.

(340)

J.D. 3 yrs.

Measles.

T.A.B.&.S - 0.04cc-were injected and each bleb was typical.

2nd Day. Each injection had a pink, oedematous area ($\frac{1}{2}$ " in diameter). The colour was red at the centre with a pink areola. There was swelling and tenderness. The colour was lost on pressure.

3rd Day. There was a faint brownish discolouration at each injection but no swelling or induration. All the areas were alike.

4th Day. The arm was normal.

- (341) M. McC. 3 yrs. Measles.
T.A.B.&.S -0.04cc-were injected and each bleb was typical.
2nd Day. There was a pink, oedematous area ($\frac{1}{2}$ " in diameter) at each injection. The colour was deepest at the centre of each macule and was lost on pressure. All the areas were alike.
3rd Day. There was an area of brownish discolouration at each area but no swelling or induration.
4th Day. The arm was normal.
- (342) G.J. 9 yrs. Diphtheria.
T.A.B.&.S -0.04cc-were injected and each bleb was typical.
2nd Day. There was a pink, oedematous area at each injection. Each was soft, tender and slightly swollen. The colour was deepest at the centre of each and was lost on pressure. All the areas were alike.
3rd Day. There was a faint brownish discolouration at each area but no swelling or induration.
4th Day. The arm was normal.
- (343) F.L. 2 yrs. Measles.
T.A.B.&.S -0.04cc-were injected and each bleb was typical.
2nd Day. The child was very ill and cyanosed. The injections had given rise to deep bluish areas which were lost on pressure. There was no swelling or tenderness.
3rd Day. The marks were smaller and had a brownish tint. There was no swelling or induration.
4th Day. The child died on the 4th day.
- (344) M.O. 6 yrs. Measles.
T.A.B.&.S. - 0.04cc-were injected and each bleb was typical.
2nd Day. There was a pink, oedematous area at each injection. Each was $\frac{1}{2}$ " in diameter. At the centre the colour was red. The colour was lost on pressure. All the areas were alike.

3rd Day. There was a faint brownish discolouration at each injection, but there was no swelling or induration.

4th Day. The arm was normal.

(345)

J.C. 8 yrs.

Measles.

T.A.B.&.S - 0.04cc-were injected and typical blebs resulted.

2nd Day. There was a pink oedematous area ($\frac{1}{2}$ " in diameter) at each injection. Each was soft, tender and swollen. The colour was deepest at the centre of each area. The colour was lost on pressure. All the areas were alike.

3rd Day. There was a faint brownish discolouration but no swelling or induration.

4th Day. The arm was normal.

(346)

A.S. 5 yrs.

Measles.

T.A.B.&.S - 0.04cc-were injected and each bleb was typical.

2nd Day. There was a slightly pink, oedematous area at each injection. Each area was $\frac{3}{4}$ " in diameter and swollen and tender. The colour was deepest at the centre of each and lost on pressure. All the areas were alike.

3rd Day. There was a faint brownish discolouration at each injection but no swelling or induration.

4th Day. The arm was normal.

(347)

M.L. 4 yrs.

Measles.

T.A.B.&.S - 0.04cc-were injected and each bleb was typical.

2nd Day. There was a bright pink, swollen, oedematous area soft, tender, and swollen, at each injection. The colour was deepest at the centre and was lost on pressure. All the areas were alike.

3rd Day. There was a brownish discolouration but no swelling or induration. All were alike.

4th Day. The marks were still brown.

5th Day. The arm was normal.

(348) J.M. 7 yrs.

Measles.

T.A.B.&.S - 0.04cc-were injected and each bleb was typical.

2nd Day. There was a pink, oedematous area, ($\frac{1}{2}$ " in diameter at each injection. The colour was deepest at each centre and lost on pressure. There was slight swelling and induration. All the areas were alike.

3rd Day. There was a pinkish-brown area at each injection but no swelling or induration.

4th Day. The arm was normal.

(349) J.G. $2\frac{1}{2}$ yrs.

Measles.

T.A.B.&.S - 0.04cc-were injected and typical blebs were formed.

2nd Day. There was a large pink, oedematous area, (4" by 2") in which there were red areas denoting the 1st and 3rd injections. The part was swollen, and soft, and tender, and lost on pressure.

3rd Day. There was a brownish discolouration at all the areas of injection but more marked at the 1st and 3rd than at the others. There was no swelling or induration.

4th Day. The arm was normal.

(350) M.D. 2 yrs.

Measles & Bronchopneumonia.

T.A.B.&.S - 0.04cc-were injected and typical blebs were formed.

2nd Day. There was a purplish-blue colour at each injection. The child was cyanosed and the colour at the injections corresponded to that of the lips. These injections were soft and slightly oedematous but apparently not tender. The colour was lost on pressure. All were alike.

3rd Day. The marks were unchanged.

4th Day. The marks were smaller and brownish. There was no swelling or induration. The child died late on the 4th day.

(351) P.B. 2 yrs.

Measles.

T.A.B.&.S - 0.04cc-were injected and each bleb was typical.

2nd Day. There was a pink papule at each injection. Each was $\frac{1}{3}$ " in diameter. The colour was lost on pressure and all the areas were alike.

3rd Day. There were brownish papules $\frac{1}{8}$ " in diameter, which were not indurated.

4th Day. The papules were white at the crown and brownish at the base. There was no induration.

5th Day. The arm was normal.

(352) T.R. 3 yrs. Measles.

T.A.B.&.S - 0.04cc-were injected and each bleb was typical.

2nd Day. Each area was pink and $\frac{1}{3}$ " in diameter. There was tenderness and slight swelling. The colour was lost on pressure. All the areas were alike.

