THE

BULLETIN

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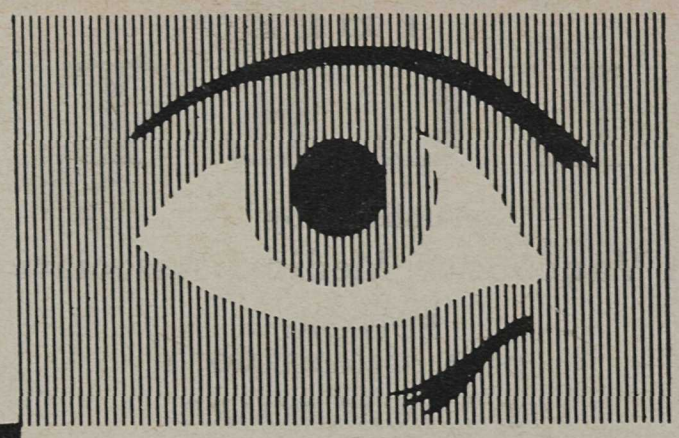

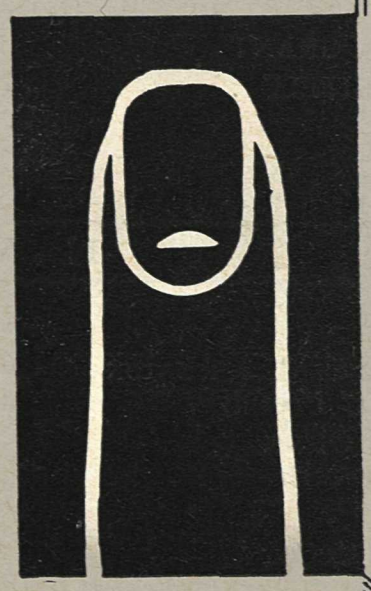

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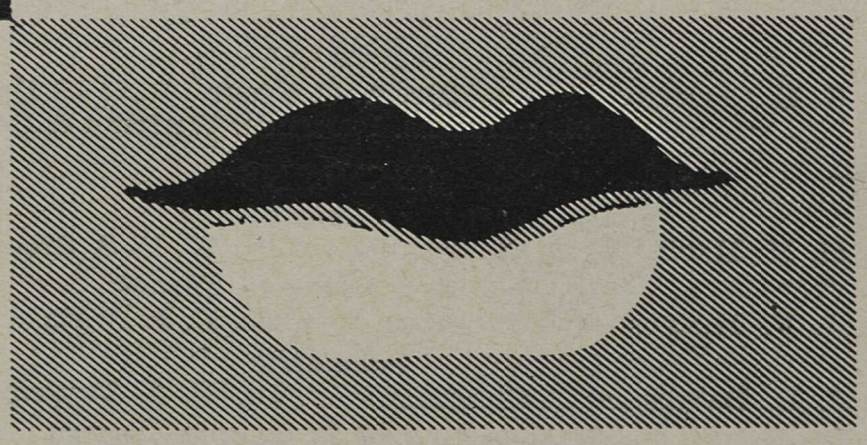

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VANCOUVER MEDICAL ASSOCIATION

Founded 1898; Incorporated 1906

PROGRAMME FOR THE FIFTY SECOND ANNUAL SESSION
(Spring Season)

MARCH 2nd—SPECIAL MEETING Speaker—Professor F. H. Bentley, Department of Surgery, University of Durham Medical School, England.

MARCH 6th—SPECIAL MEETING, Lecture by Sir Reginald Watson-Jones, title: "The New World of Orthopaedic Surgery."

MARCH 8th (WEDNESDAY) "OSLER LECTURE"—Presented by DR. GEORGE A. DAVIDSON, HOTEL VANCOUVER Title: "Men of Osler's Time."

MARCH 28th—SPECIAL MEETING—"Lecture by Dr. Cecil Watson, Professor of Medicine, University of Minnesota, Title: "Some Fundamental and Clinical Aspects of the Problem of Hepatic Cirrhosis."

APRIL 4th—GENERAL MEETING—"The Problem of the Prostate", Dr. L. G. Wood.

MAY 2nd—ANNUAL MEETING.

It has been the practice in the past to hold a meeting of the Clinical Section of the Vancouver Medical Association on the third Tuesday in each month. These meetings were held at alternate hospitals and owing to this fact, often two Clinical meetings were held at a hospital in one month. To overcome this situation a plan has been worked out whereby the members of the Vancouver Medical Association are invited by the various hospital Directors to attend their Clinical Staff meetings. These meetings will be held as follows:

Second Tuesday—Shaughnessy Hospital

Third Tuesday—St. Paul's Hospital

Fourth Tuesday—Vancouver General Hospital

Notice and programme of these meetings will be circularized by the Executive Office of the Vancouver Medical Association.

All special and general meetings will be held in the Tuberculosis Institute Auditorium.

THE BULLETIN

Publishing and Business Office — 17 - 675 Davie Street, Vancouver, B.C.

Editorial Office — 203 Medical-Dental Building, Vancouver, B.C.

The Bulletin of the Vancouver Medical Association is published on the first of each month.

Closing Date for articles is the 10th of the month preceding date of issue.

Manuscripts must be typewritten, double spaced and the original copy.

Reprints must be ordered within 15 days after the appearance of the article in question, direct from the Publisher. Quotations on request.

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Neustaedter, T.: Am. J. Obst. & Gynec. **46**:530 (Oct.) 1943.

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VANCOUVER HEALTH DEPARTMENT

CASES OF COMMUNICABLE DISEASE REPORTED IN THE CITY

STATISTICS — DECEMBER, 1949

Total Population—Estimated	376,000
Chinese Population—Estimated	7,455
Hindu Population—Estimated	275

NOVEMBER, 1949

	Number	Rate per 1000 Pop.
Total deaths (by occurrence)	349	11.1
Chinese deaths	19	30.5
Deaths, residents only	321	10.2

BIRTH REGISTRATIONS—RESIDENTS AND NON-RESIDENTS
(includes late registrations)

	November, 1949	
Male	448	
Female	442	
	890	28.4

INFANT MORTALITY—Residents only:

	November, 1949
Deaths under 1 year of age	12
Death rate per 1000 live births	18.6
Stillbirths (not included in above item)	5

CASES OF COMMUNICABLE DISEASES REPORTED IN THE CITY

	November, 1949		November, 1948	
	Cases	Deaths	Cases	Deaths
Scarlet Fever	19	0	8	0
Diphtheria	0	0	0	0
Diphtheria Carriers	0	0	0	0
Chicken Pox	100	0	306	0
Measles	80	0	61	0
Rubella	10	0	10	0
Mumps	79	0	17	0
Whooping Cough	1	0	0	0
Typhoid Fever	0	0	0	0
Typhoid Fever Carriers	0	0	0	0
Undulant Fever	5	0	2	0
Poliomyelitis	1	0	2	0
Tuberculosis	49	11	42	6
Erysipelas	0	0	1	0
Meningitis	2	0	1	1
Infectious Jaundice	0	0	0	0
Salmonellosis	5	0	1	0
Salmonellosis Carriers	0	0	0	0
Dysentery	2	0	1	0
Dysentery Carriers	0	0	0	0
Tetanus	0	0	0	0
Syphilis	38	2	26	1
Gonorrhoea	180	0	171	0
Cancer (Reportable)				
Resident	63	57	77	45
Non-Resident	19	5	42	7

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MACDONALD'S PRESCRIPTIONS LIMITED

MEDICAL-DENTAL BUILDING, VANCOUVER, B. C.

The Editor's Page

In the daily press one read last week an announcement that the B. C. Government plans to spend twenty million dollars on new schools in this province within the next year or two. This is good news, and one would not grudge a penny of this sum. But there was no mention of any immediate programme of hospital construction, and we confess to a feeling of disappointment, to put it very mildly. The only mention of the matter came in a paragraph or two which pointed out that even if construction were begun immediately, it would be some three years before any actual good could come of it. Some vague statement about plans now in progress for the new buildings of the Vancouver General Hospital was made—we seem to have been reading statements of that sort at regular intervals for the past few years—but nothing has yet come of it.

We cannot help wondering what the long-suffering public would say if they really knew how bad things really are in the present hospital situation. How more and more difficult it is getting to be, almost to the point of impossibility, to get sick people, who really need hospital care, into hospital beds. How disgracefully crowded the hospitals are—and what agonies every admitting office has to go through daily in their herculean efforts to find accommodation for desperate cases. How operations must be cancelled again and again, some five or six times, because there is no bed available. We understand there is a survey proposed or under way, to examine into this.

It is difficult to estimate at all accurately the enormous loss of time and money that this entails—the real hardship that it brings to people, the added length of invalidism caused by conditions which, while perhaps not immediately fatal or menacing to life, yet cause disability at work, pain and ill-health and suffering. The woman who needs an operation or hospital care, and has to undertake prodigies of effort to arrange about her household and family's care while she is in hospital—then is told there is no bed—and has to repeat this process several times. All this and many other considerations come to mind.

We know, of course, that there are many explanations of the present woeful situation, nor do we seek to place it on the shoulders of Hospital Insurance, as the average layman is vociferously doing a thousand times a day. Hospital Insurance is a noble idea, and a great forward step. We believe sincerely that it was an act of statesmanship, and definitely the right thing to do. But whether it is that the timing was not quite right, or that unforeseen and unpredictable complications have risen, we see a state of affairs that is rapidly reaching a very critical point.

There does not seem to be any planning, or definite idea of how to meet this problem—or if there is, it is being kept very dark: and the public is becoming very much disturbed about it. Why cannot hospitalization in the province be put on a long-term basis, as schools are, as water-supply is, as electrical power is? Why cannot we have a Hospital Commission, or some such body, similar to the Water Commission, the Power Commission, the Workmen's Compensation Commission—where men appointed to the job can study the whole problem from a long-term viewpoint, assigning hospital beds to areas on the basis of needs, and not according to the local ideas of local Hospital Board?

Our hospital system suffers from a lack of cooperation between the various hospitals, each of which is administered by a Board, which struggles jealously to maintain and improve the standing of its own hospital, without any regard to the others. We need someone to do what Dr. A. K. Haywood, the former superintendent of the Vancouver General Hospital, did in Montreal many years ago, get the hospitals together and working along a plan of mutual adjustment and cooperation, of which we have none here at present. Certainly we want to preserve free action and independence in our

hospitals, but perhaps this is being carried too far, and leading to overlapping, delay in constructive action, and waste of time, effort and money. We have no doubt that better minds than ours are working on this problem and can only hope and pray that they will soon reach an adequate solution.

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CANADIAN RED CROSS BLOOD TRANSFUSION SERVICE

We publish herewith a letter from the Red Cross Blood Transfusion Service, which is self-explanatory, and should be read by every medical man.

Dr. Moore, we understand, told Dr. Johnston in conversation that they are very much gratified by the results they have obtained from the leaflets which have been left in doctor's offices. He stated that over 250 donors had come forward since this practice was inaugurated. This is excellent, and we should do our best to help this along by drawing our patients' attention to these leaflets, as well as in other ways. *Editor.*

British Columbia Depot

28th Avenue West & Laurel
Vancouver, B.C.
January 31st, 1950

Dr. Gordon Johnston, Secretary,
Vancouver Medical Association,
Vancouver, B.C.

Dear Doctor Johnston:

I would like to take this opportunity of bringing to the attention of the Blood Donor Committee of the Vancouver Medical Association the following rules of the Canadian Red Cross Blood Transfusion Service, which have been devised for the safeguarding of persons who suffer from hypertension.

