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The BULLETIN

of the

VANCOUVER MEDICAL ASSOCIATION

Vol. XV. JUNE, 1939 No. 9

With Which Is Incorporated
Transactions of the

Victoria Medical Society

the

Vancouver General Hospital

and

St. Paul's Hospital

In This Issue:

OLFACTION
CARCINOMA OF THE CERVIX
NEWS AND NOTES

V. M. A. SUMMER SCHOOL, JUNE 6-9, 1939, INCL.

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THE VANCOUVER MEDICAL ASSOCIATION

BULLETIN

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

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

EDITORIAL BOARD:

DR. J. H. MACDERMOT

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

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

Vol. XV. JUNE, 1939 No. 9

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VANCOUVER HEALTH DEPARTMENT

STATISTICS, APRIL, 1939

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

	Number	Rate per 1,000 Population
Total deaths	214	9.9
Japanese deaths	8	10.9
Chinese deaths	11	17.3
Deaths—residents only	186	8.6
BIRTH REGISTRATIONS:		
Male, 191; Female, 195	386	17.8

INFANTILE MORTALITY:	April, 1939	April, 1938
Deaths under one year of age	11	9
Death rate—per 1000 births	28.5	26.8
Stillbirths (not included in above)	10	8

CASES OF COMMUNICABLE DISEASES REPORTED IN THE CITY

	March, 1939		April, 1939		May 1st to 9th, 1939	
	Cases	Deaths	Cases	Deaths	Cases	Deaths
Scarlet Fever	21	0	22	0	7	0
Diphtheria	3	0	0	0	0	0
Chicken Pox	119	0	59	0	32	0
Measles	6	0	0	0	7	0
Rubella	2	0	2	0	1	0
Mumps	2	0	18	0	14	0
Whooping Cough	127	1	129	1	86	0
Typhoid Fever	2	1	0	0	0	0
Undulant Fever	1	0	0	0	0	0
Poliomyelitis	0	0	0	0	0	0
Tuberculosis	27	13	28	9	9	--
Erysipelas	4	0	1	0	1	0
Ep. Cerebrospinal Meningitis	0	0	0	0	0	0

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

	Burnaby	West Vancr.	Richmond	North Vancr.	Vancr. Clinic	Hospitals, Private Drs.	Totals
Syphilis	0	0	1	0	34	18	53
Gonorrhœa	0	0	0	0	50	7	57

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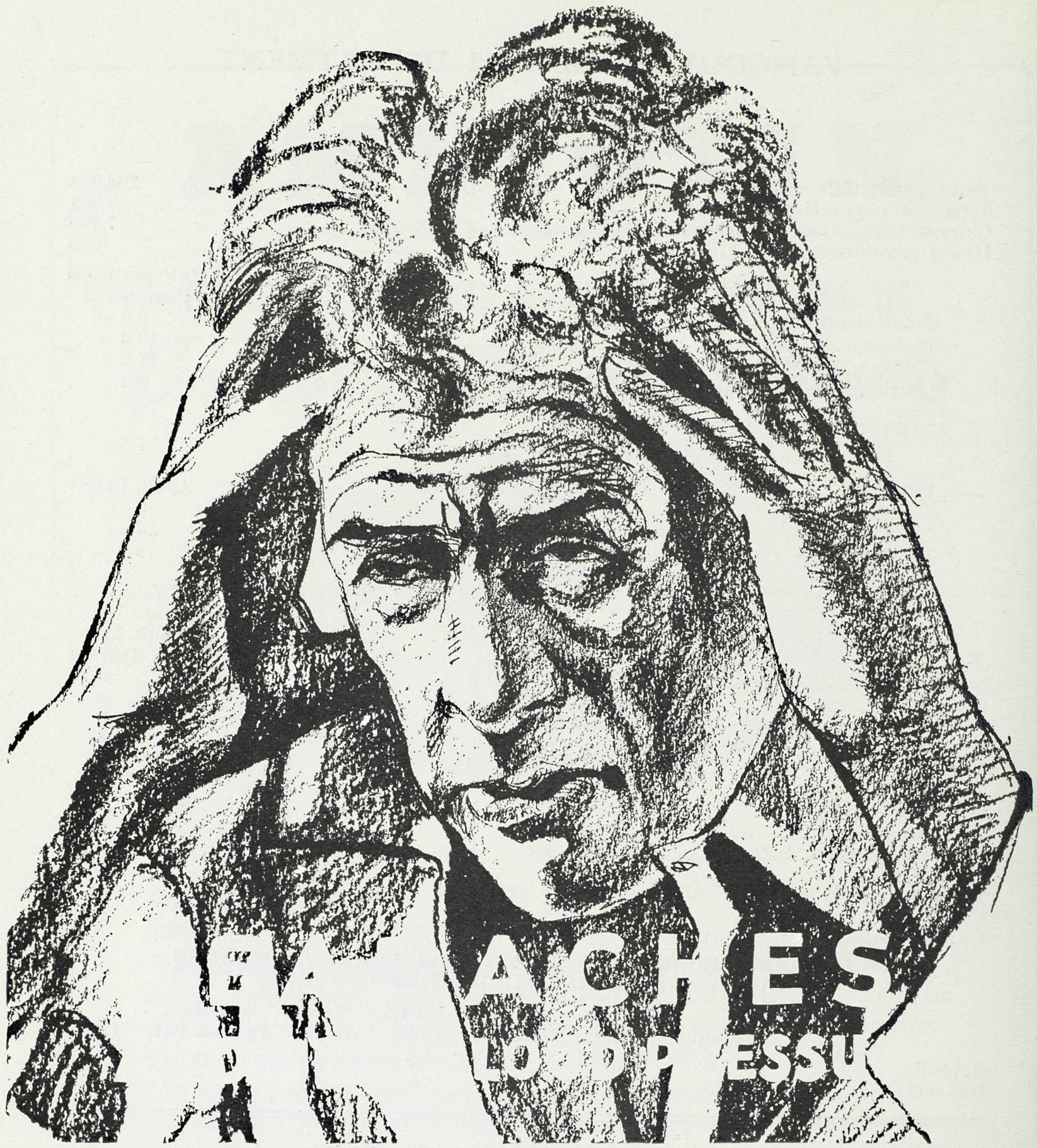