3rd Day. There was a faint brownish discolouration at each area. The colour was not affected by pressure. There was no swelling or induration.

4th Day. The arm was normal.

(353) M. M'L. 7 yrs. Measles.

T.A.B.&.S - 0.04cc-were injected and each bleb was typical.

2nd Day. There was an extensive pink, oedematous area, (3" by $\frac{1}{2}$ ") with deeper areas at the injections. The colour was lost on pressure. The part was swollen and tender.

3rd Day. There was a pinkish-brown colour at each injection but no swelling or induration.

4th Day. The arm was normal.

(354) E.B. 4 yrs. Measles.

T.A.B.&.S - 0.04cc-were injected and each bleb was typical.

2nd Day. There was a pink oedematous area about $\frac{1}{2}$ " in diameter, at each injection. The colour of each was deepest at its centre. There was slight swelling and tenderness. The colour was lost on pressure. All the areas were alike.

3rd Day. There was a brownish discolouration at each injection but no swelling or induration.

4th Day. The arm was normal.

(355) W.A. 5 yrs. Measles.

T.A.B.&.S - 0.04cc-were injected and each bleb was typical.

2nd Day. There was a pink and soft, oedematous area, ($\frac{3}{4}$ " in diameter) at each injection. The colour was deepest at the centre of each and was lost on pressure. All the areas were alike.

3rd Day. There was a faint brownish discolouration at each area but no swelling or induration.

4th Day. The arm was normal.

(356) D.S. 5 yrs. Measles.

T.A.B.&.S - 0.04cc-were injected and typical blebs resulted.

2nd Day. There was a pinkish-brown area at each injection. Each was $\frac{1}{2}$ " in diameter. The colour was lost on pressure. There was no swelling or induration.

3rd Day. There was a brownish discolouration at each area but no swelling or induration.

4th Day. The arm was normal.

(357) A.A. 8 yrs. Measles.

T.A.B.&.S - 0.04cc-were injected and each bleb was typical.

2nd Day. There was a slight brownish-pink area ($\frac{1}{2}$ " in diameter) at each injection. There was no swelling or tenderness. The colour became brown on pressure.

3rd Day. There was a brownish discolouration at each injection but no swelling or induration.

4th Day. The arm was normal.

(358) M.R. 4 yrs. Measles.

T.A.B.&.S - 0.04cc-were injected and typical blebs resulted.

2nd Day. There was a faint pink oedematous area ($\frac{1}{2}$ " in diameter) at each injection. There was no swelling or induration. The colour was lost on pressure.

3rd Day. The arm was normal.

359)

M.L. 6 yrs.

Measles.

T.A.B.&.S - 0.04cc-were injected and typical blebs resulted.

2nd Day. There was a dull red area at each injection. Each was $1/3$ " in diameter. The colour was lost on pressure. All the areas were alike.

3rd Day. There was a faint brown area at each mark but no swelling or induration.

4th Day. The arm was normal.

360)

A.D. 5 yrs.

Measles.

T.A.B.&.S - 0.04cc-were injected and typical blebs resulted.

2nd Day. There was a diffuse pink, oedematous, area, (3 " by $1\frac{1}{2}$ ") with deeper colour at each site of injection. There was tenderness and swelling. All the areas were alike. The colour was lost on pressure.

3rd Day. There was a brownish-pink area at each injection but no swelling or induration.

4th Day. The arm was normal.

Stools. / Skin Tests. / Temp. Normal. / at 3rd test / 1st. others / Day.

Name.	Pos:	Neg:	Vidal	In Pyrexia Day	In Convalescence. Result.	Temp. Normal.	at 3rd test 1st. others	Day.
	Admission							
1. M.G.	"	45th	+	13th	50th	26th	+	3rd
2. T.	"	-	+	16th	-	?	.	3rd
3. Y.	"	40th	+	23rd	55th	19th	+	3rd
4. B.	"	30th	+	18th	36th	28th	$\frac{1}{2}$ "	3rd
5. S.	"	30th	+	10th	28th	?	+	3rd
6. M.	"	36th	+	29th	65th	30th	$\frac{1}{3}$ "	2nd
7. M.	"	40th	+	15th	50th	40th	+	3rd.
8. C.	"	42nd	+	30th	50th		-	3rd
9. A.S.	"	-	+	19th		26th	$\frac{1}{3}$ "	3rd
10. L.	"	38th	+	9th	38th	16th	$\frac{1}{3}$ "	2nd
11. B.	"	40th	+	13th	36th	28th	$\frac{1}{2}$ "	3rd
12. E.	"	44th	+	23rd	50th	16th	+	3rd
13. C.	"	18th	+	9th	26th	40th	$\frac{1}{2}$ "	
14. McL.	"	40th	+	30th	75th		$\frac{1}{3}$ "	

Notes.

1. Area at 1st mark was more extensive than at others.
2. Died on 24th Day.
3. Patient had a discharging wound on abdomen that kept the temperature from settling.
6. Temperature was kept up by an empyema.
9. Died on 24th Day.
11. Course was apyrexia. *24/9*
13. Blood was not positive till the 12th day. Course was apyrexia. *24/9*

CARRIER CASES.

Name.	Time since attack.	Stools.	Periodicity.	Skin Test. No.	Negatives.	Temp:
1. K.O. Typhoid.	5 years.	Positive	Neg: for 1st 22 days after admission then constantly positive.	9	None	Normal.
2. M.G. Typhoid.	25 years.	Positive	Constant.	3	None.	Normal.
3. M.D. Paratyphoid.	2 years.	Positive	Constant.	9	None. Last one weakly positive.	Normal.
4. J.H.	8 months (?)	Positive for one month.	?	3	Last negative.	Fever on admission. Patient had bronchopneumonia. Settled by 20th Day.
5. S.S.	Fresh Case.	Alternated & ultimately negative.	20 days.	6	Last 2 tests negative.	Patient had 2 relapses at 20 day intervals.

