THE

BULLETIN

OF

The Vancouver Medical Association

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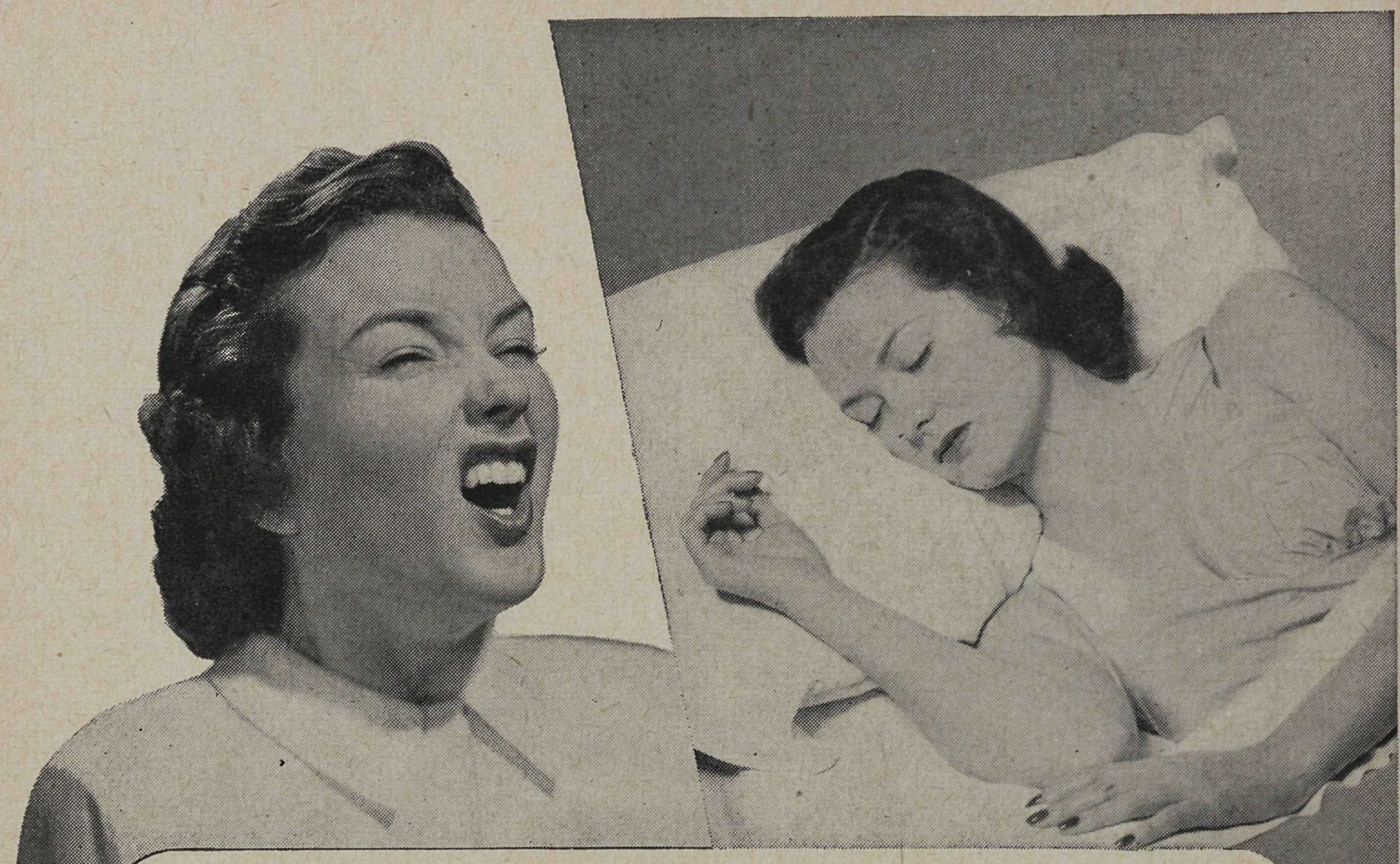

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203 Medical-Dental Building Vancouver, B. C.

THE BULLETIN

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

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

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

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

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

Advertisements

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☆*DOUGHTY, A. G.: Flaxedil in Laryngeal Intubation, The Lancet, May* 13, 1950, *p.*899.

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1 Perloff, W. H.: Am. J. Obst. & Gynec. **58**:684 (Oct.) 1949.
2 Fried, P.H. and Hair, Q.: J. Clin. Endocrinol. **3**:512 (Sept.) 1943.
3. Gray, L. A.: J. Clin. Endocrinol. **3**:92. (Feb.) 1943.
4. Harding, F. E.: West. J. Surg. Obst. & Gynec. **52**:31 (Jan.) 1944.
5. Sevringhaus, E. L. and St. John, R.: J. Clin. Endocrinol. **3**:98 (Feb.) 1943.
6. Glass, S. J. and Rosenblum, G.: J. Clin. Endocrinol. **3**:95 (Feb.) 1943.
7. Freed, S. C., Eisin, W. M. and Greenhill, J. P.: J. Clin. Endocrinol. **3**:89 (Feb.) 1943.

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VANCOUVER HEALTH DEPARTMENT

CASES OF COMMUNICABLE DISEASES REPORTED IN THE CITY

STATISTICS, MAY, 1950.

Total population—estimated	385,500
Chinese population—estimated	6,877
Hindu population—estimated	133

	April, 1950	
	Number	Rate per 1000 Pop.
Total deaths (by occurrence)	333	10.4
Chinese deaths	9	15.7
Deaths, residents only	319	9.9

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

	April, 1950
Male	407
Female	403

INFANT MORTALITY——RESIDENTS ONLY:

	April, 1950
Deaths under 1 year of age	18
Death rate per 1000 live births	30.4
Stillbirths (not included in above items)	7

CASES OF COMMUNICABLE DISEASES REPORTED IN THE CITY

	April, 1950		April, 1949	
	Cases	Deaths	Cases	Deaths
Scarlet Fever	10	—	2	—
Diphtheria	—	—	—	—
Diphtheria Carriers	—	—	—	—
Chicken Pox	157	—	319	—
Measles	312	1	245	—
Rubella	556	—	45	—
Mumps	616	—	58	—
Whooping Cough	16	—	—	—
Typhoid Fever	1	—	1	—
Typhoid Fever Carriers	—	—	—	—
Undulant Fever	—	—	—	—
Poliomyelitis	—	—	—	—
Tuberculosis	58	10	47	11
Erysipelas	—	—	—	—
Meningitis	1	—	1	—
Infectious Jaundice	—	—	—	—
Salmonellosis	4	—	2	—
Salmonellosis Carriers	—	—	—	—
Dysentery	1	—	—	—
Dysentery Carriers	—	—	—	—
Tetanus	—	—	—	—
Syphilis	17	4	29	1
Gonorrhoea	120	—	148	—
Cancer (Reportable)—Resident	103	59	96	44

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The Editor's Page

We had the pleasure, last night, of attending the meeting of the Vancouver Medical Association called by Dr. D. S. Munroe, Chairman of the group that is investigating ACTH and Cortisone in connection with the Committee of the Medical Staff of the Vancouver General Hospital, that is charged with the supervision and control of these drugs and their administration. The calling of this meeting was an excellent idea, and will do much good.

Dr. G. F. Strong, who presided in the absence of Dr. Munroe, paid a well-deserved tribute to the work of this Unit, which reported last night through some of its members. The details of the programme were not referred to here—it was of extreme interest, and the remarks of the speakers will prove of value to all of us—but as we listened, one or two ideas struck our mind, which we think might be worth exploring.

The first is a very obvious conclusion: that we must all agree whole-heartedly that the use of these mighty potencies for good (as we all hope they will prove to be) must still, and perhaps for a long time, be under rigid control. Apart from the fact that it takes much time and study to understand their use and properties, the danger of side effects, the urgent necessity for constant and controlled observation and checking, make it imperative that they should only be used under strictest hospital precautions, with daily reference to the laboratory, and under constant supervision. Any attempt to use them otherwise will have too evil effects. It will do away with much of their usefulness, and will inevitably lead to disaster in many cases. Listening to the various speakers, one wondered a bit how anyone would have the nerve to use them at all. But it would be so easy, at this experimental stage, to undo all the good that has been done by patient research and experiment, by throwing the use of these drugs open to everyone who wished to employ them; and it would discredit their use to a great degree: not to speak of the unnecessary harm that might be done to a good many innocent people.

Another idea came into our mind as we listened to the cautious, conservative conclusions reached by each speaker. How different from the first rosy pictures given us in the daily press and the magazines that go in for pseudo-medical effusions and give us so much trouble, when we have to explain that all these high-falutin statements just aren't so, and have to be taken with a large pinch of salt. We remember, all of us, how Cortisone was proclaimed to be the final answer for rheumatoid arthritis. The interviews with the twelve-year sufferer who danced down the corridor after one dose of cortisone, the pictures and so on—all of this was to be deplored. It was not documented—it raised false hopes, led to a good deal of unnecessary and futile expense on the part of those who went, like Naaman of old, to seek healing from the unfortunate and unwilling prophets, who had no desire to fill the position—and returned disillusioned, their leper's spots uncleansed.

It seems to us that there is here a plain duty facing us as a profession. We should do something about this scorehead publicity, this unwarranted ballyhooing in advance by laymen or the uninstructed, of drugs and remedies that are still unproven, still *sub judice*. This sort of thing actually delays progress and hampers research work, besides, as we said above, causing a great deal of personal unhappiness and misery. Why could we not, when this sort of publicity starts, prepare for the press some sane, deliberate statement, giving the facts, showing the need for patience and conservatism—some statement which would be authoritative—if necessary signed by names that would command respect and attention? We believe that any responsible newspaper or magazine would jump at the opportunity to publish such a statement, just as prominently as they now publish the sensational and incomplete statements that are given to them. The press is just as anxious to safeguard the public interest in this regard as we are; but we

do not work with them, we retire into our shell, muttering maledictions on the newspapers, and doing nothing about it. Such a procedure, however, as we have outlined, would have done much to avoid the necessity under which we now are, or puncturing a great many bubbles of unjustified hopes and disillusioning a great many people whose expectations of cure had been aroused by unwise and ill-informed publicity.

* * * *

We have received the following note from Dr. A. W. Bagnall, so well-known in connection with Rheumatism and Arthritis. A more complete programme will be published before the Refresher Course in September, (see below).

Prior to the Annual Meeting of the B.C.M.A., a Refresher Course in the Rheumatic Diseases will be held on Sunday and Monday, September the 24th and 25th. This will commence at 10:00 a.m. on the 24th of September in the Lecture Hall at the Vancouver General Hospital and is sponsored by the University of British Columbia Medical School and the B. C. Medical Association through its Special Committee on Arthritis and Rheumatism.

General practitioners particularly are invited since the presentations are designed to provide information of practical value rather than of didactic interest. While there is no charge for registration, all those with a real intention of attending are asked to notify:

Dr. F. W. B. Hurlburt, 1701 West Broadway, who is Course Secretary.

The subject matter will include Cortisone and ACTH in Rheumatic Fever and Rheumatoid Arthritis, other lectures of current interest, and practical demonstrations of traction, splinting and exercise therapy. The detailed programme will be published in the next issue of the Bulletin.

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LIBRARY NOTES

Hours during the summer months:

Monday to Friday ..... 9:00 a.m. to 5:00 p.m.

Saturday ..... 9:00 a.m. to 1:00 p.m.

Recent Accessions

Anus, Rectum, Sigmoid Colon: Diagnosis and Treatment, by H. E. Bacon, 2 vols., 3rd edition, 1949.

Clinical Biochemistry by Cantarow, A. and Trumper, M., 4th edition, 1949.

Medical Clinics of North America—Symposium on Cardiovascular Diseases, New York Number, May, 1950.