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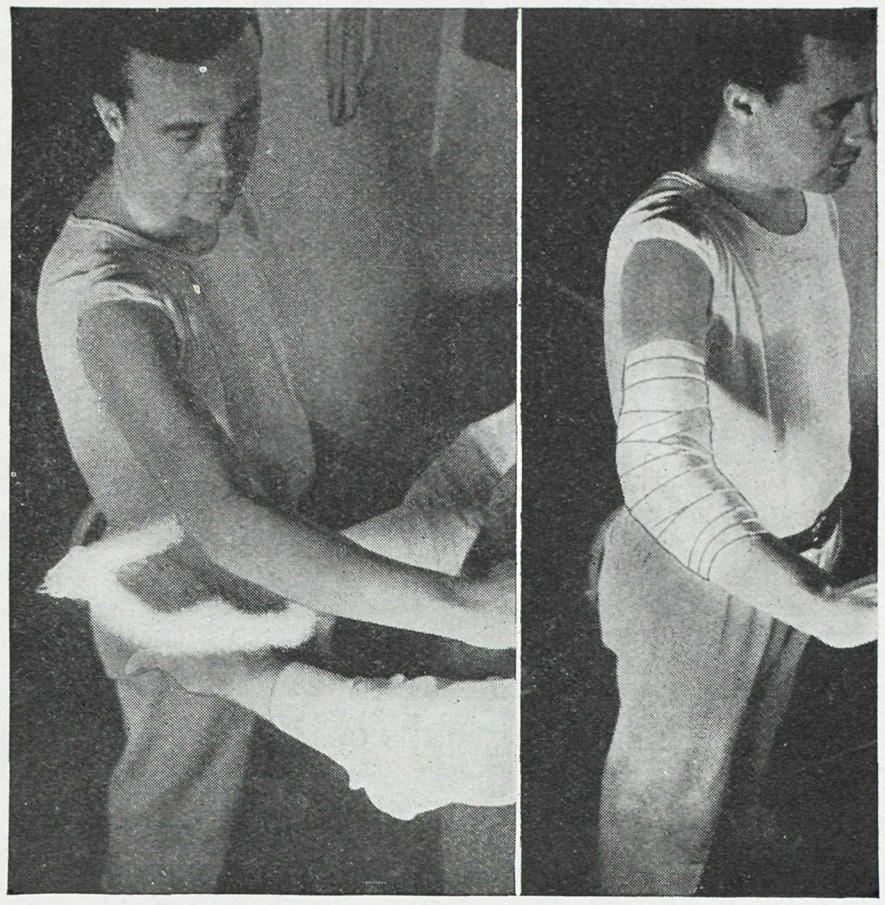

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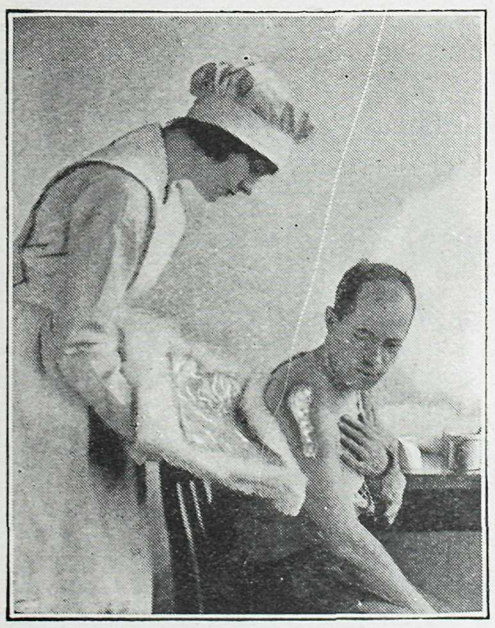
MANY physicians and surgeons have given enthusiastic expression to the use of Antiphlogistine as a surgical dressing. Wounds, such as abrasions and contusions tend to do unusually well under its use. An inhibitory antiseptic, exerting a tonic action on the capillaries, it aids the healing process, protects against further injury and helps to prevent any infection, inherent in a wound, from becoming a major one. It does not cause pain on application.



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PROVISIONAL SUMMER SCHOOL PROGRAMME
VANCOUVER MEDICAL ASSOCIATION
June 6th to 9th, 1939

TUESDAY, JUNE 6TH.

9:00 a.m.—Dr. Dwight L. Wilbur: Recognition and treatment of vitamin deficiency diseases.
10:00 a.m.—Dr. Mathe: Diagnosis and treatment of perirenal infections.
11:00 a.m.—Dr. Conn: Abortion from the endocrine and clinical viewpoint.
12:30 p.m.—LUNCHEON: Speaker, Dr. F. R. Menne: "The Physician in Relation to the Solution of Crime."
Afternoon—Clinic.
8:00 p.m.—Dr. Holman: Recognition and treatment of peripheral vascular diseases.
9:00 p.m.—Dr. Menne: Bronchogenic carcinoma.

WEDNESDAY, JUNE 7TH.

9:00 a.m.—Dr. Menne: Diseases of the thyroid.
10:00 a.m.—Dr. Holman: Carcinoma of the Stomach.
11:00 a.m.—Dr. Conn: Prolapse of the Uterus. Medical and Surgical treatment.
Afternoon—Clinic.
8:00 p.m.—Dr. Wilbur: Nervous indigestion.
9:00 p.m.—Dr. Mathe: Present day status of the treatment of prostatic hypertrophy.

THURSDAY, JUNE 8TH.

9:00 a.m.—Dr. Mathe: Conservative renal surgery.
10:00 a.m.—Dr. Menne: Modern concept of renal tumours.
11:00 a.m.—Dr. Holman: Important considerations in the technic of herniorrhaphy.
Afternoon—Golf Tournament.
8:00 p.m.—Dr. Conn: Induction of labour.
9:00 p.m.—Dr. Wilbur: Management of patients with chronic nervous exhaustion.

