

aspiration of stomach contents or mucus have been excluded.

7. Other well recognized causative factors in the production of cyanosis of the new-born and even of sudden death in infants are often ignored or minimized, in an effort to forestall misdirected criticism of the obstetrician or the infant's parent or nurse. Aspiration of mucus, with or without demonstrable atelectasis, is undoubtedly the most frequent cause of cyanosis of the new-born, and suffocation due to inhalation of vomitus or overlying by the mother during sleep is a not infrequent cause of death in normal infants.

8. The etiological relationship between the thymus gland and holding-breath spasms is very questionable. A much more logical explanation of the phenomenon would be that vigorous crying washes the CO₂ out of the blood, producing a period of apnoea and unconsciousness.

A critical review of the above arguments pro and con reveals that the case for the thymus rests on very scanty evidence, and that the most convincing argument against the gland rests in the fact that most of the suspicious symptoms can be much more logically and scientifically explained by other known pathological processes. There are still some symptoms for which there is no adequate explanation. We

all encounter, for example, the two-year old child who, following a slight injury, becomes blue and unconscious, and who remains in a state of semi-stupor for several minutes. This type of attack is not helped by x-ray therapy, and I believe there is no relation between it and the thymus. So long, however, as the medical profession persists in attributing this symptom, and similar ones, to some fanciful dysfunction of the gland, so long will scientific investigation and clinical observation be hampered in their efforts to discover the true cause and the proper remedy.

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THE COMPARATIVE VALUE OF VARIOUS TUBERCULIN TESTS IN CHILDREN, MEDICAL STUDENTS, AND NURSES-IN-TRAINING*

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UNTIL quite recently a positive tuberculin reaction in the adult was considered to be almost universal, and, therefore, of little clinical significance. For some years, however, paediatricians have received much help from the application of this test, first of all in infancy and latterly in the older child and adolescent.

That the incidence of tuberculosis is becoming less in enlightened communities is an established fact. That many persons attain adult life without having become infected by the tubercle bacillus is also well known. In many districts this reduction in infection probably has resulted from intensification of our campaign against

tuberculosis and improved living conditions. Table I demonstrates the results that have been obtained amongst school children at the Royal Edward Institute. The same supervision and, to a large extent, the same group of nurses have

TABLE I.

Year	ROYAL EDWARD INSTITUTE CONTACT CLINIC FOR CHILDREN			
	Number given Mantoux tests	Positive reactions	Positive percentage	Number of consultations
1933	726	415	57.0	2,178
1934	706	351	49.5	3,147
1935	738	316	42.8	2,854
1936	732	316	43.1	2,700
1937	556	185	33.3	2,284
1938	678	232	34.2	2,089
1939	808	270	33.4	2,588
Totals	4,944	2,085		17,840

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been responsible for the attendance at this clinic. Therefore, it can be reasonably assumed that there has been a definite reduction in the percentage number of infected children.

TABLE II.

ROYAL VICTORIA HOSPITAL CLASS 1936-1939.

Number of students admitted	72
Old tuberculin positive on admission (none sick with tuberculosis during training).....	18
“ “ negative on admission	51
“ “ refused on admission	3
“ “ positive on graduation	58
“ “ negative on graduation	16
“ “ positive on admission—clinical cases..	0
“ “ negative on admission—clinical cases.	6

Clinical cases

<i>Case</i>	<i>Time lost</i>
M.G.	13 months
C.M.	21 “
M.A.	12 “
F.L.	9 “
Average	13¾ “
I.M.	discontinued training
H.B.	“ “

TABLE III.

ROYAL VICTORIA HOSPITAL CLASS 1937-1940

Number of students admitted	72
Old tuberculin positive on admission (none sick with tuberculosis during training).....	18
“ “ negative on admission	54
“ “ refused on admission	0
“ “ positive on graduation	56
“ “ negative on graduation	14
“ “ positive on admission—clinical cases..	0
“ “ negative on admission—clinical cases.	4
Discontinued training (not illness)	2

Clinical cases

<i>Case</i>	<i>Time lost</i>
E.M.	19 months
J.C.	15 “
V.G.	20 “
J.H.	8 “
Average	15½ “

Tables II and III exemplify the great number of tuberculin-negative undergraduate nurses on entering our training school. These tests were performed with 1/10 mg. and 1 mg. of old tuberculin on all new pupils, and repeated on the negative reactors every six months. In these two classes which were followed for the three years of their undergraduate course tuberculin tests and x-raying of the chest were carried out every six months. Recently, the custom has been changed, and a check-up is made on all tuberculin-negative nurses every three months. The number of negatives on graduation closely approximates the number positive on admission. Also, every case of tuberculosis that required treatment occurred in the group that was negative on admission to the nursing school. In

other words, all these nurses probably suffered from some form of primary infection, which, in my opinion, might have been avoided had they been rendered tuberculin-positive by the injection of BCG.