Principles and Practice of Obstetrics by De Lee, J. B. and Greenhill, J. P., 9th edition, 1949.

Psychodynamics and the Allergic Patient by H. A. Abramson, 1948.

Researches on Pre-Natal Life by Sir Joseph Barcroft, vol. 1, 1946.

Textbook of Ophthalmology by Sir W. S. Duke-Elder, vol. 4, 1949.

The Yellow Emperor's Classic of Internal Medicine (Huang Ti Nei Chin Su Wen)—Chapters 1-34 translated from the Chinese with an Introductory Study by Ilza Veith, 1949 (Historical and Ultra-Scientific Fund).

William Stewart Halstead, Surgeon: by W. G. MacCallum, 1934 (Nicholson Collection).

BOOK REVIEW

SIR WILLIAM GOWERS, 1845 - 1915. A BIOGRAPHICAL APPRECIATION, by MacDonald Critchley. London: William Heinemann Medical Books Ltd., 1949 pp. 118 illustrated.

This short monograph about "the greatest clinical neurologist of all time" is one of the most fascinating and readable medical biographies that I have ever read. The correlation of historical events and the lives of other famous physicians with the unfolding life of Gowers is a fine example of the scholarly research of the author. Even those who have been familiar with the medical writings of Gowers will be astonished to read of the catholicity of his interests and skills. The author who has long been known for his lucid writing and command of English, enhances his reputation in this volume. Even those not directly interested in neurology would enjoy it.

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PROMINENT B. C. DOCTOR HONOURED BY CANADIAN MEDICAL ASSOCIATION

We are advised by the Canadian Medical Association that Dr. Frederick Moore Auld of Nelson, B. C., has been elected to Senior Membership in the Canadian Medical Association at the Annual Meeting in Halifax on Wednesday, June 21st, 1950.

This honour is conferred on a very limited number of prominent medical men who have taken an active part in medical and community leadership.

The medical profession of British Columbia and his many friends outside the profession will be very gratified that Dr. Auld has received this honour.

FREDERICK MOORE AULD was born on the farm at Cove Head, Prince Edward Island, on October 18th, 1879. Dr. Auld received his early education at the rural school and later matriculated to Prince of Wales College at Charlottetown. Here he qualified as a teacher and taught school for five years, part of which time was spent in his native province and part in Saskatchewan. In 1903 he entered McGill University, from which he holds degrees in Arts and Medicine.

During the first World War, he served with the Royal Army Medical Corps in France.

Subsequently, circumstances developed which necessitated his return to Canada and resignation from the work in China. He took over the work of the late W. Oliver Rose of Nelson, whose failing health necessitated retirement in 1929.

Dr. Auld took an active part in the affairs of the B. C. Medical Association and the College of Physicians and Surgeons. He was President of the Association from the year 1939 - 1940.

We take great pleasure in publishing the following programme of Professor G. W. Pickering's visit to Vancouver in October. Professor Pickering is Professor of Medicine in the University of London, England and he will be Visiting Chief of the Department of Medicine at the Vancouver General Hospital from October 2nd to October 6th, 1950.

All clinics, general meetings, ward walks and clinical conferences, are open to all medical practitioners, and an invitation to attend is extended by the Vancouver General Hospital.

PROGRAMME

PROFESSOR G. W. PICKERING

Professor of Medicine, University of London
Director Medical Clinic
St. Mary's Hospital Medical School
London

VISITING CHIEF, DEPARTMENT OF MEDICINE

THE VANCOUVER GENERAL HOSPITAL

OCTOBER 2nd - 6th, 1950

MONDAY, OCTOBER 2nd

8:30 to—Ward Walk, Ward "A" (Male Medicine)
10:00 a.m. Dr. D. S. Munroe, Dr. T. K. MacLean, Dr. H. Scott, Dr. H. C. Slade, Dr. G. A. Davidson.

12:15 p.m.—Surgical Clinic.
Dr. J. R. Neilson, Chief Lecture Hall, Main Building.

2:00 p.m.—Conference with Resident and Assistant Residents regarding:
Material for Clinical Meetings.

6:30 p.m.—Private Dinner.

TUESDAY, OCTOBER 3rd

8:30 to—Ward Walk, Ward "B" (Female Medicine)
10:00 a.m. Dr. E. F. Christopherson, Dr. B. M. Fahrni, Dr. J. L. Parnell, Dr. F. J. Hebb, Dr. C. E. G. Gould.

11:00 a.m.—Lecture to First Year Medical Students—
Room 200, Physics Building, University of British Columbia.

12:15 p.m.—Luncheon—
Faculty Club, University of British Columbia. Arranged by Dr. M. M. Weaver, Dean of the Medical School.

2:15 p.m.—Clinical Conference.
Dr. G. W. Pickering.
Subject: "Peripheral Vascular Disease."
Lecture Hall, Main Building.

6:00 p.m.—Dinner with Executive Committee, Vancouver Medical Association.

8:15 p.m.—Meeting, Vancouver Medical Association.
Dr. G. W. Pickering.
Subject: "Pain in Peptic Ulcer".
Auditorium, British Columbia Institute of Tuberculosis.

WEDNESDAY, OCTOBER 4th

9:00 to 10:00 a.m. —Clinical Pathological Conference.
Chairman: Dr. R. E. McKechnie.
Pathologist: Dr. H. K. Fidler.
Discussion opened by Dr. G. W. Pickering.
Lecture Hall, Main Building.

10:30 a.m.—Medical Clinic.
Chairman: Dr. M. M. Baird.
Lecture Hall, Shaughnessy.

11:30 a.m.—Pathological Conference, Shaughnessy Hospital.

12:30 p.m.—Luncheon, Shaughnessy Hospital.

2:15 p.m.—Clinical Conference.
Dr. G. W. Pickering.
Subject: "Clinic on Hypertension".
Lecture Hall, Main Building.

6:30 p.m.—Private Dinner.

THURSDAY, OCTOBER 5th

9:00 a.m.—Medical Clinic.
Dr. G. W. Pickering, Visiting Chief.
Lecture Hall, Main Building.

11:00 a.m.—Official Opening of the B. C. Research Institute.

12:30 p.m.—Luncheon.
Afternoon Free.

8:15 p.m.—Special Meeting, Attending Staff The Vancouver General Hospital.
Dr. G. W. Pickering.
Subject: "Present Status of Hypertension Problem".
Auditorium, British Columbia Institute of Tuberculosis.

FRIDAY, OCTOBER 6th

9:00 a.m.—Paediatric Clinic.
Dr. J. R. Davies, Chief, Lecture Hall, Main Building.

10:00 a.m.—Health Centre for Children.
Dr. D. H. Paterson.

12:30 p.m.—Luncheon.
Seniors, Attending Staff, Department of Medicine, Board Room, The Vancouver General Hospital.

2:30 p.m.—Concluding Lecture for Resident and Interne Staff.
Dr. G. W. Pickering.
Subject: "The Place of the Experimental Method in Medicine".
Lecture Hall, Main Building.

A BRIEF PRESENTED TO THE HEALTH COMMITTEE, VANCOUVER BOARD OF TRADE, BY DR. J. H. MacDERMOT, MAY, 1950

X-RAY MACHINES FOR FITTING SHOES

There has been a great output of X-ray machines for fitting shoes. They constitute a strong sales appeal for the store that has them. They are spectacular, appeal to the average man's curiosity and his desire to see into the mysteries of electricity, etc. The store that has one is regarded as being more up-to-date than its rival down the street that has none.

Of late there has been a good deal of investigation by health and scientific authorities into the question of whether these machines can be operated, or are being operated in such a way to be safe for use, or whether they constitute a menace to health. They have been banned altogether by the State of New York, and other States, I believe, are investigating their use.

The machine consists of a cabinet into which the customer's foot is placed. There is a fluoroscope adjusted so that the operator can, by pushing a button, turn on the X-ray tube, and then see the foot, and, it is said, judge whether the shoe that is being tried on fits the foot or not.

The following questions come to one's mind in connection with this machine:

1. Is it a valuable aid to shoe-fitting, and is it thus a useful machine?
2. Is it safe (a) to the customer? (b) to the operator? (c) to other people in the store, or nearby?
3. If not safe, what are the dangers that may attend its use? (a) to the customer? (b) to the operator? (c) to the others nearby?
4. If not safe, as at present operated, can it be made safe? Should there be legal control of these machines, and what restrictions should be imposed?
5. Do these considerations apply to other X-ray machines in commercial use—such as those used in examining metals, which undoubtedly are of great value? What relation do these machines have to industrial disease, workmen's compensation, etc.?
6. Should there be standards of knowledge set up for all who operate any form of X-ray machine, for their own protection, as well as that of the public, and should there be standards of training in this work?

QUESTION 1.

Is the machine of value in shoe-fitting? The consensus of opinion among those who know most about the foot and shoes, that is, trained and registered chiropodists, is, as far as we can ascertain, that the machine is of no value at all for the purpose of fitting shoes. The main bulk of the foot, especially in children, where this machine is chiefly used, is soft tissue—the bones are small, and take up little room. All that the operator can see, in the brief vision he has of the foot, is the bones. . He knows nothing of anatomy, physiology, or orthopedics, and cannot recognise abnormalities or deformities.

The radiologist will tell you that fluoroscopy done under the conditions which prevail in a busy shoe store is of little or no value. When he himself is going to do fluoroscopy, he wears heavy red glasses for half an hour or more, he does the work in a darkened room, and so on. The machine is used in a brightly lighted store, there is no preparation of the eyes, and it is very doubtful if the operator can see anything at all of any value. The exposure, if the directions which are supposed to ensure safety, are followed, cannot be more than a few seconds.

QUESTION 2.

Is it safe to the customer, to the operator, and to people in the vicinity of the machine?

To answer this question, we must first make some general statements about X-rays, and any form of ionic radiation.

Exposure to X-rays is never safe, and there are wide individual variations in susceptibility to their effect. Every trained worker with X-rays knows this, and takes endless and meticulously detailed precautions. If we visit a thoroughly modern X-ray department, say at a hospital like St. Paul's, we shall find all the rooms that house the machines heavily shielded by heavy lead linings—covering the walls, the doors, the floors, the ceilings, for the rays can go anywhere, up through the ceiling as well as through an open door, and affect patients upstairs. Over 100 tons of lead sheeting have been used for this purpose, I understand.

The technicians and radiologists must not go nearer to the machine than a prescribed distance, and if they have to do so, they must wear special lead-lined aprons. They stand behind lead-glass and leaded partitions when working. If an operator can help it, he never puts his hands or any part of his body in the direct path of the rays. If he must do so, he wears heavily lined gloves. These precautions cannot be taken in any store. There it has been frequently noted that the operator, happily unaware of any danger, puts his hand occasionally into the cabinet to adjust the foot, while another operator is working the machine.

There are other rules observed in properly controlled laboratories. When fluoroscoping, the milliamperage, i.e., the amount of strength of the current, is set at 5 m.a. or less, and not allowed to exceed this amount. The duration of any given exposure is rigidly controlled, and the total amount of exposure is also rigidly fixed, and nobody is allowed to transgress this.

Lastly, there are two most important things to remember about X-rays. Their effect is cumulative—that is, repeated small amounts of exposure, too close together, even though relatively harmless in themselves, tend to add up to a dangerous dose, and serious effects may ensue.

The other important point is that the effects of damaging doses of X-rays may not appear for some time. They may not appear for months or even years.. This is especially true in the case of children, as will be shown later, where permanent and severe damage may be done to the growth and well being of the child, which yet will not become manifest for a long time..

QUESTION 3.

What are the dangers (1) to the customer (2) to the operator (3) to others?

The dangers of X-rays are mainly as follows: A. *To the skin.*

1. *Burns*—This is the most serious effect as regards the skin, and may be very deadly. It requires considerable over-exposure to bring this about—but there may be other damage done to the skin by too many and too closely-repeated small doses—e.g., dryness and scaling of the skin, etc.