FRIDAY, JUNE *9th.*

9:00 a.m.—Dr. Wilbur: Headaches from an Internist's point of view.
10:00 a.m.—Dr. Mathe: Treatment of gonorrhœal urethritis.
11:00 a.m.—Dr. Conn: Treatment of non-convulsive toxæmias.
Afternoon—Clinic.
8:00 p.m.—Dr. Menne: Thrombotic embolism.
9:00 p.m.—Dr. Holman: Pre-operative and post-operative care of surgical patients.

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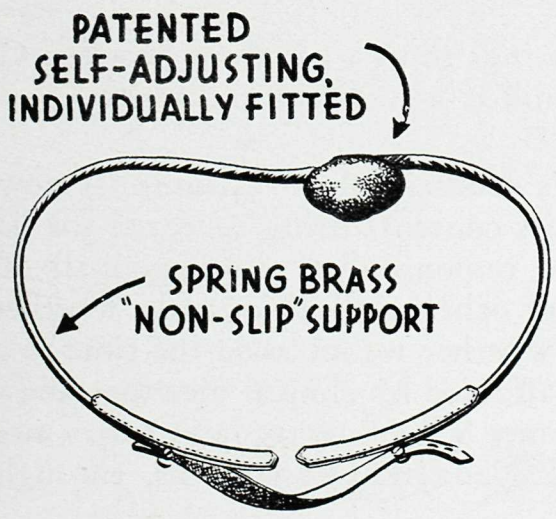

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THE EDITOR'S PAGE

MEDICAL EDUCATION IN BRITISH COLUMBIA

There is no medical department in the University of British Columbia. We might bewail the fact, pointing out that several cities in Canada, smaller than Vancouver and with comparatively small stores of clinical material, are the homes of medical schools.

Vancouver, nevertheless, can claim to be a seat of medical education, without having any formally designated schools of undergraduate or postgraduate instruction. The Vancouver General Hospital is not only the largest hospital in British Columbia; it is the largest in Canada in respect of bed capacity. It is doubtful if any other hospital in America is so completely a *general* hospital as the Vancouver General. With the exception of mental disease (and it must not be forgotten that there is a psychiatric observation ward, and a psychiatry department in the outdoor dispensary), every other department of medicine and surgery is accommodated in the blocks of buildings occupying the General Hospital. These include Tuberculosis, Venereal Disease, Contagious Diseases, Cancer, Maternity, and Infant Hospital units.

This exceptional opportunity for graduate instruction and training attracts to its residential staff yearly graduates from leading Canadian and other Universities. There is also a constant attendance in the various department of practitioners who find their needs for refresher work well supplied. The members of the attending staff recognize as a part of their duties the superintendance and instruction of the internes. In the monthly staff clinical meetings, the weekly ward rounds and clinico-pathological conferences, these latter not only attend but take an active part in the preparation and presentation of clinical material.

A very important medical educational activity is the Annual Summer School of the Vancouver Medical Association. At a comparatively trifling cost to each of those attending, lectures and clinics are presented by eminent authorities and teachers from leading Canadian and American Medical Schools over a period of four days. As we have already pointed out, clinical facilities are of the best, and on more than one occasion visiting clinicians have expressed themselves astonished at the wealth of material placed at their disposal.

The programme for this year's Summer School brings to us a list from Western Canadian and American universities, whose names are familiar as teachers and writers.

The BULLETIN itself is one of British Columbia's educational institutions. It now has an accepted place in the world's medical literature, its contents being accepted for listing in the *Cumulative Medical Index*. We feel that a responsibility rests upon all of us, whether we write for publication in the BULLETIN or other medical journals, whether we teach in the hospitals which have resident staffs, or whether we set aside the time to avail ourselves of the instruction and mental stimulation afforded by clinical meetings and conferences at hospitals, and more especially at the Summer School, to recognize that medical education is actively carried on in British Columbia, and that it is of us, through us, and by us.

D. E. H. CLEVELAND, M.D.

THE BULLETIN OF THE VANCOUVER MEDICAL ASSOCIATION
on behalf of the Medical and Hospital organizations it represents,
wishes a heartfelt greeting of

Welcome to Their Majesties

God Save the King

NEWS AND NOTES

Dr. and Mrs. W. J. Knox of Kelowna spent a few days in Vancouver to attend the graduation of their son Bob from University of British Columbia. Dr. Knox called at the office while in Vancouver.

* * * *

Dr. and Mrs. L. A. C. Panton of Kelowna motored to Vancouver to attend the graduation of their daughter Mary from the Vancouver General Hospital.

* * * *

Dr. W. H. Moore of Victoria paid a flying visit to New York, Montreal and Toronto. While travelling between Fort William and Kenora he assisted with a maternity case.

* * * *

Dr. D. M. Baillie of Victoria spent about three weeks of April on a motor trip through California.

* * * *

Dr. W. Allan Fraser of Victoria attended the recent meeting of the Western Branch of the American Urological Association, held in Del Monte, California.

* * * *

Drs. G. A. McCurdy and D. B. Roxburgh of Victoria attended a recent meeting of the Northwest Pacific Society of Pathologists, held at Portland, Oregon.

* * * *

Dr. M. R. Caverhill of Victoria was married in Vancouver to Miss Verna Tucker, a graduate of Vancouver General Hospital. Dr. and Mrs. Caverhill are spending their honeymoon on a motor trip to up-island points. They will reside in Victoria.

* * * *

Dr. and Mrs. J. S. Daly of Trail are receiving congratulations on the birth of a daughter.

* * * *

Dr. C. M. Bennett of Nelson is doing post-graduate study at Rochester, Minn.

* * * *

Dr. C. A. Drummond of Ashcroft was appointed Medical Health Officer and School Health Inspector for Ashcroft and District.

* * * *

Dr. A. C. McCurrach of Blue River was appointed Medical Health Officer and School Health Inspector for Blue River and District.