As you are aware, we accept donors only between the ages of 18 and 65. Under no circumstances are donors accepted outside these age limits. Where a person has hypertensive disease, we require a letter from the patient's doctor requesting and recommending a donation of a pint of blood each time the person attends the clinic.

We would much prefer the doctor to mention in his letter the blood pressure of the patient. The reason for this is that it is a proven fact that there is a risk attached to taking a pint of blood from a person whose systolic pressure is over 200. Where we are aware that the pressure is over this figure, we do not accept a donation.

One factor is that we are from time to time requested by a doctor to take half a pint or less of blood from a patient suffering from hypertension. As outlined above, I think that you will agree that we are within our rights in only accepting donors who are willing to donate a full pint of blood. There must be some risk attached if the patient can only donate half a pint of blood without suffering ill effects.

The reason for these rules is simply that we feel that to take blood from such a patient in a busy clinic is a definite hazard both to us and to the person concerned. We believe that it is much safer for the patient to have such treatment performed by the physician who is treating the disease.

I would be grateful if you would disseminate this information among the practioners in the Vancouver area, as several instances have occurred which have given rise to inconvenience to the patients in that we have refused them.

Yours very truly,

Signed, B. P. L. Moore, M.B.,
Provincial Medical Director

BOOK REVIEW

Surgery of the Hand

By STERLING BUNNELL, M.D., 2nd edition, 1948

In his second edition Sterling Bunnell has incorporated the advances and references gained from many thousands of hand injuries occuring in the second world war. This book is an exhaustive study of the surgical diseases of the hand and as such involves general, plastic, orthopedic, traumatic and reconstructive surgery.

One may find a detailed account of the origin and development of the hand, its normal anatomy and physiology and methods of diagnosing deviations from this. Surgical technique is thoroughly discussed, with special emphasis on how to deal with acute injuries, how to close wounds and skin defects, where best to place skin incisions and how to adequately splint the hand.

Special attention is paid to injuries of joints, bones, tendons and nerves and the various reconstructive procedures to be used under varying circumstances. In addition to traumatic conditions a detailed account of congenital, infectious and neoplastic lesions of the hand are also included.

In short this scholarly work is pleasant to read, is replete with illustrations and contains an enormous amount of information on the hand and its surgical care. It cannot be too highly recommended. G.C.J.

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ST. PAUL'S HOSPITAL

The New Premature Unit

In order that adequate care may be given to small infants born prematurely in institutions and localities where special nursing care and special equipment are not available, a new Premature Unit is being opened at St. Paul's Hospital in the Department of Paediatrics. This unit is to serve as the nucleus of a premature programme for the surrounding area, and will co-ordinate the services of the physicians, the V.O.N. nurses and the social service personnel. It will also function as a teaching unit for nurses from other parts of the province, so that similar units may be established elsewhere.

The unit will be supervised by two graduate nurses who have recently returned from a course in premature care at Johns Hopkins Hospital. Strict nursing technique will be carried out and all new admissions will be isolated for forty-eight hours. Before discharge home visits will be made by the V.O.N and instruction given to the mother if requested.

Infants admitted to the unit may be cared for by their own physicians. It is hoped that a follow up on all cases will be carried out through cooperation with the doctor in charge in private cases and by following staff cases in the out-patient's department.

In order to provide adequate transportation two ambulances are being equipped to carry electric incubators and oxygen, and if necessary these incubators can be similarly connected in an ambulance aircraft. It will not be necessary or possible for all premature infants to be cared for in such a unit and it is intended for only the very small infants requiring special care. It should be remembered that 50% of these infants will expire in the first 24 hours and 70% in the first 48 hours so it is this period when special care is especially required. A notice has been sent to outlying hospitals concerning care in this early period and care in transportation. Any physician desiring the admission of an infant to the unit is requested to contact the Admitting Department, St. Paul's Hospital and transportation arrangements will be made.

AMYLOID DISEASE

(Based on 46 Post Mortems)

by DR. C. S. RENNIE

Read before N.W. Pacific Internists' Society

I wish to thank you for the opportunity to speak to you today. I am going to discuss the subject of amyloid disease, not because I have anything new to offer, but rather to summarize the findings of 46 cases found in the postmortems performed at the Vancouver General Hospital between the years 1939 and 1948, and at the same time attempt to present today's thoughts on the subject.

The condition was first drawn to the attention of the medical profession in 1832 by Hodgkin who described it in the spleen but did not name it. In 1838 Bright noted the "spleen has the appearance of suet". Carswell, in 1838, was of the opinion that the condition was malignant. Budd in his writings in 1845 refers to it as the "scrofulous enlargement of the liver" expressed by the epithet "waxy". Rokitansky considered the process a species of fatty degeneration. At the Physiological Society meeting in Edinburgh in 1853 Bennett and Gairdner stated "the condition of the liver was common in scrofulous, syphilitic and other chronic exhausting conditions." It was Gairdner's opinion that the condition was due to a peculiar modification of protein compounds. In 1854 Sanders stated that waxy degeneration of the spleen, liver and kidneys occurred in 10 percent of all necropsies at the Edinburgh Royal Infirmary. Shortly after this Virchow named the infiltrating material as amyloid or starch-like degeneration. This name has persisted ever since.

At St. George's Hospital between 1867 and 1894 Dickinson encountered this condition in 201 autopsies while at Guy's Fogge found 244 in 21 years. From the literature it would appear that this condition which was reasonably common prior to 1900 is much less common today.

Wickmann in 1893 made a comprehensive survey of amyloidosis and classified it into "local" and "generalized". Lubarsch in 1929 suggested "typical" and "atypical". Reemann, Kouchy, and Ecklund in 1935 put forth the following clinicopathological classification which, until the etiology is known I would recommend to you:

1. Primary amyloidosis—localized or systemic.
2. Secondary amyloidosis.
3. Tumour-forming amyloidosis.
4. Amyloidosis associated with multiple myeloma.

In 1882 Birch-Hirschfeld produced amyloid disease experimentally in the dog by injection of pus subcutaneously. This was later confirmed by Charrin. Several experimenters since have produced the condition by injection of pyogenic organisms, pus and inorganic substance. Kuezynski produced it by feeding mice a diet rich in proteins.

Amyloid disease is an entity, recognized by the presence of characteristic homogeneous protein material in various organs of the body. Its exact chemical nature is unknown. It has been shown to be composed of two protein fractions and one polysaccharide fraction. Analysis have shown it to consist of a variety of amino-acids which vary qualitatively and quantitatively in different individuals and even in the same individual in different organs. The theories proposed as to its etiology are as follows:

1. The allergy theory.
2. The antigen-antibody union and precipitation theory.
3. The theory of disordered endogenous protein metabolism.
4. The hyperproteinemia (hyperglobulinemia) theory.
5. The theory of disordered endogenous protein metabolism in which the reticulo-endothelial is involved.

I give you these to emphasize the fact that the etiology is unknown.

The pathology of this condition is still controversial. The type of the disease would appear to have a direct bearing on this. In the primary type there is no predisposing illness or disease, there is a marked affinity for smooth and striated muscles, especially the myocardium—tongue—skin—gastro-intestinal tract and blood vessels. The staining reactions are variable and the substance tends to be deposited in a nodular form. In the secondary type which is commonly associated with chronic suppuration, neoplasm, chronic infection or chronic debilitating disease there is an affinity for organs such as spleen, liver, kidneys, and adrenals. In type 3 "Tumour-forming amyloidosis" the tumours are found in relation to the nasal septum, larynx and bronchi. Type 4 resembles the primary type but is associated with multiple myeloma.

Amyloid is a protein in nature—a compound of albumen with chondroitin—sulphuric acid. There would appear to be some relationship to cholesterol metabolism (according to Boyd) with an involvement of the reticulo-endothelial system (Aschof, Jacobi, and Grayzel).

By far the commonest division is the secondary type. Here we find the *spleen,* in which the disease usually begins, to be enlarged, firm, elastic and translucent. The amyloid may be distributed in two ways:

a. The common one—in the walls of the arteries of the malpighian bodies—the sago spleen.
b. Changes affect the connective tissue of the venous sinuses and the reticulum of the pulp in a diffuse manner—the "bacony" spleen.

The liver enlarged, firm but elastic—the cut surface is translucent. The process appears in the connective tissue between the sinus endothelial liver cells. The tissue becomes swollen, so that the liver cells are comprised, atrophy, and the sinusoids become narrowed.

The kidneys present special problems on account of secondary changes. The changes begin in the connective tissue of the vessels in the glomerular tufts, and also involve the walls of the arterioles and the connective tissue under the basement membrane of the collecting tubules. Owing to the obstruction to the glomerular circulation the convoluted are deprived of their blood supply and may undergo degenerative changes. They may gradually atrophy and be replaced by fibrous tissue.

PRIMARY AMYLOID DISEASE—occurs in middle life or later. It is comparatively rare. Wild described the first case in 1886. About 45 cases have been reported in the literature. It is, however, a well recognized entity. The four outstanding characteristics are:

54% 1. *High incidence of congestive failure*—an intractable type with a very rapid downhill course. This occurs in spite of vigorous therapy. The patient usually shows an enlarged heart without evidence of valvular disease, hypertension or coronary sclerosis. The myocardial failure is directly related to the infiltration of the heart with amyloid material. It was found to be due to:

a. Widespread interstitial deposition of this amyloid material with consequent stenosis or complete obliteration of the venules and capillaries of the myocarddium.
b. Mechanical interference with the function of the valves.
c. Obliterative infiltration into the walls of the coronary arteries with coronary insufficiency.
d. Obliterative infiltration into the walls of the pulmonary vessels leading to chronic corpulmonale.
e. Pericardial or endocardial deposits followed by interference of cardiac function.
f. A combination of any of the above.

The electrocardiogram frequently shows myocardial damage in altered T ways—prolonged P.R. interval and low voltage.

42% 2. *Macroglossia*—It is often mistaken for malignancy. The involved muscles become greatly enlarged and firm, often resulting in dysphonia and dysphagia.

It is occasionally accompanied by swelling of the neck and face due to amyloid involvement of skin, subcutaneous tissues or muscles. A fixed staring expression may result in an appearance similar to that of paralysis agitans.

42% 3. *Asthenia*—progressive weakness and fatigue due to the involvement of skeletal muscles which are enlarged and firm. The clinical picture can simulate myotonia.

31% 4. Weight loss.

PRIMARY AMYLOID DISEASE of the *SKIN* may produce lesions varying in appearance from extensive eruption of sharply defined firm opalescent papules, firm translucent waxy papules, nodular lesions or the sclerodermic type. They are usually found about the eyes and mouth and on the neck, trunk, extensor aspects of the extremities and fingers. When this disease affects the *INTESTINE* the symptoms are constipation or diarrhea, constipation being more frequent. Abdominal pain, vomiting and meteorism, haematemesis or gastrointestinal haemorrhage. Infiltration of the BLOOD VESSELS produces the frequent symptoms of purpura. The diagnosis is usually made by the history, physical examination, the congo red test plus biopsy. The danger is overlooking of the condition due to its infrequency. One should keep in mind:

1. The absence of primary disease.
2. The spleen, liver, kidney and adrenals are not involved.
3. The high incidence of congestive failure which fails to respond to treatment.
4. Macroglossia.
5. Asthenia—out of proportion to physical findings, and the loss of weight.