B. *To the blood. Anaemia* of various degrees of severity is one of the dangers attending too prolonged exposure. All those operating machines in properly controlled laboratories have their blood tested at frequent intervals.

C. *To the genitalia.* This is a very real danger, and in days gone by, before this was understood, many of those who pioneered in X-ray work were rendered sterile.

To guard against these dangers, certain standards have been set by such bodies as the American Bureau of Standards, the New York City Health Department, and others. The unit of exposure in X-ray work is the "roentgen", and this is divided into parts, such as the milliroentgen, and so on. The standards of safety set the maximum permissible dose per exposure at 2r, i.e., 2 roentgens. There shall not be more than 3 exposures in one day, and not more than 12 exposures in one year. This is *the maximum.*

Actually, these maxima are constantly exceeded. For a twenty-second exposure (the one most commonly used) doses ranging from 10 to 116r could be delivered. The

child may have several shoes tried on in the same store, or may go to other stores, or may have a virtually unlimited number of exposures in the same year.

The machine "scatters" radiation, which adds to the dosage received and definite leakage of small amounts of energy also occurs. This is chiefly of importance to the operator, but may also affect other parts of the child's body, notably the genitalia.

Thus, we may see that there is definite danger:

1. To the child, from overlong or too frequently repeated exposures—

A. To its skin.

B. To its bony structure. In childhood the ends or "epiphyses" of the long bones are the part of the bone from which growth mostly takes place. If they are damaged, distortion, deformity, or stoppage of growth will occur. They are particularly sensitive to ionic radiation, such as X-rays. The effects do not appear for a long time after the exposure, and can only be prevented by the most rigid care.

A child is small, and its body is more easily reached by the emanations from the machine. Its genitalia are relatively close to the source of exposure. There is no doubt that repeated and excessive exposures are a menace to the child's gonads, especially in the case of boys.

2. To the operator. These people are quite untrained. They have no knowledge of the dangers of X-ray machines, or how to avoid these dangers. They have no protection, and they are entitled to this protection. They definitely face danger, to their hands, to their blood, to their genitalia, and it is quite wrong that there should be no restrictive control that would protect them.

The maximum permissible daily dose of radiation to which persons can be safely exposed throughout their working lives has been considered for many years to be O.1r. *per day,* i.e., 100 mr. Recently, the advisory committee on X-rays and radium has reconsidered this dose, and recommended that it be lowered to 0.3 *per week.*

Scattered radiation will account for 100 mr. per hour at 10 feet from the cabinet, and 15mr. at 25 feet. If the operator is careless, and gets his hands or other parts of his body too close to the rays, the exposure is even greater..

3. To others in the vicinity. There is probably no danger to these.

"Whatever the permissible exposure may be, all workers must recognize that *any* amount of radiation is potentially dangerous. There is *no* exposure which is absolutely safe, and produces no effect." (Lapp and Andrews.)

"Any X-ray apparatus represents a source of insidious harmful radiation, the use or abuse of which may lead to significant damage, often without recognition of clear-cut casual relationship. The early history of the use of diagnostic irradiation without precaution and the subsequent appearance of skin and neoplastic ('cancerous') change after years of latency should provide adequate warning against careless exposure to any source of ionizing radiation."

QUESTION 4. Can these machines be made safe?

Possibly they can, in the hands of operators who are properly trained, know the proper use and the dangers of abuse, of the machine, are subject to rigid control and inspection. The machine setting must be rigidly controlled (it is too high in many machines).

The number of exposures, per day and per year, must not be exceeded. The public should be told of the dangers of over-exposures. We question whether any parent, if informed of these dangers, would be willing to expose his or her child to them, unless the most rigid standards were observed. We question, too, whether any of the operators know what is their own personal stake in the matter, and whether any of them will be willing to do this work if they did know, without adequate protection.

SUMMARY

In view of the fact that these machines are relatively, if not entirely, useless for shoe-fitting, that they are very easily abused, by over-eager, uninformed, or unscrupu-

lous owners and operators, and that such abuse can be productive of very serious damage to operators, and to customers, especially children, it is a question whether the sale and use of these machines should be permitted at all. If they are permitted, it is urged that the most rigid safeguards and controls should be imposed on their use. These safeguards should be imposed, not only on foot-machines, but on all X-ray machines used anywhere, in industry, where they are of very great value and are constantly used—in offices of doctors, dentists, and others who use them for diagnostic or other purposes.

We would suggest that a careful study be made of this whole question. There should be consultation, between physicists, radiologists, paediatricians, orthopaedists, and so on. The Board of Trade would be interested in safeguarding the legitimate interests of businessmen who deal in this type of product. It is not suggested for a moment that there should be a witch-hunt in this matter. If these machines can be shown to be of use, and can be made safe, there should be no objection to their use. But we suggest that this use should be under strict legislative control, and that the conditions of use, if the machine is to be permitted at all, should be laid down by the Provincial Board of Health, and should be made law. The University of British Columbia, with its Physics Department, could be of immense assistance in these deliberations.

We feel, too, that this is a matter in which the Workmen's Compensation Board is vitally interested, since X-rays are used in industry, and X-ray damage is, or should be, compensable. The men working in shoe stores should possibly come under the W.C.B. also.

Lastly, we feel that the public as a whole should be aware of the dangers of X-ray and other ionic radiation. Without any scarehead methods, surely a wider knowledge of the potential dangers of what many of them regard as a scientific toy or a magical machine, would be of value and would at least put the onus of abuse on the right shoulders.

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MINISTER OF NATIONAL HEALTH AND WELFARE
Ottawa, Canada.

June 28th, 1950.

Dr. J. H. MacDermot,
Vancouver Medical Association.

Dear Doctor MacDermot:

It was indeed an honor to address the Vancouver Medical Association on my recent visit to Vancouver, and I was delighted to have this opportunity of meeting the members of your Association. May I tell you how much I appreciate the warm welcome extended to me on this occasion.

With kindest personal regards, I am,

Yours sincerely,
PAUL MARTIN.

HEADACHE*

L. R. F. ZELDOWICZ, M.D.

Headache, one of the most common complaints, often presents a diagnostic problem. Headache is not a diagnosis—it is most often a symptom or syndrome. The headache may originate from tissues within the head or from tissues outside the cranial cavity. It may accompany almost any systemic disease, as it may be referred to the head from quite remote organs. The most common type, however, does not show any demonstrable tissue pathologic charge and is presumably due to functional disorder of the autonomic nerves and frequently is associated with a psychogenic condition.

Establishment of the diagnosis calls for full clinical investigation—medical, neurological, psychological and often otorhinolaryngological. X-ray of the skull, and eye fundi, should be routine examination, and in some etiologically doubtful cases electroencephalographic investigation is required.

In this short paper the classification of different groups of headaches and the present view on the mechanism of headache will be discussed and some forms of cephalalgias will be reviewed.

Classification:

1. Headache due to organic, circumscribed or diffuse diseases within the cranial cavity, the most common of which are tumours, abscesses, vascular anomalies, meningitis and others.
2. Headaches due to involvement of tissue outside the cranial cavity such as the eyes, ears, nasal sinuses, teeth and throat. This type of headache is usually considered as of reflex origin due to rich interconnections on the periphery between sensory cranial nerves themselves (nerves 5, 7 and 9 and with autonomic nervous fibres).
3. Headaches connected with different systemic diseases of general infections, such as pyrexial headache due to hypertension, blood diseases, etc.
4. The so-called "primary" headaches—
   (a) Migraine.
   (b) Histaminic Headache.
   (c) Sympathetic Headache
5. The tension headache.
6. The post-traumatic headache.

The Mechanism of Headache.

According to newer investigations the tissues which are capable of giving rise to painful sensations are:—

1. The dura mater which is sensitive to traction, especially in the tentorium. The maximal sensitiveness is in the region of the vessel, especially the dural sinuses.
2. The intracranial and extracranial vessels with their adjacent tissues, namely, the internal carotid artery, the middle cerebral artery (more in the region of the Sylvian fissure), and the external carotid artery with its branches, particularly the temporal artery. The arachnoid and the brain tissue by itself is painless.

How then does pain originate? It may arise because of traction or displacement of the dura or its sinuses. Distension of the wall of dilated vessels is another important factor in pain production according to experiments of Hess and Pickering (22, 23). The vessels may distend because of increased intravascular pressure, diminished support from outside or active vasodilatation. These two mechanisms (traction of the dura and distension of the cranial vessels) may co-exist and may account for almost all types of headache irrespective of their etiology. Those painful stimuli are mediated centrally by sensory cranial nerves which are, mainly, branches of the trigeminal nerve. In this way we understand that the headache commonly associated with a raised intracranial pressure is not directly related to the pressure, although the headache usually manifests itself more

*Read at the May, 1949 meeting of Federation of Medical Women of Canada (B.C. Branch).

when the intracranial pressure is very low. In the intracranial expanding processes the stretching, displacement or distension of the enumerated pain-sensitive organs is the main pain-producing factor. The same is true in a post-lumbar puncture or the so-called "drainage" headache. According to Pickering, Kunkle, Ray and Wolff (16) the post-lumbar puncture headache increased when the jugular veins are compressed as it augments the distension of intracranial veins. On the other hand, they decrease by intrathecal administration of physiological sodium chloride which restores the volume of cerebrospinal fluid. In meningitis the pain-sensitive nerve endings are probably stimulated by a chemical substance from the inflammatory foci. In hypertension the headache is explained by increase of the amplitude of intracranial pulsations and by increased internal pressure exerted upon dilated vessels.

As will be discussed later in the primary headaches, in migraine, histaminic headaches and probably sympathalgic and tensional headaches, the exaggerated vasomotor reflexes (chiefly vasodilation) seem to be of great significance in production of painful vascular stimuli.

Clinical Review of Some Forms of Headaches.
Migraine.

Migraine is characterized by:—

1. Cortical disturbances (scotoma, photophobia, paresthesias in the extremities, speech disorder, etc). These symptoms and signs are understood to be due to the vasoconstriction.
2. Periodicity of cephalalgia which is often connected with the menstrual period. This usually starts as unilateral pain and then is more generalized. This phase is due to vasodilation of pain-sensitive arteries inside and outside the head.
3. Gastrointestinal disturbances (nausea, vomiting, diarrhoea, abdominal pain), vestibular disturbances (vertigo, unsteadiness), often increased excretion of urine, sometimes sleep disturbances, all of which are due to dysfunction of the autonomic nervous system.
4. Positive familial history which manifests the hereditary trait of the disease.

If not all of the features are present, some of them beside headache should be present, otherwise the diagnosis of migraine is not certain.

In discussing this condition, the importance of personality structure in patients suffering from migraine should be stressed. Usually they are tense, driving people who are rigid, ambitious and perfectionistic. According to Marcussen Wolff (19) they are "considered reliable, conscientious and hard working. To this is added more stress by the belief that no one could do a job quite as efficiently or as thoroughly as they. They become resentful because they cannot keep up with the load which the world and they themselves impose. The outcome: tension, fatigue and exhaustion." It is understood that the headache itself is the end manifestation of a chain of bodily changes (autonomic and endocrine) set off by insidious, slowly accumulating emotional tension. Strenuous emotional experiences may also precipitate an attack of migraine immediately or as late as 24 hours afterwards. In light of the above considerations, the preventive treatment in migraine should include psychotherapy. The treatment of the attack itself is pharmacological.

Histaminic Headache.