Acute Cases.

I. (a)	lst.	T.	D.B	P.B	P.B	P.B	P.B	B	+
(b)	others.	T.	D.B	P.B	P.B	P.B	P.B	B	+
(c)	lst.	T.	D.B	P.B	P.B	P.B	P.B	B	-
(c)	others.	T.	D.B	P.B	P.B	P.B	P.B	B	-
II.	lst.	T.	D.B	P.B	P.B	P.B	P.B	B	+
(a)	others.	T.	) C.B(	P.B	P.B	P.B	P.B	B	+
(b)	lst.	T.	D.B	P.B	P.B	P.B	P.B	B	-
(b)	others.	T.	) C.B(	P.B	P.B	P.B	P.B	B	-
IV. (a)	lst.	T.	) C.B(	P.B	P.B	P.B	P.B	B	+
(b)	others.	T.	D.B	P.B	P.B	P.B	P.B	B	-
(b)	lst.	T.	D.B	P.B	P.B	P.B	P.B	B	+
V. (a)	others.	T.	P.B	P.B	P.B	P.B	P.B	B	+
(b)	3rd.	H.	H	P.B	P.B	P.B	P.B	B	+
(c)	others.	T.	D.B	P.B	P.B	P.B	P.B	B	+
(c)	lst.	T.	D.B	P.B	P.B	P.B	P.B	B	-
(c)	others.	T.	D.B	P.B	P.B	P.B	P.B	B	-
VI. (a)	lst.	T.	D.B	P.B	P.B	P.B	P.B	B	+
(b)	others.	T.	D.B	P.B	P.B	P.B	P.B	B	+
(c)	lst.	T.	D.B	P.B	P.B	P.B	P.B	B	-
(c)	others.	T.	D.B	P.B	P.B	P.B	P.B	B	-
VII. (a)	lst.	T.	D.B	P.B	P.B	P.B	P.B	B	+
(b)	others.	T.	D.B	P.B	P.B	P.B	P.B	B	+
(c)	lst.	T.	D.B	P.B	P.B	P.B	P.B	B	-
(c)	others.	T.	D.B	P.B	P.B	P.B	P.B	B	-
VIII. (a)	lst.	T.	D.B	P.B	P.B	P.B	P.B	B	+
(b)	others.	H.	H	P.B	P.B	P.B	P.B	B	-
(b)	lst.	T.	D.B	P.B	P.B	P.B	P.B	B	-
(b)	others.	T.	D.B	P.B	P.B	P.B	P.B	B	-

Case At 144 hrs. 120 hrs. 96 hrs. 72 hrs. 48 hrs. 24 hrs. 12 hrs. 6 hrs. 3 hrs. 1 hr. 0 hrs. Result.

IX.	Acute Cases. lst. others.	T. T.	D.B. D.B.	P.B. B	P.B. .	P.B. .	Died. .	.	+
X.(a)	lst.	T.	D.B.	P.B.	P.B.	P.B.	.	.	+
	others.	T.	D.B.	B	B	B	.	.	+
(b)	lst.	T.	D.B.	P.B.	P.B.	P.B.	B	.	+
	others.	T.	D.B.	B	B	B	.	.	+
(c)	lst.	T.	D.B.	B	B	B	.	.	-
	others.	T.	D.B.	.	.	.	.	.	.
XI.(a)	lst.	T.	(	P.B.	P.B.	P.B.	B	.	+
	others.	T.	) C.B (	B	B	B	.	.	+
(b)	lst.	T.	D.B	P.B	P.B	P.B	.	.	+
	others.	T.	D.B	B	B	B	.	.	-
(c)	lst.	T.	) C.B (	B	B	B	.	.	.
	others.	T.	)	B	B	B	.	.	.
XII.(a)	lst.	T.	D.B	P.B	P.B	P.B	B	.	+
	others.	T.	D.B	B	B	B	.	.	-
(b)	lst.	T.	D.B	B	B	B	.	.	.
	others.	T.	D.B	B	B	B	.	.	.
XIII.(a)	lst.	T.	D.B	P.B	P.B	P.B	B	.	+
	others.	T.	D.B	B	B	B	.	.	-
(b)	lst.	T.	D.B	B	B	B	.	.	.
	others.	T.	D.B	B	B	B	.	.	.
XIV.(a)	lst.	T.	D.B	P.B.?	P.B.	P.B.	.	.	?
	others.	T.	D.B	B	B	B	.	.	+
(b)	lst.	T.	D.B.	P.B	P.B	P.B	B	.	-
	others.	T.	D.B	B	B	B	.	.	.
(c)	lst.	T.	D.B	B	B	B	.	.	.
	others.	T.	D.B	B	B	B	.	.	.

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Chronic Carriers. IV.(c) others.	T. T.	D.B D.B	B B	B
V. (a) 1st. others.	T. H.	(C.B(P. P.B	P.B H	P.B B	B B	.	+
(b) 1st. others.	T. T.) C.B(P.B P.B	P.B P.B	P.B B	B B	.	+
(c) 1st. others.	T. T.	) C.B(	P.B P.B	P.B P.B	P.B B	B B	.	+
(d) 1st. others.	T. T.	) C.B(	P.B P.B	P.B P.B	P.B B	B B	.	+
(e) 1st. others.	T. T.	) C.B(	P.B P.B	P.B P.B	P.B B	B B	.	-
(f) 1st. others.	T. T.	) C.B(	P.B P.B	P.B P.B	P.B B	B B	.	-

T. = Typical, white, rounded bleb.
H. = Haemorrhagic area.
D.B = Discrete, pink, oedematous bleb.
P.B. = Purple, oedematous bleb.
B. = Brown discolouration
C.B. = Large bleb - pink + oedematous + common to all the areas.