SECONDARY AMYLOID DISEASE—is by far the most common type. It usually occurs at a much earlier age. It can occur during the course of many chronic illnesses, most commonly in tuberculosis and chronic suppuration. The organs usually involved are the spleen, liver and kidneys. It is found most prevalent in males and most commonly in the first, second and third decades of life. The average length of the initial disease prior to the complication of amyloid disease is about five years (Jacobi and Grayzel). The clinical features can vary considerably and be coloured by the primary illness. The pattern is usually *PALLOR,* changing to a pasty or waxy color. *WEIGHT LOSS*—a marked loss of subcutaneous fat in the extremities. *WEAKNESS*—poor muscle tone and flabbiness. *POOR APPETITE. ENLARGEMENT OF THE ABDOMEN*—due to increase in size of liver and spleen with absence of ascites. The superficial abdominal and thoracic veins become prominent, dilated and tortuous. *OEDEMA OF THE FEET AND LEGS*—usually moderate only. *BLOOD PRESSURE*—usually low or normal. *EYE*—Signs—absent at any stage. Early in the disease there is normal output and normal ability to concentrate. In some cases, as the disease progresses the output decreases and the ability to concentrate, leading to a terminal anuria. Albumin is usually found in the urine and can vary from a slight amount to a great amount. The albumin globulin ratio reverses and later the serum protein decreases. The N. P. N. is normal but may rise moderately. Casts of all description with occasional R. B. C. and W. B. C. The liver function tests depend on the extent of liver involvement. There is usually a hypochromic microcytic anemia. In the diagnosis:

1. The history is most important. Presence of a primary chronic disease, infection or suppuration.
2. Pallor or waxy appearance—weight loss to emaciation, weakness, large abdomen, palpable liver, spleen, absence of ascites, dilated, tortuous abdominal or abdominal veins, peripheral oedema (usually occurring in one-half or more of cases) normal eye grounds.
3. Laboratory findings of albuminuria, reversed albumin, globulin ratio, decrease in serum protein, positive congo red test. Biopsy gingival, liver or spleen.

In the differential diagnosis one must keep in mind glomerular nephritis, lipoid nephrosis, renal tuberculosis and congestive heart failure.

TYPE 3: *TUMOUR-FORMING AMYLOIDOSIS*—may be solitary or multiple, usually seen in the larynx, tongue, eye, bladder and bones. In its characteristics it resembles primary amyloid disease.

TYPE 4: *AMYLOID DISEASE ASSOCIATED WITH MULTIPLE MYELOMA* —It is stated that in multiple myeloma amyloid disease is a frequent accompanying disease, and in every case of amyloid disease without a primary cause one should look for multiple myeloma. It should be remembered that it has the characteristics of primary amyloid disease.

A word about the congo red test: It is a reasonably simple and safe test. Precaution must be taken in the time it is used and the condition of the dye. The test was introduced by H. Bennhold in 1923 and has received a few modifications. Tests to be considered positive must show an absorption of 90% or more of the dye.

No specific treatment has had universal success. Potassium iodide, liquor potassii have been favorite drugs. Whitbeck introduced the use of liver by mouth and reported excellent results in 5 out of 7 cases. Trasoff and co-workers cite 29 cases of recovery since 1880. 13 children with chronic suppurative disease were successfully treated with oral liver. Jacobi and Grazel treated 16 patients for one year or more with secondary amyloid disease to tuberculosis with oral liver and reported 9 cured. Experimentally mice have recovered when the dietary cause was removed. It has been shown that secondary amyloid disease is a reversible condition.

The evidence today suggests that the fundamental disturbance in all types of amyloid disease is the same. It would appear likely that under certain conditions a fundamental disturbance in protein metabolism may occur which results in this abnormal deposition of an unusual protein. The basic mechanism will be discovered sooner or later. Until then we should suspect the condition oftener and attempt to diagnose it earlier. Any and all forms of known treatment should be instituted early and actively. We should be well advised as medical men to concentrate a little more diligently on the dietary requirements of the chronically ill, and the ageing person.

At the General Hospital in Vancouver over a period of ten years, 1939 to 1948 inclusive, 46 cases were found in routine post mortem examinations out of a total of 9418. 45 cases were of the secondary type of amyloid disease and one was associated with multiplemyeloma. A more detailed breakdown of these figures is as follows:

32 of these 45 cases had as a primary disease tuberculosis, 2 being bone tuberculosis and 30, other forms of tuberculosis.

13 cases had the following illnesses as a primary disease:
Bronchiectasis and pulmonary abscesses—One case.
Bronchiectasis and carcinoma of the lung—One case.
Bronchiectasis and carditis—One case.
Cirrhosis of the liver (portal)—One case.
Cirrhosis of the liver and chronic glomerulonephritis—One case.
Chronic osteomyelitis—One case.
Chronic dermatopathy—One case.
Myocardial degeneration—Two cases.
Chronic colitis—One case.
Chronic arthritis—One case.
Bronchogenic carcinoma—One case.

1 case associated with multiple myeloma.

The involvement of organs was as follows:
Spleen—39 cases.
Kidneys—37 cases.
Liver—22 cases.
Adrenals—5 cases.

Other organs involved were:

Pancreas—One case.
Colon—One case.
Small bowel—One case.
Lymphatic glands—One case.
Lungs—One case.

Of the 46, 10 were female and 36 were male, the youngest being 16 years and the oldest 76 years, with an average age of females 39 years, and average age of males 54 years, an over-all average of 50 years.

No cases between the ages of one and 10.
2 cases between the ages of 10 and 20.
1 case between the age of 20 and 30.
9 cases between the ages of 30 and 40.
8 cases between the ages of 40 and 50.
13 cases between the ages of 50 and 60.
10 cases between the ages of 60 and 70.
2 cases between the ages of 70 and 80.
1 case age unstated.

The average length of illness, female 8 years, male 9 years.

Of the 46 cases 7 died shortly after admission, 3 deaths were outside hospital. In the remaining 36 case records we find amyloid disease to be suspected and proven in 2 cases, both by liver biopsy and one the congo red test.

In reference to the one case associated with multiple myeloma we find that in this same period of time, 1939 to 1948, 21 cases were admitted to the Vancouver General Hospital, of which 5 were treated and discharged, 16 died in the Institution with 12 having postmortem examinations performed, and of these 12 one case showed amyloidosis of the lungs.

How do our findings compare with those of other hospitals?

1. Our rate in routine post mortem examinations is lower—0.48% as compared to 0.6%.
2. Our average age in which secondary amyloid disease was found is much higher than the general average. Ours had ages between 30 - 70 with the greatest number between 50 - 60 as compared to the usual ages of 1 - 30.
3. Tuberculosis as an initial disease is found to be less of a factor in our series. Saleeby found tuberculosis to be the underlying cause in 82% of cases. Waldenstrom 93% and Rosenblatt 88%.
   In ours 72%.
4. The percentage of bone tuberculosis is lower in our cases.
5. The frequency of involvement of the organs—spleen—kidneys—liver and adrenals, is the same.

CONCLUSIONS

1. It would appear from this brief review that there is the need in our chronically ill and tuberculosis cases for a more thorough, carefully recorded history and physical examination with appropriate laboratory investigation, and more frequent progress notes with periodic re-assessment of the condition. Our approach and handling of this group must be revised.
2. We should suspect amyloid disease more frequently than we do, and institute investigations earlier and more promptly in the illness.
3. We should use biopsy with congo red test more often.
4. Liver therapy by mouth should be tried over a long time in diagnosed cases.

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5. In the treatment of chronically ill and ageing patients more attention should be paid to the dietary habits and needs.

SUMMARY

1. A brief review of amyloid disease is given.
2. The pathological-clinical features, etc. are given.
3. 46 cases of amyloid disease of which 45 are secondary amyloidosis and one associated with multiple myeloma are reviewed and summarized.

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VANCOUVER GENERAL HOSPITAL

PHYSIOLOGY AND ENDOCRINE RELATIONSHIPS OF THE THYROID

DR. T. R. OSLER

The thyroid gland contains approximately 20% of the total body iodine, thus having a far greater concentration than other tissues. The normal gland contains 2 to 28 mg. (.1 to .5% dry weight) of iodine. It is present practically entirely in the colloid and varies with the iodine intake, geographical location and state of endocrine function. The quantity increases from birth to puberty, reaching a maximum at about 20 years, and decreasing after 50. By far the largest amount of the thyroid iodine is in the organic form.

Nature of Thyroid Hormone

The tissue cells of the thyroid produce a protein substance "thyroglobulin" within the follicles and this acts as a scaffolding for the iodine-containing amino acids. The thyroglobulin then fixes the iodine absorbed from the gut, etc. as "iodothyroglobulin" which is a composite protein molecule containing thyroxin (25 to 35%) and di-iodotyrosine (60 to 65%) in a peptide combination. The colloid is believed to contain a proteolytic enzyme which breaks the iodothyroglobulin down into an "iodoprotein" which is felt to be the true thyroid hormone.

This then passes into the blood stream and circulates as an integral part of the plasma proteins in much the same way as do antibodies.

The thyroxin and the di-iodotyrosine which make up the iodothyroglobulin are synthesized from tyrosine by the thyroid gland. It may be said at this time that thiouracil and related compounds exert their antagonistic effect on the thyroid hormone by reducing the glands' ability to take up iodine and thus inhibiting the synthesis of the di-iodotyrosine and thyroxine. The mechanism of the benefit obtained in hyperthyroidism by iodine is not clear, but Marine suggests that it may be due to mechanical blockage of the hormone output by rapid formation of colloid.

By virtue of the glands' ability to trap and fix iodine in the organic molecule and release it as required, the thyroid maintains the blood iodine level within normal limits. The remarkable affinity of the thyroid colloid for iodine may be demonstrated by the injection of radioactive iodine, the isotope finding its way into the thyroglobulin of the gland within 2½ minutes, and pratically saturating the organ within 15 minutes. It appears first in the di-iodotyrosine and later in the thyroxin.

Di-iodotyrosine is physiologically inert by whatever the route of administration.

Thyroxin is relatively inert by mouth, owing to its low solubility.

Iodothyroglobulin and desiccated thyroid are active orally, and their action appears to be related to the total iodine content rather than the thyroxin content alone.

Secretion of the thyroid hormone is regulated by:

1. Thyrotropic hormone produced by the anterior pituitary. Administration of this substance results in a disappearance of the colloid, a hyperplasia of the epithelium with an increase in mitotic figures, a decrease of the iodine content of the gland and an increase of the blood level.

   All signs of hyperthyroidism are produced including exophthalmos. The normal rate, after an initial response period in which hyperplasia of the thyroid and a rise in the metabolic rate occur, becomes refractory to the thyrotropic hormone. The refractoriness has been shown by Collip and Anderson to be due to the formation of an "antihormone" which they have found in the serum of the treated animals. Exophthalmos occurred to the greatest extent during the refractory phase. Thus the effect on the eyes appears to be independent of the effect on the B.M.R. In fact, anterior pituitary extract may produce exophthalmos in thyroidectomized animals.

2. *Sympathetic Stimulation*:

   This indirectly controls the ouptut of hormone by nervous regulation of the blood supply to the gland.

3. Work with tracer substances has provided evidence that tissues other than thyroid retain a primitive ability to synthesize thyroxine.

