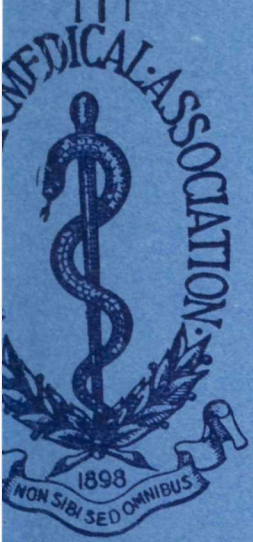

The BULLETIN

of the

VANCOUVER MEDICAL ASSOCIATION

Vol. XV. JULY, 1939 No. 10

With Which Is Incorporated
Transactions of the

Victoria Medical Society

the

Vancouver General Hospital

and

St. Paul's Hospital

In This Issue:

THE INTERPRETATION AND EVALUATION OF PUBLIC HEALTH LABORATORY TESTS

NEWS AND NOTES

BRITISH COLUMBIA MEDICAL ASSOCIATION
ANNUAL MEETING, SEPTEMBER 18, 19, 20, 21

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THE VANCOUVER MEDICAL ASSOCIATION

BULLETIN

Published Monthly under the Auspices of the Vancouver Medical Association in the interests of the Medical Profession.

Offices: 203 Medical-Dental Building, Georgia Street, Vancouver, B. C.

EDITORIAL BOARD:

DR. J. H. MACDERMOT

DR. G. A. DAVIDSON DR. D. E. H. CLEVELAND

All communications to be addressed to the Editor at the above address.

Vol. XV. JULY, 1939 No. 10

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VANCOUVER HEALTH DEPARTMENT

STATISTICS, MAY, 1939.

Total population—estimated	263,974
Japanese population—estimated	8,891
Chinese population—estimated	7,728
Hindu population—estimated	389

	Number	Rate per 1,000 Population
Total deaths	238	10.6
Japanese deaths	6	7.0
Chinese deaths	11	16.7
Deaths—residents only	212	9.5
BIRTH REGISTRATIONS:		
Male, 189; Female, 160	349	15.2

INFANTILE MORTALITY:	May, 1939	May, 1938
Deaths under one year of age	8	14
Death rate—per 1000 births	22.9	42.9
Stillbirths (not included in above)	6	7

CASES OF COMMUNICABLE DISEASES REPORTED IN THE CITY

	April, 1939		May, 1939		June 1st to 15th, 1939	
	Cases	Deaths	Cases	Deaths	Cases	Deaths
Scarlet Fever	22	0	10	0	10	0
Diphtheria	0	0	0	0	0	0
Chicken Pox	59	0	61	0	21	0
Measles	0	0	7	0	3	0
Rubella	2	0	1	0	0	0
Mumps	18	0	27	0	21	0
Whooping Cough	129	1	112	0	55	0
Typhoid Fever	0	0	0	0	0	0
Undulant Fever	0	0	0	0	0	0
Poliomyelitis	0	0	0	0	0	0
Tuberculosis	28	9	37	15	15	--
Erysipelas	11	0	3	0	0	0
Ep. Cerebrospinal Meningitis	0	0	0	0	0	0

V. D. CASES REPORTED TO PROVINCIAL BOARD OF HEALTH, DIVISION OF VENEREAL DISEASE CONTROL.

	Burnaby	West Vancr.	Richmond	North Vancr.	Vancr. Clinic	Hospitals, Private Drs.	Totals
Syphilis	0	0	0	0	36	27	63
Gonorrhœa	0	0	0	0	51	16	67

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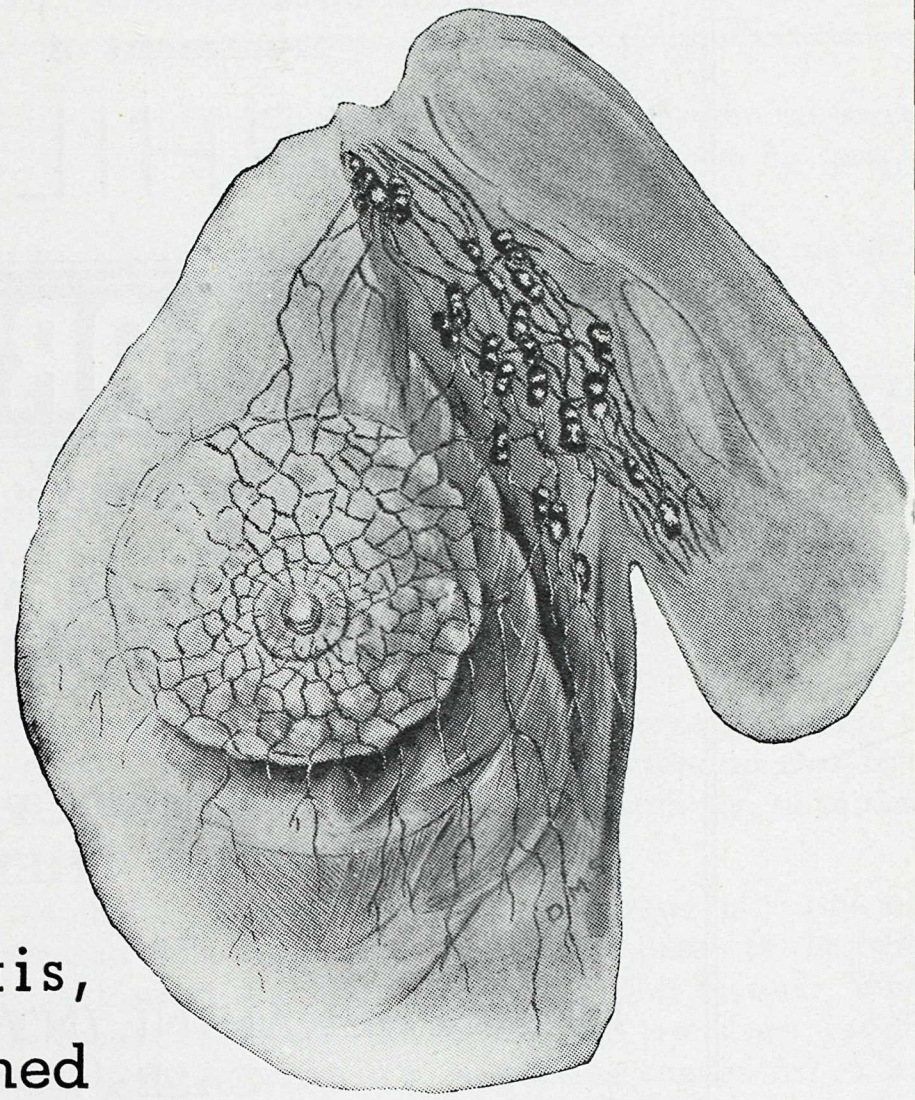

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THE EDITOR'S PAGE

Reading the press reports of a radio address delivered recently by the Provincial Secretary of B. C., Hon. Geo. M. Weir, we were struck by a paragraph culled from his speech, which reads as follows:

"Unmet medical needs account for a substantial proportion of the demands for mothers' allowances, old age pensions, poor relief and institutional relief of various kinds." (*News-Herald*, June 20th, 1939.)

Dr. Weir was making a plea for Health Insurance as at least one remedy, and a major remedy, for these evils amongst others, and he was emphasizing the need for preventive medicine as an economic remedy. We are not denying that there is a considerable amount of truth in what he said—it is agreed by all that illness is a potent factor in indigence—though, in no flippant spirit, we take leave to doubt whether it often leads to demands for old-age pensions. It is true that, in times past, when labour markets were normal and work obtainable by all who wanted it, and were fit for it, there were many who put the ratio of indigence due to illness as high as 50% of the total.

But we take leave to question whether this tradition of ascribing a large proportion of indigence and penury to "unmet medical needs" is not one of those traditions that have become more or less clichês that we repeat glibly and often quite inaccurately, since time has robbed them of much of their truth.

In the first place, the use of the phrase "unmet medical needs" arouses our suspicion. Are these *medical* needs a main factor in the relegation of these unfortunates to the relief line, the mothers' allowance group, the institutional life? What about other factors? What about the greatest factor of all, the economic factor? Unemployment, low wages, insufficient income? What about housing, slums, overcrowding, poor living conditions? These are not medical needs: and yet, as so ably pointed out by the Secretary of the American Foundation, Miss Lape, some two or three years ago, these economic and social needs are far more serious menaces to the well-being of the poor than illness and "medical needs" which are so aften exploited, and, we feel, over-emphasized, by special pleaders for one remedy or another.

Moreover, as Miss Lape also points out, the "medical needs" are far better met, far less "unmet," than any of the others.

No provision is made for free groceries and clothing, for better housing, for a living wage, for social conditions; not until indigence supervenes is anything done. We submit, in this regard, that preventive measures are necessary, not only, as Dr. Weir points out, for medicine, but also from a social and economic point of view. Give people work and an adequate wage, and the question of unmet medical needs will not arise to any great height. Preventive economics may well be as important as preventive medicine.

Medical needs, on the other hand, *are* to a great extent met—not from a preventive point of view, we agree, but preventive medicine must of necessity be a function of the government. The medical profession has contributed very largely to the meeting of medical needs, and if medical needs are unmet, we believe that this is far more due to the fact that people are loath to accept charity, and their economic condition will not allow them to seek the relief they should. This is emphatically not the fault of the medical profession. We say this because frankly we are quite tired of hearing so much of the social maladjustment and malaise that exist put upon the shoulders of the only profession that is doing much to lessen them. This is the poverty that came of the illness that was not treated by the doctors early enough, because of its cost. A sort of House that Jack Built. We think it is time that people realised that they are on the wrong trail in this regard.

Otherwise, we agree heartily that preventive medicine is necessary and the amount of it sadly inadequate at present. We go further and say that any Health Insurance measure

that does not provide it equally with therapeutic medicine will be largely devoid of any true constructive value. Any Health Insurance Act that merely provides a minimum of cheap medical service to a limited section of the community, that takes no cognisance of prevention, that does not deal with the other economic and social causes of indigency and that ignores the by-products of the indigent and handicapped classes, however much temporary and apparent relief it gives, will do little to lessen either the incidence or the cost of disease, which place so tremendous a burden on the back of our social organism.

* * * *

Reports of the Canadian Medical Association Annual Meeting at Montreal are not yet to hand, but it is apparent that much good work has been done, and that our representatives from B. C. have made valuable contributions to the programmes, both business and scientific. One very gracious and well-deserved tribute comes to British Columbia in the election of Dr. Glen Campbell to Senior Membership in the Association. This honour is not lightly conferred, and has only been given to one other member of the profession this year.

We congratulate Dr. Campbell sincerely on this well-merited recognition of his long and useful life as a doctor.

NEWS AND NOTES

Dr. C. M. Bennett of Nelson has returned from post-graduate study at the Mayo Clinic.

* * * *

We extend sympathy to Dr. J. R. Parmley, whose father passed away suddenly in Penticton on June 9th. Mr. Parmley was one of Penticton's pioneers and finest citizens.

* * * *

A new portable X-ray unit has been added to the Penticton Hospital equipment and is welcomed by the profession.

* * * *

Dr. and Mrs. F. W. Andrew of Summerland have been spending some time at the Coast attending the wedding of their son, Bill.

* * * *

On June 17th the Penticton Hospital took fire about 1:30 p.m. Heroic work on the part of the nurses, doctors, fire brigade and volunteers prevented a catastrophe in the overcrowded building. Strong efforts are being made to provide a new hospital.

* * * *

Dr. C. H. Hankinson of Prince Rupert has returned from a holiday in the South much improved in health and has resumed his practice.

* * * *

Dr. R. G. Large of Prince Rupert has left for a two weeks' visit in Vancouver, Victoria and Jasper.

* * * *

Dr. J. P. Cade of Prince Rupert has returned from a vacation in the South.

* * * *

Dr. R. E. McKechnie is visiting in Kelowna, where he joined Dr. W. J. Knox and Dr. L. A. C. Panton on a fishing trip to Beaver Lake.

* * * *

Dr. J. S. Henderson of Kelowna is spending a short holiday fishing at Beaver Lake.

* * * *

Dr. and Mrs. A. S. Undedhill of Kelowna are attending the Gyro convention to be held in Jasper.

* * * *

Congratulations are extended to Dr. and Mrs. N. H. Jones of Port Alberni on the birth of a daughter on June 20th.

Dr. and Mrs. J. Bain Thom of Trail spent a week in Vancouver during the recent visit of the King and Queen.

* * * *

Dr. Wilfrid Laishley of Nelson was also among those who saw the King and Queen. He had quite a good view of Their Majesties at Kamloops.

* * * *

Dr. G. B. Helem of Port Alberni has left for his vacation. He plans to motor via Winnipeg to the Mayo Clinic.

* * * *

Dr. J. S. McCallum of the Department of Pensions and National Health, Victoria, motored up to Port Alberni to conduct an examination of the candidates for the position of Medical Officer to the Indian Affairs Branch.

* * * *

Dr. and Mrs. J. P. Ellis and family of Lytton are coming to the coast for an extended vacation. Dr. J. H. Beattie will do *locum tenens* at Lytton.

* * * *

Dr. Campbell Davidson of Qualicum spent a week in Vancouver during the Royal Visit.

* * * *

Dr. R. H. B. Reed has gone to Rock Bay, where he has taken over the hospital work of Dr. F. H. Stringer.