* * * *

Dr. G. F. Young of Salmo was appointed Medical Health Officer and School Inspector for Salmo and District.

* * * *

Dr. Alan Beech of Salmon Arm was appointed Medical Health Officer and School Health Inspector for the district surrounding Salmon Arm.

* * * *

Dr. R. W. Garner of Port Alberni is home from this trip to Chicago and Rochester.

* * * *

Dr. W. J. S. Millar of Vancouver was relieving during Dr. Garner's absence.

* * * *

Dr. and Mrs. M. G. Archibald of Kamloops are at present holidaying in the East, attending the graduation exercises of their son, William Stanley Archibald, from McGill University. Dr. Archibald is also doing some post-graduate work.

* * * *

Dr. Neil Alexander Stewart of Whitehorse and Miss Verna Margaret (Peggy) Vandervoort, R.N., were united in marriage on May 2nd. They have returned to Whitehorse with the best wishes of their friends.

Congratulations are extended to Dr. .and Mrs. G. H. Francis of Pioneer Mines on the birth of a daughter on May 18th.

* * * *

Dr. W. S. Kergin of Premier will be relieved by Dr. H. Ostry during three weeks' absence.

* * * *

We regret to report that Dr. E. M. Robertson of Sooke is confined to hospital. Dr. John Brown is carrying on her practice.

* * * *

Dr. F. E. Coy of Invermere is travelling to Montreal to attend the Annual Meeting of the Canadian Medical Association.

* * * *

Dr. Glen Campbell of Vancouver will be honoured by the Canadian Medical Association at the Annual Meeting when Senior Membership in the Association will be conferred upon him.

* * * *

Dr. C. H. Hankinson has been at Harrison Hot Springs Hotel convalescing from an operation at Prince Rupert several weeks ago.

* * * *

Dr. F. M. Auld of Nelson, Dr. S. A. Wallace of Kamloops and Drs. G. C. Kenning and P. A. C. Cousland of Victoria attended the meeting of the Board of Directors of the British Columbia Medical Association on May 10th.

* * * *

Dr. and Mrs. Grant Lawrence have returned from a motor trip through the Western States. While away, Dr. Lawrence attended the post-graduate course at the Oregon Academy of Ophthalmology and Otolaryngology, held in Portland, Oregon, April 3rd-8th.

* * * *

Dr. J. H. MacDermot has left for a motor trip to California, and expects to be away about three weeks.

* * * *

Dr. J. A. Montgomery left early in May for a visit to the East. While away he will attend the Annual Meeting of the Americal Medical Association at St. Louis, Mo.

* * * *

Dr. J. A. Smith has been enjoying a three weeks' vacation.

LIBRARY NOTES

New Books Added to the Library.

Beaumont, G. E., and Dodds, E. C.—Recent Advances in Medicine. 1938.
Thorek, Max—Modern Surgical Technic. 1938.
Best, C. H., and Taylor, N. B.—The Living Body. 1938.
Hermon, Leon—Practice of Urology. 1938.
McCollum, E. V., and others—Newer Knowledge of Nutrition. 1938.
Murphy, W. P.—Anæmia in Practice. 1939.
Blum, Sanford—Pædiatric Symptomotology. 1939.
Genner, V.—By-effects in Salvarsan Therapy, and Their Prevention. 1936.
Yearbook of General Medicine, 1938.
Yearbook of General Therapeutics, 1938.
Yearbook of Physical Therapy, 1938.
Watson, Leigh F.—Hernia. 1938.

Some time ago a list of Journals devoted to *General Medicine* was published in the Bulletin; following is the list of *Surgical* Journals:

Annals of Surgery (American).
Archives of Surgery (American).
American Journal of Surgery.
British Journal of Surgery.
Surgery, Gynæcology and Obstetrics.
Journal of Bone and Joint Surgery.

DR. GEORGE BLAIR HENDERSON

The passing of Dr. G. B. Henderson of Creston leaves the profession the poorer. This medical gentleman made a fine contribution to that community. The honoured place he had won by his years of service was shown by its citizens on the day of the funeral.

Dr. Henderson was in his 63rd year, was born and educated in Ontario. After graduation in 1906 he came to British Columbia, and had practised in this province during 32 years. Dr. Henderson had participated actively in all phases of Church and community life, having served on the Council, the Board of Trade, and all public enterprises. The profession extends sympathy to Mrs. Henderson and family in their sorrow.

* * * *

DR. LLOYD N. BECKWITH

The passing of Dr. Beckwith of Trail was a great shock to his medical friends.

Dr. Beckwith had been in practice in Trail during the past two years. He had previously been at Dawson Creek and after leaving the Peace River country had opened an office in Grand Forks, whence he moved to Castlegar and later Trail.

Dr. Beckwith was born in Nova Scotia forty-four years ago. Following service overseas he entered Medicine, graduating from University of Manitoba in 1930. Dr. Beckwith served as interne at the Royal Jubilee Hospital and is remembered by the profession in Victoria because of his work at that time.

Dr. Beckwith is survived by his wife, to whom he was married last year, and by his mother and brother. The profession wishes to extend sincere sympathy to his family in their bereavement.

FRASER VALLEY MEDICAL ASSOCIATION

The Annual Golf Tournament of the Fraser Valley Medical Association was held at the Vancouver Golf and Country Club on Thursday afternoon, May 11th.

Following this the Annual Dinner and election of officers took place. At the dinner, golf prizes were awarded: Dr. F. D. Sinclair of Cloverdale winning the low net and Drs. E. H. McEwen and G. S. Purvis of New Westminster tying for low net.

Dr. Robert Langston was presented with a travelling bag on the eve of his departure for two years' post-graduate work, and flowers for Dr. Kay (Woods) Langston.

Officers for the coming year were elected as follows: President, Dr. W. A. Clarke, New Westminster; Vice-President, Dr. L. S. Chipperfield, Coquitlam; Secretary-Treasurer, Dr. A. N. Beatty, Ioco.