Histaminic headache was described as a new entity by Horton, McLean and Craig (15). In 96% of the cases the pain is unilateral or hemicranial, often spreading to the face and neck. The attacks are much shorter than in migraine, lasting from 10 minutes to 5 hours, and there is often a history of several attacks in a 24-hour period. Additional signs are typical vasomotor unilateral symptoms such as blushing, nasal congestion, marked epiphora and increased skin temperature with sweating on the involved side of the face. The vessels are commonly grossly distended, particularly the temporal artery. In contrast to migraine, gastrointestinal disturbances are uncommon.

Cortical disturbances (scotomata, hemianopia and others) are absent. It bears no relationship to menstruation and in this type of headache the reclining position is intolerable. Usually the patient sits up or paces the floor with his hands clasped over the painful area and this probably helps to reduce the engorgement of the vessels. Some patients can obtain temporary relief from their attacks by digital pressure on the common carotod artery, the temporal artery or over the orbit. In the painful period these patients show hypersensitivity to histamine as determined by the size of the wheal produced by intradermal injection. 0.1 to 1.0 mgm of histamine base reproduces the attack of headache the treatment of choice is histamine desensitization.

Sympathalgic Headache.

Sympathalgic headaches were first described by French neurologists Souques, Alajouanine and Thurel (2). The nosological identity of this condition still remains open to discussion as to whether they represent a special entity. This problem also involves discussion concerning the part played by the sympathetic nervous system in pain production and pain conduction. Various syndromes connected with involvement of specific parts of the sympathetic nerves and ganglia have been isolated and described as:—

1. Sluder's Syndrome (spheno-palatine ganglion) (24).
2. Charlin Bonnet Paufique Syndrome (ciliary ganglion) (6).
3. Heymanowich's Syndrome (sinus caroticus) (13).
4. Barre-Lieou Syndrome (vertebral or so-called cervical sympathetic posterior nerve) (17).
5. Syndrome of the Temporal Artery isolated by Siccard, Chavany, Alajouanine and Proby (7).

Probably in the same category might be included cases described as "Atypical Migraine" of Penfield, Mixter, White and Adson (20,21, 1); "Atypical Facial Neuralgia" of Frazier and Glasez (3, 12); "Autonomic Facio-Cephalalgias" of Briekner and Riley (5); and many others described under different names.

This group of headaches improved best under operative procedures on the cervicothoracic sympathetic fibres and ganglia. In my personal clinical experience, good results were obtained by cauterization and, in some cases, by alcoholization of the sphenopalatine ganglion (10).

The sympathalgic headache seems to differ from migraine, the histaminic headache and trigeminal neuralgia by the following characteristics:—

1. Their constancy. They are of months, sometimes years duration with episodes of exacerbation superimposed on the persistent pain.
2. Their location. The pain is widespread involving various areas of the head, usually the face, overlapping as a rule, the area innervated by the trigeminal nerve. The pain often extends to the upper extremity and sometimes to the chest. It is more restricted to one side but not strictly unilateral.
3. Their character. Often true causalgic with burning, itching sensations. Some patients complain of dull pain, numbness, pulsations, crawling sensations, compression and other very bizarre sensations.
4. The vasomotor and secretory signs are common and are similar to histaminic cephalalgia. Palpitation and cardiac pain are also rather a common complaint.
5. Sensory disturbnces in the form of hypoalgesia and less common, of hyperalgesia, are present in the involved area.
6. Psychic manifestations (emotional instability, depressive mood, loss of interest) are interpreted as phychic repercussion due to neuro-vegetative dysfunction.

Tensional Headache.

The headache appears in conjunction with emotional conflicts. The diagnosis is based on personality study, assessment of traumatising factors, and social, economic and psychosexual adjustment of the patient, providing, of course, that structural lesions were excluded. According to Friedman (11) two mechanisms may account for this group of headache.

1. Changes in the calibre of cranial vessels (chiefly vasodilation.) and
2. Spasm or tonic contraction of skeletal muscles of the head and neck.

This latter by itself may produce or aggravate the already existing headache.

Post Traumatic Headache.

Some intractable post-traumatic headaches in which all investigation (x-ray, pneumoencephalography, electroencephalography) rules out their organic nature, are closely related to tensional headaches. Similarly in this group, physiologic and psychogenic mechanisms are probably responsible for the headache. Physiological mechanism includes distension of the cranial vessels and sustained contraction of skeletal muscles of the head and neck. In some cases scarring of the external tissue is blamed for reflex headache. Psychogenic mechanism may include the immediate effect of the injury (anxiety, depression, resentment or frustration), the pre-traumatic neurotic features or conflicts and stresses incidental to the injury.

I have attempted to give a short review of the different groups and forms of headache. From the vast and often confusing field I have chosen only those groups of headache which were proven not to be connected with any organic disease. Although these various forms have different clinical characteristics and different etiology, it seems more and more evident that the pathogenic mechanism is overlapping, and, possibly in all these forms, vasomotor disorder, chiefly vasodilatation, can be considered as the main pain producing factor. This vasodilatation may be due to familial pre-disposition to exaggerated vascular reflexes, as in migraine; to hypersensitivity to histamine, as in the histaminic cephalalgias. There is also a theory that emotional factors on higher autonomic integration level may set off reflexes, possibly through the hypothalamus, which are mediated to the vessels, probably by chemical acetylcholine mediators (histamine, and others) released by nervous stimulation.

Our knowledge of the subject of headaches still remains unsatisfactory. Presumably we get one glimpse on the various possible links in pain producing mechanism and interrelation between different clinically isolated forms of headache.

METHODS OF TREATMENT

The therapeutic approach to the reviwed groups of headache include the following:

1. Psychological.
2. Pharmacological.
3. Combined psychological and pharmacological.
4. Surgical.

The psychological approach consists of psychotherapy which aims to solve the underlying conflict, to release the nervous tension and to promote better adjustment.

The pharmacological approach includes the following groups of drugs—vasoconstrictors, vasodilators, desensitizing and analgesics.

As a vasoconstrictor Gynergen (Ergotamine Tartrate) is used mainly, early in an attack of migraine. The dosage is 0.25 to 0.5 mgm. intramuscularly or intravenously or 1 mgm. tablet sublingually, followed by 2 tablets every half hour. Maximum dose is 10 mgms. Dihydroergotamine proved to be less toxic. The dose is 2 to 4 mgm intramuscularly.

As a vasodilator of quick action, a face mask of a mixture of 10% carbon dioxide and 90% oxygen usually applied three times, each of four minutes duation, with intervals of five minutes, is used. Amyl nitrate is a potent vasodilator used in inhalation. Both methods are chiefly used early in an attack of migraine or in the vasocconstrictor phase.

As a vasodilator of prolonged action, used as preventive measures for treatment of most popular are Phenobarbital Gr. ½ three times a day, of Nicotine Acid 50 mgms. 3 times a day. Atkinson's method is more effective (3). The tolerance is first checked with 25 to 30 mgms. of Nicotinic Acid given intramuscularly (flush reaction) then intravenous doses, starting with 20 to 30 mgms. and increasing daily by 5 mgms. until a 50 mgm. dose is reached. Afterwards intramuscular injections of 25 to 50 mgms. are given daily or every second day. At the same time 50 to 150 mgms. are given by mouth.

other drugs such as Priscol, Octin "Merck," and Prostigmin were found to be helpful although their action on cranial vessels not, as yet, been well proven.

Of the desensitizing drugs, histamine seems to be the method of choice in histaminic cephalalgias, although a large percentage of improvement was obtained in cases of migraine. It is said that the best results were achieved by the combined intravenous and subcutaneous administration. The method is tedious and requires thorough and prolonged administration. 0.275 Histamine Phosphate corresponds to 0.1 histamine base. The first injection of 1/10 of the 1 c.c. solution subcutaneously. Later the dosage is increased by 0.05 c.c. of the solution twice daily until 1 c.c. of the solution is reached. Flush reaction, headache and discomfort calls for decrease of the dosage by 50% and later the schedule is continued as before. In the combined intravenous subcutaneous method, histamine is given intravenously in isotonic solution of Sodium Chloride (1 mg. of histamine base as 2.75 mg. of histamine phosphate in 500 c.c. of isotonic solution of sodium chloride) by drip method daily for two weeks, avoiding the flush reaction, then histamine azoprotein is given subcutaneously. Epinephrine and ascorbic acid are used to combat side effect. Benadryl, antistine and pyribenzamine are often effective.

Of the analgesics the most commonly used is Codein Gr. ½ to Gr. 1 combined with Acetlysalicylic Acid. Morphine and other addiction-producing drugs are condemned.

Surgical treatment includes different methods as simple novocaine infiltration of the engorrged vessel (i.e. the temporal artery), novocaine block of the sympathetic ganglia, and various operations on the sympathetic nervous system such as periarterial sympathectomy, ganglionectomy and rmsectomy..

In some intractable headaches, Watts and Freeman (25) recommend lobotomy. According to them, after frontal lobotomy and the presumed degeneration of the dorsomedial nuclei of the thalamus that follows, patients state that they still fe:l their pain, but that it has ceased to bother them.

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RECENT DEVELOPMENTS IN THE USE OF RADIOACTIVE ISOTOPES

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Radioactive Isotopes of Phosphorus and Sodium.

It is my purpose now to continue from what Dr. Wood has said about the use of radioactive iodine and to discuss somewhat briefly some applications of two more very useful radioactive isotopes, namely, radioactive phosphorus and radioactive sodium.

Radioactive phosphorus has been used for the treatment of various diseases since 1936 when it was prepared in small amounts in the cyclotron. Since then, of course, radioactive phosphorus has become abundantly available because of the development of the atomic pile. Radioactive phosphorus, P^{32}, emits B-particles of high energy which can penetrate body tissues to a depth of approximately 7 mm. The use of radioactive phosphorus depends on the fact that it is selectively taken up by certain tissues and cells of the body. These tissues are chiefly those which are involved in various blood diseases and lymph node diseases. Because it is selectively taken up, radioactive phosphorus can be used as a means of supplying internal radiation. The introduction of radioactive phosphorus as well as other radioactive elements is not without its hazards, however, since for therapeutic purposes, a rather high dose of the radioactive isotope must be administered. The high energy of the radiation may injure other adjacent tissues, especially if the isotope has a relatively long half-life. Radioactive phosphorus has a half-life of 14.3 days and, since the body retains up to 75% of a given dose, steady irradiation will take place for several weeks.

One of the early pioneers in the use of P^{32} in the treatment of blood disorders was J. H. Lawrence. Since his studies began, many others have expanded the work so that now information is available on several hundred cases. In general, the treatment is simple and consists merely of giving the P^{32} as a solution of sodium hydrogen phosphate orally or by intravenous injection. A very informative review of the use of P^{32} as a therapeutic agent in blood disease is that by Rheinhard and his associates[1]. I shall give you only their general conclusions.

It was felt by these workers that radioactive phosphorus is the best therapeutic agent available at the present time for polycythaemia vera. In the vast majority of the patients there was complete haematologic and almost complete symptomatic remission. Remission from a single treatment was found to last from six months to several years and the cases are still being followed. Therapy with P^{32} appeared to have very little effect on the clinical course of patients with acute or subacute myelogenous leukaemia, but in the chronic form, P^{32} was at least as good as X-radiation with the advantage that there was freedom from radiation sickness. The results of Reinhard and associates indicate that P^{32} is also as effective as X-ray therapy in prolonging life in these cases.

In the great majority of patients suffering from acute lymphatic leukaemia, the clinical course was not favourably influenced by P^{32} therapy. The results were no better than with roentgen radiation. P^{32} was of no value in the treatment of monocytic leukaemia and, in Hodgkin's disease, lymphosarcoma, reticulum cell sarcoma and multiple myeloma, X-ray was better than P^{32} therapy. In all the various types of diseases treated, P^{32} was shown to have a profound effect on the bone marrow so that complications may occur as a result of therapy—leucopenia, thrombocytopenia and anaemia.