* * * *

Dr. Stringer is temporarily on the staff of the Shaughnessy Military Hospital during the illness of Dr. Jones.

* * * *

Drs. George Hall, F. M. Bryant and S. G. Kenning of Victoria were in Vancouver on June 5th conducting the oral examinations for the Medical Council of Canada.

* * * *

Dr. P. M. McLean, until recently at the Vancouver General Hospital, is now associated with Dr. R. N. Dick of Chemainus.

* * * *

Dr. J. G. McLeod is temporarily carrying on the practice at Blakeburn.

* * * *

A strong contingent of Vancouver Eye, Ear, Nose and Throat Specialists attended the meeting of the Pacific Coast Oto-Ophthalmological Society in San Francisco in June. A number of those attending will combine attendance at this meeting with a longer holiday. Dr. Paton, with his family, will motor to the Eastern States, to be away about six weeks. Dr. Leeson, who has been away for some weeks, is expected back shortly. Dr. R. B. Boucher is also away, enjoying a holiday in the South.

* * * *

Dr. Watson Dykes left immediately after Summer School for a long motor trip to the East.

* * * *

Dr. G. E. Seldon is out of town for a few weeks, enjoying a holiday.

* * * *

Dr. W. A. Whitelaw attended the graduation at McGill of his son, Dr. D. McKay Whitelaw, who was awarded high honours, winning the Holmes Gold Medal for the high aggregate for the full course, over the five years, and the Henry Forsythe Prize for Surgery. He also made the high aggregate in the final year. Dr. Whitelaw, Jr., will remain in the East to do post-graduate work in Boston.

* * * *

Dr. C. W. Prowd has been in the Eastern States for several weeks, and is expected back shortly.

* * * *

At the Annual Meeting of the Canadian Medical Association, being held in June in Montreal, Dr. D. E. H. Cleveland is to give a paper on "The Place of Allergy in the Diagnosis of Skin Conditions," and Dr. R. P. Kinsman will speak on "Some Aspects of Intracranial Birth Injuries."

A meeting of the North Shore Medical Society was held on June 13th, when the speaker was Dr. C. H. Gundry of Vancouver.

* * * *

Dr. and Mrs. A. C. Nash of West Vancouver have left on a three months' trip to England.

* * * *

Dr. J. S. McCannell of Victoria was married on June 10th to Miss Betty McRobbie of Portland. On returning from their honeymoon, Dr. McCannell will become associated with Doctors Kenning and Kenning.

* * * *

Dr. C. A. Armstrong has returned from a trip to the East and resumed practice at Port Simpson. Dr. A. G. MacKinnon will be remaining to assist him during the summer months.

* * * *

Dr. E. B. Pugsley of Prince Rupert has returned from a prolonged visit in the East, where she was engaged in post-graduate work.

* * * *

Dr. and Mrs. M. G. Archibald of Kamloops recently went East to attend the graduation in medicine from McGill of their son, Stanley. Dr. Archibald underwent an operation at the Royal Victoria Hospital, Montreal, and Mrs. Archibald was also ill, but both are now reported to be doing well.

* * * *

Dr. R. W. Irving of Kamloops has now returned from his recent visit to Europe and has resumed his practice.

* * * *

Dr. D. J. M. Crawford of Trail has returned from Montreal, where he did three months in post-graduate work.

* * * *

Dr. H. R. Christie of Rossland has left for three months' post-graduate course in New York.

* * * *

Congratulations are extended to Dr. and Mrs. K. P. Groves on the birth of a son on June 8th.

LIBRARY NOTES

PUBLICATIONS OF MEMBERS

Dr. D. E. H. Cleveland: "Varioliform eruption from sulfanilamide." *Arch. D. and S.*, v. 39, p. 693.

Dr. Earl R. Hall: "Chronic Prostatis (non-specific)"—*C.M.A. Jl.*, Apl., 1939, p. 382.

Dr. R. E. McKechnie II, Iris Corbould and R. H. Clark: "The intravenous feeding of amino acids."—*Am. Jl. Dig. Diseases*, May, 1939, p. 185.

JOURNALS IN THE LIBRARY

OBSTETRICS AND GYNÆCOLOGY

American Journal of Obstetrics and Gynæcology.
Journal of Obstetrics and Gynæcology of the British Empire.
Surgery, Gynæcology and Obstetrics.

CHILDREN'S DISEASES

American Journal, Diseases of Children.
British Journal of Children's Diseases.
Journal of Pædiatrics.

EYE, EAR, NOSE AND THROAT

Archives of Otolaryngology.
American Journal of Ophthalmology.
Annals of Otology, Rhinology and Laryngology.
Archives of Ophthalmology.
Laryngoscope.
British Journal of Ophthalmology.
Journal of Laryngology.

DERMATOLOGY AND VENEREAL DISEASES

British Journal of Dermatology.
American Journal of Syphilis.
Archives of Dermatology and Syphilis.

UROLOGY

Journal of Urology.
British Journal of Urology.

TUBERCULOSIS

American Review of Tuberculosis.
British Journal of Tuberculosis.

RADIOLOGY

American Journal of Roentgenology and Radium Therapy.
Radiology.
British Journal of Radiology.

(*To be continued*)

Vancouver Medical Association

SUMMER SCHOOL ATTENDANCE

The attendance at this year's Summer School reached a new "high," with a total of 219 ticket holders. This may have been due to the unusually large number of men from out of town.

Drs. E. W. Boak, H. G. Chisholm, T. McPherson, C. W. Sanders and A. C. Sinclair, all from Victoria, attended the Summer School.

From other points in the Province came the following: Dr. F. H. Andrew, Summerland; Dr. W. E. Austin, Hazelton; Dr. M. R. Basted, Trail; Dr. A. N. Beattie, Ioco; Dr. H. L. Burris, Kamloops; Dr. J. P. Cade, Prince Rupert; Dr. H. Campbell-Brown, Vernon; Dr. L. S. Chipperfield, Port Coquitlam; Dr. A. L. Cornish, Courtenay; Dr. B. Dunham, Nelson; Dr. F. O. R. Garner, Tranquille; Dr. R. R. M. Glasgow, Michel; Dr. C. H. Hankinson, Prince Rupert; Dr. J. F. Haszard, Kimberley; Dr. C. T. Hilton, Port Alberni; Dr. H. T. Hogan, Blakeburn; Dr. J. A. Ireland, Kamloops; Dr. C. F. Kincade, Kamloops; Dr. O. O. Lyons, Powell River; Dr. J. V. Murray, Creston; Dr. H. H. McKenzie, Nelson; Dr. G. K. McNaughton, Cumberland; Dr. N. J. Paul, Squamish; Dr. Paul Phillips, Princeton; Dr. F. H. Stringer, Rock Bay; Dr. Kingsley Terry, Tranquille; Dr. F. L. Wilson, Trail.

The New Westminster contingent were as follows: Dr. D. A. Clark, Dr. W. A. Clarke, Dr. C. R. Learn, Dr. E. H. McEwen and Dr. G. T. Wilson.

Some fifteen men registered from Washington and Oregon, and one man came from Vegreville, in Alberta, while another registered from London, Ontario.

The University of Wisconsin Medical School is to conduct an Institute for the Consideration of the Blood and Blood-Forming Organs, September 4-6, 1939. The programme is to include papers and round-table discussions by European and American workers in the field of hæmatology. In addition to the discussions, the following formal are to be presented:

Dr. L. J. Witts, Oxford England: "Anæmias Due to Iron Deficiency."

Dr. Cecil J. Watson, Minneapolis: "The Porphyrins and Diseases of the Blood."

Dr. Cornelius P. Rhoads, New York: "Aplastic Anæmia."

Dr. E. Mulengracht, Copenhagen, Denmark: "Some Etiological Factors in Pernicious Anæmias and Related Macrocytic Anæmias."

Dr. Harry Ergle, Baltimore: "The Coagulation of Blood."

Dr. George R. Minot, Boston: "The Nature of the Hæmolytic Anæmias."

Dr. Jacob Furth, New York: "Experimental Leukæmia."

Dr. Claude E. Forkner, New York: "Monocytic Leukæmia and Aleukocythemia Leukæmia."

Dr. Edward B. Krumbhaar, Philadelphia: "Hodgkin's Disease."

Dr. Louis K. Diamond, Boston: "The Erythroblastic Anæmias."

Dr. Edwin E. Osgood, Portland: "Marrow Cultures."

Dr. Charles A. Doan, Columbus: "The Reticulo-Endothelial System."

Prof. Hal Downey, Minneapolis: "Infectious Mononucleosis."

Dr. Paul Reznikoff, New York: "Polycythemia."

Physicians and others who are interested are cordially invited. A detailed programme may be obtained by addressing Dr. Ovid O. Meyer, Chairman of Programme Committee, University of Wisconsin Medical School, Madison, Wisconsin.

British Columbia Medical Association

(Canadian Medical Association, British Columbia Division)

President	Dr. D. E. H. Cleveland, Vancouver.
First Vice-President	Dr. F. M. Auld, Nelson.
Second Vice-President	Dr. E. Murray Blair, Vancouver.
Honorary Secretary-Treasurer	Dr. A. H. Spohn, Vancouver.
Immediate Past President	Dr. Gordon C. Kenning, Victoria.
Executive Secretary	Dr. M. W. Thomas, Vancouver.

1939 ANNUAL MEETING

DATES: SEPTEMBER 18, 19, 20, 21

HEADQUARTERS: HOTEL VANCOUVER.

PLACE: VANCOUVER.

THE STAGE IS SET.

NOW it is for you to make your PLANS.

MAKE YOUR RESERVATIONS EARLY.

* * * *

GENERAL SESSIONS

Scientific Speakers—

Dr. R. Franklin Carter, New York City; Associate Professor of Clinical Surgery, Post-Graduate School, Columbia University.

Dr. W. G. Cosbie, Toronto; Senior Demonstrator in Obstetrics and Gynæcology, University of Toronto.

Dr. H. B. Cushing, Montreal; Emeritus Professor of Pædiatrics, McGill University.

Dr. Alexander Gibson, Winnipeg; Associate Professor of Clinical Orthopædic Surgery, University of Manitoba.

Dr. Roscoe R. Graham, Toronto; Assistant Professor of Surgery, University of Toronto.

Dr. F. S. Patch, Montreal; Professor of Urology, Head of the Department of Surgery, McGill University.

Dr. E. P. Scarlett, Calgary; Internal Medicine.

Representing Canadian Medical Association—

Dr. F. S. Patch, Montreal, President.

Dr. T. C. Routley, Toronto, General Secretary.

* * * *

The Committee on Programme is composed of—

Dr. G. F. Strong, Chairman; Drs. W. T. Ewing, Roy Huggard, J. R. Naden, J. R. Neilson, R. A. Palmer, A. B. Schinbein; Ex-officio: Dr. D. E. H. Cleveland, President; Dr. A. H. Spohn, Honorary Secretary; Dr. M. W. Thomas, Executive Secretary.

The Committee on Programme has been meeting regularly and will have earned our gratulatory thanks for the fare offered.

FEATURES

There will be—

- Eighteen lectures.
- Meetings of Scientific Sections.
  Note: There are now three sections formed:
  Eye, Ear, Nose and Throat;
  Pædiatrics;
  Radiology.
- Three Round Table Conferences:
  Subjects:
  Nutrition and Gastro-Intestinal Diseases, led by Dr. H. A. Des-Brisay.
  Obstetrics, led by Dr. J. W. Arbuckle.
  Orthopædics, led by Dr. D. M. Meekison.
  It is proposed to have these Conferences on three successive days—Tuesday, Wednesday and Thursday, for a period of one hour, beginning at 8:30 a.m.
- Official Luncheon.
- Special Luncheons.
- Annual Dinner (with outstanding speaker).
- Annual Meetings:
  College of Physicians and Surgeons of B. C.
  British Columbia Medical Association.
- Symposium on Public Health.
- Sessions on Economics.
- Clinical Demonstrations.
- Other Special Features.
- Golf—for all—with prizes.
- Tournament for Trophy.
- Entertainment for Ladies.

And so we present the foreword of a good meeting.
Make your plans now and your reservations early.

* * * *

WHO'S WHO?

RUPERT FRANKLIN CARTER, M.D.

Dr. R. Franklin Carter, of New York City, a well-known teacher, is Associate Professor of Clinical Surgery, Post-Graduate School, Columbia University.

WARING GERALD COSBIE, M.D., F.R.C.S. (C.)

Dr. W. G. Cosbie of Toronto will deal with subjects in his specialty—Obstetrics and Gynæcology,—in which department of the Faculty of Medicine of the University of Toronto he is a valued teacher.

HAROLD B. CUSHING, B.A., M.D.C.M.

Dr. H. B. Cushing of Montreal is Emeritus Professor of Pædiatrics on the Faculty of Medicine, McGill University. When the Chair of Pædiatrics was founded in the Faculty of Medicine at McGill University in 1937, Dr. Cushing was made Professor of Pædiatrics. Dr. Cushing is widely known as a teacher.

ALEXANDER GIBSON, M.A., M.B., Ch.B. (Edin.), F.R.C.S. (Eng.), F.R.S. (Edin.)

Dr. Alexander Gibson of Winnipeg comes to British Columbia to participate in the Programme of Lectures at the Annual Meeting as an exchange speaker from the Manitoba Medical Association. This was a happy thought and a much appreciated gesture of friendliness on the part of Manitoba.

Dr. C. H. Vrooman of Vancouver will travel to Winnipeg to contribute to the programme of the Manitoba Medical Association in its Annual Meeting.