Case.	At Injection.	24 hrs.	48 hrs.	72 hrs.	96 hrs.	120 hrs.	144 hrs.	Result.
Inoculated. I. 1st. others.	T. T.	D.B D.B	B B	B B	.	.	.	-
II. 1st. others.	T. T.	D.B D.B	B B	.	.	.	.	-
III. 1st. others.	T. T.	D.B D.B	B B	B B	.	.	.	-
IV. 1st. others.	T. T.	D.B D.B	B B	.	.	.	.	-
V. 1st. others.	T. T.	) C.B (	B B.	B B.	.	.	.	-
VI. 1st. others.	T. T.	D.B D.B	B B	B .	.	.	.	-
VII. 1st. others.	T. T.	D.B D.B	B B	.	.	.	.	-
VIII. (a) 1st. others. (b) 1st. others.	T. T. H. T.	D.B. D.B H D.B	B B B B	B . B .	.	.	B .	- . -
IX. 1st. others.	T. T.	) C.B (	B B	.	.	.	.	-
X. (a) 1st. others.	H. T.	H D.B	P.B B	B .	.	.	.	-
(b) 1st. others.	T. T.	D.B D.B	B B	B .	.	.	.	-
XI. 1st. others.	T. T.	) C.B (	B B	.	.	.	.	-

Case.		24 hrs.	36 hrs.	72 hrs.	96 hrs.	120 hrs.	144 hrs.	Result.
Innuculated.								
XII. 1st.	T.							-
others.	T.	D.B D.B	B B					
XIII. 1st.	T.							-
others.	T.	D.B D.B	B B					
XIV. 1st.	T.							-
others.	T.	D.B D.B	B B					
XV. 1st.	T.							-
others.	T.	D.B D.B	H B	B B	B B	B B		
XVI. 1st.	T.							-
others.	T.	() C.B(. .					
XVII. 1st.	T.							-
others.	T.	D.B D.B	B B	B B	B B	B B		
XVIII. 1st.	T.							-
others.	T.	() C.B(	B B					
XIX. 1st.	T.							-
others.	T.	D.B D.B	B B	B B	B B	B B		
XX. 1st.	T.							-
others.	T.	D.B D.B	B B	B B	B B	B B		
XXI. 1st.	T.							-
others.	T.	D.B D.B	B B	B B	B B	B B		

Case.	At Injection.	24 hrs.	48 hrs.	72 hrs.	96 hrs.	120 hrs.	144 hrs.	Result.
Controls.								
(1)	T.	D.B.	B	.	.	.	.	.
(2)	T.	D.B.	B	B	.	.	.	.
(3)	T.	D.B.	D.B.	.	.	.	.	.
(4)	T.	D.B.	B	B	.	.	.	.
(5)	T.	D.B.	B	B	.	.	.	.
(6)	T.	D.B.	B	B	.	.	.	.
(7)	T.	D.B.	B	B	.	.	.	.
(8)	T.	D.B.	B	B	.	.	.	.
(9)	T.	D.B.	B	B	.	.	.	.
(10)	T.	D.B.	B	B	.	.	.	.
(11)	T.	D.B.	B	B	.	.	.	.
(12)	T.	D.B.	B	B	.	.	.	.
(13)	T.	D.B.	B	B	.	.	.	.
(14)	T.	D.B.	B	B	.	.	.	.
(15)	T.	P.B.	B	B	B.	.	.	.
(16)	H.	D.B.	B	B	.	.	.	.
(17)	T.	D.B.	B	B	.	.	.	.
(18)	T.	D.B.	B	B	.	.	.	.
(19)	T.	D.B.	B	B	.	.	.	.
(20)	T.	P.B.	B	Died	.	.	.	.
(21)	H.	H.	B	B	.	.	.	.
(22)	T.	D.B.	B	Died	.	.	.	.
(23)	T.	D.B.	B	.	.	.	.	.
(24)	T.	D.B.	B	.	.	.	.	.
(25)	H.	P.B.	B	.	.	.	.	.
(26)	T.	D.B.	B	.	.	.	.	.
(27)	T.	D.B.	B	.	.	.	.	.
(28)	T.	D.B.	B	.	.	.	.	.
(29)	T.	D.B.	B	.	.	.	.	.
(30)	T.	D.B.	B	B	.	.	.	.
(31)	H.	P.B.	H	B	.	.	.	.
(32)	T.	D.B.	B	B	.	.	.	.
(33)	T.	D.B.	B	.	.	.	.	.
(34)	T.	D.B.	B	.	.	.	.	.
(35)	T.	C.B.	B	B	.	.	.	.
(36)	(H.)	P.B.	B	B	.	.	.	.
(37)	(T.)	D.B.	B	.	.	.	.	.

Case.	At Injection.	24 hrs.	48 hrs.	72 hrs.	96 hrs.	120 hrs.	144 hrs.	Result.
Case.	At Injection.	24 hrs.	48 hrs.	72 hrs.	96 hrs.	120 hrs.	144 hrs.	Result.