Lawrence has published extensively also reports concerning his studies on the treatment of various blood disorders with P^{32} and notes,[2] that, after oral or intravenous administration of P^{32}, the red count returns to normal, the spleen decreases almost to normal size and there is relief from all symptoms of the disease. Associated with this is an increased life expectancy and a low rate of remission. Lawrence and his colleagues[3] have recently published results of the treatment of 100 cases of chronic lymphatic leukaemia by use of P^{32}. Thirty-three of these patients have lived for five or more years after the onset of the disease, and ten have lived eight or more years. Another advantage

is the convenience of the treatment both for the patient and the physician. All that is involved is the matter of the few minutes required to make an intravenous injection or to swallow the dose, and, as has been mentioned already, there is no radiation sickness.

Among the many problems involved in cancer work is the precise location of the tumour tissue, either preoperatively or at the time of the operation. Radioactive phosphorus is being used for this purpose also. Low-Beer and his group have done considerable work[4] in attempting to distinguish preoperatively between benign and malignant breast tumours by surface measurement of the P^{32} radiation from breasts of patients given radioactive phosphorus. Each patient was given 300-500 microcuries of P^{32} as isotonic disodium hydrogen phosphate 24 to 48 hours before surgery. Two, four, six, and twenty-four hours later, surface measurements were made directly over the palpable breast tumour and over comparable areas on the opposite normal breast and other fleshy parts of the body.

At the time of this report, Low-Beer's group had studied 25 patients. Of these five had obviously malignant lesions. The counts over the palpable tumour were 25% higher than in corresponding areas of the opposite breast and adjacent areas of the same breast. Twenty had palpable tumours with unresolved malignancy. Of these, eleven had a 25% higher count over the tumour area and all eleven were shown to have malignancies. Nine showed less than 25% excess counts and of these eight were found to have benign tumours.

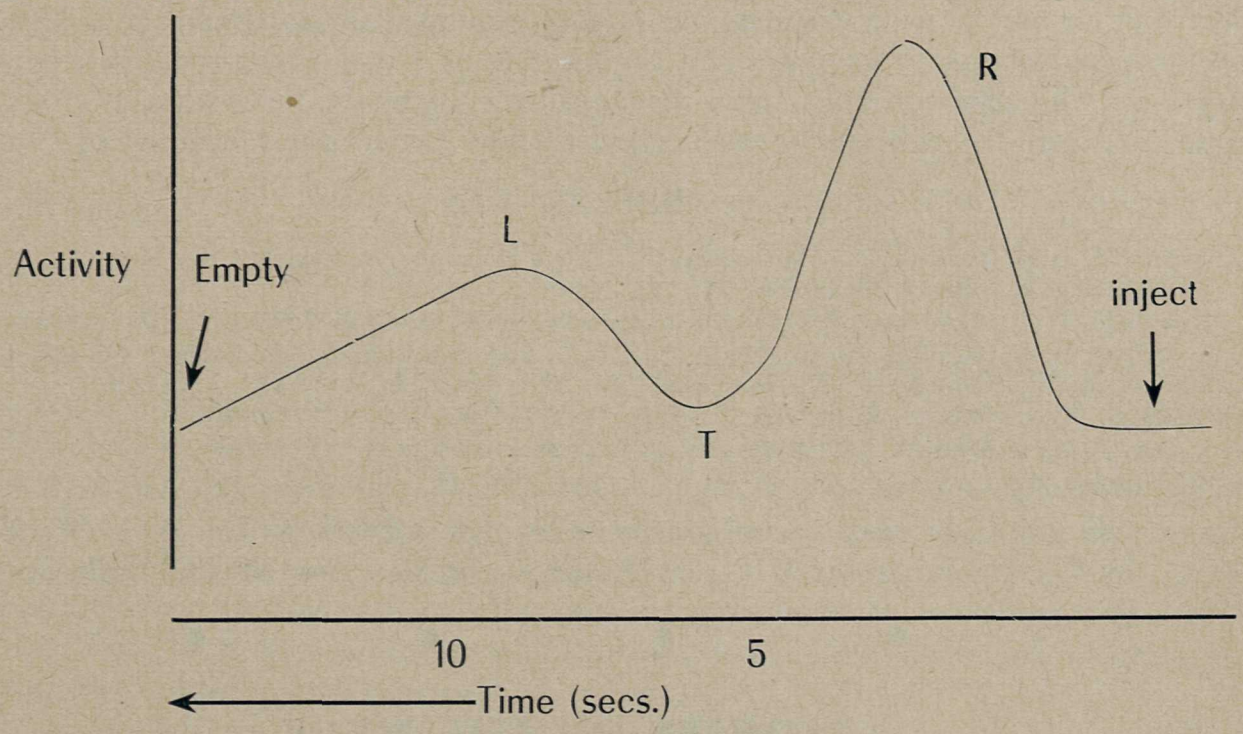
Radioactive phosphorus has been used recently to obtain precise location of cerebral tumours at operation, using a very fine counter as a probe[5]. After injection of P^{32} into the patient it was found that the radioactivity in the tumour tissue may be up to 11 times greater than that of adjacent normal white matter. The activity found in gray matter is higher than in white matter but never approaches that of tumour tissue. In all the patients the approximate location of the tumour is determined by the other techniques of neurological examination and the P^{32} used for precise location. After exposure of the appropriate area of the cerebrum or cerebellum, the counter is introduced into a convolution as far from the site of the tumour as is permitted by the exposure, in order to obtain a normal count. The probe is then withdrawn, carefully cleaned and then inserted into the suspected convolutions until an immediate increase in the counting rate is encountered. This indicates at once the presence of the tumour.

I would like now to discuss very briefly uses made of isotopes of another element, sodium. One such radioactive isotope is Na^{24} which emits gamma rays, which are very penetrating and can easily be detected from within the body tissues by externally placed counters. The limiting factor in the use of Na^{24} is that it has a very short half-life, about 14 hours, and so must be used for short-term experiments. This isotope has been used to determine circulation time[6] or rate of blood flow in a limb. For example, the tracer is injected at one point and the time of arrival of radioactivity at another point is determined by use of a counter. In this manner it has been ascertained that the foot-groin flow time is 18 ± 0.9 seconds with a range of 4-50 seconds.

For longer term experiments, it is advantageous to use another radioisotope of sodium, namely Na^{22}, which has a half-life of three years so that it remains detectable for many weeks. Using this isotope, Reaser and Burch[7] showed that a normal person excreted, over a ten week period, about ninety times as much sodium as did a person with congestive heart failure, when both were given salt ad lib.

A very interesting application of radioactive sodium to medical problems has been in the development of the technique known as radiocardiography in which a record is made of the passage of radioactive blood through the cardiac chambers[8]. This technique has been found useful in diagnosis and prognosis of a number of cardiac conditions. In this technique a Geiger-Muller counter tube is placed over the precordium and 100-200 microcuries of Na^{24} are injected into one of the antecubital veins. The counter tube is attached to an ink-writing recorder and a record is traced out as the radiations from the

sodium in the blood pass into the counter through the body tissues. In normal subjects a curve as shown below is obtained.



The injection point is at the far right. The first wave is called the R-wave and traces the blood on its way through the chambers on the right side. The L-wave traces the "labelled" blood through the large pulmonary veins behind the heart and through the left cardiac chambers. In the R-wave, the upstroke represents the arrival of the Na^{24} into the superior vena cava and the right cardiac chambers. This wave rises abruptly 1/4 second - 2 seconds after the injection. Sometimes the R-wave describes a sharp point and descends sharply, other times there is a plateau before descent. The R-wave descends here because the labelled blood is leaving the right side. The curve is J-shaped at this point. The bottom of the R-wave is T, the transition point or zone, and corresponds to the time when most of the labelled blood is in the lungs on the way from the right to the left side of the heart. The L-wave is lower than the R-wave and is about twice as long in time. This is explained by the fact that the radioactive sodium is diluted in a large volume of blood as it flows through the pulmonary vascular bed into the veins and the left chambers. The ascending limb represents the filling of the great veins on the left side of the heart, occupying about 3 seconds. The long, gentle descending slope represents emptying of the left cardiac chambers of the bulk of the labelled blood. The descending limb of the L-wave is comparatively long and in the normal radiocardiogram is equal in time to the R-wave plus the ascending limb of the L-wave. The taking of a radiocardiogram requires only about 25 seconds from the time of injection of the radioactive sodium.

The use of this technique in diagnosis requires, of course, the establishment of the normal pattern and characteristic patterns to be found in various heart conditions. Prinzmetal[8] has determined many of these patterns and by comparison has been able to rule out suspected heart cases on the one hand and to establish unsuspected cases on the other.

In conclusion, I should like to say a few words about the apparatus required for these various applications of radioactive isotopes. For example, in order to take radiocardiographs, the following pieces of equipment are required: a Geiger-Muller counter tube, a lead shield for the counter, a counting circuit and a recorder. The sad point is that all are expensive items, a factor which limits their use to institutions which have money available for the purpose. Further, the apparatus required for radiocardiography is relatively simple. Other applications require more elaborate setups. Another point to remember is that the use of a Geiger-Muller tube is often fraught with frustration. The construction of these devices is still in part empirical, and though attempts are made

to make them behave according to accepted standards, they may suddenly stop working or may function in some utterly impossible manner. A good deal of the apparatus is electronic in nature so that unless one is well-grounded in electronics it is highly desirable and comforting to have at hand the services of a competent specialist, preferably a physicist, who can not only treat the apparatus correctly but, what is perhaps more important, can design better apparatus and thereby extend the usefulness of the isotopes.

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This article should be read in conjunction with that written by Dr. A. J. Wood, B.S.A., D.S.C., of The University of B. C., published in the May issue of The Bulletin.

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TUMORS OF THE NECK

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Probably no one region in the body affords such a diversified pathological showroom as the neck, for within the relatively narrow confines of the anterior and posterior triangles congenital abnormalities, cysts, inflammatory lesions, primary benign and malignant and secondary malignant tumors may arise. In this short paper I propose to deal only with those subdermal tumors, using the word tumor in the broad sense of a swelling or mass, arising at this site and under the following headings:

CYSTS—Branchial cleft or Branchiogenic; Thyroglossal; Dermoid; Cystic hygroma; Sebaceous or Epidermoid.

INFLAMMATION—Specific Parotitis (Mumps); Non-specific submaxillary and parotid salivary adenitis; Thyroiditis; Non-specific lymphadenitis (Acute and Chronic); Tuberculosis adenitis.

PRIMARY TUMORS BENIGN—Lipoma; Fibroma; Thyroid adenoma; Carotid body adenoma or tumor; Mixed tumors of salivary glands; Diffuse thyroid hypertrophy.

PRIMARY TUMORS MALIGNANT—Branchial Cleft carcinoma; Malignant adenoma of thyroid; Diffuse carcinoma of thyroid; Malignant mixed tumors of salivary glands; Lateral aberrant thyroid tumor; Lymphoblastomas—Hodgkin's lymphosarcoma, etc.

SECONDARY MALIGNANT TUMORS—From tongue, lip, larynx, buccal and alveolar mucous membrane, nasal accessory sinuses, pharynx, naso-pharynx, pyriform sinus, lung, stomach, etc.

CYSTS

Branchial cleft or branchiogenic cysts generally arise from the 3rd branchial cleft, are usually at the level of the hyoid bone, slowly growing, painless swellings that may have been present for a period of years with very little appreciable change in size but suddenly may become quite large, tense, tender and red, suggesting secondary infection. They are smooth and semi-fluctuant to palpation but, if they become suddenly larger and present a firm consistency to the palpating fingers with some fixation to the adjacent tissues, the possibility of malignant change must be borne in mind. Less frequently these cysts may arise from the 2nd cleft and then present themselves as a swelling beneath the mastoid process and usually extend into the oral cavity. Histologically they are charac-

teristically lined by ciliated columnar epithelium if fairly deeply situated, but if more superficial the lining is of a stratified squamous type and there is abundant lymphoid tissue both in follicular and diffuse arrangement in the wall.