Dr. Gibson is Associate Professor of Clinical Orthopædic Surgery and Lecturer in Applied Anatomy at the University of Manitoba, and a valued teacher.

ROSCOE REID GRAHAM, M.B., F.R.C.S. (C.)

Dr. Roscoe Graham of Toronto scarcely requires introduction. He comes to British Columbia as the Assistant Professor of Surgery in the Faculty of Medicine of the University of Toronto. Dr. Graham has been asked by the Department of Cancer Control of the Canadian Medical Association to deal with Cancer Education. Dr. Graham will make a valued contribution to our Lecture Programme.

FRANK STEWART PATCH, B.A., M.D., C.M., F.R.C.S. (C.)

Dr. Frank S. Patch is now the head of the Department of Surgery, an added responsibility, in that he has been for several years Professor of Urology in the Faculty of Medicine at McGill University. Dr. Patch has served Canadian medicine for some years as Treasurer and he is now visiting British Columbia as President of the Canadian Medical Association. He has willingly agreed to contribute to the Lecture Programme.

EARLE PARKHILL SCARLETT, B.A., M.B., F.R.C.P. (C.)

Dr. E. P. Scarlett of Calgary graciously accepted the invitation of the Committee to participate in the Lecture Programme. His reputation precedes him. Dr. Scarlett possesses a flair for medico-literary writings. Some of his published articles on other than scientific subjects fill one with interest and a hope that he may continue other studies.

THOMAS CLARENCE ROUTLEY, M.D., LL.D., F.R.C.P. (C.)

Dr. T. C. Routley of Toronto (or should we say "of Canada"?) will form an important part of the visiting group of official heads of our medical family. Dr. Routley, our General Secretary of the Canadian Medical Association, always comes helpfully and assists us willingly towards a successful meeting.

CANADIAN MEDICAL ASSOCIATION DEPARTMENT OF CANCER CONTROL

Forms of the Department of Cancer Control of the Canadian Medical Association which are to be used in reporting cancer cases are now being distributed to nine Hospital Study Groups throughout the Province.

B. C. CANCER FOUNDATION

Arrangements have been completed to institute a drive, in aid of the B. C. Cancer Foundation, for $200,000, $50,000 of which has already been subscribed. It is anticipated that the additional $150,000 will be raised, and the money will be used to expand the facilities of the present Institute.

A Technical Committee has been appointed, under the Chairmanship of Dr. Max Evans, consisting of Drs. W. L. Graham, B. J. Harrison, A. Y. McNair, H. H. Pitts, W. H. Prowd and A. B. Schinbein. The function of this committee will be to advise the Directors as to the use of the monies received.

PROVINCIAL BOARD OF HEALTH

DIVISION OF VENEREAL DISEASE CONTROL

EDITOR THE BULLETIN:

Dear Dr. MacDermot:

I am enclosing a copy of "The Malarial Treatment of Neurosyphilis" for your consideration for publication in the BULLETIN. We are urging the general practitioners throughout the province to give this treatment themselves whenever possible, and it would be of great assistance to us if you could publish it as one of the treatment series which Dr. Williams started last winter.

Yours sincerely,

S. E. C. TURVEY, M.D.,

Consulting Neurologist, Venereal Disease Control.

N.B.—The article referred to in the above correspondence will be found on page 308 of this issue.

THE INTERPRETATION AND EVALUATION OF PUBLIC HEALTH LABORATORY TESTS*

C. E. DOLMAN, M.B., B.S.; M.R.C.P.; D.P.H.; Ph.D.

Director, Division of Laboratories, Provincial Board of Health of British Columbia;
Professor of Bacteriology and Preventive Medicine, University of British Columbia;
Research Member, Connaught Laboratories, University of Toronto.

[This very timely paper of Dr. Dolman's should be carefully read by every medical man in B. C. It is, to begin with, far more interesting reading than its somewhat austere and formal title would suggest. We take our laboratories far too much for granted, and are not doing our part towards giving them the support and fair treatment to which they are entitled, and which, as Dr. Dolman so well points out, they must have, if they are to carry on and give us the help which we must have in our work. In reading this paper, one cannot but feel that we have in B. C. a laboratory system to be proud of, and staffs that would adorn any organization. One feels, too, that there is considerable danger that unless all concerned do their share in avoiding overloading and unnecessary demands on this organization, it may be severely handicapped, or even crippled, by overwork. So that it is up to each one of us to do his share in prevetning such a disaster, which would hurt us all.—ED.]

At the outset, I want to emphasize that the scope of my remarks will be confined to public health laboratory tests; that is, to laboratory work relating to the diagnosis, control, and prevention of communicable disease. I shall not attempt to discuss clinical pathological tests, or laboratory work relating to the diagnosis, therapeusis, and prognosis of the individual ailment. Thus you will not expect me to comment on the more or less complex significance of blood chemistry findings, sedimentation rates, leucocyte-monocyte ratios, renal tolerance tests, sulphanilamide estimations, and the like. Even if we also exclude from consideration such tests as fall into a somewhat undifferentiated group, more than enough material remains, under the unequivocal heading of public health laboratory work, for a very concentrated address.

May I first make a few general comments on public health laboratory work? Twenty-five years ago, more than four-fifths of all deaths on the North American continent occurred from communicable diseases. Today, only about one-fifth of all deaths are of such origin. This prosaic statement epitomizes the quiet revolution, the almost unsung triumph, which has been wrought in a generation by the practice of preventive medicine; and it would be hard to exaggerate the part played in this achievement by the public health laboratory. Unfortunately, British Columbia cannot claim to have pioneered in recognizing the importance of public health laboratory work. In this Province, twenty-five years ago, no public funds were being appropriated for such work. Even fifteen years ago, a small subsidy of $25.00 monthly, paid to one person, was apparently the only support given by the State for this purpose. Today the Division of Laboratories of the Provincial Board of Health of British Columbia operates under an annual budget of roughly $45,000.00, and employs over thirty persons, the majority of whom have University honour degrees. But while marked expansion has occurred, far more is needed to ensure reasonable standards of emoluments and of working conditions for specialists whose techniques, talents, and integrity are of high calibre, and also to secure to the community more of those benefits which are bound to accrue from really close association of public health laboratory procedures with the spirit of research. On this last point I shall have more to say later.

In British Columbia in 1938 some 150,000 public health laboratory tests were performed (about one test to every five inhabitants of the Province), of which nearly 120,000 were done in the Vancouver laboratories alone. Our turnover has trebled in Vancouver during the past four years. With the recent establishment of a seventh branch laboratory at Prince Rupert, the profession can hardly complain of being under-serviced in respect of public health laboratory work. Indeed, one is often impelled to consider the contrary possibility. The Province of Quebec, for instance, with more than four times our population, has no branch laboratories; while Ontario, with five times our population, has only five branch laboratories. Again, England and Wales, with roughly fifty times our population, shows only seven times our annual turnover of laboratory tests relating to venereal disease control. In the whole of Denmark, with about ten times the population served by the

* Being the substance of an address given before the Victoria Medical Society, April 3rd, 1939.

Vancouver laboratory, the annual turnover of Kahn blood tests is only one-quarter the number of such tests performed last year by us in Vancouver. (Incidentally, our own relatively very high turnover of venereal disease tests can hardly be dismissed as merely an expression of a higher local incidence of these diseases. The fact that in England and Wales only one-twelfth of all specimens relating to venereal diseases are sent to the public health laboratories by private practitioners—over 90 per cent of such specimens being sent in from the special government clinics—while in Vancouver five-sixths of all specimens relating to venereal disease reach us from the private practitioner, may well be significant in this connection.)

Perhaps later there may be time to comment further on the contributions to be made by the public health laboratory to a programme of venereal disease control. Returning, meanwhile, to our general summary of the current laboratory situation, we are faced with the paradox that although the incidence of communicable disease is today so much lower than it was a generation ago, yet public health laboratory work continues to increase in both scope and volume. This situation may be attributed to increasing requisitioning of routine tests, to development of new methods and more sensitive techniques, and to enlarging conceptions of the bounds of public health. The effect has been the emergence of an increasing dependence upon the laboratory, whose test tube procedures, and reports thereon, have tended more and more to be regarded as oracular and beyond dispute, albeit often passing understanding. Under such circumstances, it is perhaps not surprising if hands lose their cunning, ears their acuity, and eyes their perspicacity—if, in fact, the fine art and science of clinical diagnostics is being lost—that there should be a display of indignation when the laboratory leaves one stranded by hedging its report about (quite properly) with reservations. The laboratory has indeed indispensable contributions to make to the practice of modern scientific medicine. But it is as fallacious to over-estimate the conclusiveness of laboratory findings as it is unprofitable to impugn their accuracy. It is, of course, axiomatic that any laboratory report is valuable only in proportion to the general reliability of the laboratory issuing it, and to the responsibility and skill of the technicians performing the test. Further, if a specimen be improperly taken or transmitted, no amount of skill can be anything but wasted upon it. You would be surprised to learn, for instance, how often blood specimens reaching us for culture are grossly contaminated on arrival, or the numbers of cultures we are asked to make for *B. tuberculosis* from phenolized specimens, of throat swabs reaching us for examination which have never touched a throat, and of milk samples for total bacterial count which may have been two whole summer days in transit. For the purpose of this discussion, we shall assume that specimens have been properly collected and transmitted, and that the laboratory technical assistance available is quite satisfactory. The latter assumption, with very few reservtions, is thoroughly warranted in British Columbia.

Limitations Inherent in Methods of Isolating Pathogenic Micro-Organisms.

Turning from the general to the particular, let me allude briefly to certain limitations and difficulties inherent in current methods of isolating pathogenic micro-organisms from specimens of human origin, or from materials with which infected persons may have been in contact.

i. *Fastidiousness of many pathogens in respect of nutritional requirements for growth.*

The fact is often forgotten that many pathogenic micro-organisms are quite fastidious in their nutritional requirements. Even the hæmolytic streptococcus, and the pneumococcus, cannot be isolated on simple nutrient agar medium. The gonococcus, meningococcus, *B. tuberculosis, Brucella abortus* and *Hæmophilus pertussis,* require medium fortified by certain special factors, while some of these require also to be incubated in an atmosphere containing a relatively high percentage of carbon dioxide before they will form visible colonies. In recent years, the importance to bacterial metabolism of accessory growth factors, analogous to the vitamins required for effective metabolism among the higher animals, has been established.

ii. *Frequency of association of pathogens with heavily-contaminated material.*

The fact that most pathogens are sought in pharyngeal mucus, sputum, fæces, or in milk and water, which are normally heavily contaminated with a variety of non-pathogens,

entails the use of selective media for their isolation. A variety of special media are thus required for isolation of, e.g., the diphtheria bacillus, or the typhoid-paratyphoid-dysentery groups of micro-organisms.

The foregoing points emphasize the extreme importance to a public health laboratory of its media-making department; for the laboratory must needs accept the responsibility of supplying the basic, pre-requisite conditions for isolating a given pathogen from a specimen suspected of containing it. A trained chemist should be in charge of such departments, with adequate assistance and suitable quarters. I have noted with interest that the New York State Department of Health was recently voted $150,000 for extension of the media-making department of its Division of Laboratories and Research. By contrast, in Vancouver our own media have had to be made, until quite recently, in a narrow corridor, six feet by ten, connecting two houses. Along this corridor there was continual pedestrian traffic, while cleaning and sterilization procedures were performed in the same confined space. Certain alterations have permitted this situation to be slightly, but only slightly, alleviated. Yet our own turnover of tests is nearly one-third that of the Central Laboratories of the New York State Health Department.

iii. *The consequences of random sampling.*

Were it not so often lost sight of, one would hesitate to emphasize the fairly obvious fact that single negative reports on specimens sent in for culture, or for direct smear examination, can rarely be looked upon as final evidence of freedom from the suspected infection. This is especially true of conditions in which only very few micro-organisms may be present in the specimen, as in most cases of residual gonococcal infection, or in which the micro-organisms are discharged from the body intermittently, as in carriers of the typhoid-paratyphoid-dysentery group. In a recent outbreak of typhoid fever, a single colony of *B. typhosus* was noted on a large Petri dish of special medium (bismuth sulphite agar), which permits a relatively heavy inoculum of fæces to be cultured. The stool specimen came from a suspected carrier, who, it transpired however, was incubating the disease; for he developed the symptomatology of typhoid fever some days later. All the other plates inoculated from the same specimen were negative.

In culturing a milk sample for *Br. abortus,* marked variations are often encountered in the numbers of colonies growing on the different plates. Several plates may, for instance, be entirely negative, while another plate, inoculated with the same volume of the treated sample, may show scores of Brucella colonies. Such fortuitous circumstances as the degree of clumping or of phagocyotisis of the micro-organisms, and slight variations in the technique of spreading the samples on the different plates, will influence the individual plate findings.

One might multiply illustrations of the important point that no laboratory can guarantee absence of a given pathogen from a specimen, on the basis of one, or of many, negative attempts to isolate it by cultural methods. Even if it were feasible to culture every portion of several consecutive specimens from the same patient, no nutrient medium is yet known which ensures colony formation from every viable pathogen present in the inoculum. Negative reports on cultural examinations must therefore be interpreted as conventionally, rather than categorically, negative. For its part, the laboratory should seek to diminish the gap between the conventional and the categorical negative, by using nutrient media appropriate to the needs of the micro-organisms sought, and by employing techniques which ensure examination of a liberal number of representative samples of the specimen submitted.