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Base.	At Infection.	24 hrs.	48 hrs.	72 hrs.	96 hrs.	120 hrs.	144 hrs.	Result.
(151)	T.	D.B.	B	B	B	B	B	-
(152)	T.	D.B	B	B	B	B	B	-
(153)	T.	D.B	B	B	B	B	B	-
(154)	T.	C.B	B	B	B	B	B	-
(155)	T.	D.B	B	B	B	B	B	-
(156)	T.	D.B	B	B	B	B	B	-
(157)	T.	D.B	B	B	B	B	B	-
(158)	T.	D.B	B	B	B	B	B	-
(159)	T.	C.B	B	B	B	B	B	-
(160)	T.	C.B	B	B	B	B	B	-
(161)	T.	C.B	B	B	B	B	B	-
(162)	T.	D.B	B	B	B	B	B	-
(163)	T.	D.B	B	B	B	B	B	-
(164)	T.	C.B	B	B	B	B	B	-
(165)	T.	D.B	B	B	B	B	B	-
(166)	T.	D.B	B	B	B	B	B	-
(167)	T.	D.B	P.B	P.B	B	B	B	+
(168)	T.	D.B	B	B	B	B	B	-
(169)	T.	D.B	B	B	B	B	B	-
(170)	T.	D.B	B	B	B	B	B	-
(171)	T.	C.B	B	B	B	B	B	-
(172)	T.	C.B	B	B	B	B	B	-
(173)	H.	D.B	B	B	B	B	B	-
(174)	T.	C.B	D.B	B	B	B	B	-
(175)	T.	D.B	B	B	B	B	B	-
(176)	T.	D.B	B	B	B	B	B	-
(177)	T.	C.B	B	B	B	B	B	-
(178)	T.	D.B	B	B	B	B	B	-
(179)	T.	C.B	B	B	B	B	B	-
(180)	T.	C.B	B	B	B	B	B	-
(181)	T.	C.B	B	B	B	B	B	-
(182)	T.	D.B	B	B	B	B	B	-
(183)	T.	C.B	B	B	B	B	B	-
(184)	T.	D.B	B	B	B	B	B	-
(185)	T.	D.B	B	B	B	B	B	-
(186)	T.	C.B	B	B	B	B	B	-
(187)	T.	C.B	B	B	B	B	B	-
(188)	T.	D.B	B	B	B	B	B	-
(189)	T.	C.B	B	B	B	B	B	-
(190)	T.	D.B	B	B	B	B	B	-
(191)	T.	D.B	B	B	B	B	B	-

Case.	At injection.	24 hrs.	48 hrs.	72 hrs.	96 hrs.	120 hrs.	144 hrs.	Result.
(192)	T.	D.B	B	.	.	.	.	-
(193)	T.	D.B	B	.	.	.	.	-
(194)	T.	D.B	B	.	.	.	.	-
(195)	T.	D.B	B	.	.	.	.	-
(196)	T.	D.B	B	.	.	.	.	-
(197)	T.	D.B	B	.	.	.	.	-
(198)	T.	D.B	B	.	.	.	.	-
(199)	T.	D.B	B	.	.	.	.	-
(200)	T.	D.B	B	.	.	.	.	-
(201)	T.	D.B	B	.	.	.	.	-
(202)	T.	D.B	B	.	.	.	.	-
(203)	T.	D.B	B	.	.	.	.	-
(204)	T.	D.B	B	.	.	.	.	-
(205)	T.	D.B	B	.	.	.	.	-
(206)	T.	D.B	B	.	.	.	.	-
(207)	T.	D.B	B	.	.	.	.	-
(208)	T.	D.B	B	.	.	.	.	-
(209)	T.	D.B	B	.	.	.	.	-
(210)	T.	D.B	B	.	.	.	.	-
(211)	T.	C.B	B	.	.	.	.	-
(212)	T.	D.B	B	.	.	.	.	-
(213)	T.	D.B	B	.	.	.	.	-
(214)	T.	D.B	B	.	.	.	.	-
(215)	T.	D.B	B	.	.	.	.	-
(216)	T.	D.B	B	.	.	.	.	-
(217)	H.	D.B	B	.	.	.	.	-
(218)	T.	D.B	B	.	.	.	.	-
(219)	T.	D.B	B	.	.	.	.	-
(220)	T.	D.B	B	.	.	.	.	-
(221)	T.	D.B	B	.	.	.	.	-
(222)	T.	D.B	B	.	.	.	.	-
(223)	T.	D.B	B	.	.	.	.	-
(224)	T.	D.B	B	.	.	.	.	-
(225)	T.	D.B	B	.	.	.	.	-
(226)	T.	D.B	B	.	.	.	.	-
(227)	T.	C.B	B	.	.	.	.	-
(228)	T.	D.B	B	.	.	.	.	-
(229)	T.	C.B	B	.	.	.	.	-
(230)	T.	D.B	B	.	.	.	.	-
(231)	H.	P.B	P.B	B	B	B	B	-