MATERNAL WELFARE

The American Congress on Obstetrics and Gynæcology is holding a meeting in Cleveland, Ohio, September 11th-15th, 1939, the purpose of which is: "To present a programme of our present day medical, nursing and health problems from a scientific, practical, educational and economic viewpoint as far as they relate to human reproduction and maternal and pre-natal care."

Dr. C. T. Hilton, Chairman of the Committee on Maternal Welfare of the British Columbia Association, states that this meeting is for those interested in Maternal Welfare and is to be practical and not entirely devoted to the work of specialists.

Vancouver Medical Association

SUMMER SCHOOL, June 6th, 7th, 8th, 9th, 1939

The Programmes for the Summer School have been mailed to all members of the profession in British Columbia, and more copies are available at the office if needed. The list of addresses shows a varied and well-balanced course, and there should be something of interest for all General Practitioners. Many Specialists will find subjects of great interest as well.

Clinics.

Details of the clinics have been arranged, as follows:

Tuesday, June 6th, 3 p.m., Vancouver General Hospital—Dr. Wilbur: "Gastro-intestinal bleeding."

Wednesday, June 7th, 2:30 p.m., St. Paul's Hospital—Dr. Holman: "Carcinoma of the Large Bowel."

Friday, June 9th, 2:30 p.m., Vancouver General Hospital—Dr. Conn: "Sterility."

Luncheon.

The Luncheon will be held on Tuesday, June 6th, at 12:30 noon in the beautiful cafe on the ground floor of the Hotel Vancouver, entrance to which can be made from the main lobby or the Hornby Street entrance. Dr. Frank Menne, who is no stranger to Vancouver, will be the speaker, and, as announced, will speak on "The Physician in Relation to the Solution of Crime." Dr. Menne has made a study of criminology and the address will be of unusual interest.

Golf.

The Golf Tournament will be held at Jericho Golf and Country Club, and all arrangements are in the capable hands fo Dr. H. H. Pitts, Dr. Fraser Murray and Dr. J. P. Bilodeau.

The management of the Hotel Vancouver has placed at the disposal of the Summer School Committee, for lectures, a very beautiful room, which is known as "Salon A," on the second floor of the hotel. There is ample accommodation, and as the room is on a corner, good ventilation is assured. For many this may be the first introduction to the interior of the hotel and the Committee feels very fortunate to be among the first to hold a large gathering there. On the same floor as the "Salon A" are cloak rooms and a very quiet and beautiful lounge, so that it will prove a quiet and delightful meeting place for all those attending the Summer School.

VANCOUVER MEDICAL ASSOCIATION.

Two additions to the decoration of the reading room have been made recently which are worthy of attention by all members of the Association. A handsome bronze plaque has been placed on the East wall, in memory of Dr. F. de Verteuil who was drowned off the coast of Chile in 1914. Dr. de Verteuil was the only member of the Association to perish in the Great War. Also, a very handsome mahogany panel has been placed on the South wall, which will be known as the "Donors' Panel," on which will be inscribed the names of those making substantial donations or bequests to the Association. At present the list stands as follows:

Sir William Osler	$100.00
Francis John Nicholson	500.00
John Mawer Pearson	300.00
Thomas Fison Saunders	500.00

The Association feels that in this way suitable recognition may be made and the remembrance kept fresh, of those who show in this way their appreciation of and loyalty to the Association and its members.

OLFACTION

R. Scott-Moncrieff, M.D.

I cannot resist the temptation to begin by quoting the opening paragraph of that delightful book by Dan McKenzie entitled *Aromatics and the Soul*: "I sing of smells, of scents, perfumes, odours, whiffs and niffs, of aromas, bouquets, and fragrances, and also, though temperately and restrainedly, I promise you, of effluvia, reeks, fœtors, stenches, and—stinks."

It is a curious fact that our native language does not possess a terminology descriptive of smells. We never truly and accurately name an odour. The most accurate description is to say: "It smells like something or other." In this defect smell is unique among the senses. Even the sense that governs equilibration, of which the consciousness under normal conditions is never aware, has furnished us with such definitive terms as "giddy" and "dizzy." Vision is represented by hundreds of words. We have, for instance, names not only for the primary colours, but also for many of their combinations. The sense of hearing, upon which speech is entirely dependent, has given rise to a multitude of words, many of which are onomatopœic. Even the sense of taste has its vocabulary, a complete one as it happens, since each of the four varieties of taste has its own appropriate nme.

Such terms as have been borrowed, generally from another sense, or from another language, or from the source of the smell, are more or less vague and indeterminate. Dan McKenzie puts it thus: "This delay in the naming of all classes of odours justifies the statement—'Smell is speechless.' It shows, in other words, that, although the influence upon the mind may be profound, yet that influence does not extend as far as the speech centres. It remains in the subconscious."

This all indicates that in man the sense of smell is, and through the centuries has been, dominated by the majority, if not all, the other senses—especially, of course, sight and hearing. It is maintained by some that this dominance of the eye and the ear over the nose has been brought about chiefly by the adoption of the upright position and arborial habits. Under these circumstances sight and hearing are of much greater use than olfaction in the acquisition of food and the avoidance of enemies.

This greater development of sight and hearing than of the sense of smell is beautifully exemplified by tracing the evolution of the brain. Herrick says of this: "The metamorphosis of the cerebral hemispheres from a simple olfactory reflex apparatus in the lower fishes to the great organ of the higher mental processes upon which all human culture depends is a very dramatic history." In other words, in the lower fishes almost the entire forebrain is devoted to the function of olfaction, while in the higher mammals and man the non-olfactory centres have become the dominant parts of the cerebral hemispheres.

Olfaction may be said to be the lowest—the most animal-of senses: so much so that in polite society it is hardly good manners to mention smells. It has reached its highest development not in man but in species otherwise far his inferior, for instance, the dog, which is, I suppose, the best known of the keen-scented or macrosmatic group. Some species, such as the porpoises and the toothed whales, are thought to be entirely anosmic. Man occupies the intermediate, microsmatic group. Parker maintains that in mammals this difference is paralleled by the development of the nose, and that the macrosmatics have as many as ten turbinal bones, whereas the microsmatics have, as a rule, four or less.