A somewhat comparable figure was obtained by Dr. F. G. Pedley with the medical students at McGill University. Dr. Pedley's study is not far advanced, but in the first year group he found 38.1 per cent positive and in the second year 43.2 per cent. Presumably by the time these two groups have become hospital interns the number of positives will have markedly increased, and 4 or 5 per cent of casualties will have occurred.

Being local institutions, the Royal Victoria Hospital, the Royal Edward Institute, and McGill University statistics have been utilized—but the same trend will be found in any enlightened community. The tuberculin test, therefore, becomes of importance to every physician or nurse interested in tuberculosis.

In childhood, as a rule, allergy is well marked, and some inconvenience attends a test by means of a needle. Therefore, inunction or patch tests have a definite application as a case-finding measure. The number of positive reactions produced by these two methods is practically identical.

The percutaneous or inunction test.—In 1907 Moro and Dagenough first described the inunction method for the diagnosis of tuberculosis. This ointment consisted of old tuberculin in a basis of anhydrous wool fat. In 1919 Hamburger introduced a so-called percutan ointment. In 1938 we studied intensely a small group of cases. Our patients ranged in age from 23 months to 13 years. All children in this group reacted positively to the intradermal injection of 1/10 mg. (1/10 c.c. of 1 in 1,000 solution) of old tuberculin. There were variations in their response to the injection of weaker solutions of old tuberculin, but the percutaneous test in our group was just as reliable as one test intradermally with 1/10 mg. (1/10 of 1 in 1,000 solution of old tuberculin).¹

Subsequent work in a group of tuberculous children at the Jeffrey Burland School confirmed these results.

There are some who prefer the percutaneous method because they maintain a plaster can easily be removed. But, generally speaking, it is agreed that the percutaneous, the Pirquet and patch tests yield comparable results.

In adolescence or adult life there is no objection to the intradermal method and, therefore, in these cases it should always be employed. The method of carrying out the tests is of some importance, that is to say, that it should be intradermal and not subcutaneous. In scientific work P.P.D. is to be preferred but in ordinary clinical use old tuberculin yields satisfactory results. The initial dose should never be more than 1/10 mg., as Edith Lincoln has emphasized the potential dangers from intensive reactions, and there is now therefore, a tendency to make the first dose 1/100 mg. If the first dose yields negative results after 48 hours, a larger one should be employed, and the American National Tuberculosis Association recommends the following graded dosage: (1) 1/10 mg., (2) 1 mg., (3) 10 mg. Even in the presence of fever anergy cannot result with a

dose of this size and it can be stated with confidence that with such a routine 99.5 per cent of cases of tuberculosis will give positive reactions. The question of the age of the old tuberculin is of some importance and usually fresh solutions are prepared every six weeks, although in my experience 1 in 1,000 solution kept in refrigeration and in the dark has remained potent for two years.

This contribution is made to emphasize the lessened incidence of primary infection in childhood and the consequent rather common first infection in young adults whose way of life necessitates proximity to the case with positive sputum—which means the increasing importance of tuberculin tests in all groups.

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DRAINAGE OF TUBERCULOUS CAVITIES BY ASPIRATION (MONALDI METHOD)*

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YOU will presumably be interested to hear about that new method of drainage which I have already applied in nine cases of select pulmonary tuberculosis cavities, three of which date back to May, 1939.

It was probably during the summer of 1938, after hours of discussion, study, and hesitation that Monaldi first undertook this therapy as an ultimate measure following the failure of all other known methods of treatment. The results were so gratifying and the disadvantages so few that it was decided to apply it immediately to as many as 50 patients; reports add that there was but one death, which, apparently, may have been due to surgical intervention, though, actually, the real cause remains unexplained.

To the name of Monaldi, a member of the Italian school so productive in pulmonary therapy and physiology, were soon added those of my Swiss professors and renowned phthisiologists, Morin, Cardis, Michetti, Jeanneret, Rossel, Burnand, Franken, and our comrade Chadourne, of France, who, beyond the Italian

boundaries, were the first to adopt the method which Mayer, of New York, qualified as the "most ambitious approach to new methods". As a matter of fact, in spite of the method's denial of all existing theories its efficacy asserts itself.

Its technique is rather simple. Following a tomography or, preferably, a seriescopy, an outline of the fluoroscopic image of the cavity is drawn on the skin; under local anæsthesia and through a trocar a permanent catheter is introduced at the level of a costal interspace into the cavity itself, the opposite end of the catheter being connected to a continued suction apparatus.

What happens? The intracavitary air pressure being constantly under negative pressure, the walls of the cavity are somewhat less responsive to the force of expansion of the inspiratory action, which force of expansion, as we know, has a tendency, at each respiratory movement to enlarge the cavity, whereas the expiratory phase, due to the action of the elastic fibres, favours a diminishing of volume and the closure of the cavity. If the force of aspiration through the catheter rises above that of Nature (usually termed drainage bronchus)

* Read at the Fortieth Annual Meeting of the Canadian Tuberculosis Association, Montreal, June 25, 1940.