Effects of Thyroid Hormone:

1. *Hypothyroid*—Experimental thyroidectomy produces in animals of all ages a marked diminution of basal and general metabolism. In the young, there follow retardation of general growth, of ossification and development of sex organs, delay in involution of the thymus and slight enlargement of the A.P. and adrenal cortex. The skin thickens and its hairy covering develops imperfectly. Body temperature is subnormal. There is usually marked lack of intelligence indicating involvement of C.N.S. and especially the brain. Corresponding effects as far as they are possible are produced in the adult animal. Muscle loses tone and becomes weaker; sexual function is depressed; dullness and apathy are marked. The skin is dry, hair tends to fall out. Anaemia is usual. Tissue regeneration is retarded. Temperature is sub-normal. Heat production is lessened and consumption of iodine and production of carbon dioxide decreased.

2. *Hyperthyroidism*—Artificial hyperthyroidism produces the most diverse results. The normal animal loses weight and excretes more urea and creatine. It uses more oxygen and produces more carbon dioxide and heat. It oxydizes more CHO and depletes liver of glycogen stores. There is frequently a hyperglycaemia.

Physiologic Actions of Thyroid Hormone.

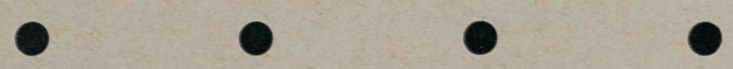
1. Calorigenic—The thyroid hormone acts directly on the tissue cells and accelerates their oxidative processes without mediation of the sympathetic nervous system, as we once thought. Thyroid tissue alone is unresponsive and its oxidative processes are probably depressed. There is a latent period of several hours following administration before the effect is noted and the action last for 10 to 20 days or longer.

   The nature of the stimulating activity is peculiar. The pulse rate and minute volume of blood flow are increased far more by thyroid than they are by substances such as dinitro-phenol that increase oxygen consumption to the same degree. Also, hyperthyroid patients appear to waste out of all proportion to the metabolic rate. In part this may be due to greater muscular activity, though in part it must be attributed to a certain type of inefficiency. In other words, muscular activity seems to cost the hyperthyroid patient more.

2. Effect of Carbohydrate Metabolism—It has been shown by studies of respiratory exchange that the hyperglycemia which follows the administration of carbohydrate is due to more rapid absorption of sugar from the intestine, and that the hyperthyroid subject oxidizes sugar just as readily, if not more so, than the normal. In myxoedema, no characteristic disturbances of carbohydrate metabolism can be detected.
3. Effect on Insensible Perspiration—Some observers have reported an increase of insensible perspiration in the hyperthyroid subject and a decrease in hypothyroidism.

Relationship of the Thyroid to Other Endocrine Organs

1. The relationship to the pituitary has been discussed.
2. Adrenals:
   (a) Subjects of hyperthyroidism show an increased susceptibility to adrenalin. The threshold dose of adrenalin for oardiac acceleration is reduced by a previous administration of thyroxin.
   (b) Thyroxin administration to normal dogs results in a hyperglycaemia which does not occur if the adrenal veins have been tied first.
   (c) Injury to the adrenal cortex caused an increased of 60% in heat production which does not occur if the B.M.R. had been first lowered by thyroidectomy.
   Marine suggests that the adrenal cortex normally exerts, through the pituitary, some inhibitory control over thyroid function.
3. Gonads:
   The following observations suggest an inter-relationship between the thyroid and the gonads:
   (a) Thyroid enlargement is frequently observed at puberty and during menstruation or pregnancy.
   (b) Castration in the dog usually leads to slow reduction in the size of the thyroid and a depression of the B.M.R.
   (c) The continued injection of estrogenic substances into rats results in thyroid enlargement followed after a few days by involution of the gland.
   (d) Thyroid feeding is said to inhibit estrus. These relationships are probably about through the pituitary gland.



TREATMENT OF HYPERTHYROIDISM

DR. B. F. PAIGE

The treatment and the outlook in thyrotoxicosis have undergone great changes since the advent of the anti-thyroid drugs, of which propylthiouracil is the latest and the one in general use.

Whether or not the patient is going to have medical treatment right through or is going to be prepared for sub-total thyroidectomy, the initial treatment of a case of hyperthyroidism is the same. The patient should be started on 100 mgms. of propylthiouracil t.i.d. before meals, simultaneously with 4 minims of Lugol's iodine daily. This therapeutic programme should be maintained until the B.M.R. is 0, and the thyrotoxicosis is adequately controlled as judged by the subjective and objective manifestations. If surgery is chosen subtotal thyroidectomy should then be performed without changing the medication. If surgery is not employed, the B.M.R. should be allowed to decrease to just below 0. The propylthiouracil dosage is then reduced to 150 mgm. per day and later to 75 mgm. per day if the B.M.R. continues to fall, always supposing in doing this that you are continuing to treat this patient without operation. A further reduc-

tion of the B.M.R. when the patient is receiving 75 mgm. suggests that the medication can be discontinued with the probability that the remission will continue for a long time. In general, it is advisable to continue the medication until the B.M.R. has been maintained below 0. for 10 months. When and if this is done the expectation of a permanent remission is about 80% according to the experiences of Dr. Sturgis and of his group Ann Arbor, Michigan.

The type of patient who is "curable" by medical treatment alone is usually one with a non-nodular goitre, relatively young, and not suffering from pressure symptoms or a substernal goitre, and who does not show a toxic reaction with propylthiouracil (which makes the drug unsuitable).

I will leave to Dr. Warcup the more detailed discussion of the types of cases for which surgery is obviously indicated from the beginning. It is advisable from the point of view of treatment to regard hyperthyroidism as a single problem, whether it is primary or secondary. If it is of the so-called secondary type with a toxic adenoma. the response to propylthiouracil is not likely to be so good, and there are other reasons also which Dr. Warcup will mention.

Indications for the Use of Propylthiouracil:

It should be used as preoperative treatment in all cases of toxic goitre, and also in all those cases where it is hoped medical treatment alone will suffice. It is advisable to use it even in mild cases with minimal toxic symptoms, as even these patients may come to surgery and will occasionally have a severe postoperative course without propylthiouracil.

If surgery becomes necessary, it is felt that the patient can be handed over to the surgeon in better shape if prepared with propylthiouracil than if he had been treated with iodine alone. It is permissible to use propylthiouracil and iodine as the sole form of therapy in an attempt to cure the following patients:

Those with persistent or recurrent thyrotoxicosis following thyroidectomy.

Patients over 50 years of age with severe heart disease; those patients who are considered to be too old to withstand operation; patient with vocal cord paralysis and parathyroid tetany; and finally, patients with exophthalmic goitre in whom the gland is inconspicuous and in whom there are no pressure symptoms.

With regard to the toxicity of propylthiouracil, the drug was originally thought to have no untoward effects. However, there are now three case reports at least of agranulocytosis and 11 instances of severe leukopenia due to its use. (Seen in Vancouver). Agranulocytosis and drug fever are the only toxic reactions that will require discontinuing the drug. One must warn the patient to report immediately if he has fever, sore throat, skin rash, malaise or enlarged glands. If these appear, stop the drug immediately and do a white cell count and differential. If there is a leukopenia of less than 4,000 WBC per cu. mm. or a polymorphonuclear percentage of 30% or less, the drug should be discontinued and penicillin given to prevent or control sepsis. Remember that leukopenia of some degree is common in untreated thyrotoxicosis, so that a total blood count must be done before treatment is started to serve as a reference base line. Do not advocate repeated white counts, as previously.

It has been found that patients do just about as well on 150 mgm. of propylthiouracil per day as they used to do on 600 mgm. per day of thiouracil. However, it has been shown that they do even better when the dose of propylthiouracil is raised to 300 mgm. per day and that is why we recommend this higher dosage.

Other Forms of Treatment:

Dr. Warcup will deal with the surgical side.

There seems to be no place nowadays for X-ray therapy in the treatment of thyrotoxicosis.

The other drug to be considered is radioactive iodine, the one now in use being 1.131, which has a half life of 8 days. There is no doubt about the fact that the thyroid

gland in hyperthyroidism takes up a very great proportion of the administered dose of radioiodine, in some cases as much as 80% as against about 20% in the thyroid of the normal person. As might be expected, it has proved possible to reduce the symptoms of thyrotoxicosis by the effffect of the drug on the gland. The difficulties are that we are not yet certain about the carcinogenic possibilities, and also animal experiments have shown a toxic effect on the renal tubules. In addition, it takes expensive equipment and a highly trained, specialized team to use the drug at all. This cannot be done in small centres therefore. At present it should be used only in patients unsuitable for surgery or propylthiouracil. It may prove of great value in carcinoma of the thyroid especially as the drug is taken up by the metastases in many cases, though not in all.

To sum up, all patients with thyrotoxicosis should now be treated initially with propylthiouracil and iodine, irrespective of whether or not they are ultimately going to need surgery.

The only exception to this will be in the case of patients who prove to have toxic reactions to propythiouracil.

Purely medical treatment with propylthiouracil and iodine is likely to cure patients with thyrotoxicosis in whom the gland is inconspicuous and in whom there are no pressure symptoms, particularly if they are in the younger age group. Medical treatment is also indicated in those with a recurrence after thyroidectomy, in cases with severe heart disease (particularly if over 50), in patients too old for surgery, and in those who refuse operation.

The chief use of iodine in thyrotoxicosis today lies in augmenting the antithyroid effect of propylthiouracil preoperatively.

The possibilities and limitations or radioactive iodine have been stressed.

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THE SURGERY OF THE THYROID

DR. L. W. WARCUP

To open my discussion on the surgery of the thyroid gland, I will first give a classification of the disease. This falls into four main groups, namely:

1. *Disturbances of Function*:
   (a) Diffuse Goitre Without Hyperthyroidism.
   (b) Diffuse Goitre With Hyperthyroidism (Graves, Disease or Primary Toxic Goitre).
   (c) Nodular Goitre Without Hyperthyroidism.
   (d) Nodular Goitre With Hyperthyroidism. (Secondary Toxic Goitre.)
   (e) Benign Solitary Adenoma.
2. *Neoplasms*:
   (a) Papillary Carcinoma or Haemangio-invasive.
   (b) Non-papillary Carcinoma or Lymphangio-invasive.
   (c) Adeno-or Squamous Carcinoma.
3. *Congenital*:
   (a) Lingual Thyroid.
   (b) Thyroglossal Cysts.
4. *Questionably Ineffective*:
   (a) Subacute Thyroiditis.
   (b) Riedel's Struma.
   (c) Hashimata's or Lymphadenoid Goitre.

1. DISTURBANCES OF FUNCTION:

(a) The diffuse goitre without hyperthyroidism is usually, if not always, found in children in endemic areas. The period of adolescence is one of iodine insufficiency due to increased demands. The gland hyperthrophies and undergoes hyperplasia; then, after the period of insufficiency is passed and there is sufficient hormone to satisfy the body requirement involution takes place. The follicls then again become filled with pink staining colloid, but although the compensation is restored, the gland is no longer normal in size or in histological structure. Instead it is enlarged, the follicles have increased in size with their cells flattened. This is the diffuse goitre. Although the thyroid gland is capable of undergoing repeated cycles of hyperplasia and hypertrophy, followed by involution in response to repeated cycles of iodine deficiency, each cycle produces further changes, and with each cycle the gland undergoes a further change.

Large diffuse goitres are rarely seen because, with repeated cycles of hyperplasia and involution, the gland develops involutionary nodules, as in the study by Wegelin in Switzerland, where he showed the transition of diffuse to nodular goitre with advance in age.

Adolescent goitre or diffuse goitre in adolescence can often be prevented, but once established can rarely be cured by medical treatment. Adequate doses of iodine, supplemented by desiccated thyroid, produce a physiological rest for the thyroid, but the most that can be expected is to prevent further enlargement.

