allowed home and was apparently well. Since this experience she has again become pregnant and had a baby girl with no untoward results.

The last two cases are more or less types of the toxæmias of pregnancy that we have endeavoured to treat with kemithal sodium, to see if there were any beneficial results from this form of therapy. In our opinion, we think that the results are more or less comparable, and that kemithal sodium is equal if not superior to pentothal sodium in that clinical observation shows its sulphur contents may be greater than those of pentothal sodium.

Apart from the above case reports we were obliged to use pentothal sodium for the treatment of intravenous procaine convulsive seizures. This was not a simple procedure of dispelling convulsions by a small dose of pentothal, but large doses were employed until the detoxification process was completed by the body, before the discontinuance of the drug could safely be done.

We were not able to find out the sulphur content of pentothal sodium and kemithal sodium. We were informed that they were the same, but one would suspect that the latter contained larger amounts. Certainly one would suspect this by the odour of kemithal in comparison with pentothal. On the other hand larger doses of kemithal can be given without the respiratory depression and consequently more of the sulphur radicle.

Whilst we cannot explain all the end results, we think that the thiobarbiturates are possibly responsible for the results that we have recorded. The two thiobarbiturates that we have employed were first pentothal sodium, and later kemithal sodium. We think it is reasonable to assume that the sulphur radicle may be beneficial in some of the toxic and convulsive states.

BILATERAL PNEUMOTHORAX COMPLICATING THYROIDECTOMY.—During the course of a sub-total thyroidectomy for moderately enlarged, nontoxic, diffuse nodular goitre, a hissing sound was heard, and the patient became cyanotic with laboured respiration. A diagnosis of bilateral tension pneumothorax was made, and later confirmed by x-ray. The patient responded well to pleural decompression. Moriarty, G.: *Harper Hosp. Bull.*, **7**: 301, 1949.

ETIOLOGICAL SIGNIFICANCE OF PULMONARY CALCIFICATIONS AT UNIVERSITY OF TORONTO

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IN the 1948 routine radiological chest survey at the University of Toronto, 8,144 films were taken and 122 of these showed pulmonary calcifications. This is an incidence of about 1.5%. This incidence is to be compared with Beadenkoff's[1] figures of 20% of films with pulmonary calcifications in the Mississippi Basin and "less than 10%" in regions just south of the Great Lakes.

In the past five years it has been increasingly realized that conditions other than tuberculosis can cause pulmonary calcifications; and in particular, that calcifications can be caused by fungus infections of lung, such as coccidiomycosis, aspergillosis, and histoplasmosis.

Studies of skin sensitivity to coccidioidin, to tuberculin, and to histoplasmin have been made[1] and correlated with pulmonary calcification as occurring in various parts of the United States. The percentage of reactions to coccidioidin was found to vary from 0 to 11% according to the region surveyed; and the greatest incidence of skin sensitivity to coccidioidin was found in the South Western and Middle Western States.

The percentage of reactors to tuberculin was found to vary from 19 to 32% within the United States (among students at the University of Chicago). The available figures for the University of Toronto are derived from a survey of female students only and show that in 1947 of 1,428 students 19% reacted positively to tuberculin.[2]

The percentage of reactors to histoplasmin was found to vary from 70 to 3.7% among the Chicago students, according to the geographical distribution of the domicile of these students. Skin sensitivity to histoplasmin was most frequently found in students from the Mississippi Basin and corresponded quite closely with the incidence of pulmonary calcifications. The figure of the incidence of histoplasmin sensitivity *among cases showing pulmonary calcifications* at the University of Toronto is provided in this resport, and is *not* comparable to the above figures, because at Chicago all students were

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tested, not only those with pulmonary calcifications.

Material and method.—This report is concerned with the group of students found at the University of Toronto in 1948 to have pulmonary calcifications shown in an x-ray film of the lungs in one (the largest) section of the Health Service. There were 77 such cases. All were recalled to the Health Centre by letter, and 63 actually attended and form the group here reported.

Each student was given 1/10 c.c. intradermally of histoplasmin "H 40" supplied by the U.S. Public Health Service, and in the other arm was given 1/20 mgm. tuberculin supplied by Connaught Laboratories Toronto. The tests were read in 48 hours. If the tuberculin test was negative, 1 mgm. was given and read in 48 hours. The tuberculin test was not recorded as negative unless negative to 1 mgm. Reactions both to tuberculin and histoplasmin were recorded as negative unless 5 mm. in diameter or more.

Tuberculin syringes were used. The syringes used for the histoplasmin tests were new syringes and were not used to give tuberculin.

Results.—Table I shows the results obtained.

TABLE I.

RESULTS OF SKIN TESTING

	Cases
Tuberculin positive, histoplasmin negative	20
Tuberculin positive, histoplasmin positive	13
Tuberculin negative, histoplasmin positive	23
Tuberculin negative, histoplasmin negative	7
Total	63

It is interesting that only 33 of these 63 cases of pulmonary calcification were tuberculin positive, and that 36 cases reacted to histoplasmin. The numbers involved are too small to make a geographic survey of much value, but it was noted that positive reactors to histoplasmin included individuals from all Provinces of Canada except Newfoundland and Prince Edward Island.

X-ray appearances. — An attempt was made to find some characteristic by which calcification due to histoplasmosis might be distinguished from that due to tuberculosis in the x-ray films. Table II shows the results obtained.

In this table calcifications are classified both according to their appearance and distribution on the P-A x-ray film. So far as distribution is concerned, "upper half" refers to calcifications at or above the 4th anterior rib, and "lower half" to the lung below this level. The points that may be noted in this table are:

1. Bilateral calcification is more often associated with a positive histoplasmin test than with a positive tuberculin test. (Comparable figures in the table are bracketed.)