Incidentally, a negative report on a direct microscopic smear examination should be viewed with similar, or even greater, reservations. In chronic gonorrhœa, for instance, recent work in the Vancouver laboratories has established (in an investigation involving the largest group of parallel laboratory examinations of this type yet recorded) that the cultural method is a far more sensitive index of residual infection than is the direct smear method. The local findings show how indefensible, from every standpoint, is the practice of relaying laboratory forms reporting negative smear findings for the gonococcus, to prostitutes who use such forms as letters of introduction to prospective clients.

iv. *Difficulties of final identification.*

To be able to recognize and differentiate hæmolytic staphylococci and streptococci on a blood plate ordinarily calls for no great skill or experience, although even this cannot always be done at a glance. But real difficulties often present themselves before suspicious colonies can be positively identified as a particular pathogen. Very considerable experience is required, for instance, in order to pick out Brucella colonies from a liver infusion-methyl violet agar plate inoculated with raw milk of high total colony count. Good eyesight, to say the least, is needed to spot the minute early colonies of *H. pertussis* on a cough plate. Again, in examining heavily-contaminated gonococcus culture plates, where one or two overgrown colonies appear to give a modified oxidase reaction, much time and trouble would be involved in attempting (often unsuccessfully) to determine whether gonococci were actually present at the sites of such reactions. Such findings are customarily reported as suspicious, and the time and trouble reserved for other purposes.

I will allude to just one other example of this type of difficulty. Members of the large Salmonella group of micro-organisms cannot be distinguished by their morphological appearance, colony form, motility, or by many of the simpler biochemical tests. The final identification of some members of this group may involve several weeks or months of intricate agglutinin-absorption procedures; while occasionally we have isolated strains of this group having a hitherto unrecorded antigenic structure. From the standpoint of treatment, all the enteric group of infections may be akin; but in addition to the spirit of research, there is sometimes an epidemiological end to be served in attempting such final identification.

Limitations of Sero-Diagnostic Methods.

Over half the examinations made in our laboratories are concerned with attempts to throw light on the diagnosis of present or recent infection by serological methods. The purpose of all such methods is to detect the presence of specific antibodies in the circulating blood, *e.g.*, agglutinins in the Widal reaction, complement-fixing bodies in the Wassermann reaction, precipitins in the Kahn reaction. There are many limitations, some of which are illustrated below, to the clinical significance of laboratory findings in tests of these types.

i. *Specific antibodies may not be detectable despite the presence of infection.*

As is generally realized, specific antibodies do not appear in the peripheral circulation in amounts sufficiently above the upper limits of the normal range until the antigenic stimulus has been applied for several days, or even longer. Thus, the Kahn blood test may be negative, although dark-field examination of fluid from a suspected chancre may provide indubitable evidence of syphilitic infection. Again, the Widal reaction may be negative, although blood or stool culture may yield *B. typhosus*. But in each of the foregoing instances, either before or soon after a pathogenic micro-organism has ceased to be detectable in the discharges or the blood stream of the infected person, specific circulating antibodies will usually be present to a titre above normal limits. Therefore when clinical and epidemiological evidence points to some specific, early infection, the provisional diagnosis should not be ruled out because of negative serological findings. A repeat test after a few days' interval will, in such circumstances, often clinch the diagnosis by indicating the development of specific antibodies to a titre well above normal limits.

Occasionally, however, the development of specific circulating antibodies in significant titre may be indefinitely deferred. Typhoid fever without a positive Widal reaction, while comparatively rare, is by no means unknown. In the less acute types of brucellosis, the specific agglutinin titre occasionally remains within normal limits throughout the often prolonged course of the infection. The same is frequently true of bacillary dysentery, for which early stool culture, and *not* an agglutination test, provides the only satisfactory laboratory method of diagnosis.

ii. *Specific antibodies may be present despite absence of current, or even recent, infection.*

Artificial immunization (as with T.A.B. vaccine), or earlier infection with a micro-organism antigenically related to that now under suspicion, may account for the presence

of circulating antibodies. Moreover, specific antibodies may still be detectable in quite high titre many years after recovery from a given infection. The rate of decline of an antibody titre in an individual's blood stream is as variable and unpredictable as its rate of appearance, or as the maximum titre attained. Hence the impossibility of assigning definite clinical significance to all antibody titres above a certain minimum level. In general, a definitely rising antibody titre in the course of an illness is diagnostic; but there are exceptions. Again, the titre of the "O", or somatic, agglutinin for *B. typhosus* is of greater import to the diagnosis of typhoid fever than is the titre of the "H", or flagellar agglutinin. On the other hand, the "H" tends to outlast the "O" following T.A.B. vaccination. While many such generalizations might be made, none of them could be looked upon as rules. As is true of all laboratory procedures, serological findings must be interpreted in the light of the clinical evidence available.

Realizing this, the laboratories have sometimes deemed it in the public interest to turn a deaf ear to opportunity. Two or three years ago, for instance, there was considerable local demand for the gonococcus complement-fixation test to be made available, as an aid to the diagnosis of gonorrhœal arthritis. Apart from certain special difficulties attendant upon standardization of the antigen suspension used in the gonococcus complement-fixation test, we foresaw, on the basis of previous experience with newly-introduced tests of this type, that requisitions would soon reach the Laboratories for the complement-fixation reaction in early cases of gonorrhœa, in many of which the reaction might well be negative. On the other hand, recovered cases of gonorrhœal urethritis (a high proportion of the population, one gathers), having an arthritis of non-related ætiology (also a common condition) might give an entirely misleading positive reaction. While physicians have, in my view, no right to requisition tests whose results they will be unable to interpret, the Laboratories should protect both the profession and themselves from tests which are more likely to confuse than to clarify diagnostic issues.

iii. *Errors due to use of faulty antigens.*

Antigen suspensions often prove unstable, and are then liable to become either ultra-sensitive or of greatly reduced sensitivity. Some bacterial suspensions may indeed undergo spontaneous agglutination, while others may remain inagglutinable by a high titre agglutinating serum. Such extremes of sensitivity are, of course, detected by inclusion of appropriate controls in every test of this kind. But protection against minor deviations from optimal sensitivity is provided only by careful standardization procedures. The reporting of a positive Widal reaction on a blood specimen by one laboratory, and of a negative reaction on the same specimen by another laboratory, can hardly occur today in British Columbia. All branch laboratories are supplied with standardized suspensions for agglutination reactions by the main laboratories in Vancouver. For the Kahn test, and for other similar serological tests for syphilis, careful standardization of the antigen is of paramount importance. Again, all branch laboratories operating in conjunction with the Division of Laboratories of the Provincial Board of Health are supplied with Kahn antigen prepared and standardized in Vancouver, and checked at intervals in Dr. Kahn's own laboratory at Ann Arbor, Michigan.

In all the serological tests for syphilis, the objective is to use an antigen having the maximum sensitivity consistent with the nearly 100 per cent specificity to which the better tests approach. The ideal test would be 100 per cent specific and 100 per cent sensitive—assuming that agreement could be reached as to what level of sensitivity would detect the minimal definite serological evidence of syphilis. In practice, sensitivity has often to be sacrificed to specificity, and antigens whose specificity has been sacrificed to sensitivity are held in growing disfavour. Notwithstanding the high specificity of a properly-performed Kahn test, serologists are officially agreed that a diagnosis of syphilis should never be made on the basis of a single positive reaction unsupported by a history or clinical signs of syphilitic infection.

That the serological tests for syphilis should impart such highly specific implications has been a source of wonderment ever since Porges and Meier found in 1908 that an alco-

holic extract of beef heart muscle would serve just as well, for antigen, as the aqueous extract of syphilitic fœtal liver which Wasserman had advocated for his test two years previously. Evidence is accumulating that the serological tests for syphilis exemplify the outstanding practical application of a heterophile reaction—denoting the presence of chemically similar constituents in biologically unrelated forms. Apart from the Wasserman-Kahn-Hinton-Kline group of tests, which presumably depend upon the existence of a component possessed in common by the *Spirochæte pallida* and the lipoids present in an alcoholic extract of beef heart muscle, other examples of heterophile reactions are the Weil-Felix reaction in typhus fever, and the Paul-Bunnell test for infectious mononucleosis. The former is based on joint possession of a heterophile antigen by the *Rickettsia prowazeki* of typhus fever, and by *B. proteus, strain X 19;* while the latter depends upon sheep erythrocytes, and the inciting agent (presumably a virus) of infectious mononucleosis, or "glandular fever," likewise owning a common heterophile antigen. Numerous other examples of heterophile reactions have been reported.

This explanation of the mechanism underlying the serological tests for syphilis leads to the conclusion that what we actually test for in such reactions is the presence of specific spirochætal antibody; and further, that one of the basic criteria of cure in syphilis entails the disappearance from the blood stream of all detectable spirochætal antibody. If this conclusion be just, how unphysiological are current chemo-therapeutic measures for syphilis! Incidentally, the same conception of heterophile antigens may serve to account for the "false" positive reactions obtained in a fairly high proportion of cases of leprosy and malaria, and to a lesser extent in certain other febrile illnesses.

A word or two about "doubtful" reports on Kahn tests. Some physicians still appear to resent such a report, deeming it perhaps an indication of doubtful laboratory technique having been used on the specimen in question. Actually the term signifies definite, but incomplete, precipitation in the Kahn test, and is usually indicative of the presence of only small amounts of specific antibody in the specimen. The laboratory obviously cannot tell, from examination of a single specimen, whether such a small amount of antibody be on the increase, as in a progressive infection; or on the decrease, as in a case responding to chemo-therapy; or whether it represents merely a minor response to a heterophile antigenic stimulus provided by some infective agent other than the *Spirochæte pallida.* The whole zone of incomplete precipitation represents but a very small fraction of the total range of antibody titres which quantitative assays show may be present in sera giving complete precipitation. To assign the terms 1+, 2+, 3+ to this narrow zone of varying degrees of incomplete precipitation, imputes to minor differences in antibody content a significance which they can hardly carry; and, moreover, endows laboratory technicians with a degree of reproducibility of technique which can seldom be claimed.

A doubtful report means that a repeat specimen should be sent to the laboratory; and, if the report is still doubtful, yet other specimens may be necessary before the sum total of the laboratory findings, taken in conjunction with clinical findings, permits a decision to be reached as to whether or not the person in question has syphilis. Supplementary serological tests, such as those of Hinton and Kline, often furnish valuable information when the Kahn reaction has proved doubtful. As soon as our facilities permit, the Vancouver laboratories propose to perform, and to report upon, the Hinton and Kline tests on all Kahn-positive and Kahn-doubtful specimens. While this undertaking is believed to represent a progressive step, it is bound to lead to occasional discordant reports on the same specimen. In such contingencies, the laboratories will endeavour to facilitate the physician's interpretation of the reports by issuing a general statement; but we cannot act in a consultative capacity on the individual case. May I be permitted to reiterate that all laboratory findings must be interpreted in the light of clinical evidence; and to add that maximum benefits will not accrue to the public health from advances in scientific medicine until the average general practitioner contrives to keep abreast of new developments in the health laboratory field.

The Future of Public Health Laboratory Services.

Most of my comments have intentionally been concerned with pointing out the limitations of public health laboratory tests. There seemed little purpose in cataloguing

the numerous public health laboratory facilities at present available; for practitioners are in some respects only too familiar with most of these already. Moreover, it would be folly for a laboratory to advertise its readiness to undertake new tests, however competent to perform them, so long as it lacks those amenities for handling the present turnover which the nature of the work, and the qualifications of the workers, should command. But our circumstances will undoubtedly improve, for our foothold is secure. Perhaps I may be permitted, before concluding, to comment briefly upon some of the near-term trends and functions, as I see them, of public health laboratory work.

i. *The trend towards routine testing.*

The sporadic case, or the carrier, of a communicable infection, acquires increasing significance as the general incidence of the infection declines. Routine laboratory testing, for the detection of unsuspected cases or carriers, has thus (somewhat paradoxically) led to increasing numbers of certain laboratory tests, although the morbidity rates of the diseases to which such tests relate may have steadily diminished. There are no signs of abatement of this trend towards routine testing, which, while readily understandable, is only partially defensible; for it is tantamount, in the ultimate analysis, to placing an unfair degree of responsibility for the control of communicable disease upon the laboratory technician's shoulders.

One often wonders whether the time spent by the public health laboratory in the routine cultural examination of throat swabs for the diphtheria bacillus might not have been put to more profitable uses. Periods of many months may elapse without virulent diphtheria bacilli being isolated from a single swab. In Vancouver, in 1938, nearly 8000 throat swabs were cultured at a cost of about $3000.00. Only a few of these swabs proved positive, and these were sent in from cases having definite clinical signs of diphtheria. For roughly the same expendtiure of public funds, this group of nearly 8000 could have been actively immunized against the disease by means of toxoid.

Again, to requisition routine Widal agglutination tests on persons exhibiting no signs or symptoms of enteric infection, and who have given no evidence of being possible carriers, is absolutely unfair to a laboratory staff which is trained to regard every specimen as important; and the practice is, incidentally, unscientific. In Vancouver, we have not felt that circumstances warranted our doing such routine tests even on restaurant employees, in the absence of suggestive clinical or epidemiological evidence. The cost of detecting a typhoid carrier by routine laboratory testing of food handlers has been computed in the United States at over $500. (The same sum might far better be spent by health officials upon enlightening hotel and restaurant managements as to how, for instance, staphylococcal food poisoning may be avoided.)