Therefore we know that practically 100% of all diffuse goitres without hyperthyroidism occur in adolescents, and that they are due to goitrogenic agents, absolute or relative deficiency of iodine. Treated medically to prevent further cycles of hyperplasia, there is no indication for surgical removal unless they are extremely large, or for cosmetic reasons, and in this regard it should be emphasized that a goitre that appears very large in an adolescent may not be noticeable when the subcutaneous fat deposits in later life.

We have stated how the diffuse goitre of an adolescent becomes a multinodular goitre without hyperthyroidism; here we have to deal with other factors; namely, the serious complications of this established disease. They are:

(1) Hyperthyroidism.
(2) Intrathoracic Growths—practically all are adenomas from a normally situated gland.
(3) Growth to excessive size.
(4) Development of malignant tumours—malignant tumours of the thyroid are seven times as common in regions of endemic goitre as elsewhere.

The removal of all nodular goitres would be impractical. In the first place, the incidence of adenomatous goitre is extremely high; in some regions the majority of the population may be affected. In the second place, the type of adenomatosis which is present in these cases appears, as Reinhoff's studies indicate, to be a physiological process of degeneration and regeneration that involves the entire gland, so that even after a subtotal thyroidectomy has been performed a certain amount of adenomatous tissue remains. Since in cases of multinodular goitre it is impractical to perform a total ablation of the thyroid for adenomatous goitre, and since the condition involves the whole gland, it is not surprising that the recurrence rate is high.

Indications for thyroidectomy in a patient with a multinodular goitre are:
(1) Enlargement of an Adenoma.
(2) Development of Hyperthyroidism.
(3) Pressure Symptoms Denoting Intrathoracic Extension.
(4) Cosmetic Reasons.

A different problem is presented by the finding of a firm, circumscribed, discrete adenoma, amongst the other nodules. This adenoma should be removed, regardless of the fact that there is no hyperthyroidism; even if the adenoma is small, or enlarging, it should be removed. These discrete adenomas have certain clinical and pathological qualities of neoplastic growth. It is in this type that malignant change is commonly seen—at least 5% of such adenomas are found by the pathologist to be malignant. These tumours—discrete adenomas—should be removed, not because of the possibility of the tumour becoming malignant, but because the tumour may be malignant at the time.

Calcified adenomas—are important only to be distinguished from carcinoma. X-ray will do this, but does not mean that there cannot be a carcinoma in the same gland—because again carcinoma is seven times more common in multinodular goitres than in normal glands.

In the intrathoracic goitre—which is practically always an adenoma from the left lower pole—the indications for removal may be listed as:
(1) Hyperthyroidism Developing in the same Gland.
(2) Dyspnoea.
(3) Choking Sensation.
(4) Stridor.

Diffuse goitre with hyperthyroidism—is a systemic disorder involving widespread disturbance of the neuro-endocrine system. It is difficult and often impossible to draw sharp lines of differentiation between Graves' disease and nodular goitre with hyperthyroidism. The goitres of patients with Graves' disease obey the same law that Wegelin has so clearly demonstrated in the incidence of involutionary nodules and adenomas in endemic goitre. Elderly patients with long-standing Graves' disease usually have nodules. The glands of children and young adults with Graves' disease of short duration are rarely nodular.

As has been mentioned in a previous paper, the increased incidence of cardiac complications in patients with nodular goitre is not dependent upon any qualitative difference in the thyroid hormone, but results from the increased incidence of organic heart disease in the older groups of patients who have nodular goitres.

The average age of patients with hyperthyroidism associated with nodular goitre is approximately 13 years greater than that of patients with Graves' disease. There is little clinical difference between hyperthyroidism associated with Graves' disease and that associated with nodular goitre, and, also, it is impossible always to determine before

operation whether or not adenomas are present, since early adenomatous changes cannot be palpated easily.

Up until 1900 a surgeon only saw a patient when he or she was moribund. After 1900 the surgical conquest of hyperthyroidism was greatly established in safety by the preoperative use of iodine—so well accepted that up until 1942 few chose to consider hyperthyroidism as other than a surgical problem. Today, as a result of the discovery of the powerful and effective antithyroid drugs, the controversial issue of whether or not hyperthyroidism is better treated by medical management has again arisen.

In the not too distant future it is quite possible that the radiologist using radioactive iodine will be called upon to play an ever-increasing part in the treatment.

The medical treatment of hyperthyroidism is not as simple as it sounds; too often there is a tendency to deviate from schedule dosages, to interrupt treatment, or to change to some other form of therapy. Propylthiouracil is a weaker antithyroid drug than thiouracil. After an effective single dose of propylthiouracil the uptake of radioactive iodine is blocked for only four hours. The physician who is content to treat hyperthyroidism symtomatically by giving enough propylthiouracil to effect a gratifying improvement in the patient's symptoms without bringing the B.M.R. to 0 will obtain few long-standing remissions.

The results of inadequate medical treatment are comparable in every respect to those of inadequate thyroidectomy. Judging from the experiences of a large American clinic, they find that about 50%, probably less, if adequately treated, and they stress strongly the fact that these patients must have had a B.M.R. of 0, plus absence of all signs for a least one year's treatment with propylthiouracil, will remain in remission. It is entirely possible that the treatment of Graves' disease may become comparable to that of duodenal ulcer. The initial treatment may be medical, excepting in certain cases of unusual severity. Surgical treatment is indicated in those patients who

(1) Do not respond to medical treatment.
(2) Do not co-operate.
(3) Are subject to recurrences and do not wish to continue indefinitely on medical treatment.

For patients with nodular goitres with hyperthyroidism, thyroidectomy after appropriate preparation is the treatment of choice. There is reason, to believe, though not clearly understood, that the hyperthyroidism associated with a nodular goitre is not controlled by propylthiouracil and then, as before, there is the complication of the adenomas —the danger that they will enlarge, the possibility of carcinoma.

Following this brief discussion we can then summarize our findings by dividing patients with hyperthyroidism into four main groups from the therapeutic point of view:

Group I. Patients to be treated definitively by antithyroid drugs and the hyperthyroidism completely controlled for one year in the hope of inducing a long-standing remission include:

(1) Patients with mild Graves' disease, with a small diffuse gland.
(2) Patients who refuse operation or who prefer to try medical treatment.

Group II. Patients to be treated by antithyroid drugs in preparation for operation include:

(1) Patients with large diffuse goitres and hyperthyroidism .
(2) Patients whose goitres enlarge under medical treatment.
(3) Patients with nodular goitre and hyperthyroidism.

Group III. Patients to be prepared for operation with iodine:

(a) Patients intolerant of antithyroid drugs.
(b) Patients with nodular goitre and mild hyperthyroidism.

Group IV. Patients in whom operation is contra-indicated and who are treated indefinitely, if necessary, with antithyroid drugs:

(a) Aged patients.
(b) Patients with short life expectancy.

(c) Patients with recurrent hyperthyroidism when the technical difficulties of operation are greatly increased.

Pre-operative Management of Patients with Hyperthyroidism

The complications of hyperthyroidism, such as thyroid crises and cardiac decompensation, are difficult to treat, but easy to avoid. The chief factors influencing the risk of thyroidectomy are:

(1) The condition of the heart.
(2) The age of the patient.
(3) Response of the pulse curve to preoperative treatment.
(4) High B.M.R. at time of operation.
(5) Degree of extension of goitre into the thorax.

The presence of cardiac decompensation, auricular fibrillation, valvular heart disease or severe myocarditis increase the risk of thyroidectomy, the mortality being seven times as high. It is advisable that these patients be well controlled with digitalis before surgery is considered.

In regard to age, mortality in the aged is four times as great, a prime factor being pneumonia. In consideration of this factor the time can be well chosen when the patient has no respiratory involvement.

In regard to the pulse curve, although the pulse rate at the time the patient is seen bears no definite relationship to mortality, the response to preoperative treatment does. The pulse rate should be reduced to normal before operation. This shows a physiological remission of the hyperthyroidism.

The suggested routine of preparation for a hyperthyroid patient before operations in a well known American clinic is as follows:

(1) Allow 1 day's treatment with proplythiouracil for everyone plus of B.M.R.
(2) 15 days after this should be the ideal day to perform surgery.

Their routine is 50 mgms. of propylthiouracil t.i.d. and h.s.—that is a total of 200 mgms. daily; 21 days before surgery Lugol's iodine 10 mgms. is given t.i.d. That is, for 1 week the patient receives Lugol's and propylthiouracil. For the last 15 days the patient receives only Lugol's, the patient being admitted to the hospital 7 days before surgery.

Under this regime they have never operated on a patient with a B.M.R. of over +10, and have had no reactions to thyroidectomy.

In regard to diet, it must be remembered that a patient with a B.M.R. of +50 is using 50% more energy, and therefore requires this amount more calories. The diet must be arranged to supply this.

In regard to the technique, it does not warrant description outside of saying that a radical subtotal thyroidectomy must always be performed. There are many ways of doing this. The mortality rate has been below 1% for over 10 years now.

Briefly, the complications of thyroidectomy are:

(1) Injuries to recurrent laryngeal nerve. The incidence in a very large series was quoted as 0.4%.
(2) Postoperative haemorrhage.
(3) Serum.
(4) Infections.
(5) Tetany.

Hypocalcaemia, probably due to oedema, has occurred in 1.5%.

The incidence of permanent symptoms of tetany is 1.18%.

(6) Residual or recurrent hyperthyroidism. The incidence of recurrent hyperthyroidism averages 2.1% to 8.6%. However, this last figure was in a series up to 1939.

(7) Postoperative hypothyroidism. Inversely proportioned to the incidence of recurrent hyperthyroidism, its appearance is a welcome sign and is easy to treat.

Postoperative care requires only a few remarks:

Morphine.

Carbohydrate fluids as early as desired, diet increased as rapidly as tolerated.

Lugol's should be given for a day or two postoperatively, so that there will be no exacerbation of symptoms incident to its withdrawal.

There are many other factors that could be dealt with in regard to hyperthyroidism, but cannot be handled in a short time, so the next subject that requires mention is congenital abnormalities:

(1) Cysts and sinuses of the thyroglossal tract—

Are epithelial-lined cysts and sinuses of the neck and are congenital. The cyst and sinus are always in the midline and may be above or below the hyoid bone. The treatment is surgical *excision*, the entire tract being dissected out from the foramen caecum to where, if it is a sinus, it has ruptured into the skin.

(2) Lingual Thyroids—are rare. The only point bearing mention here is that the presence or absence of a normal thyroid must be established before removing a lingual thyroid, the absence being quoted by one man as 10% to as high as 100% by another author.

III. Neoplasms of the thyroid.

From a clinical point of view carcinomas of the thyroid can be divided into two main groups—the papillary and the non-papillary. Papillary act as lymphangio-invasive and metastasize to lymph nodes, whereas the non-papillary are haemangio-invasive and metastasize by blood stream, the great differences in their behaviour being explainable by the above faculty of spread.

The incidence of Carcinoma of the Thyroid.

Vital statistics rate the thyroid as sixteenth in the list of organs affected by malignant disease. Analyzing a surgical series of 537 surgically removed *Nodular Goitres* the following figures were arrived at:

In 537 nodular goitres (toxic, non-toxic, benign and malignant):

30 malignant tumors were found ..... — 5.6%

263 nodular goitres with hyperthyroidism, non malignancies — 0 %

In 274 nodular goitres with hyperthyroidism:

20 malignancies ..... —10.9%

Of these:

176 multinodular—6 were malignant ..... — 3.4%

98 solitary tumours—24 were malignant ..... —24.5%

Here then I may repeat what I have tried to indicate before when dealing with indications for removal of nodular goitres without hyperthyroidism.