2. The irregularly shaped calcifications are more often associated with tuberculin than histoplasmin positivity. (The comparable figures in the table are italicized.)

3. Upper lobe localization of calcification is associated with a positive tuberculin test. Edwards, Lewis, and Palmer[3] in their much larger series found that, "Among tuberculin reactors, the infiltrates are found to be localized in the upper portion of the chest. Among histoplasmin reactors the infiltrates are scattered generally throughout the lung fields."

DISCUSSION

It is apparent that pulmonary calcifications are often associated with a positive skin reaction to histoplasmin. If such lesions are actually caused by histoplasmosis, then earlier lesions similarly caused and which may be expected to have the radiological appearance of a fresh infiltrate, probably are to be found occasionally and could be readily mistaken for tuberculosis or for one of the other fungus diseases of the lung. Such small infiltrates have been reported as related to histoplasmin sensitivity by Edwards, Lewis, and Palmer.[3] These authors studied x-ray films of 12,803 student nurses and found 12 with "poorly circumscribed infiltrates" who reacted to histoplasmin but not to tuberculin. None of these 12 lesions showed progression of disease. Ten clinical

TABLE II.

X-RAY APPEARANCES

Skin test	*Single round*	*Single irregular*	*Multiple round*	*Multiple irregular*	*Round lung and hilus*	*Irregular lung and hilus*	*Bilateral*	*Upper half of lung*	*Lower half of lung*	*Upper and lower*	*Total cases*
Tbc. neg.; Hist. neg.....	4	0	1	0	2	0	0	1	6	0	7
Tbc. neg.; Hist. pos.....	8	*0*	0	*0*	9	*0*	(6)	9	13	1	23
Tbc. pos.; Hist. pos.....	1	1	0	0	6	2	3	6	7	0	13
Tbc. pos.; Hist. neg.....	7	*1*	2	*1*	6	*2*	(1)	9	9	2	20
Totals.....	20	2	3	1	23	4	10	25	35	3	63

cases of pulmonary histoplasmosis were observed by Bunnell and Furcolow[4] in Kansas City, with at least two complete recoveries and five deaths. Krug and Glenn[5] state that "Since 1905 when the first cases were reported in the Canal Zone only 82 reports of histoplasmosis are to be found. All these patients died of the disease."

It would appear therefore that histoplasmosis, like tuberculosis, normally heals without causing clinical illness, but is at times a progressive and fatal disease. It must therefore be treated much as tuberculosis is treated.

Summary and Conclusions

A total of 122 cases showing pulmonary calcifications radiologically was found by an x-ray survey in which 8,144 chest films were taken of students, male and female, at the University of Toronto in the fall of 1948. This is a much lower incidence of calcification than is found in most parts of the United States.

Sixty-three unselected individuals showing pulmonary calcifications were skin tested; 36 of these reacted to histoplasmin; 33 reacted to tuberculin. This, together with a growing weight of evidence in the literature, suggests that pulmonary calcification is often due to *histoplasma capsulatum* rather than to *M. tuberculosis*. Certain other fungi are also thought to cause pulmonary calcifications.

Because histoplasmosis is a disease closely resembling tuberculosis, treatment and control measures will be very similar in the two diseases. For practical purposes there is nothing to be gained by attempting to differentiate between the two diseases in the stage of calcification. But histoplasmosis should be kept in mind in the differential diagnosis of persistent pulmonary infiltrates in Canada as in the United States.

I wish to express my appreciation to Dr. C. D. Gossage, Director of the University of Toronto Health Service, for his unfailing interest and assistance in this study.

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Résumé

Il s'agit d'une étude faite à l'université de Toronto sur 122 cas de calcifications pulmonaires trouvées à l'examen de 8,144 clichés de dépistage. On fit des épreuves cutanées à 63 de ces 122 cas; 36 réagirent à l'histoplasmine et 33 à la tuberculine. Ces faits concordent bien avec ce qui a été trouvé aux Etats-Unis et ailleurs i.e. que le calcifications pulmonaires sont souvent dues à *Histoplasma capsulatum* plutot qu'à *M. tuberculosis*. Au point de vue pratique il ne sert à rien de différencier les deux puisque le traitement est le même, cependant on doit toujours penser à l'histoplasmose dans le diagnostic différenciel des infiltrations pulmonaires persistantes. Yves Prévost

IMMUNIZATION IN PRACTICE*

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IN 1944, at the 75th annual meeting of this Association, the Committee on Economics reported under the heading of "Principles Relating to Health Insurance" as follows: "Each province should be served by an adequate Department of Public Health, organized on the basis of the practising physician taking an active part in the prevention of disease". This recommendation, I take it, includes immunization.

The first problem I would discuss is, "Should immunization be left to the practising physician, or should it be left to the public health agency, or should both be doing this work?" A complete answer to this question is not immediately obvious. Let us consider what develops when it is left to the practising physician alone.

I am well aware that some physicians are specially interested in this matter, and do excellent work in their community; but we are speaking now of the profession generally. The average physician has many unforeseen calls upon his time. Many find it difficult to take a day, or even a half day, away from the urgencies of practice to inoculate groups of children in the schools, particularly isolated rural schools. These visits must be scheduled a reasonable time in advance, and if one is alone in practice, such schedules may be difficult to meet.

On the other hand, to attempt to get the babies, pre-school and school children from the countryside over to come to the doctor's office for this purpose is likely to result in failure to

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