In man much of the keenness of the sense of smell has disappeared, and yet the high development of this sense in our ancestry has left such a profound impression on our central nervous appartus that we are often surprised by the power of our olfactory associations. Each one of us has without doubt been surprised by the sudden flow of seemingly long-forgotten memories conjured up by some special, whiff, niff, aroma or stink. Mem-

ories thus recalled are sometimes extraordinarily vivid. In my own case, the smell of a particular flower, especially when encountered accidentally, will force into consciousness scenes which otherwise remain buried in the past. The first time this occurred to me the smell which was responsible for the phenomenon was so faint that it was not recognized at all, and it was only after the same thing had recurred more than once that the exciting factor was discovered.

If such powerful associations are possible in man, whose olfactory potentialities are so limited and to whom this sense means so little, it is far beyond our comprehension to imagine what this same but vitally important sense must mean to the dog. Any mongrel is certainly capable of seeing his master, but he is not sure of himself until he has smelled him. He may bark at the sound of a dog at his front door, but it is only by sniffing at the crack under the door that he will show any definite signs of pleasure or annoyance.

Anatomy and Physiology of Olfaction

The paired olfactory organs in man are situated high in the nasal cavities. They are separated by the septum which forms, normally, a smooth medium partition between them. The lateral nasal walls are thrown into a number of more or less horizontal folds, the nasal conchæ or turbinals, generally three in number. Sometimes the superior is missing. Sometimes there is a supreme turbinal, in which case it is situated above and behind the superior. The inferior turbinal is the largest and extends through most of the length of the cavity of the nose, approximately parallel with the floor. The vestibule of the nose opens almost directly into the inferior meatus. The space situated between the septum and the laterally placed turbinals is known as the common meatus and becomes continuous posteriorly and above with the olfactory cleft, the chink between the septum and the superior turbinal and its meatus. See Fig. I.

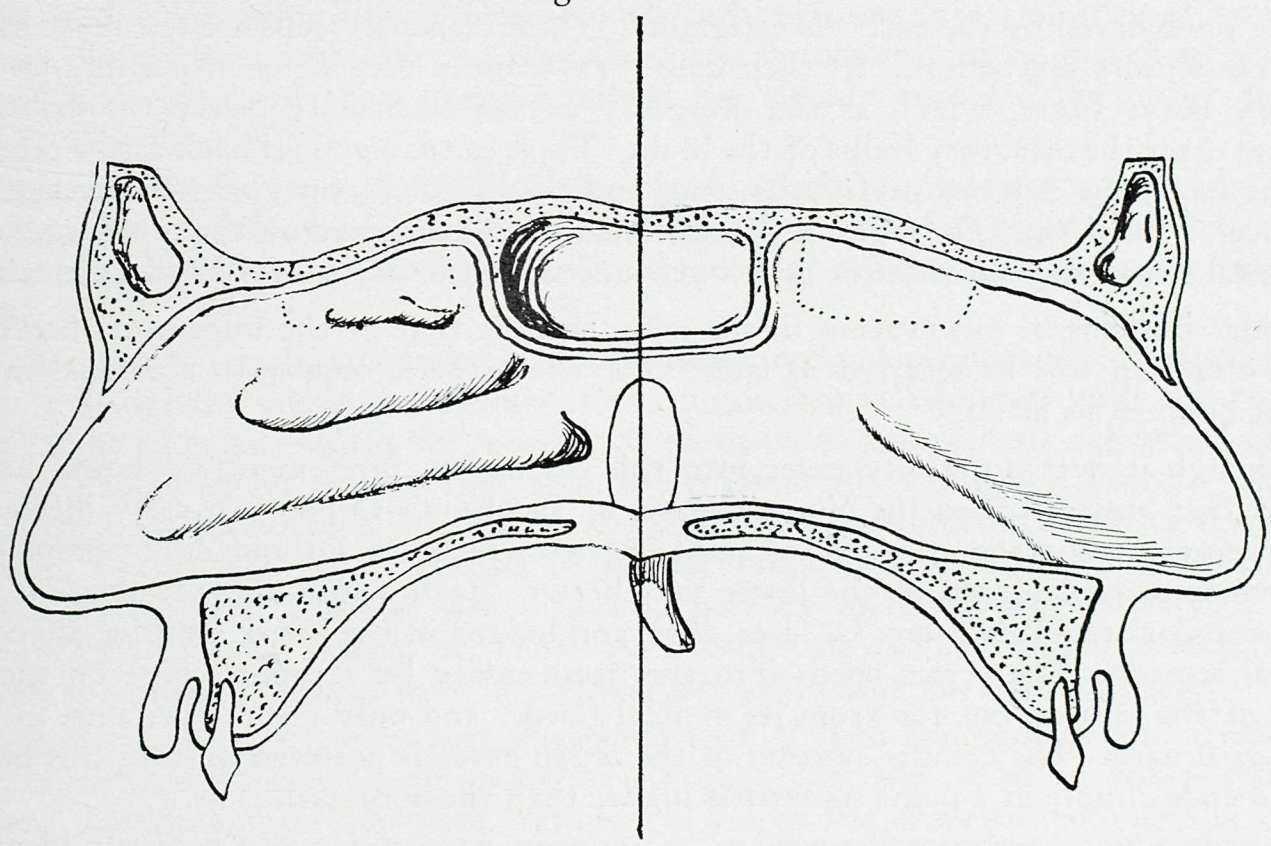

Fig. I. The Nose in Section.

The nasal mucous membrane begins at the inner lip of the vestibules. It is of two types, the so-called respiratory, and the olfactory. The change from one to the other is generally quite a sudden one, as in the relatively wide intermediate zone in which the mucosa is thicker than the olfactory but thinner than the respiratory types. The distribution of the true olfactory mucosa is limited in man to a small area on the lateral and medial surfaces of the olfactory cleft of about equal dimensions. Laterally, it extends down to about the level of the free edge of the superior turbinate, that is roughly a finger's breadth below the cribriform plate, and is about twice as long as it is high.
See Fig. II.