Surgeons realize that conservative treatment of adenomatous goitre is frequently unwise. Often errors are made and enlarging tumours of the thyroid treated by iodine; delay is disastrous. These occasional errors have encouraged an over-statement of dangers of carcinoma of the thyroid in nodular goitre. Surgeons who suggest that all nodular enlargements of the thyroid should be removed, regardless of history, physical findings, or apparent benign quality of involuntary nodules, may be conscientiously attempting to give their patients maximum protection against carcinoma. However, indiscriminate thyroidectomy performed on everyone with nodular goitre would entail morbidity and mortality out of all proportion to the number of cases of fatal cancer that it might prevent. But, here I wish to emphasize again the points which indicate surgery:

(1) Any adenoma which is firm and of different consistency from the rest of the gland.

(2) Or, one giving pressure symptoms indicative of growth.

(3) Conspicuous adenomas for cosmetic reasons.

(4) All adenomas in children.

And finally, and most important of all:

(5) All discrete or solitary adenomas, regardless of age.

Age of the patient is not a factor; carcinoma of the thyroid may appear at all ages. Also, the size of the tumour is no criterion; they may be very small, but most are hard and firm.

The relationship of benign adenomas to malignant adenomas is a subject of great controversy, as to whether a benign adenoma becomes malignant, or, as more likely in a nodular goitre, the malignancy develops in the parenchyma and forms a nodule. That is again, the concern is not whether the adenoma will become malignant, *but*—is it malignant now?

Papillary Carcinomas—Are defined as epithelial neoplasms, formed by cuboidal or columnar epithelium, partly or wholly in papillary arrangement. These tumours are usually unrelated but occasionally are present in the contralateral lobe. They are not encapsulated. Papillary tumours are found in the younger age group—the average age in one series being 31 years. They metastasize to the lateral cervical glands. There is a very slight tendency to spread distantly. There is a marked tendency for the tumour to calcify. There is a marked tendency for the tumour and metastases to grow slowly.

In an analysis of 34 cases of papillary carcinoma of the thyroid with and without lateral cervical metastases, 20 are alive without recurrence over 2 years; 2 are alive but have recurrences, 3 are dead of the disease, 3 died of other causes, 6 could not be traced.

It is recommended that, regardless of the extent of invasion of the lateral cervical region and mediastinum the tumour should be removed surgically. The operation should be a lobectomy, leaving none of the affected lobe and dissection of the involved glands. Even should glands reappear, they should be excised.

Irradiation therapy, either by radium or deep X-ray, has not affected a regression or even controlled the growth of these tumours.

Non-papillary Carcinoma of the Thyroid—This is the type that arises in an adenomatous goitre; that is the older age group. They are much more invasive, penetrating the capsule and surrounding tissues. They spread distantly via the blood stream. In these cases evidence of metastases, even to the lateral cervical nodes, is a sign of incurability.

The average age in a series is 51 years of age. 68% were women.

The most common symptom was referable to pressure, but about 20% complained of systemic symptoms such as nervousness, loss of weight, palpitation or fatigue, hyperthyroidism being suspected, but there was no increase in B.M.R. Amongst the important physical findings may be mentioned.

1. A hard tumour.
2. Fixed to deep structures of the neck so that it does not move with swallowing.
3. Preoperative paralysis of the vocal cords, one or both.

Differential diagnosis must include:

1. Subacute thyroiditis.
2. Reidel's struma.
3. Hashimota's disease.

Indications for radical operation:

A history of a recent enlargement of a pre-existing goitre and the finding of a hard uncalcified mass indicates an excision of the *affected lobe;* extension bilateral involvement of the thyroid by a malignant tumour is usually associated with invasion of contiguous structure and indicate incurability. Likewise, paralysis of one or both cords before operation shows extracapsular extension. Pain is a bad prognostic sign, usually indicating invasion of the capsule and cervical plexus. The demonstration of secondaries in the lungs or bones, of course, indicates inoperability.

Whenever possible, a radical operation should be performed, consisting of removal of the affected lobe, of the jugular vein and thyroid veins. Often this is impractical, but is the ideal method.

It is also recommended that a course of postoperative X-ray therapy should be given. An analysis of results in 49 cases shows:

26% were alive and apparently free from ca. for a period from 3 to 17 years after operation.

35% were alive after 5 years.

65% had died within 5 years.

At the end of 10 years 68% were dead.

It is apparent that when a permanent cure is not affected the majority die within 5 years. However, surgery enters even these incurable cases. A lot of these cases develop severe dyspnoea due to the infiltration and growth and there are two types of treatment necessary or available, namely:

(1) Tracheotomy and irradiation.

(2) Resection of the isthmus and any surrounding tissue that can be cut away, plus irradiation. This is not curative but relieves the great distress of the dyspnoea.

The third and final type that requires mention is the small but important group —the small tumours not suspected preoperatively—adenocarcinoma.

Their size varies from 1.5 cm. to a few cm. They are not encapsulated. Their cut surface resembles a scirrhous carcinoma of the breast. They do not appear to metastasize. They can almost be classified as carcinoid tumours or, as Dr. Allen Graham calls them, adenocarcinoma not arising in an adenoma.

The fourth group of disease of the thyroid that I will deal with is the thyroiditis class:

Subacute thyroiditis—has been variously named tuberculosus, psuedotuberculous, or giant cell thyroiditis; tubercle bacilli cannot be demonstrated in these lesions. The possibility that the disease is a virus infection cannot be excluded. The onset is usually sudden and often synonymous with an upper respiratory infection:

More common in women.

Pain on swallowing, radiating up to the ear, characterisitc of subacute thyroiditis.

The gland is usually tender.

There is an elevated temperature and a greatly accelerated B.M.R.

The pulse rate is very rapid.

The natural course of the disease is towards spontaneous recovery. It will respond completely to X-ray therapy. This is mentioned only to state that surgery is not indicated.

Hashimota's Disease—Is a progressive disease associated with systemic disorders, in which there is degeneration of epithelial elements of the thyroid and replacement of lymphoid and fibrous tissue. The etiology is unknown. It is characterized by:

Occurs in late 40's and 50's.

Practically always in women.

Onset is insidious.

Glands are not tender; there is no fever, no increased pulse rate of B.S.R.

The entire gland is usually involved.

There does not appear to be any tendency to spontaneous remission.

The thyroid is firm, friable, and not very vascular.

The gland is diffusely enlarged, often with retrotracheal extensions.

The treatment is again X-ray therapy, but this depends on the diagnosis being made preoperatively. If at operation it is recognized, then only the isthmus should be removed —to prevent development of hypothyroidism.

Riedel's Struma—A chronic, proliferating, fibrosing, inflammatory process, involving usually one, but sometimes both lobes of the thyroid, as well as the trachea and the muscles fascia, nerves and vessels in the vicinity. It produces a bulky tumour and may be indistinguishable preoperatively from an inoperable carcinoma.

Affects women much oftener than men and occurs beyond the age of 50:
Onset is insidious and painless.
The tumour grows slowly.
Symptoms of pressure are often severe.
The temperature and pulse are normal and rarely is there any systemic reaction.
B.M.R. is usually normal.
The thyroid is stony, hard and fixed to other tissues.
The entire lobe of the thyroid will be strong, hard, adherent and avascular.
The gland is brittle and white and cuts almost like cartilage.

In treatment X-ray has not been satisfactory. Treatment is indicated usually to relieve the obstruction. Complete surgical removal is usually impossible without irreparable damage to vital structures, so one must be content with less radical removal. An important point in the surgery of this is that in the centre of the hard lobe will be degenerating tissue and if the surrounding tissue is opened it will be possible to relieve a lot of the obstruction by removing this.

● ● ● ●

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You may register for one or both programs. The fee for either program is $50.00 and for both is $75.00.

The guest speakers will be Dr. John R. Lindsay, Professor of Otolaryngology University of Chicago Medical School; Dr. Gordon D. Hoople, Professor of Otolaryngology Syracuse University Medical School; Dr. Paul Chandler, Professor of Ophthalmology Harvard University Medical School; and Dr. Michael Hogan, Associate Professor of Ophthalmology University of California Medical School.

If you plan to attend the Convention, kindly write to the Secretary. Arrangements for hotel accommodations have been made through our organization. If you desire hotel reservations, so designate on the form. DO NOT write directly to the hotels.

The fee for either section is $50.00. The fee for both sections is $75.00. This will include the cocktail party, the annual banquet, the daily lunches and a printed abstract of the lectures given by the guest speakers.

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NEWS AND NOTES

Among new Canadian Fellowship winners are *Drs. V. O. Hertzman and Jack Balfour,* now practising in Vancouver; and *T. McMurty* now in Vernon.

Dr. Moe Chepesiuk is now practising at Shaughnessy Hospital again after a prolonged illness in Oakland, California.

Drs. W. Stark and A. Trotter have opened orthopaedic practices in Victoria. Dr. Stark has spent the past year in Los Angeles.

Washington medical students now spend one month of their final year with a general practitioner. *Dr. E. C. McCoy* has *Dr. William Stewart* with him this month in Vancouver.

Dr. Howard Black, president of the General Practitioners' Association of Vancouver, attended the annual meeting of the American Academy of General Practitioners in St. Louis this month. *Dr. McKenzie Morrison* also attended as an observer.

A *Medical Curling Club* has been conducting a successful winter programme in Vancouver.

Dr. A. C. McCurrach from Edmonton has joined the X-Ray staff of *Drs. Turnbull, Dickey and Sloan* in Vancouver who have opened a new office in the Medical Dental Building.

Dr. Max Earle has opened a practice of obstetrics in Vancouver on his return from England.

Dr. Shillabeer has begun general practice in Vancouver West Point Grey. He was formerly in Alberta.

Dr. Tom Bridges is now practising in Vancouver with *Dr. John Parks.*

Dr. Malcolm Allan is now on the surgical staff of the B.C. Tuberculosis Institute.

Dr. C. S. Allen is practising orthopaedics with *Dr. Don Starr,* in Vancouver after a year at Mayos.

Dr. James Ireland has opened a urologic specialty in New Westminster.

New Paediatricians in Vancouver include *Drs. Ben Schuman, Sandy Lang and Campbell.*

Dr. A. Gray is now practising in Victoria, B.C. after leaving Duncan.

Dr. J. Gibbings is practising in Woodfibre and hopes to continue obstetrics interneship next year. His predecessor *Dr. K. C. Boyce* is now back at Kingston, Ontario.

Dr. C. H. Ployart has opened new offices in Vancouver Jericho district for general and physical medicine.

Dr. Lennox Arthur, formerly on the staff of General Hospital is now resident physician at Harrison Hot Springs.

Dr. G. L. Smith is back in practice after a severe auto accident in December.

Dr. M. Pickering has begun general practice in the South Hill Medical Dental Building in Vancouver.

New fathers include *Drs. Myles Plecash, R. M. Foxgard, J. Gibbings, Wallie Boyd. W. Charlton.*

Dr. Murray Enkin, former interne at the Grace Hospital in Vancouver is now practising in Regina.

Dr. Hector Gillespie, former orthopaedic resident at the Vancouver General Hospital is now studying in Princess Elizabeth Hospital, Exeter, England. He will return to Canada in June.

Dr. Palmer MacLean is taking further studies in bone surgery in Liverpool.

Dr. James Routledge, is now in Montreal after a year in Hospital for Women's Disease in Chelsea.