I view the routine Kahn blood test in a different light, particularly when this is applied to such groups as pregnant women, and prospective marital partners. Indeed, the obscurity and latency of the symptomatology of syphilis, its epidemiology and comparatively high incidence, and the notable specificity of the sero-diagnostic tests available, would, I feel, warrant an annual routine Kahn test on every adult and adolescent in the Province. Obviously, in the present state of North American civilization, there are insuperable difficulties in the way of any such scheme, while in a better state of civilization syphilis would be abolished; so we need not elaborate the idea. But it is amusing to reflect upon the numbers and types of persons whom we might dismiss, with absolute confidence, from the blood-sample queue. I doubt whether the local incidence of syphilis greatly exceeds 1 per cent (*not* 10 per cent!) of the general population. However, in order to ensure detecting the one, it would be well worth while testing the ninety and nine. For assuming that 1 per cent of all tests would be found positive, the cost of detecting each case of probable syphilis by routine Kahn testing would not greatly exceed $30.00. Routine Kahn testing is, on the whole, an incomparably better investment for the State than is routine Widal testing for typhoid carriers, or routine throat swabbing for diphtheria carriers.

ii. *Reduction in the costs of public health services to the community.*

The average, all-inclusive cost per test performed at the Vancouver laboratories is roughly 30 cents. The cost per test performed in the branch laboratories is twice this

amount. Naturally, some of the more intricate procedures may involve several dollars' worth of time and supplies. Certain comments on the costs of routine, or (more properly designated) *random* requisitioning of public health laboratory tests, have been made in the foregoing section. As physicians and health officials become more discriminating in their selection of persons from whom to take specimens for laboratory examination, the dramatic savings accruing to the public and private purse from proper use of public health laboratory facilities will become more generally recognized.

III. *Fostering the spirit of research.*

No public health laboratory can be really up-to-date unless it is animated by the spirit of research. The sensitivity and specificity of existing methods must be constantly verified, and, if possible, improved. There will always be new methods to devise, and new light to throw on old problems. And the public health laboratory must always be on guard against the contingency that the known pathogens, or their sisters, cousins and aunts, may be in process of developing new habits of parasitism towards mankind.

In the Vancouver laboratories, despite appalling handicaps, we have pioneered in many fields. Our close working association with Connaught Laboratories, through its Western Division, and with the Department of Bacteriology and Preventive Medicine at the University of British Columbia, has permitted us to employ such new procedures as the complement-fixation test for smallpox; the kitten test for staphylococcus enterotoxin, or food poisoning substance; and the identification of *B. typhosus* by Craigie's bacteriophage-typing methods. Then, too, our work on *Br. abortus* and the local milk situation, and on gonococcus culturing, has been of conspicuous interest. Many of these, and other, procedures and investigations have been, or will be, published. Countless other problems, of lesser general interest, but of high individual import, are regularly being solved in the laboratories. Such accomplishments, under our present working conditions, are perhaps creditable: under what we hope may be future working conditions they would be inevitable. For a public health laboratory staff, imbued with the proper attitude towards its daily assignments, has almost unlimited material for research.

iv. *Collection of epidemiological and statistical data.*

The materials for research, to which I have just referred, include, of course, not only the specimens sent in, but also the reports sent out. Large numbers of reports on tests of a given kind accumulate annually, and provide valuable data for statistical analysis. The Vancouver Laboratories, for instance, went to considerable pains recently to furnish the most authoritative figures at present available on the current local incidence, and the trends of incidence, of syphilis and gonorrhœa. If only more physicians would spend half a minute in proper completion of requisition forms which may entail the laboratories doing at least half an hour's work *on behalf of their patient*—for, after all, the laboratories are not operated by public funds primarily for the physician's benefit—much more explicit statistical data of this kind could be compiled.

Again, we often bewail our inability to pursue the many promising clues for epidemiological investigation presented, for example, by almost every outbreak of typhoid fever, or of bacillary dysentery, whose diagnosis is established in the laboratories. Appointment of an epidemiologist, trained also in medical statistics, to the staff of the Division of Laboratories, would be a logical and most advantageous development.

v. *Broadening of scope of public health laboratory functions.*

As we broaden our conception of what is meant by public health services, so may the public health laboratory anticipate being called upon to broaden the scope of its activities. May I first emphasize that, for the proper conduct of such work, no matter how narrow its compass be kept, the spirit of research is an inherent necessity, and this fact should be accorded official recognition. Clandestine research is a distasteful anachronism.

Some of the larger public health laboratories in the United States prepare biological products for both active and passive immunization. Such a development is not warranted in Canada, for small laboratories could not economically manufacture biological products of such high quality as are available at low cost from Connaught Laboratories.

Certain public health laboratories perform blood counts, urinalyses, and tests of the category usually designated blood chemistry. My own view is that work of this sort should continue to be done in hospital laboratories. Experience has shown that inclusion of clinical pathological work in the repertory of a public health laboratory is apt to introduce a foreign atmosphere. Incompatibilities of attitudes develop, and minor differences in objectives soon become magnified.

In many countries the State is showing a practical interest in cancer control. I feel very strongly that the soundest and most economical contribution the State can make to cancer control, apart from public health educational activities, is the provision of facilities for microscopic examination of biopsy specimens from suspected lesions. Through such a service, operated as a separate unit of the Division of Laboratories of the Provincial Board of Health, a report by a competent pathologist might be made on all tumour specimens sent in, for some such nominal fee as one dollar. It is hoped that provision may be made for establishment of a tumour diagnostic laboratory in British Columbia in the not distant future.

vi. *Diminution of the lag between pioneer and practitioner.*

This last point is the nearest to one's heart. The laboratory is the ultimate source and referee of most medical science. It was profound realization of this which led Pasteur to cry: "Take interest, I implore you, in those sacred dwellings which one designates by the expressive term: Laboratories. Demand that they be multiplied, that they be adorned. These are the temples of the future, temples of well-being and happiness. Thence it is that mankind grows greater, stronger, and better. . . ." In British Columbia we have hitherto been very disobedient to Pasteur's behest.

The pioneer has always been many years, sometimes even centuries, ahead of the practitioner, and this holds for almost any field of human activity. Fracastoro published his monumental work *De Contagione* in 1546, or 132 years before Samuel Bennett (a Somersetshire physician, whose recipe book is in my possession) advocated an infusion compounded of vinegar, treacle, an assortment of spices and herbs, the whole to be washed down with wormwood ale, as a sure specific against the plague, and other "epidemicall disseases." William Harvey had written his classic on the circulation of the blood nearly fifty years before Samuel Bennett's time; while Anthony van Leeuwenhoek (whose "little creatures—one thousand times smaller than the eye of a big louse," seen through his home-made microscopes, we now know to have been related to the causal agents of the plague and other "epidemicall disseases") was Samuel's contemporary.

Again, in the very year 1767 that Seth Alden (a direct descendant of the John Alden who came over on the Mayflower, and apprenticed to a physician and surgeon of Norwich, Connecticut) recommended in his notebook for a man "sick of a pulmonary consumption . . . Hold a cat to his mouth so that he may breathe into the cat's mouth when he is asleep for the space of half an hour at a time. . . ." in that same year it was that John Hunter, founder of the experimental method and inductive logic as applied to medicine, inoculated himself with gonococcal pus in an attempt to prove whether syphilis and gonorrhœa were one and the same disease: and thus gave himself not only gonorrhœa, from which he soon recovered, but also a "Hunterian chancre," the precursor of the aortic aneurysm which caused his premature death. Although one is tempted to elaborate the theme, it must suffice to add that Edward Jenner, John Hunter's pupil, whose great contribution to human welfare, vaccination against smallpox, is of almost unique significance, died nine years before Seth Alden.

Today there is less excuse for the lag between pioneer and practitioner. I am convinced that the surest way of reducing this lag to a minimum is to endow the laboratory worker with those perquisites of emolument, equipment and opportunity, which preoccupation with his work, and abhorrence of exaggeration and self-advertisement, preclude the true medical scientist from obtaining in full measure on his own account; and further, to encourage him to teach as well as to investigate. Such recognition and encouragement comes best to the laboratory worker from his colleagues in practice, whose interest it is, as well as that of the public at large, that he strives to serve.

RADIATION TREATMENT OF CARCINOMA OF THE SKIN

An analysis of 114 cases of Carcinoma of Skin which have come under the care of the X-Ray Department during the past three years.

DR. C. A. FRASER.

The large majority of these cases have been confirmed by biopsy. They have been classified under the following headings: Distribution of lesion, duration prior to treatment, age of patient, time since treatment, and pathological classification.

I. *Location*:

Cheek	27	Ears	13	these one had numerous lesions throughout body)	4
Forehead	21	Neck	8		
Eyelid	18	Hands	6		
Nose	16	Miscellaneous (of			
					114

It will be noted that the areas affected are the exposed portions of the body.

II. *Age*:

2 patients under 30;
7 patients 30–40;
14 patients 40–50;
25 patients 50–60;
29 patients 60–70;
19 patients 70–80;
4 patients 80–90;
14 patients no record of age.

III. *Duration of lesion prior to treatment*:

Duration	No. of Patients	Recurrence	
Under 1 month	4		
Under 3 months	15		
Under 6 months	9	3	
Under 1 year	14		
Under 2 years	20	5	
Under 3 years	9		
Under 5 years	6		
Under 15 years	15	3	
Under 16 years	1	Recurrence at edge of old lesion after eighteen months which cleared up under further treatment.	
Under 20 years	1	Recurrence after one year. Now O.K. for two years. (Patient had hyperkeratotic skin and has had numerous lesions.)	
Under 25 years	1	Recurrence two years after treatment.	
Scar 50 years	1	(Squamous cell.) Amputation of patient's arm four months after treatment.	
Years (no definite time)	8	3	

IV. *Time since treatment.*

Healed for over 3 years	4	All of them "Alive and well."
Healed for 3 years	9	7 remained healed; 2 have had recent recurrences.
Healed for 2 years	25	18 remained healed; 7 had recurrence after 2-year period. (There was one death in this group—patient aged 88.)

Healed for 1 year	18	15 remained healed; 3 recurrences after 1 year.
Healed for 6 months	34	28 of these remained healed for 6 months or over. About 20 of them, however, may rightly belong in the 1, 2, or even 3-year cure grounps but unfortunately they have been lost sight of after the 6-month period and we have been unable to trace them. It is interesting to note that a patient having reported regularly for a year or more usually continues to keep in touch.
		6 recurrences (including one death). This was a squamous cell carcinoma of the skin of 18 months' duration in a young woman who was pregnant. The lesion cleared up under treatment but broke down again after confinement. The lesion had invaded the bone. Death intervened 2½ years after onset.

V. *Pathological classification*:

Squamous cell, 34; basal sell, 48; baso-squamous cell, 8; miscellaneous, 8; no biopsy, 16.

In addition to the two deaths already tabulated there were five others, four of them over 75 years of age, of which were due to carcinoma elsewhere, namely, prostate and rectum.

There were nineteen cases which were lost sight of entirely.

In conclusion, there are one or two things to which I should like to draw your attention. First, the pliability of the scar, or rather the skin, because there is comparatively little true scarring; the skin is smooth and mobile. If, of course, there has been deep ulceration and extensive tissue damage priorf to therapy there will naturally be scar from the usual healing processes. Also there is very little deep tissue damage, so that if the patient has a recurrence and has to receive further radiation he may do so without fear of permanent damage to the underlying structure, as the radiation given is of a superficial nature.

From the patient's point of view this method of therapy has several definite advantages: (1) The small number of treatments usually required; (2) the short duration of each treatment, and (3) the economic factor, in that he is not required to take an enforced holiday while undergoing treatment. In the vast majority of cases there is no necessity whatsoever of staying away from business.

The average number of treatments in this group is three and the usual time per treatment is fifteen to twenty-five minutes, certainly under one hour. There are some who hav had a smaller daily dose spread over a fortnight, in which case each treatment required but a few seconds. This time factor has been still further diminished during the past two months with the use of the new Choul apparatus.

STRABISMUS

Dr. C. E. Davies

The purpose of this paper on Strabismus is to set forth in not too technical a way the problems which confront an oculist in handling a case of squint, and to give those who have not made a study of this branch of medicine an appreciation of why these cases are best treated early, and a proper follow-up maintained.

Strabismus consists in the deviation of the visual axis of one of the eyes from that required by normal physiological conditions.

For simplicity's sake, Strabismus may be divide dinto two main groups:

1. *Known causes*:
   (a) Paralytic Strabismus—which may be congenital; the result of birth injuries or other external trauma; an injury to the sixth nerve; or specific infections, as lues.

(b) Secondary contractures of a vertical muscle following a paresis of an opposing or yoke muscle.

2. *Concomitant Strabismus*:

In this the visual axes, although abnormally directed, retain their relationship to each other no matter in what direction the eyes move.

It differs, therefore, in this respect from paralytic strabismus, in which the relationship of the visual axes to each other changes with every movement of the eyes.

Thus if one would have the child look in various directions, and note the change in the angle of the squint, one can readily make a diagnosis as to whether the condition is due to a paralysis of the muscle or to a concomitant strabismus.

The terms used in the classification of muscular imbalance are often confusing:

Orthophoria—when the eyes are in their normal alignment.
Esophoria—when the eyes converge.
Exophoria—when the eyes diverge.
Hyperphoria—when the muscular imbalance is vertical.