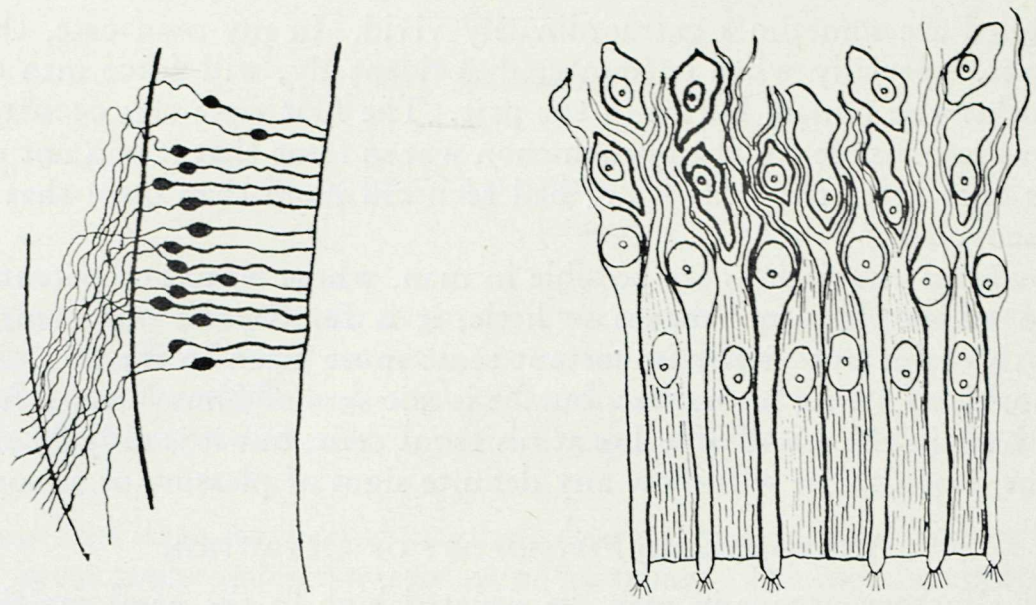

FIG. II. Olfactory Mucosa.

The respiratory mucosa is a pseudo-stratified, columnar, ciliated epithelium. The first to demonstrate with certainty the structure of the olfactory epithelium was Erlich in 1886. It is composed of at least three classes of cells: basal cells, ordinary epithelial or sustentacular cells which in man contain a yellow pigment, and the true sense cells whose free endings project as hairs into the mucoid film covering the surface. These protoplasmic filaments, said to number six to eight in man, are much longer than cilia and, of course, lack the power of motion. Being very delicate and easily destroyed, they remained for long unobserved by the early investigators. These olfactory cells are the most numerous of the sensory epithelium. At their deeper extremities they taper off rapidly into fine olfactory nerve fibres, which as the olfactory nerves eventually pierce the cribriform plate and enter the olfactory bulbs of the brain. These in turn extend back as the olfactory tracts as far as the anterior perforated space and the optic chiasma, where they enter the substance of the brain. Throughout this distance they lie exposed on the under surface of the frontal lobes. Beyond this, the distribution of the olfactory nerves hardly concerns us.

Besides this special innervation in the nose, there is that of the trigeminal nerve. Its part in olfaction will be referred to later. The sympathetic supply to the nasal mucosa does not concern us at all.

Although it does not really enter into this discussion, brief mention should here be made of that vestige called the Vomero-nasal or Jacobson's Organ. In early infancy all human beings show traces of a pair of these organs, which are without doubt homologues of the vomero-nasal organs of the lower vertebrates. Each one in the newborn infant is a short tubular structure from 1-2 mm. long and lodged in the lower anterior portion of the nasal septum. The organ opens into the nasal cavity by a minute pore on the free surface of the septum not far from its ventral border and only a short distance in from the external naris. The tubular portion of the organ extends posteriorly from this minute pore and ends blindly at a point somewhat higher than the pore itself.

In early human embryos the pore of the vomero-nasal organ can be easily identified on the median face of the nasal chamber just within the anterior naris. In adults the organ, though commonly present, may disappear completely. When present it occurs near the ventral margin of the septum. As seen in transverse section it has the appearance of a tube flattened in the plane of the nasal septum. Its lateral wall is covered with an epithelium that resembles histologically the respiratory epithelium of the nasal cavity. This lateral epithelium may even be ciliated. The median wall is covered with an epithelium much like the olfactory epithelium of the nose except that differentiated olfactory cells are apparently not present. As it appears to be without nervous connections, the vomero-nasal organ in man is probably entirely rudimentary. As regards its function almost nothing is known, but the hypothesis most commonly favoured is that it is a subsidiary organ of olfaction.

The olfactory stimulus in the ordinary course of events reaches the sensory epithelium with the air inspired, and in the reverse direction when *tasting* what is in the mouth and pharynx. Taste in the strict meaning responds only to the four stimuli—salt, sour, bitter and sweet, all other flavours being recognized by smell, touch, temperature, etc.

Of paramount importance in the physiology of olfaction is the matter of air currents within the nose, and this has been accurately mapped out by a number of observers. One of the first was Paulsen (1882) who worked with cadavers. After carefully sectioning a head, he placed pieces of litmus paper at various points throughout the nose, replaced the two halves and then drew ammonia vapour through the nose by applying suction to the trachea. The course of the air stream was demonstrated by the litmus paper which had changed colour. These findings were later confirmed by workers using living subjects. They show that it is only the eddies of air which reach the olfactory areas of the nose. During quiet respiration these eddies are very slight, but are greatly increased by more forceful, and especially short, sharp respirations, an action which one does unconsciously when trying to sense a weak odour.

The potential responsiveness of the olfactory organ seems to be inexhaustible. Consider for a moment the way in which the nose is capable of appreciating and at once differentiating the great number of new odours which man has produced in recent years—odours, that is, which are foreign to nature. Besides all these there is the multitude of recognizable, natural odours. When one also takes into account the fact that the ultimate mechanism of olfactory stimulation remains unsolved, it is little wonder that the matter of classifying smells is by no means settled.