Dr. Frank Wilson is now interning in orthopaedics in Atlanta, Georgia.

Dr. R. G. Hart is now practising in Vancouver after two years in Victoria.

Dr. R. E. Beck will undertake a residency in medicine at Royal Victoria Hospital in Montreal next year. At the same hospital in obstetrics will be *Dr. M. Turko.*

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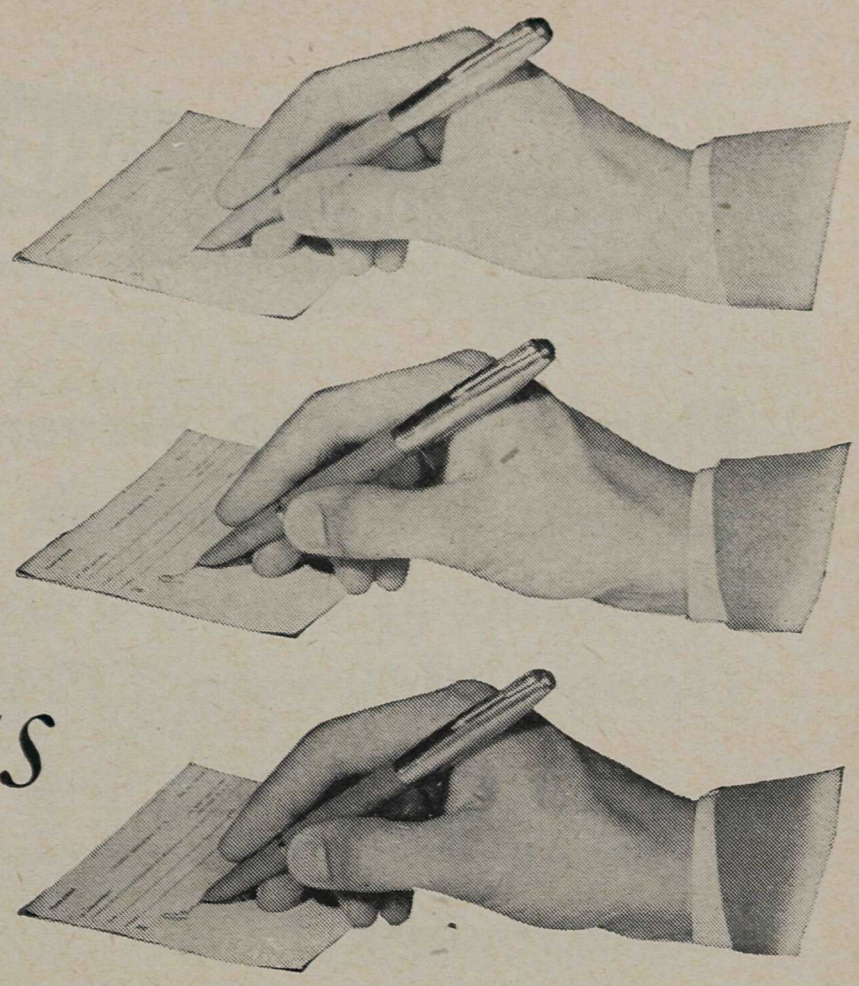

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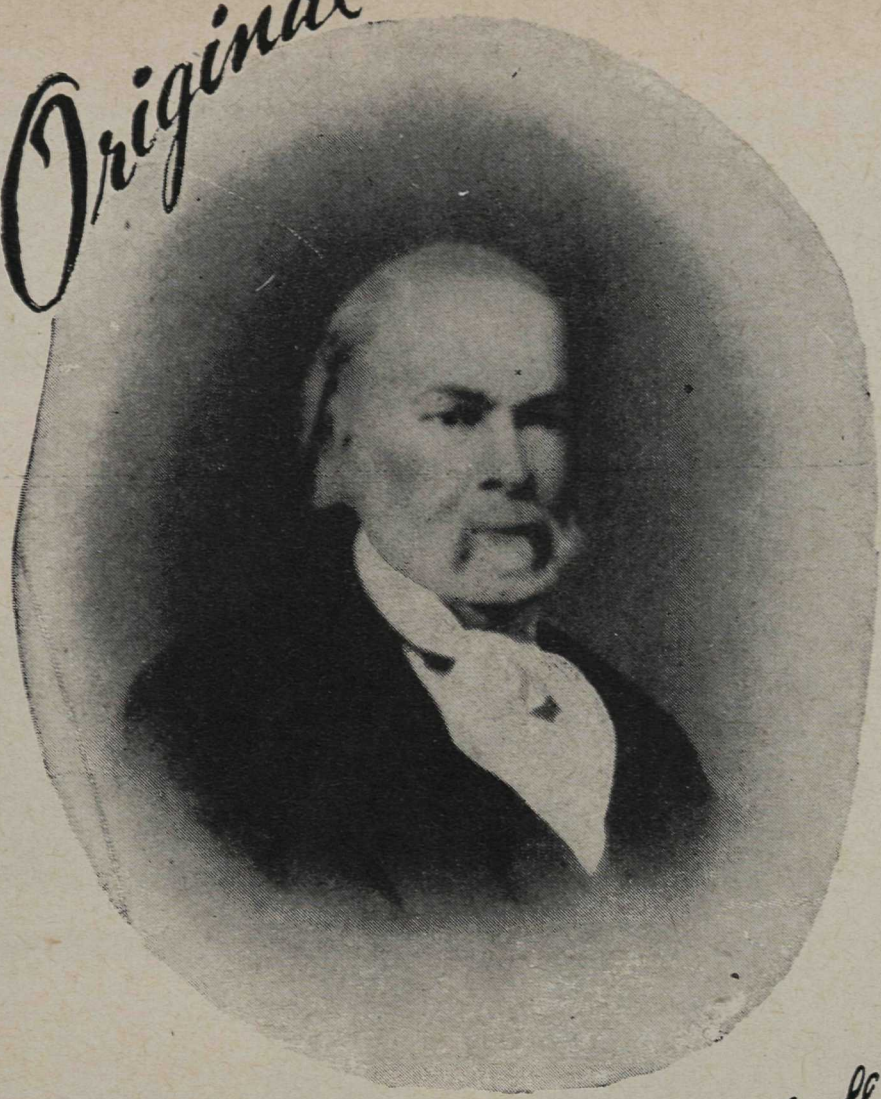

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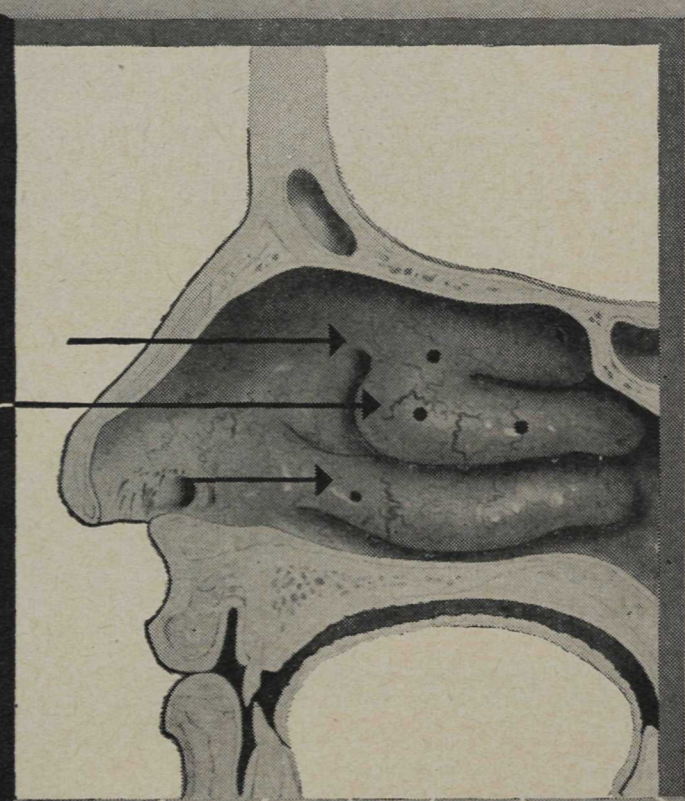

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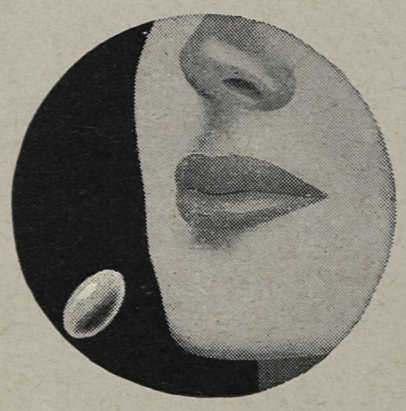

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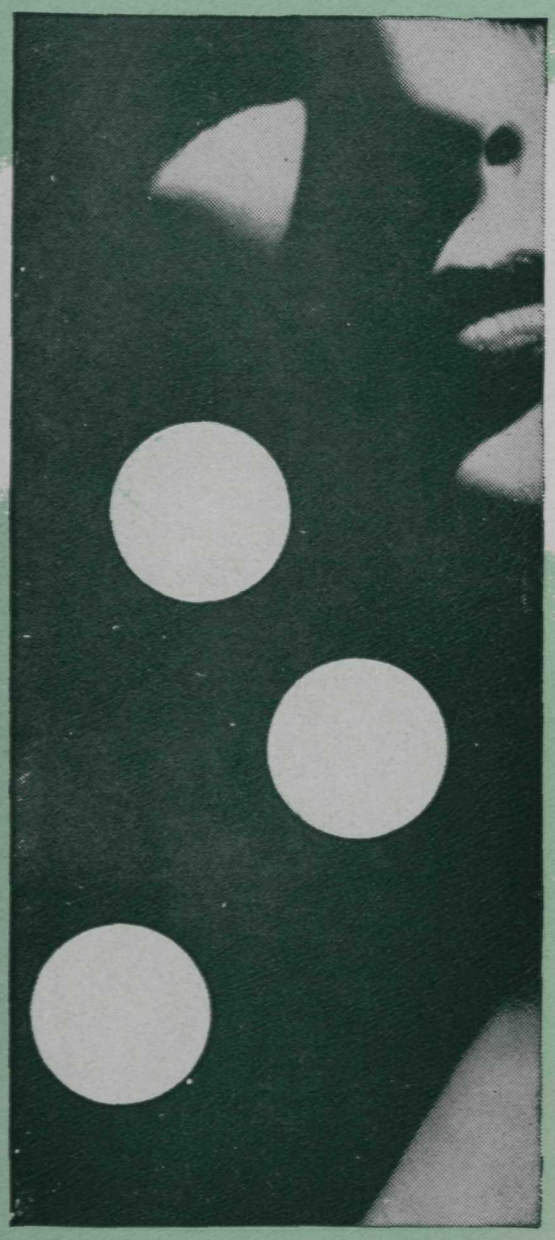