The Anatomy of the Orbit and the Relation of the Ocular Muscles:

We come now to a problem, the proper understanding of which simplifies to some extent the interpretation of muscular imbalances.

In considering the orbit, the medial wall forms with the lateral wall an angle of approximately 45 degrees; and the eye is slung by ligamentous attachments at the base of this pyramid.

The four straight muscles arise from the apex of the orbit, and pass directly forward to become attached to the globe anterior to the equator. The two oblique muscles have a more complicated course. The superior rectus arises from the margin of the optic foramen to pass to the trochlea or pulley, and from there is attached to the posterior superior surface of the globe; while the inferior rectus arises from the inner third of the inferior orbital ridge, and passes in and up to be attached to the posterior surface of the globe. Thus it can be seen that the internal rectus is the only muscle which can exert a pull on the eye when the eye is in its central position, and that various positions of the eye detract from, and add to, the leverage of the individual muscles.

For example—with the eye abducted, the superior rectus, which previously exerted a pull at an angle, now directs its energy in a straight line, causing an elevation of the eye.

Similar examples could be shown of the other five muscles, however, when, out of their own particular field of action, they have superimposed a rotator and a ductor action due to the indirectness of the pull.

Any attempt at analyzing the action of each of the individual muscles becomes complex and confusing, and of necessity detracts from the purpose of this paper. However, it is of importance to know that each muscle, with the exception of the internal and external rectus, has more than one action, which is dependent upon the position or field in which that eye is placed.

Having the action of the muscles as a background, let us consider the innervation of these muscles.

The third, fourth and sixth nerves supply the motor nerve energy. There is also a co-ordinating centre or "yoke" mechanism by which the same strength of impulse is sent to similar yoke muscles so that the eyes retain their identical alignment in all positions. There are also centres for convergence and accommodation which are so closely allied that the stimulation of one automatically stimulates the other.

The development of binocular or single vision is dependent upon these association or co-ordinating centres. First, to keep the eyes properly aligned; and secondly, to make the necessary changes, as objects are seen closer or farther away.

It has been definitely established that there is a "fusion centre" in the brain which is responsible for binocular vision. This centre develops fairly early in infancy, from about the sixth to the ninth month, and should be fairly well fixed, a fact which can be readily demonstrated by watching a child play with a toy.

There are some, however, in which the "fusion-centre" is not well established; and it has been found in these children, especially those who are far-sighted, that one of the eyes

has a tendency to turn in. (Time does not permit of a discussion of divergent squint, or exophoria, which are less common.

Consequently, there are found two factors at work: First, weak or under-developed fusion; and second, far-sightedness, which means excessive accommodation in order to see objects close at hand.

This overstimulation of accommodation causes an overaction of convergence, and with a weak fusion centre, the eyes have a tendency to "squint" ; possibly only a little at first, when tired, over-excited, or following an illness; but gradually becoming more pronounced until the condition is permanent.

Of the two, the monocular is the easier to correct, and as a rule responds well on wearing glasses. The alternating strabismus, on the other hand, is found to have an absence of the fusion centre; glasses are of no avail; and surgery gives only a good cosmetic result.

The danger of the monocular strabismus is the development of amblyopia, or lowered vision in the squinting eye. This may develop rather rapidly, and once established, requires endless patience and perseverance on the part of the parents and the oculist to correct.

The question arises as to when strabismus should be treated. The paralytic type depends upon the cause, and is definitely a muscular or nerve deficiency. Concomitant strabismus, on the other hand, is an imbalance of an extremely complex mechanism, and the longer it is left the more difficult the problem becomes, and the poorer the results.

Retinoscopy under complete cycloplegia gives an accurate estimate of the refractive error. Children of eighteen months or under can be tested by this method, and glasses prescribed to relieve the accommodation spasm. This is often all that is required, especially in children with under 20 degrees of squint.

The question arises also as to the value of eye training, or orthoptics. This is a relatively new branch in the field of ophthalmology, and is now accepted as a very essential part of our armamentarium.

It has been discovered that the same results, and in many cases better results, can be obtained as in wearing glasses, by breaking down convergent spasm with orthoptic training. Here, also, the fusion centre is strengthened so that the eyes have a greater tendency to stay straight, owing to fusion control. Again, in the child who has an amblyopic eye, orthoptic training is often the only way in which it can be stimulated.

In cases where surgery has had to be resorted to, post-operative therapy with orthoptics will often improve the sight, and develop binocular vision.

THE OPERATIVE TREATMENT OF OCULAR DEVIATIONS

DR. J. A. SMITH.

Before going on to the consideration of the different operations employed today for the correction of ocular deviations, I would like to compliment Dr. Davies on his very excellent and interesting paper. The problem of muscular imbalance, along with the more apparent deviation and squints, is attracting the attention of ophthalmologists more and more the world over as the years pass by. It is not only a very interesting department of ophthalmology, but a very gratifying one to the ophthalmologist, when satisfactory results are obtained by either orthoptic training or by means of an operation. In deciding on an operation, the broad general principle is adopted of advancing or shortening a weak or underacting muscle and lengthening a strong or overacting one. It will therefore be most necessary for the operator to diagnose the existing condition and to employ the operation which is suitable for the case.

A great number of the older practitioners will remember quite well that up to twenty-five or thirty years ago the only operation used was a tenotomy. Only the apparent deviations, such as divergent and convergent squint, were operated upon, and the overacting muscle was completely severed and allowed to reattach itself where it might. This operation was looked upon as a very minor one, and was carried out in homes and hotel rooms under a light anæsthetic. In the case of a convergent squint, many were overcorrected and were transformed into cases of marked divergence. At the present time we occasionally pick up one of these cases, and it is necessary to identify the severed tendon and reattach it, at the same time shortening the opposing muscle.

A great improvement in muscle surgery came with the advancement operation of Dr. Worth of London. This operation is employed extensively at the present time for shortening muscles, specially in the more apparent deviations. It consists of shortening the muscle by carrying forward its insertion a definite number of degrees.

Dr. Reese of New York devised a shortening operation which was accomplished by a resection of a portion of the belly of the muscle. This is still carried out at the present time by a large number of operators.

It is thought by some that one of the causes of squint is a faulty insertion of the tendon; that is to say, in the case of a divergent squint the insertion is placed too far back on the globe. If this is the case, then the advancement operation of Worth would be the preferable operation.

Within the past fifteen years, Dr. Roderick O'Connor of San Francisco has devised a cinch operation which is very ingenious and very useful, especially in cases of the latent deviations spoken of as phorias. The use of this operation allows of a definite shortening depending on the number of strands of Dermol suture used. One strand of Dermol interwoven between the fibres of muscle will give a shortening of 2.5 degrees. This operation is employed by several of the best-known ophthalmologists on the Pacific Coast with very satisfactory results.

The Green Brothers of San Francisco still do "a tucking operation," but this form of shortening has been abandoned in most of the principal centres of ophthalmology today.

Of the lengthening operations in vogue today, the most popular seems to be the recession operation originated by Dr. Jamieson of Brooklyn, N.Y., about 1921. Following this procedure, the muscle is severed at its attachment and set back a measured distance on the glove. This operation is much safer and more accurate than the aforementioned complete tenotomy. Other operations of tendon lengthening were devised by Bishop Harmon of London, by the Greenes and Roderick O'Connor of San Francisco. These all consist in partial section of the tendon, and repeated if necessary.

Special Considerations in the Operative Treatment of Ocular Deviations

In treatment of convergent squint of the alternating type, and in cases where vision is fairly good in each eye, the operation of choice in the writer's opinion is a double advancement of the external recti, the correction being divided between the two eyes. Later, if necessary, a recession can be done on the internus of the commonly deviating eye. Following Jamieson's teaching, many ophthalmologists are receding both interni without advancing the externi. In my opinion this is a wrong procedure in the majority of cases, as it weakens convergence and does not strengthen the weakened externi.

In cases of divergent excess where convergence is good, complete tenotomy of one or both externi gives perfect results. Cases of divergence excess with convergence insufficiency will require an additional advancement of at least one internal rectus. Complete tenotomy of both external recti can be performed in cases of divergent squint of 30 degrees or over when convergence is good without danger of causing diplopia. The amount of correction obtained from any muscle operation depends upon the muscle operated upon and also on the priority of another operation on the same or opposing muscle. Slight overcorrection is to be desired in advancement operations. This is also true of recessions done on the internal recti for convergent squint when no previous advancement operation has been performed on the externi. No improvement can be obtained by advancing a completely paralyzed muscle.

In conclusion, I would like to take up one more condition of which Dr. Davies has spoken, namely, paresis of a superior rectus with secondary deviation of the inferior oblique of the opposite eye. Two different schools—one headed by Dr. Roderick O'Connor and the other by Dr. White of New York—have each their own ideas as to the treatment of this condition. Dr. O'Connor suggests shortening the paretic muscle, while Dr. White of New York completely tenotomizes the secondarily deviating inferior oblique. Good results are obtained in both instances, but the tenotomy operation tends to bring both eyes to the lower level, which is the desired position for everyday work.

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THE ROYAL JUBILEE HOSPITAL

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THE PSYCHIATRIC ASPECTS OF ENURESIS

DR. D. E. ALCORN.

A clinical conference was held at the Royal Jubilee Hospital on Friday, February 24th, 1939, at 12 noon, under the chairmanship of Dr. H. H. Murphy. The speaker was Dr. D. E. Alcorn; his subject: "The Psychiatric Aspects of Enuresis."

It is with some hesitation that I address this meeting on the subject of enuresis, since it is one which is rarely regarded as serious. However, I feel that it is a condition of some importance, even part from the possibility of the presence of a serious organic condition, which may manifest itself in this form, in so far as it is often a difficult problem for the general practitioner, and on the psychiatric side is evidence of gross personality maladjustment, which may lead the patient into further difficulties.

The word "enuresis" is derived from the Greek "Enourein," meaning to void urine, and is defined as an involuntary discharge of urine, either diurnal or nocturnal, though usually the latter. It usually occurs in children up to the age of 10 or 12 years, when it usually ceases, although it may persist into adult life.

As in all psychiatric conditions, even relatively simple situations, the symptom is the result of the totality, and combination, of etiological factors, not one of which may in itself be sufficient to produce enuresis, but, as one after another is added, a point is reached where the individual cannot compensate, and enuresis results. This explains, I think, the success of the most varied forms of psychiatric and physical treatment.

Among the etiological factors not definitely psychiatric in character may be listed the following:

(1) Congenital: Both locally in the form of an abnormal communication between the bladder and the surface of the body through a communication with the vagina, epispadias, extroverted bladder, patent urachus, etc., or through the absence of the sphincter, or more distally through defective innervation because of spina bifida, or other anomaly of the cord. To this group would also belong those conditions in which there is interference with intelligence, because of microcephalus, hydrocephalus, porencephaly, Mongolian idiocy, etc.

(2): Pathological conditions in: (a) The bladder, such as irritative processes (cystitis, calculus), diminution in size and changes in tone (both hypertonicity and atonicity); (b) the urethra, in urethritis, balanitis, adherent prepuce, foreign body, and other irritative conditions, also phimosis, narrowing of the meatus, enlarged prostrate, and other conditions which interfere with urinary discharge; (c) the central nervous system: in injury to the cord centres as in myelitis, cord tumors, tabes, cord injuries, injury to the higher centres as in cerebral palsy, acute meningitis, cerebral neoplasm, encephalitis, cerebral concussion, subdural hæmatoma, epilepsy (during a seizure), chorea, etc., and in severe headaches, neuralgia, etc.; (d) in renal conditions where there is a high acid content, or large

quantities of urine as in chronic nephritis, or where large quantities of fluids are taken in; (e) in irritative conditions of the genitalia, such as vulvovaginitis, or an adherent clitoris; (f) in irritative conditions of the rectum such as anal fissures, anal polypi, intestinal parasites, especially pinworms, etc.; (g) in endocrine conditions such as diabetes mellitus, or diabetes insipidus; (i) it may also occur in certain types of anæmia.

In most of these conditions, however, the enuresis is not the presenting symptom, and occurs only incidentally during the course of the disease. The treatment is obviously that of the underlying organic condition. At the same time, even when physical factors are present they may not be the sole cause of the condition I have seen a case of enuresis in a spina bifida cleared up with psychotherapy.

In addition to the above, there are other physical factors which, though not definitely pathological, seem to be predisposing. Thus children suffering from enuresis are not infrequently underweight, hyperactive, nervous, asthenic, and have a curious transparent color. Many show excessive sweating, mottling of the skin, flush or pale easily, and give other evidence of vasomotor instability.

In addition to the above there are a number of physiological factors which may precipitate enuresis.

Thus there are thise which cause an increase in renal function, such as the taking of large quantities of fluid, as in soups, and it is for this reason that it is good policy to limit, and if possible forbid, the taking of fluids after 4 p.m. in the form of either water, milk or soup. Foods which are likely to cause thirst, such as salty, highly-seasoned foods, sweets, ice cream, soda, pickles, mustard, frankfurters, etc., should also be eliminated from the diet. Diuretic substances such as tea and coffee should also be forbidden.

Dampness on the surface of the body, either in the form of damp cold clothing, damp rooms, dirty day clothing, or even the presence of another enuretic person in the same room, may cause micturition. To prevent this, the clothing both day and night should be dry and clean, the child should have a room to itself, which should be heated, and the windows should be open at night.