Thyroglossal duct cysts are always in the midline, being a patent vestigial remnant of the duct passing from the foramen caecum at the base of the tongue to the thyroid isthmus, and cystic dilatation may occur from the secretion of its lining columnar epithelium. It is usually below the level of the hyoid bone but it is sometimes found at the base of the tongue in those instances where the entire canal does not remain canalized. The diagnosis of this condition affords no particular difficulty, a fact which, unfortunately, may not hold true for the remedial measures.

In the sense that the so-called Cystic Hygroma is of a cystic nature it seems reasonable to describe it under the cyst category, although actually it is a tumor composed of dilated lymphatic channels. It arises usually in the anterior triangle as a soft, cystic swelling probably somewhat lobulated in outline and may attain a considerable size with sufficient pressure on the trachea and adjacent tissues to cause no little apprehension. They are generally seen in babies or young children and are said to frequently undergo spontaneous cure, probably owing to the fact that they seem prone to secondary inflammation, which, with the subsequent fibrosis, probably constricts and obliterates the lumina of the dilated lymph channels.

Dermoid cysts containing sebaceous material and hair may appear in the midline of the neck and in the sites of the bronchial clefts, usually the 2nd. They are congenital inclusion cysts along the line of the embryonic fissures and from the standpoint of different diagnosis would appear to be most likely confused with thyroglossal duct and branchiogenic cysts but their rather doughy consistency on palpation may be a point in making the distinction.

Sebaceous or epidermoid cysts may sometimes attain a considerable size in the relatively loose tissues of the neck and may appear in many positions. If secondary infection intervenes and frequently, consequent calcification, a very firm, somewhat fixed tumor mass may result which may present no small problem in diagnosis. However, one may find a small stoma in the skin overlying it from which, on pressure, some of the sebaceous material may be expressed.

INFLAMMATIONS

One may mention, in passing, the specific inflammatory hypertrophy of the parotid gland in Mumps. Though occasionally only unilateral it is more consistently bilateral and in general, the diagnosis presents no great difficulty.

Acute inflammations of both the submaxillary and parotid salivary glands occur generally by direct extension of inflammation from the oral cavity through Wharton's and Stenson's ducts as in the so-called surgical mumps. Chronic inflammations occur usually by reason of a sialolith or calculus in the duct, and the history of considerable swelling of the gland during meals with gradual decrease after is very significant and probing of the duct or radiographic examination should disclose the sialolith. The anatomical position of the swellings usually furnishes the clue to the structures involved.

Tuberculous cervical adenitis is probably much less frequent at the present time than it was some 15-20 years ago. This may appear as a few or a chain of enlarged glands on one or both sides of the neck, relatively painless and not particularly tender and at first, fairly discrete. Gradually, however, they become matted together as periadenitis begins and if caseation becomes marked they may coalesce to form a large abscess cavity —the so-called "cold abscess". Aspiration of at least some of the pus for examination, which is usually productive of no non-specific bacteria, the possible finding of tubercle bacilli on direct smear or the inoculation of a guinea-pig and appropriate special media, should eventually establish the diagnosis. One, of course, may extirpate all enlarged and grossly involved glands in the area but there appers to be considerble controversy as to the relative merits of surgery or X-ray as remedial agents and one might wish to establish

the diagnosis first before deciding upon the plan of therapy. In this respect removal of a single node for microscopic examination would probably expedite the decision.

Acute cervical lymphadenitis may usually be traced to some acute inflammatory process in the tonsils, teeth or oral cavity generally. The glands become suddenly enlarged to a varying degree, painful, tender and with possibly some redness of the overlying skin and some hperpyrexia. The lymph nodes may still remain definitely enlarged after the acute process has subsided but are no longer particularly painful or tender but may be firm and rubbery and we now have a more or less chronic lymphadenitis.

While acute inflammations of the thyroid gland are extremely rare, there are two distinct entities which may be described under Chronic Thyroiditis, viz.— Riedel's Struma or Woody Thyroiditis and Hashimoto's Struma or Struma Lymphomatosum. These practically always occur in women, the former in a younger age group (20 to 40 years) than the latter (40 to 60 years). Pain, tenderness, swelling and dysphagia are the prominent symptoms, with a sensation of pressure on the trachea a very consistent one. The duration of symptoms in Riedel's is usually one to two years, while in the Hashimoto type it is usually many years. In the latter it is usually a diffuse process, while in the former it is unilateral in about 30% of cases. Signs of gradually developing hypothyroidism, even to a myxoedemic state, are usually present. The chief differentiation is from carcinoma of the thyroid, as the thyroid in both conditions is very firm and may be fairly well fixed to the surrounding tissues, but instead of weight loss there is usually weight gain due to the myxoedema. However, one must resort to surgery to explore the thyroid and either extirpate it or remove a portion for histological examination in order to determine the diagnosis. The Hashimoto type is said to respond well to deep X-ray therapy but one is probably desirous of first establishing a diagnosis before deciding on the mode of therapy, which must be, as stated above, by surgical exploration. One should also mention another type which is relatively uncommon, known as the Giant Cell variant of de Quervain. In this type a fairly consistent radiation of pain to parietal, occipital, shoulder and neck areas may serve as a possible clue to this process and of the three is characterized by pain as an almost paramount symptom, the Hashimoto type being the least consistent in this respect.

BENIGN PRIMARY TUMORS

Lipomas and Fibromas are sometimes found in the neck, not necessarily at the sites of the various congenital cysts, which fact is a clue in differential diagnosis. They usually are slow-growing, well circumscribed, painless, freely moveable masses of varying size and shape, the consistency of the fibroma probably more rubbery and firmer than the lipoma which may, in addition, have a somewhat lobulated outline to palpation.

Mixed tumors of the salivary glands, chiefly the parotid but also the submaxillary, are not uncommon. While the mixed tumors of the parotid, may not, anatomically speaking, be within the realm of tumors of the neck, nevertheless it oftentimes originates in the tail of the gland and presents in the supero-posterior portion of the anterior triangle just beneath the angle of the jaw, those of the submaxillary gland, of course, presenting in the anatomical site of this gland. Like the branchial cleft cysts they may be very slowly growing, reach a stationary period and then later, again enlarge. They may be semi-fluctuant to feel, slightly lobulated and relatively freely moveable but if very sudden, rapid enlargement occurs with a firmer consistency and relative fixation to surrounding tissues the possibility of malignant change must be entertained.

Carotid body tumors are worthy of mention, although I believe one may freely assert that they are rare. They occur at the bifurcation of the common carotid, which they may completely encompass, thus affording extreme difficulty to complete extirpation. They usually occur about puberty as unilateral, slowly growing, smooth, fairly firm, rather deeply situated tumors which are non-productive of any signs or symptoms other than for the presence of a tumor mass. They usually do not attain any great size, probably walnut to pigeon's egg being the average. They belong to the chromaffinoma group such as the pheochromocytoma of the adrenal.

The enlargements of the thyroid gland, whether due to adenomata, Grave's disease or hyperthyroidism and simple colloid goitre with their various signs, symptoms, etc., are so well known that I will not burden you with their repetition here, for the anatomical site, the movement of the mass on deglutition all point to the structure affected, and the diagnosis of the particular type of affection may be established by a number of procedures (basal metabolic rate, blood cholesterol, etc.) However, I should like to mention the so-called Lateral Aberrant Thyroid tumors here. Usually situated in the anterior triangle they occur most frequently in young persons and are entirely separate from the thyroid gland proper. They tend to grow slowly and remain well circumscribed but metastasize to the cervical lymph nodes, in this respect being at variance with the usually malignant thyroid adenomas which metastasize by the blood stream. They are usually unilateral and histologically present a cystic papillary type of structure. Being of a generally low grade of malignancy, their complete excision is curative, uness they have already metastasized.

PRIMARY MALIGNANT TUMORS

As previously mentioned, branchial cleft cysts and mixed tumors of the salivary glands may undergo carcinomatous change or may probably be carcinomatous from the outset. The possibility of this malignant process is suggested by their sudden rapid increase in size, hardness and fixation especially in a patient over 40 years of age.

While sarcoma of the thyroid has been reported it is extremely rare and many authorities are of the opinion that actually, they are more likely to be extremely anaplastic carcinomas, as it is a well known fact that carcinomas of the thyroid may present a variety of bizarre histological pictures in their cellular structure. Carcinoma of the thyroid, however, is not particularly infrequent. Approximately 80-85% of the carcinomas of the thyroid arise in adenomas and there is usually a history of a nodular swelling in the neck over a period of years with often very little symptomatology. This may show sudden, rather rapid increase in size, firmer consistency and may or may not be adherent to adjacent tissues. Symptoms of hyperthyroidism are not infrequently associated. As metastases are haematogenous and usually early the secondary growths may be far afield before the patient seeks medical advice. Diffuse carcinoma of the thyroid may be of medullary, adenocarcinomatous or scirrhous type and in these cases the whole gland may be enlarged, usually rather rapidly and be firm, fixed to surrounding structures, painful quite frequently and symptoms of dysphagia and dyspnoea from tracheal and oesophageal pressure may be present. Surgery and deep X-ray therapy are certainly worthwhile as therapeutic measures especially if the carcinomatous process has not yet permeated into the adjacent tissues. Unfortunately, in the late cases especially, the recurrent laryngeal nerves on one or both sides may be involved by actual tumor invasion necessitating a permanent tracheotomy.

The lymphoblastomas from a very interesting group with generally, very little difference in the appearance in situ and consistency to the palpating fingers can be discerned between the various types—Hodgkin's granuloma, lymphosarcoma, reticulum sarcoma, lymphoid leukaemia, giant follicular lymphoma or lymphoblastoma and I believe, infectious mononucleosis should be mentioned in this category, although, it is not a neoplasm but an inflammatory process. However, it can be more easily discussed in the differential diagnosis in this group.

There may be unilateral or bilateral enlargement of the lymph nodes in both triangles and they are usually discrete as opposed to the matting together of the tuberculous nodes. Usually painless and not tender. There may be some degrees of pyrexia, notably in Hodgkin's granuloma and infectious mononucleosis—in the former of the Pel-Ebstein type, i.e., lasting a few days with an afebrile period of one to two weeks intervening. In infectious mononucleosis, diagnostic points are the almost absolute lymphocytosis of generally not more than 20,000 lymphocytes per cmm., with varying numbers of large monocytic cells noted in the blood smears and the heterophile antibody or Paul-Bunnell reaction and the process is usually initiated with a fairly severe sore throat.

A white blood cell count and smear will also be of diagnostic assistance in lymphoid leukaemia in differential diagnosis from other cervical masses and here the count may range from 50,000 to 1,000,000 or even more with a predominance of immature lymphocytes. However, in the terminal stages of lymphosarcoma, a leukaemic blood picture may present.

The giant follicular lymphomas may present the greatest lymphadenopathy and their histological character apart from the marked hypertrophy and hyperplasia of the lymphoid follicles is not particularly atypical. Despite this fact and their relatively slow growth, however, they eventually resolve into a frank lymphoblastoma of one or other of the malignant lymphoblastomas. They are highly radio-sensitive. Probably the most expedient aid in diagnosis is the excision of one of the larger lymph nodes for histological examination but even here the pathologist is often hard put to it to arrive at a dogmatic diagnosis in the early stages of the disease.