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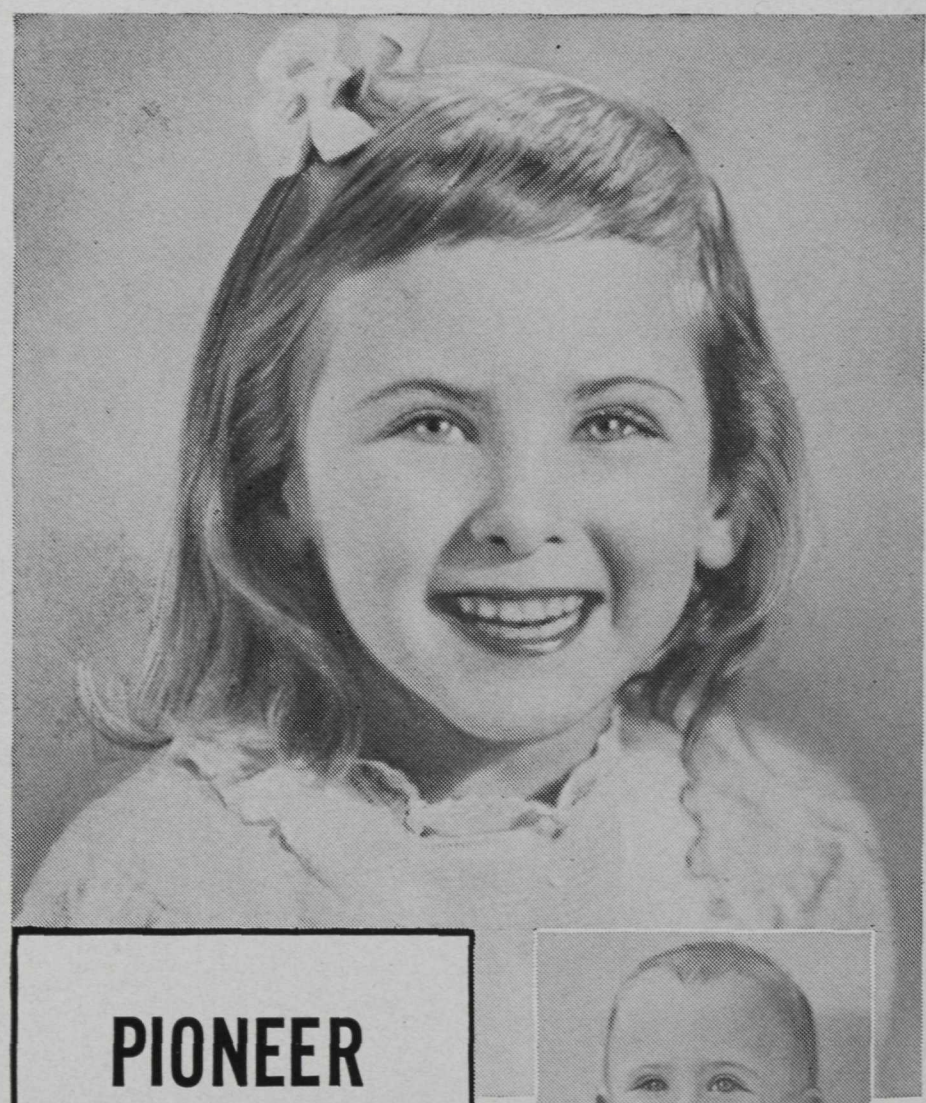
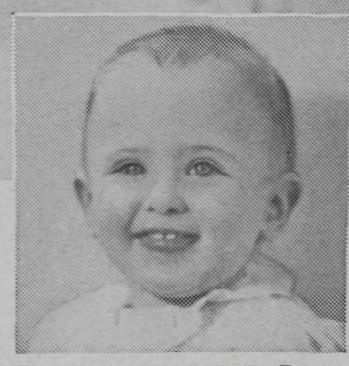
AYERST, McKENNA & HARRISON LIMITED *Biological and Pharmaceutical Chemists* **MONTREAL, CANADA**

2977



PIONEER MEAT EATER

(5 years later)



Five years ago, little Betsy Traynor was a participant in Swift's Meats for Babies first feeding test.

Current Clinical Meat Feeding Studies

REPORT No. 1

MEAT FOR ALLERGY FEEDING

From this research has evolved a milk substitute for feeding to allergic infants and children who cannot tolerate milk. The formula, which may be easily made up by the mother, consists of Swift's Strained Beef supplemented with calcium, phosphorus salts, carbohydrate and fat. Studies show that the calcium, phosphorus and protein are utilized as well as these same nutrients when derived from milk.

This study on the nutritional value of a meat formula is part of an extensive clinical research program now being conducted through grants-in-aid made by Swift.

Way back when Betsy started Swift's Meats, meat was a "revolutionary" food for a baby. Betsy and her fellow participants were the first babies *ever* to eat Swift's specially prepared strained meats. Many of the infants in this original group were only six weeks old at the time!

Betsy's bubbling good spirits and sound, sturdy development testify to the benefits of regular meat-feeding early in life. And Betsy's mother will tell you, "She's the very picture of health!"

Today any baby can have the same right start in life that lucky little Betsy had. Doctors recommend Swift's Meats for Babies now in the early weeks of life—to provide the complete high-quality proteins and iron every infant needs every day for sound growth and development.

Swift prepares an appetizing variety of: beef, lamb, pork, veal, liver and heart—to help infants form sound eating habits.

Swift's Meats for Babies are expertly trimmed to minimize fat content—carefully cooked to preserve a maximum of essential meat nutrients. Swift's Strained Meats for Babies—Diced Meats for Juniors—are convenient and economical, cost less than home-prepared meats.

ACCEPTED COUNCIL ON FOODS AND NUTRITION AMERICAN MEDICAL ASSOCIATION

All nutritional statements made in this advertisement are accepted by the Council on Foods and Nutrition of the American Medical Association.

SWIFT QUALITY FOODS

SWIFT

...foremost name in meats

...first to develop and clinically test 100% Meats for Babies

Mrs. Snacker IS A VITAMIN-LACKER

She nibbles and pieces and samples and tastes all day long. In fact, Mrs. Snacker is always hungry — except at mealtime. So her diet too often sidesteps many of the vitamins essential to balanced nutrition. • If there's a better candidate for a subclinical vitamin deficiency than Mrs. Snacker, it might be the hurrier or the worrier, the heavy smoker or the toper. These meal skimpers—vitamin-lackers all—have never learned that unbalanced eating leads to unbalanced nutrition and from there to any number of ills. • In the interval between dietary sin and complete reform, you can't prescribe better vitamin insurance than DAYAMIN. The DAYAMIN capsule is small, has a pleasing vanilla bouquet. Each capsule provides the daily optimum requirements of six essential vitamins, plus pyridoxine and pantothenic acid. One capsule daily as a supplement; two or more for therapeutic use. Your pharmacist can supply them in boxes of 30 and bottles of 100.

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(ABBOTT'S MULTIPLE VITAMINS)

EXCLUSIVE AMBULANCE

LIMITED

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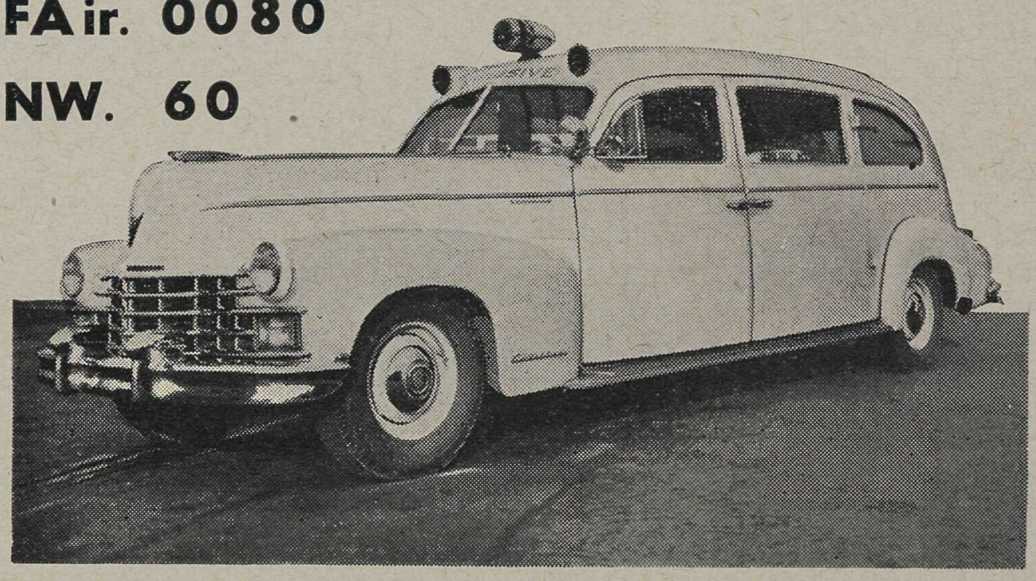

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INDICATIONS: Amenorrhea, Dysmenorrhea, Menorrhagia, Metrorrhagia, and to aid involution of the postpartum uterus.

GENERAL DOSAGE: One to two capsules, three to four times daily—as indications warrant.

In ethical packages of 20 capsules each, bearing no directions.

Literature Available to Physicians Only.

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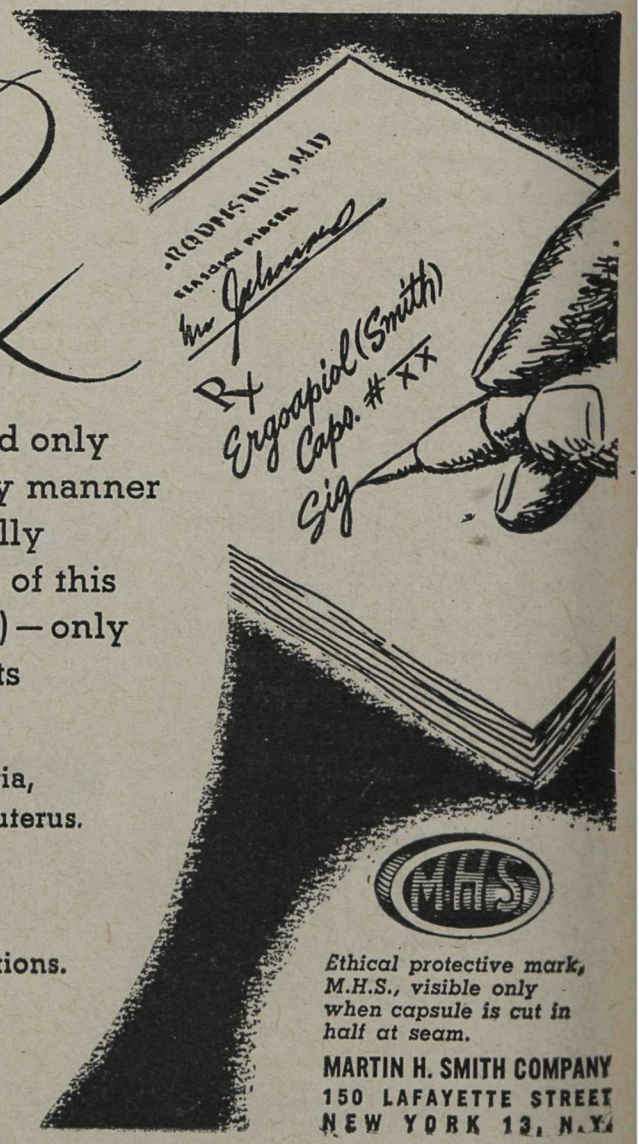

Ethical protective mark, M.H.S., visible only when capsule is cut in half at seam.

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For Infant Feeding

Delta Brand Milk is a low butterfat evaporated milk of 4%, Irradiated and **Vacuum Packed** under careful control which when diluted with water presents a milk of 2% butterfat. Non-fat solids are the same as standard evaporated milk, but calories per ounce in Delta Milk are 31.5 instead of 42.

COMPOSITION OF DELTA BRAND MILK

Fat	**4%**	**Total Solids**	**22%**
Vitamin D	**324 International Units per Imperial quart**		
Calorific value per ounce (avoirdupois)			**31.5**

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