Emotional upset may cause involuntary micturition. This may be either pleasurable (enuresis, even diurnal in character, may occur after prolonged laughter in a theatre) or unpleasant. This especially is the case when the upset occurs before going to bed.

It is for this reason that the child's activity should be diminished as much as possible during the evening, and temper tantrums, teasing, threats of punishment, especially with reference to enuresis, sending the child to bed without supper, and even quarrelling between other persons in the home, should be avoided as much as possible.

While the elimination of these factors rarely deals with the cause of the condition, yet they aid in dealing with the situation and in giving some measure of confidence to the child, and to the parents, that the problem may still be overcome. In addition to the above, the child's bladder should be emptied on going to bed, and at least once, perhaps twice, during the night, at fixed times. The hour at which enuresis occurs varies considerably. An hour and a half after going to sleep is the most frequent, although it is often as late as four hours after going to sleep. Regularity is extremely important; the child should go to bed at a fixed hour, and be awakened at a fixed hour, preferably by an alarm clock.

As the enuresis is controlled, by these and other methods, the strictness of the regime may be gradually relaxed, and the child allowed to resume a normal existence.

Improper training is an important cause of enuresis. This may arise from inadequate care and supervision, or from too much. Examples of the former are to be found in institutions, boarding schools, large families; and of the latter in only children, with neurotic, overprotective mothers who not infrequently have an abnormal interest in the child's urogenital activities, and this may also occur where the child has been ill for long periods. Examples of both groups are frequently found in broken homes, *i.e.*, where the father is dead or has deserted, where the mother is absent or there is a step-parent, or the child is living with foster parents or grandparents. A more adequate, consistent form of training should be instituted, the child should be given a greater feeling of independence, and should

it be impossible to alter the mother attitude, the child should be removed from the home for a time, preferably to a hospital, as the best results seem to obtained there.

Not infrequently the enuresis is a sign of revolt on the part of the child against its surroundings, etiher against an overprotective and interfering parent, an affectionless home or institution, or even as a means of controlling the family and securing something on which the child has set his heart. As far as possible this situation should be diagnosed and remembered. If possible, the child should be given a greater sense of security and independence; in short, he should be allowed to do some things for himself, make some of his own decisions and take responsibility for some of his acts. This can not infrequently in part be accomplished by handing over to the child the entire management of the routine of his treatment, the furnishing an alarm clock, and nothing more. Under these circumstances, children who had previously been in revolt against parental authority will observe conscientiously the dietary restrictions and other limitations imposed on them. This method may also relieve the careless, perhaps overburdened, parent of the necessity of supervising a complicated regime. Of course, such a method is of little use in younger children.

It is perhaps too simple to describe many of the types of behaviour which might fall into this group as forms of revolt. Often enough the child is totally or partially unconscious of the situation and unaware of the connection between it and the eneuresis. The attempt of a feeble-minded child to keep up with its school work, of an asthenic, poorly-nourished boy to hold his own on the playground, or of a shy,introverted girl to make friends, may present an almost intolerable problem to the child, against which it revolts. Each one of these situations must be dealt with.

As regards the deep, unconscious mechanisms involved, our information is still very fragmentary and theoretical. Nevertheless, a fixation of interest on genital functions, and a prolonging of this interest past the normal period, is of some importance. Sexual fantasies, in which enuresis has replaced orgasm, have also been known to play a role.

It is for this reason that in cases of enuresis a thorough study of the child's personality and adaptation should be made, and abnormalities dealt with.

Drugs are of little use in the treatment of this condition, and their effect may be harmful, even leaving out of consideration the acute confusion which sometimes occurs with hyoscine, in so far as the family, and patient, may rely on the medicine to effect a cure, and be less careful of the regime and the psychological factors.

I do not believe that masturbation is an important factor in causing enuresis, and certainly the use of mechanical appliances to prevent masturbation is contraindicated.

In conclusion, I would like to point out that enuresis is of greater importance than mere persistent wetting of the bed would give to it.

* * * *

Dr. Alcorn described a few cases illustrative of the complex etiological factors which may be present in this condition.

The meeting was then thrown open for discussion.

THE MALARIAL TREATMENT OF NEUROSYPHILIS

S. E. C. Turvey, M.D.

I. *Indications*:

1. Early paresis and preparesis in young robust persons.
2. The same conditions in older patients without contraindications.
3. Presence of neurosyphilitic or other optic nerve disease contraindicating tryparsamide.
4. Resistant nonparetic asymptomatic neurosyphilis (in late latency, not early syphilis).
5. Where a reasonable trial of tryparsamide has failed (one year) and no contraindications to malaria appear.
6. Optic atrophy (probably inferior to intraspinal therapy) and gastric crises, persistent lightning pains when not otherwise contraindicated.

II. *Contraindications*:

1. Unsatisfactory strain of malarial organism.
2. Old age. The age limit should be based on physical status rather than years.
3. Definite cardiovascular disease, especially coronary and myocardial, and including arteriosclerosis.
4. Pulmonary tuberculosis, latent or active.
5. Chronic alcoholism.
6. Marked diabetes (mild is not).
7. Severe anæmia.
8. Obesity.
9. Persistent thymus.
10. "Galloping" paresis.
11. Advanced tabes with severe ataxia, decubitus, pyelonephritis.
12. Pregnancy.
13. Kidney disease.
14. Marked hepatic disease or insufficiency, or splenic disease.
15. Severe debility.
16. "Last stages."

III. *Preparatory management*:

1. Hæmoglobin, red cell count, leucocyte count.
2. Non-protein nitrogen of blood.
3. Urinalysis.
4. Cardiac examination, including X-ray.
5. Give five grains of quinine by mouth to test for idiosyncrasy.

IV. *The Parasite*:

The organism to be injected is the "Plasmodium vivax," which produces tertian malarie. Intravenous inoculation usually causes daily chills (quotidian) and the patient must be healthy and robust to stand this. Intramuscular or subcutaneous inoculation is preferable, for, even though the incubation period is prolonged, the chills are more likely to occur every other day (tertian) and this is safer for the patient.

The incubation period for subcutaneous injection is 10-20 days. The first rise in temperature is not necessarily malarial. Inject 3–5 c.c. of the citrated blood subcutaneously in the interscapular or pectoral region. If the fever is delayed, inject 4–5 minims of adrenalin subcutaneously, or ½ c.c. typhoid vaccine, or 2–5 c.c. milk intramuscularly.

The doors and windows of the patient's room should be covered with mosquito-proof screens in summer.

V. *Period of fever*:

1. The patient must be kept in bed during the period of fever therapy. The blood pressure, pulse and temperature are charted every hour during the fever.
2. The patient should have each day: (a) 3500 c.c. of fluid at least. If he drinks less than this, it must be given intravenously; (b) at least two tablespoonfuls of table salt; this can be given in fruit juices or water.
3. Hæmoglobin and red cell count should be done every third day; urinalysis and non-protein nitrogen should be done every 5–6 days.

VI. *Complications*:

1. Neurological and psychic: Delirium, hallucinosis, excitement, exaggerated or appearing for the first time with onset of fever or during the period of incubation. Focal symptoms from nervous system, paralysis, convulsions, apoplectiform seizures, crises, lancinating pains.

2. Cardiovascular: Myocardial collapse. Falling blood pressure, below 75 mm. systolic the danger point.
   Daily observation.
   Transient benign œdema. Tachycardia, 160 upper limit of safety.
3. Pulmonary: Bronchitis, bronchopneumonia, lobar pneumonia. Lighting up of latent or active tuberculosis. Edema secondary to cardiac failure.
4. Nephritic: Rising non-protein nitrogen (50 mg. per cent upper limit of safety). Nephritis. Cystitis, ascending urinary tract infection.
5. Liver and spleen: Hepatic injury, enlargement, rising icterus index (take twice weekly if patient is jaundiced), jaundice. Splenic enlargement and (rarely) rupture.
6. Gastro-intestinal: Uncontrollable diarrhœa. Melæna.
7. Hæmatogenous: Progressive severe anæmia. Blood count three times weekly. Fall below 2,000,000 red blood cells dangerous.
8. Malaria *per se*: Inoculation with estivo-autumnal strain of Plasmodium. Daily chills instead of alternate days (tertian vs. quatidian type) unless the patient is young and robust. Hyperpyrexia. Quinine idiosyncrasy. Recurrence of malarial infection (usually in mosquito-infected patients). Prostration terminating in coma (loss of strength between paroxysms of fever first warning).
9. General: Lighting up of other infections, particularly focal.

These symptoms are treated symptomatically as when they occur otherwise in general medical practice. Thus, adrenalin is injected for dangerously low blood pressure or collapse, digitalis is given for a failing heart, and high blood urea is treated by intravenous fluids, vomiting is treated by alkalis by mouth, etc., etc. If any of the serious complications occur, administer quinine grains five intravenously immediately and repeat in two hours.

VII. *Stopping the fever*:

1. Routine: Allow the patient to have eight to ten chills. Just before the last chill commences, give quinine sulphate, grains ten, every six hours for six doses; then grains ten twice daily for two days, then grains ten once daily for six days. (Prescribe quinine in five-grain capsules.) In an emergency, the quinine can be given intravenously. If idiosyncrasy to quinine is present, use atebrine tablets (grains 1½) by mouth.
2. Emergency: Administer five grains of quinine in sterile solution intravenously and repeat every three hours for four doses.

VIII. *Post-febrile period*:

The patient may go home two to four days after the last chill but should be on rest regime for a month. A nourishing diet should be given and any anæmia treated with iron.

Further treatment should be outlined by consultation with the neurologist of the Division of Venereal Disease Control, as it varies in each case.

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Wintersteiner, Oskar, and Allen, W. M., J. Biol. Chem. ***107****:321 (Oct.) 1934.*

(2) The inhibition of uterine motility in vivo.

Allen, W. M., and Reynolds, S. R. M., Am. J. Obst. & Gynec. ***30****:309 (Sept.) 1935.*

(3) The suppression of menstruation.

Corner, G. W., Am. J. Physiol. ***113****: 238, 1935.*

(4) The inhibition of the action of the oxytocic principle of the posterior pituitary gland upon the myometrium.

Makepeace, A. W., Corner, G. W., and Allen, W. M., Am. J. Physiol. ***115****:376, 1936.*

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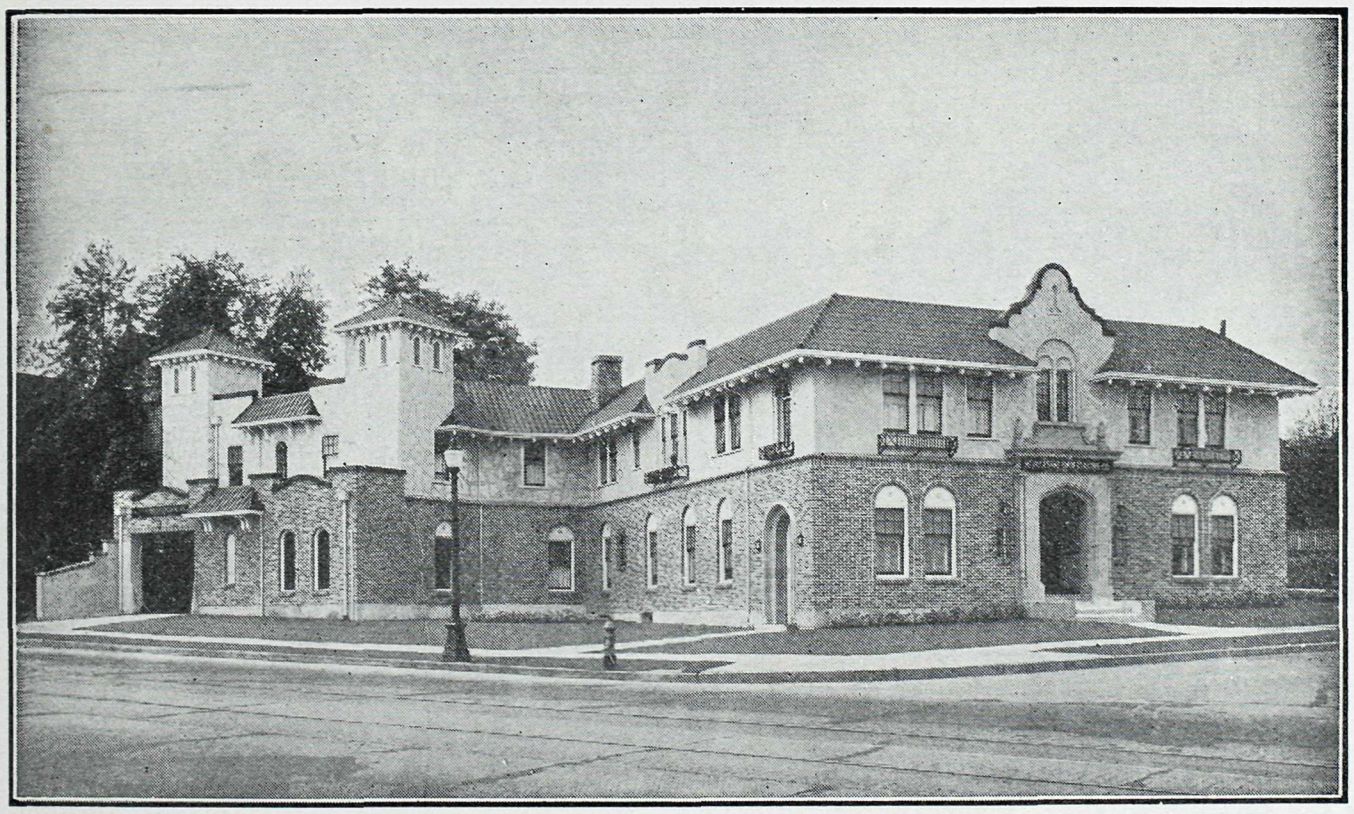