Case.	At Injection.	24 hrs.	48 hrs.	72 hrs.	96 hrs.	120 hrs.	144 hrs.	Result.
(232)	T.	D.B	B	B	.	.	.	-
(233)	T.	D.B	E	.	.	.	.	-
(234)	T.	D.B	B	B	B	.	.	-
(235)	H.	D.B	B	B	.	.	.	-
(236)	T.	D.B	B	B	B	.	.	-
(237)	T.	D.B	B	B	B	.	.	-
(238)	T.	D.B	B	B	B	.	.	-
(239)	T.	D.B	B	B	B	.	.	-
(240)	T.	D.B	B	B	B	.	.	-
(241)	T.	D.B	B	B	B	.	.	-
(242)	T.	D.B	B	B	B	.	.	-
(243)	T.	D.B	B	B	B	.	.	-
(244)	T.	D.B	B	B	B	.	.	-
(245)	T.	D.B	B	B	B	.	.	-
(246)	T.	D.B	B	B	B	.	.	-
(247)	T.	D.B	B	B	B	.	.	-
(248)	T.	D.B	B	B	B	.	.	-
(249)	T.	D.B	B	B	B	.	.	-
(250)	T.	D.B	B	B	B	.	.	-
(251)	T.	D.B	B	B	B	.	.	-
(252)	T.	D.B	B	B	B	.	.	-
(253)	T.	D.B	B	B	B	.	.	-
(254)	T.	D.B	B	B	B	.	.	-
(255)	T.	D.B	B	B	B	.	.	-
(256)	T.	D.B	B	B	B	.	.	-
(257)	T.	D.B	B	B	B	.	.	-
(258)	T.	D.B	B	B	B	.	.	-
(259)	T.	D.B	B	B	B	.	.	-
(260)	T.	D.B	B	B	B	.	.	-
(261)	H.	D.B	B	B	B	B	.	-
(262)	T.	C.B	B	B	B	B	.	-
(263)	T.	D.B	B	B	B	B	.	-
(264)	T.	C.B	B	B	B	B	.	-
(265)	T.	D.B	B	B	B	B	.	-
(266)	T.	D.B	B	B	B	B	.	-
(267)	T.	D.B	B	B	B	B	.	-
(268)	T.	D.B	B	B	B	B	.	-
(269)	T.	D.B	B	B	B	B	.	-
(270)	T.	D.B	B	B	B	B	.	-

Case.	St Injection.	24 hrs.	48 hrs.	72 hrs.	96 hrs.	120 hrs.	144 hrs.	Result.
(271)	T.	D.B	B	.	.	.	.	-
(272)	T.	D.B	B	.	.	.	.	-
(273)	T.	D.B	B	.	.	.	.	-
(274)	T.	D.B	B	.	.	.	.	-
(275)	T.	D.B	B	B	.	.	.	-
(276)	T.	D.B	B	B	.	.	.	-
(277)	T.	D.B	B	B	.	.	.	-
(278)	T.	D.B	B	B	.	.	.	-
(279)	T.	D.B	B	B	.	.	.	-
(280)	T.	C.B	B	B	.	.	.	-
(281)	T.	D.B	B	B	.	.	.	-
(282)	T.	D.B	B	B	.	.	.	-
(283)	T.	C.B	B	B	.	.	.	-
(284)	T.	D.B	B	B	.	.	.	-
(285)	T.	C.B	B	B	.	.	.	-
(286)	T.	D.B	B	B	.	.	.	-
(287)	T.	D.B	B	B	.	.	.	-
(288)	T.	D.B	B	B	.	.	.	-
(289)	T.	D.B	B	B	.	.	.	-
(290)	T.	D.B	B	B	.	.	.	-
(291)	T.	D.B	B	B	.	.	.	-
(292)	T.	D.B	B	B	.	.	.	-
(293)	T.	D.B	B	B	.	.	.	-
(294)	T.	D.B	B	B	.	.	.	-
(295)	T.	D.B	B	B	.	.	.	-
(296)	T.	C.B	B	B	.	.	.	-
(297)	T.	C.B	B	B	.	.	.	-
(298)	T.	D.B	B	B	.	.	.	-
(299)	T.	C.B	B	B	.	.	.	-
(300)	T.	C.B	B	B	.	.	.	-
(301)	T.	D.B	B	B	.	.	.	-
(302)	T.	D.B	B	B	.	.	.	-
(303)	T.	D.B	B	B	.	.	.	-
(304)	T.	D.B	B	B	.	.	.	-
(305)	T.	D.B	B	B	.	.	.	-
(306)	T.	D.B	B	B	.	.	.	-
(307)	T.	D.B	B	B	.	.	.	-
(308)	T.	C.B	B	B	.	.	.	-
(309)	T.	D.B	B	B	.	.	.	-
(310)	T.	C.B	B	B	.	.	.	-
(311)	T.	D.B	B	B	.	.	.	-
(312)	T.	D.B	B	B	.	.	.	-

Case.	At Injection.	24 hrs.	48 hrs.	72 hrs.	96 hrs.	120 hrs.	144 hrs.	Result.
(313)	H.	P.B	H	B	B	.	.	-
(314)	T.	D.B	B	.	.	.	.	-
(315)	T.	D.B	B	.	.	.	.	-
(316)	T.	C.B	B	B	.	.	.	-
(317)	T.	D.B	B	.	.	.	.	-
(318)	T.	C.B	B	.	.	.	.	-
(319)	T.	D.B	B	.	.	.	.	-
(320)	T.	D.B	B	.	.	.	.	-
(321)	T.	D.B	B	.	.	.	.	-
(322)	T.	D.B	B	.	.	.	.	-
(323)	T.	D.B	B	.	.	.	.	-
(324)	T.	D.B	B	.	.	.	.	-
(325)	T.	C.B	B	.	.	.	.	-
(326)	T.	D.B	B	.	.	.	.	-
(327)	T.	D.B	B	.	.	.	.	-
(328)	T.	D.B	B	.	.	.	.	-
(329)	T.	D.B	B	.	.	.	.	-
(330)	T.	D.B	B	.	.	.	.	-
(331)	T.	D.B	B	.	.	.	.	-
(332)	T.	D.B	B	.	.	.	.	-
(333)	T.	H	H	B	B	.	.	-
(334)	T.	D.B	B	B	.	.	.	-
(335)	T.	D.B	B	B	.	.	.	-
(336)	T.	C.B	B	B	.	.	.	-
(337)	T.	D.B	B	B	.	.	.	-
(338)	T.	D.B	B	B	.	.	.	-
(339)	T.	D.B	B	B	.	.	.	-
(340)	T.	D.B	B	B	.	.	.	-
(341)	T.	D.B	B	B	.	.	.	-
(342)	T.	D.B	B	B	.	.	.	-
(343)	T.	P.B	B	Died	.	.	.	-
(344)	T.	D.B	B	.	.	.	.	-
(345)	T.	D.B	B	.	.	.	.	-
(346)	T.	D.B	B	.	.	.	.	-
(347)	T.	D.B	B	.	.	.	.	-
(348)	T.	D.B	B	.	.	.	.	-
(349)	T.	C.B	B	P.B	.	.	.	-
(350)	T.	P.B	P.B	P.B	cyanosis & death	.	.	-
(351)	T.	D.B	B	B	.	.	.	-
(352)	T.	D.B	B	.	.	.	.	-
(353)	T.	C.B	B	.	.	.	.	-