SECONDARY TUMORS

Secondary tumors or metastases to the cervical lymph nodes may originate from a great many immediate or adjacent primary growths such as the lip, tongue, larynx, oesophagus, epiglottis, pharynx, naso-pharynx, thyroid, buccal and alveolar mucous membranes to mention a few, while carcinoma of the stomach frequently metastasizes to the left supraclavicular nodes—the so-called Virchow's gland and bronchogenic carcinoma and indeed, carcinomas of more distant organs such as testis, uterus, ovaries and cervix, etc., are, with a fair degree of frequency, found to metastasize in this site. The lymphoepithelioma of the pharynx metastasizes early to the cervical nodes and probably the largest secondary growth of all this group are produced by the transitional cell carcinomas of the naso-pharynx and nasal accessory sinuses and the squamous cell carcinoma of the pyriform sinus or fossa of Rosenmueller, the primary growth in this latter instance often being so small as to be overlooked on more than one examination at the hands of experienced specialists.

In conclusion, I must apologize for my effrontery in presenting such a hackneyed subject. However, I do feel that, in an anatomical site, small though it may be, where so many pathological processes may arise and are presented almost daily to the physician in his routine practice, reiteration of some of the salient features of these tumor masses might not be amiss.

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THE SOCIAL BURDEN OF MENTAL DISEASE

By WM. C. GIBSON, M.D.,
Director of Research, Mental Hospital of B.C.,
Given at Vancouver Institute, February 4, 1950.

Almost one hundred years ago a patient at the Glasgow Royal Infirmary for Lunatics wrote: "Lunacy, like the rain, falls upon the evil and the good; and although it must forever remain a fearful misfortune, yet there may be no more sin or shame in it than there is in an ague fit or a fever." It is with the assumption that my audience tonight has arrived at this enlightened view of mental illness that I venture to discuss the social and financial burden which it currently represents. I stress the term "social" lest anyone think it is not his burden. As I hope to show you, it is a heavy burden, borne .collectively, and much heavier, borne individually.

At the outset I want to define the problem. Then I want to break it down into units which we can comprehend, and finally, I will deal with some of the solutions to the problem, which we may use.

Every ten-year period in Canada sees the known expenditures of one-half billion dollars on mental illness, from public treasuries. From the private pockets of individuals, whose number is uncounted, a like sum is probably spent. This figure stuns us, possibly,

owing to the immensity of the sums of money involved. How many of us realize that we have as many mental hospital beds as general hospital beds in Canada? Five cents out of every tax dollar in British Columbia goes to combat mental illness. And yet we know that is not enough. (New York State spends one-third of its total operating budget on its psychiatric institutions.)

British Columbia has a special problem to face in this field, i.e., the mental diseases attributable to an increasing life expectancy. Between the years 1940 and 1980, Canada's population over age 65 is going to double. British Columbia today has a disproportionately high number of citizens in this age group, and by 1980 we will be swamped unless we start medical and social research on this group soon. Whereas a person will die when his heart or kidneys give out, he will not necessarily die when his brain ceases to function normally, with the result that such a person becomes a burden to himself, to his family and to society. The increasing cost of old age pensions and geriatric care means that the incidence of the tax load in 1980 upon a proportionately reduced labor force, will be very heavy, unless we find means to prevent or reduce cerebral arteriosclerosis.

American experience is similar to our own. Each year the public treasuries pay out for mental illness, through the State Hospitals and Veterans Hospitals, over $200,-000,000. The additional cost for private cases is unknown. The cost to the community in labor lost, in jail costs and in social disruption is incalculable. It is known, however, that there is one mental incompetent per 250 American people, which averages out at one per sixty families—*counting only those committed to mental hospitals.* For every person inside a mental hospital, there is one on the outside in need of treatment or care. One out of every 17 Americans is going to spend some time in a mental hospital. There are now 1,000,000 children in American elementary schools who are destined to spend some time in mental hospitals. It is little wonder, then, that in dollars and cents alone, the American bill exceeds one billion dollars annually. It represents a *total* loss at present.

In wartime it is possible to get exact figures as to mental disability in a finite group of men. For instance, we know that each psychiatrically disabled veteran of World War I had cost the U.S. government, up to the time of Pearl Harbor, $30,000, or a total of one billion dollars for the whole group. At that time 27 of the Veterans' Administration's 90 hospitals were reserved for neuropsychiatric cases.

In World War II the situation was staggering. The Director of the Selective Service System, Major General Hershey, summed it up thus: 4,800,000 men were reviewed by draft boards and of these 1,700,000 were found unsuitable for induction into the armed services for neuropsychiatric reasons. From those who actually were taken into the army a final total of 500,000 men was discharged for neuropsychiatric reasons. These discharges were not solely due to combat, as witness the fact that by 1944, 80 per cent of the discharged cases had never been inside a combat zone.

Since hostilities ended, the air has been blue in the United States on the subject of unpreparedness for these heavy psychiatric casualties. Johns Hopkins Medical School's famous medical researcher on the sulfa-drugs, Perrin Long, has made an illuminating survey of the records of an American General Hospital in the North African-Mediterranean theatre. Professor Long was sent to this theatre as its medical consultant. In reviewing the 70,365 admissions to one general hospital over a 25-month period, he uncovered the fact that 45 per cent of the cases were neuropsychiatric—and the worst part of it was that such a hospital was entitled, in its establishment, to only two neuropsychiatrists! A further survey of eight U.S. divisions landing on D-Day showedthat, for the succeeding two months one out of every two medical admissions was psychiatric in type. Be it said to the great credit of the doctors doing psychiatry in that area, that they were able to return 65 per cent of their cases to duty in the field, as against 60 per cent for the medical cases and 9 per cent for the surgical.

These, then, are the broad outlines of the problem. Now for the details of some of the contributing causes. Environmental and personal maladjustment *per se* are undoubtedly the cause of a great deal of unhappiness and neurotic behaviour in the

world, but they do not fill the mental hospitals. It is the grossly psychotic, the feeble-minded and the deteriorated epileptics who must be committed. It is a waste of valuable time to chronicle the day to day maladjustments of these latter cases, for the cause lies far back of mere symptoms—it is in many cases biochemical or developmental in the embryological sense of the term.

There is a no-man's land lying between organic and environmental mental illness in children. I refer to the group of cases loosely called "the behaviour disorders". It has been shown recently that many of these children have grossly abnormal brain waves, as demonstrated by the electroencephalograph. There is also a much misunderstood group of children, those with reading and writing problems, as the result of some cerebral dysrhythmia. These children, by the nature of their brain function, cannot use their temporal lobes or have damaged or malconstructed temporal lobes. We do nothing but manufacture truants among these children by blindly trying to force formalized education upon them. They cannot read because they do not get the same stimuli as normal children relayed from their eyes and ears, often because the "circuits" are "busy" within the brain.

This brings us to a brief consideration of epilepsy as a neurological problem. It is not a mental disease, although epileptics who have gone untreated for long periods will so deteriorate mentally that they may need to be committed. One American in every 200 is an epileptic. This does not mean that each epileptic has overt, thrashing seizures. Some may have no more than fleeting well-formed hallucinations. Some will hear a little tune, or an odd sound, or may experience a little dream. Some will pace the house doing quite complicated things without any knowledge of it subsequently. Birth injuries, brain scars, brain tumors or cerebral infections may be the cause of these deviations from normal. Once recognized these cases may be helped in a truly marvellous manner. Research into anti-convulsant drugs has yielded such results that the future of many epileptics has changed from darkness to light. Some less fortunate, find themselves in conflict with the law at time, and for lack of understanding, medically, they join the already large group of delinquents which cost the country so much.

Now as to delinquency, and what it costs us. The best Canadian data are to be found in the Archambault Report, arising from the Royal Commission of 1938. This is the most forthright report I have ever read, and had it cost $5.00 instead of $1.00 it might well have become a "best seller".

The report gives detailed cost figures on a group of 188 recidivists, who have been convicted a total of 3,434 times, or an average of 19 times per man. The cost of convicting these delinquents was $18,005 each, or a total of $3,250,960. Add to that the cost of institutionalizing these citizens, averaging three years in reformatories or jails, and eleven years in penitentiaries, and we find that the taxpayer has paid out $25,453 for each of them. This is a dead loss too. Place over against this the cost to the state of educating a child from age 6 to age16 — a mere $1,000; and you will soon see the costliness of delinquency devoid of effective rehabilitation. The comparison is doubly relevant in that 32 per cent of the 188 recidivists were convicted of their first offence at the age of 16 years or less! Less than two per cent of the 188 men ever finished high school. Only 12 per cent ever went to high school. And lest anyone clings to the quaint notion that the 188 "*must* be foreigners," may I say that 83 per cent of the group were Canadian born.

Another social cost of mental illness manifests itself in the problem of alcoholism. New York State, with a population of 13,000,000, has 280,000 excessive drinkers, 70,000 of them chronic alcoholics. An excellent survey was made in the city of Buffalo for the year 1940-41, covering Erie County, whose population was approximately 800,000. In that year 7,280 alcoholics (or one person in every 110 approximately) were either apprehended, convicted or hospitalized at public expense, the total cost being $162,616. The social cost apart from dollars and cents, and the loss of productive labor which this disease entailed, must be added to this figure.

Habituation to drugs is another mental illness which costs us, as taxpayers, a great deal of money. The crime associated with drug addicts' attempts to get money for drugs by strongarm methods is well known in most large cities.

The solutions to these expensive problems are beginning to dawn upon us. Once we see in psychiatric treatment an active force, rather than a custodial technique, we have set out upon the right road. Our watchword must be, "spending to save". Custodial methods of dealing with mental hospital cases, with delinquents, alcoholics, drug addicts, chronic truants and epileptics, have failed to halt the rising tide of illness, which the taxpayer is called upon to finance. The new outlook in this vast field is epitomized in the recently opened Crease Clinic at Essondale. There, early diagnosis and early, active treatment, are available to any resident of British Columbia. I know of no other part of Canada in which such facilities are available to such a large group of mentally ill people, in the early stages, and of few in the United States. A total of three hundred patients, many of them voluntary (i.e. not committed cases) can be housed in the Crease Clinic for a period not exceeding four months. Within ten years this clinic will have more than paid for itself, through early diagnosis and treatment, and through positive rehabilitation of the patients.

Mental hygiene has a great deal to offer, and properly practised, will save B. C. untold financial and social losses later. It has long seemed to me that with most of B.C.'s teachers passing through our university for some part of their training, we have a natural bottleneck here at which to work. If all teachers-in-training could be taught to recognize the incipient signs of mental disturbance in their pupils we would soon have an adequate reporting system, and truly "preventive psychiatry" could be established here. On an even broader scale, *all* students, whether in law, theology, medicine, engineering or what not, would be more useful citizens if they could be given an orientation course in mental health..

Finally, what hope does research in mental disease offer to the community? Perhaps we should ask first, "What does the community offer to research?" The figures are unbelievable! In the United States, for every dollar spent on scientific research into mental disease, $65 is spent on other medical research, and $2,500 on industrial research! In Canada the amount spent in mental research is infinitesimal. And yet the annual cost to us of mental disease is $100,000,000. With Ottawa grants, it is hoped to field teams of researchers, who can devote all their energies to these problems in research and teaching centres. The recent discoveries in endocrinology, or the hormone ACTH, and the synthesis of cortisone, offer very important tools to us in this field. Radioactive tracers and electron microscopes have further widened the field, which must now be stocked with trained researchers. Epilepsy has been brought out of the Dark Ages within the last twenty years, thanks to new methods of electrical recording from the exposed human brain in patients who trust the skill of a neuro-surgeon. Synthetic drugs have been developed for the control of convulsive seizures, and the search goes on for agents which will help children with cerebral dysrhythmias.

In the field of schizophrenia—still the largest single mental disease—we have learned more in the past 25 years than in all history, thanks to well-planned and generously sponsored research. For the fifteen years, 1920-1934 alone, almost 1,800 medical papers were published on this single disease.