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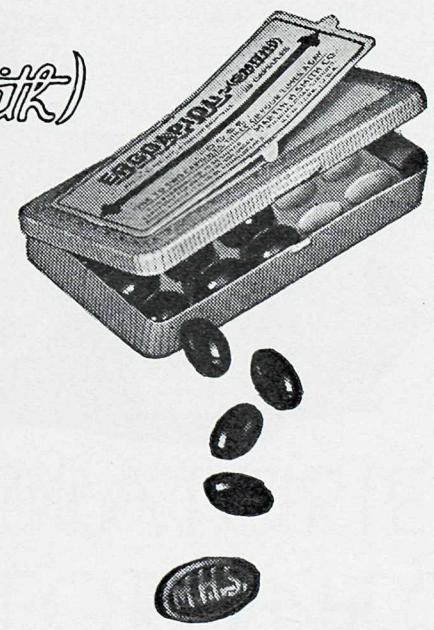

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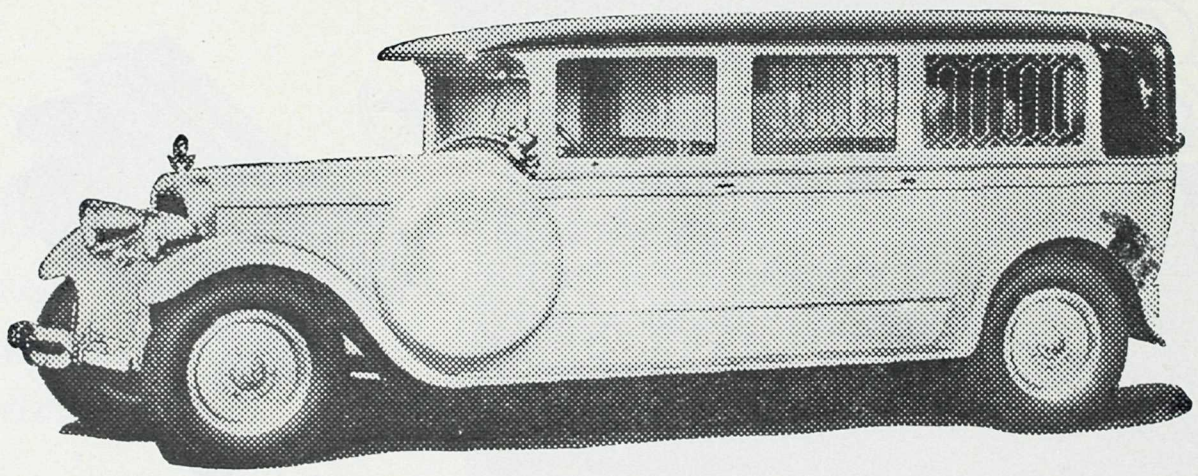

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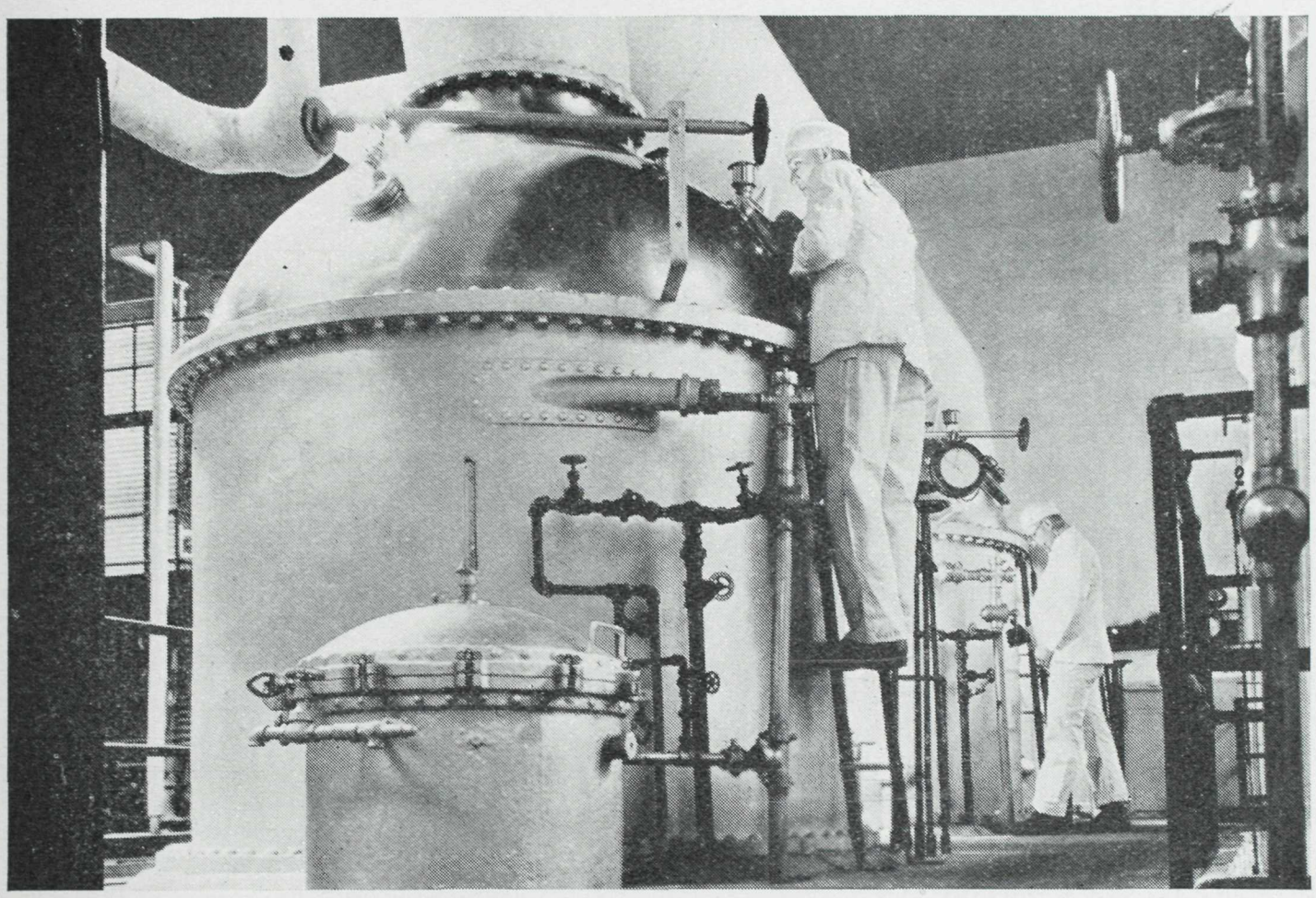

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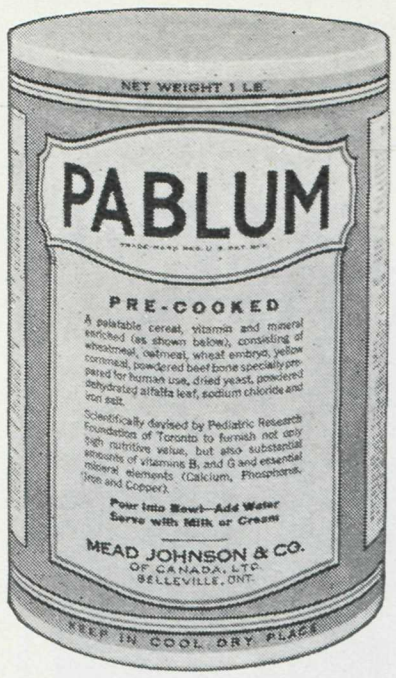

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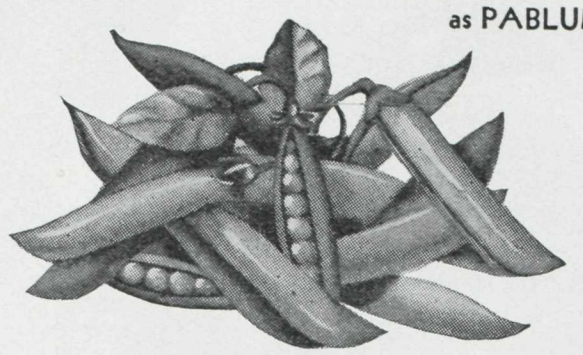

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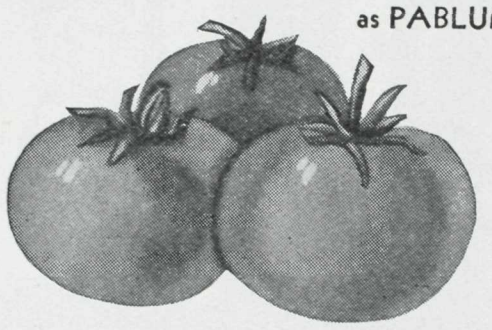

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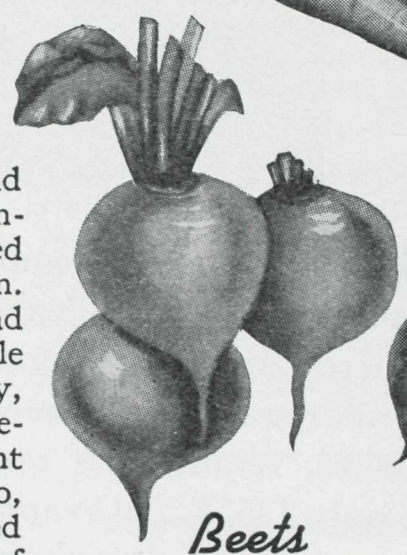

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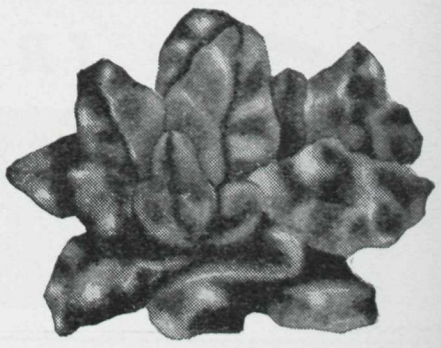

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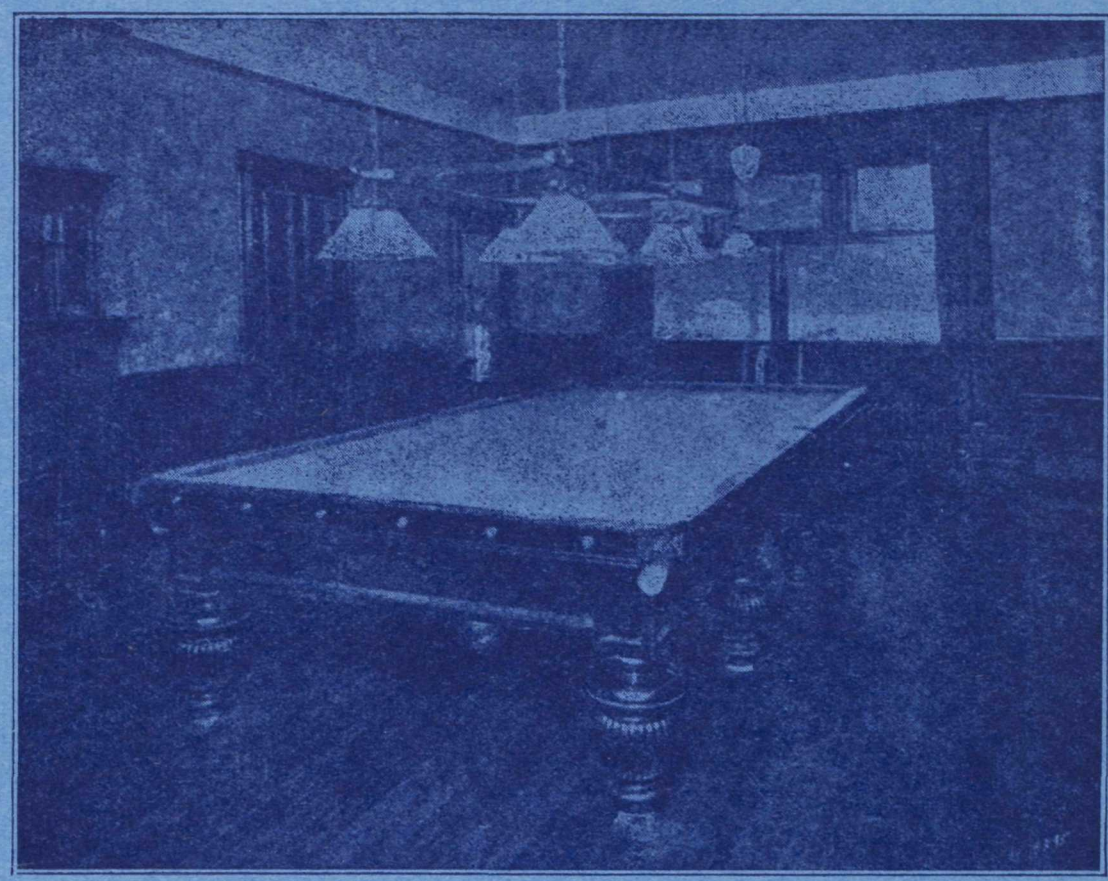

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