Case.	At Injection	24 hrs.	48 hrs.	72 hrs.	96 hrs.	120 hrs.	144 hrs.	Result.
(354)	T.	D.B	B	.	.	.	.	-
(355)	T.	D.B	B	.	.	.	.	-
(356)	T.	D.B	B	.	.	.	.	-
(357)	T.	D.B	B	.	.	.	.	-
(358)	T.	D.B	.	.	.	.	.	-
(359)	T.	D.B	B	.	.	.	.	-
(360)	T.	C.B	B	.	.	.	.	-

T = Typical white rounded bleb.

H = Haemorrhagic area.

D.B = Discrete, pink, oedematous Bleb.

P.B = Purple, oedematous bleb.

B = Brown discolouration.

C.B = Large bleb - pink & oedematous & common to all areas.

S U M M A R Y.

A. ACUTE CASES.

In 14 cases of enteric admitted to my wards in which I was able to recover B. Typhosus from the stools, typical positive results were got. In all these cases the blood serum was able to agglutinate B. Typhosus at the time of the test with one exception - in which the blood serum was negative while the skin test was suspicious. (Case XIV) Unfortunately cases in Glasgow are not, as a rule, diagnosed till the blood has been submitted to Widal's test so that the diagnostic value of the skin test could not be properly estimated. In the above mentioned case the patient was supposed to be in his 9th day of illness when he was admitted but at that time there was a negative Widal, a large spleen, rose spots, and a typical facies. Three days later the blood was positive and the skin test was definitely positive.

In another case (Case X), thought to be in his 9th day of illness, the blood and skin tests were positive. A third case (Case V) in her 10th day of illness both the Widal test and the skin test were positive. I did not get a single negative result in any case that was suffering from enteric fever. Consequently I feel entitled to deduce that the skin test is reliable as a test for the diagnosis of enteric fever comparatively early in the disease.

(2) The stools were, in every case, proved to be free from B. Typhosi before the skin test became negative. For example:-

For example:- p. 17, p. 24.

Case	I.	Skin Test	-	on 29th Day: Stools neg:	on 45th Day: Test neg:	on 50th Day
Case IV.	"	-	"	18th "	" " " "	36th "
Case V.	"	-	"	10th "	" " " "	34th "
Case X.	"	-	"	9th "	" " " "	38th "

The skin test did not show any very definite relationship to the temperature. It was usually done a few days after the temperature fell, (unless it had been done immediately before the fall). In 6 out of 10 cases where the exact date of the fall of the temperature could be noted, a positive skin test was got within 4 days of the temperature reaching normal. In 2 cases the course of the disease was apyrexial (Cases XII & XIV) during their stay in hospital. In another case (Case XI) the skin test was positive 10 days after the temperature reached normal.

- (3) There was never any recurrence of symptoms nor did the stools ever give a growth of nonlactose fermenting organisms during the period of observation after a negative skin test.
- (4) In one case (Case VI) the skin test was very suspicious seven days after the stools were first found to be negative but frequent testing failed to recover the organism and a second skin test 22 days later was definitely negative and the stools remained negative.

B.
CHRONIC CASES.

In the 5 carrier cases the stools were examined twice a week and the skin test once a fortnight.

One had enteric fever 25 years before admission. She had not been detected till a series of cases of enteric fever occurred in her home. Her stools were constantly swarming with *B. Typhosi*. 3 tests were done and all were positive. A second case had enteric fever 5 years previously. The skin test was done 9 times. At the 1st attempt (by scarification) a weakly positive result was got while the stools were still negative. Afterwards the test was invariably positive and the stools were always found to contain *B. Typhosus*. A Paratyphoid carrier was also admitted who had a paratyphoid *B* infection 2 years previously. The skin test was done 16 days after admission while the stools were still negative. Thereafter the stools and skin tests were uniformly positive.

J.H. was a typhoid case. He was said to have had enteric fever in America 8 months before admission. He had pneumonia on admission but his stools contained *B. Typhosus*. His mate on board ship developed enteric fever 4 months before he was admitted to hospital. The skin test was done 3 times and on two occasions was positive. The third skin test had a negative result and the stools were at that time negative. After some months of observation he was dismissed. *B. Typhosi* were not found in his excreta after the 1st negative skin test.

The last case was interesting in that the patient was admitted with her brother as a case of Cerebrospinal Fever. Both were recognised to be cases of enteric fever. The brother died and the sister made a rapid recovery. Her temperature was normal by the 26th day of illness and the stools failed to give any growth of non-lactose fermenting organisms. The skin test, however, remained positive and on the 44th day she had a typical relapse which ran a short course. Again there was a complete recovery and the stools became negative while the skin test remained positive. A second relapse followed with all the typical symptoms on the 60th day. On recovery this time, the skin test became negative and after 10 weeks observation she was dismissed well. During this long observation period the stools were constantly negative.