The most useful physical treatments in psychiatry—electro-convulsive therapy, insulin shock therapy, and fever therapy—are all empirical to date. If we knew how they aided the patient, we might generalize from them or greatly increase their value, and possibly develop improved variants of them. Electroconvulsive therapy was developed as the result of an incorrect theory—which was that epileptics, because of their seizures, rarely developed schizophrenia. Insulin shock therapy was developed for the treatment of chronic alcoholics, and only incidentally was it found to help schizophrenics. Fever therapy for syphilis of the nervous system developed from a very astute observation by a German medical officer in the Balkans in the First World War, that his patients with

G.P.I. improved greatly if they contracted malaria. Penicillin, of course, combined with fever, has produced good results in a large proportion of these cases.

Research is crying out to be done at the cellular level, though to administrators harassed by relatives of patients, the thing may sound ridiculous. I am reminded of the statement of Sir Walter Morley Fletcher when he was Secretary of the British Medical Research Council. He said, "If I had $5,000,000 to spend on medical research I should employ it in developing particular applications of primary physiology and biochemistry which would assuredly bear fruit later on. The new method, a new clue that has helped to conquer a disease, again and again emerged from a study of something else."

To pool the resources of a group of researchers in the biological and the social sciences is our hope here. I am convinced that in a university setting, where people are encouraged to enquire, we will be able to elucidate some of the abysmally dark sections of the problem.

I can only conclude, with Raymond Pearl, that "If there are difficulties in the subject, there are also great opportunities and promise; and furthermore there is a kind of moral necessity to go forward in the attempt to get a better understanding of the whole nature of man lest he perish."

• • • •

HYPOTHYROIDISM AND MYXOEDEMA

D. MOWAT, M.D.

These two terms have come to be synonymous but actually they are not. Hypothyroidism can exist without myxoedema, it is described in articles on the subject but clinically it is most difficult to recognize because its signs and symptoms are indefinite and varied. One author states that in most cases when it is diagnosed it is a misnomer. Myxoedema is a form of hypothyroidism with characteristic signs and symptoms.

Manifestations of myxoedema vary according to the age of the patient but in this paper only the adult form will be discussed. A classification of the disease according to its etiology is as follows:—

A. *Myoedema with Goitre.*

1. *nodular*—actually this is more likely the result of myoedema than the cause.
2. *diffuse*—enlargement due to various forms of chronic thyroiditis or specific infections.
3. *hyperplastic*—spontaneous cessation of Grave's disease, or the gland rendered inactive by X-ray, iodine, or thiouracil.

B. *Myxoedema without Goitre.*

1. *primary*—congenital absence of the gland, idiopathic atrophy, post-operative or post-radiation effects.
2. *secondary*—pituitary tumour or destruction.

By far the commonest cause is idiopathic atrophy, the etiology of which is entirely unknown.

Women are affected from 4 to 8 times as frequently as men. The highest incidence is between the ages of 30 to 50. The onset is insidious and gradual. Occasionally there appears to be a relationship between the onset and pregnancy, menopause or an acute infection. The disease occurs all over the world, but is more prevalent in goitrous regions. Some authors claims there is a familial tendency.

The symptoms of myxoedema may be divided into two groups. Those appearing early such as increase in weight, decrease in sweating, increase in susceptibility to cold, dryness and coldness of the skin, and a sensation of chilliness even in moderate temperatures, can be directly attributable to the lowered B. M. R. The later and more pronounced symptoms such as the non-pitting edema, fatigue, mental dullness, slowing of speech and muscular movements, memory loss, constipation, falling of hair, menstrual disturbance (more often menorrhagia than amenorrhoea), deafness, thickness and smoothness of the tongue, sluggishness of the reflexes, hoarseness, various sensory disturbances are specific manifestations of thyroid defiiciency.

The B. M. R. may be from low normal to 45%, lowered B. M. R. from other causes will not give this symptom complex. Hypercholesterolaemia is characteristic but not pathognomonic or necessary. A decreased urine volume is seen and albuminuria is common. The reason the patient first seeks medical aid may be because of anaemia which may be of normochromic, hyperchromic or hypyochromic variety. Other changes found are, lowered fasting blood sugar, decreased blood iodine levels, increased blood viscosity and gastric anacidity. Some authors describe an increased capillary fragility to which they ascribe the cause of the oedema, but this certainly requires confirmation.

If the condition remains untreated it becomes progressively more severe over a period of 10 to 15 years, death usually occurring from some intercurrent infection.

The treatment of spontaneous myxoedema requires very small doses of thyroid. Larger doses as given initially in the past should not be administered, as fatalities have

occurred. One quarter to one half a grain of thyroid daily is the usually accepted initial dose. The patient should be carefully watched and frequently checked during the initial stages of therapy. Extra caution is required if the disorder is of long standing or when it occurs in older patients. If the initial dose causes anginal pain or any evidence of cardio-vascular discomfort then it should be reduced and maintained at that lower level for two months before attempting to increase it. At weekly or longer periods the daily dose is gradually raised to 1 to 2 gr. which is usually sufficient to maintain the patient in normal health.

Treating the anaemia depends on what type is present. Thyroid and iron will control the normochromic or hypochromic anaemias, but liver extract may be required for the typerchromic form.

There are several reasons why the treatment may be partially or completely ineffectual.

1. Using a non-potent brand of drug.

2. Initiating therapy when the disease is far advanced and permanent changes have occurred.

3. Lack of cooperation on the part of the patient either per se or because at one time the patient has carelessly taken an overdose of the drug.

4. If the myxoedema is secondary to hypopituitarism. In this case the condition does not respond as well to thyroid alone and co-administration of anterior pituitary extract is probably necessary.

Myxoedema is frequently said to cause or assist various degenerative diseases such as arteriosclerosis but this is difficult to prove or disprove because they both commonly begin at about the same age. However, myxoedema is certainly not incompatible with life. The first patient to be treated with thyroid and who maintained her treatment for over 52 years, died 4 to 5 years ago from hypertension and pneumonia at the age of 92.

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News and Notes

This month the internes of Vancouver hospitals will take diverse paths into the medical world.

THE VANCOUVER GENERAL

Dr. George Peircey will enter General Practice at Trail, B.C.

Dr. Eric Smith will study ophthalmology at the Montreal General Hospital.

Dr. Robert Walton will become assistant resident in dermatology at Stanford University Hospital in San Francisco.

Dr. W. A. Davies will enter general practice at Invermere.

Dr. G. Marion will take a year in medicine at Queen Mary Hospital in Montreal.

Dr. George Burton will practice at Yarmouth, N.S.

Dr. John Woods will commence general practice at Dauphin, Manitoba.

Dr. R. Hitchen will study obstetrics in Honolulu.

Dr. R. E. Beck will continue his internal medicine course at the Royal Victoria in Montreal.

Dr. Glen Ankenman and *Dr. D. A. Boyes* will conduct a joint practice at Ganges Harbour on Salt Spring Island.

Dr. C. A. MacLean will study medicine at the Royal Victoria Hospital.

Dr. Michael Turko will also study obstetrics at the Royal Victoria.

Dr. Lois Crawford will undertake anesthesia at Shaughnessy Hospital.

Dr. T. R. Osler and *Dr. E. F. Weir* will continue in surgery and medicine at the Vancouver General.

Dr. Helen Martin will enter general practice at Prince Albert, Saskatchewan, and plans to be married late in the summer.

Dr. W. D. Panton will do General Practice at Hope.

Dr. J. D. Blaine will do a year of general practice at Val Marie, Saskatchewan, before continuing surgical studies.

Dr. Don Oakley and *Dr. M. H. Wong* will commence anesthesia studies at the Vancouver General Hospital.

Dr. E. A. Johnson will return to his hometown of Smith Falls, Ontario.

Dr. J. W. Evans will continue the Vancouver General Hospital obstetrics and gynecology.

Dr. J. S. Kennedy and *Dr. R. Kennedy* will practise at Climax, Saskatchewan.

Dr. A. E. Robertson will do staff medicine at Tranquille.

Dr. L. Friesen will take a year in Surgery at Shaughnessy Hospital.

ST. PAUL'S HOSPITAL

This year many of the junior internes will remain as seniors to form the first group of residents.

Dr. Leonard A. Maher will be on pediatrics.

Dr. Patrick Doyle will be on medicine.

Dr. Clarence Chouinard will do surgery.

Dr. Robert McNaughton will be on Obstetrics and Gynecology.

Dr. Joseph Petriw will continue a rotating internship.

Dr. Jack Tufteland will step into general practice in Vancouver.

To Shaughnessy Hospital will go *Drs. Stephen P. Murphy* as surgeon and *Dr. William T. Armstrong* as internist.

Dr. L. Y. Chou will study pediatrics at Johns Hopkins.

Dr. J. R. Wynne will join the R.C.A.F. at Edmonton.

Dr. Donald F. Fletcher will go to Hamilton General Hospital in the department of medicine.

Dr. John A. Raragosky will do surgery at the University Hospital in Edmonton.

Dr. Philip C. Fitzjames will work for the National Research Council at London, Ontario.

* * * *

Dr. F. M. Auld of Nelson was made an honorary senior member of the CMA at the convention in Halifax.

Dr. G. J. Wherrett said in Vancouver last month that the TB rate in Canada will probably decrease by half in the next 25 years.

Dr. R. W. Boyd of Vancouver has been elected president of the Pacific Northwest Radiological Society and *Dr. Fred Bonnell* of Victoria is a vice-president.

Dr. Hugh Brown of Vancouver will become PHO at Prince George after a holiday in Victoria.

Dr. G. M. Foster of Vancouver has retired from active practice

BIRTHS

Dr. and *Mrs. John McCaffrey* of Vancouver, a son.

Dr. and *Mrs. A. A. Larsen* of Nanaimo, a son.

Dr. and *Mrs. L. A. Patterson* of Vancouver, a son.

Dr. and *Mrs. N. L. Auckland* of Vancouver, a daughter.

Dr. and *Mrs. J. L. McMillan* of Vancouver, a son.

Dr. and *Mrs. Harold Caple* of Vancouver, a son.

Dr. and *Mrs. E. M. Stephenson* of Vancouver, a daughter.

Dr. and *Mrs. E. F. Word* of Vancouver, a son.

The following were the B. C. representatives who attended the Annual Meeting of the Canadian Medical Association in Halifax, held June 19th to 23rd:

Doctors J. C. Thomas, J. A. Ganshorn, Lynn Gunn, E. C. McCoy, R. A. Stanley, Frank Turnbull, G. L. Watson, E. O. DuVernet, D. B. Collison, B. Blair, F. P. Patterson, A. W. Bagnall, J. A. Cluff, D. E. H. Cleveland, all of Vancouver; Doctors F. M. Bryant and H. M. Edmison, of Victoria; Dr. C. C. Browne, Nanaimo; Dr. F. M. Auld, Nelson; Dr. W. L. Chisholm, Port Alberni; Dr. E. J. Ryan, Essondale; Dr. Ryall, Smithers; and Dr. G. K. McNaughton, Cumberland.

Dr. D. M. Whitley of Victoria has left for England and Scotland where he will reside for some time.

Dr. G. E. Singer who has completed his internship at St. Joseph's Hospital, Victoria, is taking up practice in Queen Charlotte Islands.

Dr. Donald R. Johnston has left Victoria for Niagara Falls.

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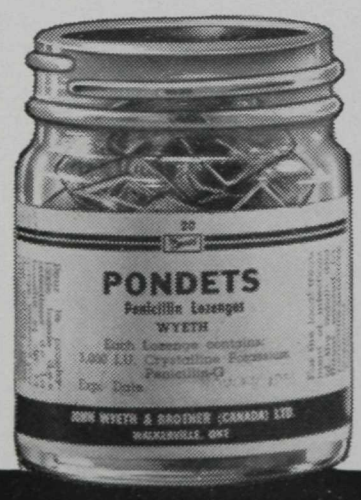

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