X / From these carrier cases it would appear that as long as there is a living organism of the Typhoid group in the body, the skin test is positive. This statement may not have immediate confirmation as there are periods in the history of some carriers when the stools are negative. The case of S.S. is a striking proof of the efficiency of the test in demonstrating how it can distinguish a carrier with the organism living in the body although there is none demonstrable in the stools. This also was demonstrated in the cases of M.D. and K.O. who had positive skin tests while the stools were yet negative.

The test does not vary with the Widal reaction as this latter continues to be positive for years after a complete recovery from enteric fever.

C.

INOCULATED PERSONS.

21 cases were tested which had positive Widal's due to previous inoculation or previous attack. In no case was there any suggestion of a positive result to the skin test.

D.

CONTROL CASES.

360 persons were tested who were known to be free from enteric and to have no history of either enteric or inoculation. Amongst these 360 there were many types of reaction. Some disappeared on the 1st day and there was no reaction. Many disappeared after the 2nd day. Most disappeared by the 4th day while a few hung on till the 5th or 6th days.

In two cases (Case 101 & Case 167) there was a definite purplish area, which was slightly swollen on the third day. In each case haemorrhage was excluded. In one of these cases the patient was 2 yrs old and in the other, the patient was 8 yrs of age. In neither case could any association with enteric be found.

Thus in 0.5% of my controls a positive result was obtained.

There was a general reaction in 5 of the controls
- i.e.

Cases, 36: 83: 322: 327: and 333. The general reaction was represented in 3 cases by a rise in the temperature of the patient by 2°F and in two by an extensive skin eruption. Thus 1.4% of the 360 controls had a general reaction.

Table showing extent of reactions on 3rd Day in inoculated cases

Case	Age	Inoculated	Widal	Stools	* Skin Test 1st area	other areas.
VIII	26	1 yr. ago	+	-	++	+
X	19	1 yr. ago	+	-	++	+
XX	23	1 yr. ago	+	-	++	+
II	27	1 1/2 yrs. ago	+	-	+-	+-
XIII	35	2 yrs. ago	+	-	+-	+-
XV	26	2 yrs. ago	+	-	++	+
XVII	27	2 yrs. ago	+	-	++	+
V	27	3 yrs. ago	+	-	+-	+-
IX	27	3 yrs. ago	+	-	++	+

*

++ denotes extensive reaction

+ " slight "

+ - " very slight "

Gay's Test.

An exact measurement of the area of the reaction following each injection was not made but where one area of a group was obviously more extensive than the other three a rough estimate was made and recorded.

- (1) Where the skin-test was positive (i.e. where there was an active resistance to organisms living in the body at the time of the test) the 1st area was invariably larger than the others on the 3rd day - giving an immunity in recovering cases of 100%.
- (2) Amongst 12 cases which had been positive but had recently become negative, the 1st area was more extensive than the others in 9. Thus 75% were immune one month after convalescence began. In the other 3 cases an exact measurement of the areas might have revealed that the 1st area was more extensive than the other areas.
- (3) One case which had recovered from enteric fever five years previously and two carriers who recovered while under observation and were tested two months after recovery, had a more extensive area at the 1st than at the other injections. Another case, recovered from enteric fever nine years previously, had all the areas alike.
- (4) Three cases which had been inoculated one year previously and two which were inoculated two years previously had 1st areas more extensive than the other areas. One case inoculated 18 months, another two years and two, three years previously had all areas alike. Thus 55.5% of those inoculated within 4 years and 72% of those inoculated within 3 years were immune from enteric fever.
- (5) Of the 360 control cases which had no history of enteric fever or antityphoid inoculation, 20 had a more extensive reaction at the 1st than at the other areas (i.e. excluding such results as were known to be due to faulty technique). These were cases 5, 7, 8, 34, 35, 51, 66, 68, 74, 85, 86, 101, 107, 153, 228, 323 and 349. Thus 5.5% of the control cases were immune.

Conclusions:-

- (1) Amongst 14 cases of typhoid fever the skin test was positive during such time as the B. Typhosus existed demonstrably in the body. The test was entirely independent of temperature or symptoms.
- (2) Amongst chronic carriers the skin test was invariably positive, even during the phases when the stools were not found to contain the typhoid group organisms.
- (3) The test was almost invariably negative in recovered cases of enteric fever and in cases that gained immunity from antityphoid inoculation as well as in cases free from a history of either.
- (4) The test became positive in acute cases about the same time as the Widal test became positive.
- (5) The test distinguished Typhoid from Paratyphoid carriers. Thus the test is of some use in the diagnosis of the peculiar typhoid group organism causing the disease, as well as in confirming the diagnosis of enteric fever. It, in the course of 3 or 4 days, gives a fairly accurate indication of whether or not a person has living organisms of the group in his body. In other words, it rapidly decides whether a person is or is not a carrier. The advantage of this will be recognised when one considers that a carrier may have normal stools for several months between the positive infective phases.

An accurate statement with regard to Gay's immunity reaction cannot be made as exact measurements of the differences in diameter of each reaction, were not made but a macroscopic estimate goes far to confirm Gay's claim.

- (a) Persons inoculated within 3 years of the test being done gave a positive immunity reaction in ~~64%~~^{72%} of the cases.
- (b) Persons inoculated more than 3 years before the test being done gave no definitely positive result.

Thus the comparatively rough estimate of the extent of the reaction gave a fairly accurate representation of what one would expect to be the immunity of the various groups.

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