Modern perfumers, who would presumably deal only with pleasant odours, have worked out a classification different from that of the majority of investigators. They have found that, at least from their point of view, the placing of odours into a number of groups has not been satisfactory, but that the so-called primary odours can be placed in a definite order. Their count for these primary odours has already exceeded the rather alarming figure of eighty.

Zwaardemaker's system (1895) of nine classes of odours stood for many years in spite of the fact that much of it is associative and subjective, and thus personal to him. Besides this there are many technical objections, with most of which the author was fully cognizant.

Parker states that a satisfactory classification seems dependent on the success with which it brings the odourous substances as stimuli into relationship with the receptors, and it ought to make evident the number of elements or components concerned in olfaction. It is admitted on all sides that olfaction is essentially a chemical process. Relationships have been found in a number of cases between chemical structure and olfactory sensation, though this seems limited to narrow ranges rather than being general. For instance, Parry (1892) found that olfactory potency increased progressively in passing from methyl to amyl among alcohols. And Backman (1917) found similar changes through the methyl-benzine series with such substitution of the methyl group.

Several other investigators have suggested that is upon the number and arrangement of certain chemical radicals or osmophoric groups that the odour of many substances depends. Henning maintains that certainly as far as the aromatic compounds are concerned it is not upon the structure of these radicals so much as their positions on the zenzene ring that their signficance depends. Thus spicy odours hold the para-position, flowery the meta- or ortho-position. Fruity odours show a forked ring, and in burnt odours the ring is smooth. Resinous odours show the radical within the ring, and in foul odours the ring is fragmentary. See Fig. III.

The most recent gleaners in this field of smells suggest a classification based upon the minimum strength at which the various odours can be identified. Of this I shall say more later on.

And this brings us to the question of the quantitative investigation of olfactory acuity and its clinical application. A number of methods have been devised with this in view. Some of the earliest of these experimenters were Valentin (1848), Fisher and Penzoldt (1886), and Passy (1892).

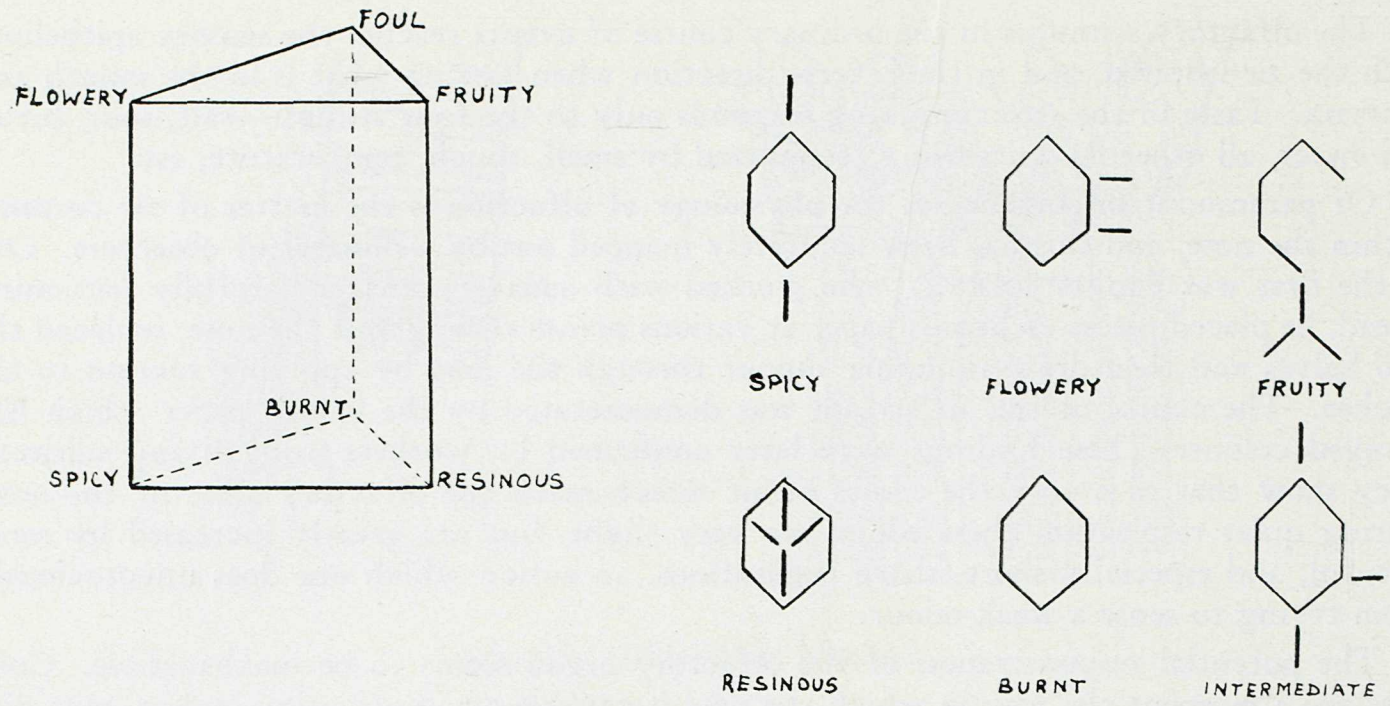

FIG. III.

All these men used the method of evapourating a known weight of a substance in a known volume of air. Some of their measurements might be of interest. For instance, mercaptan, a substance with a penetrating odour of garlic, could be recognized in a concentration of 1/92,000,000 of a milligram per litre of air.

Zwaardemaker developed one of the first practical olfactometers. It consisted of two tubes, one of which fitted within the other. One end of the inner tube was shaped to fit the nose. The test material was applied to the inner surface of the outer tube. When the inner, graduated tube was fully inserted, the odourous material was completely covered over, so that none could be picked up by the current of air inhaled through the system. As the inner tube was withdrawn, more and more of the test substance became exposed, and the amount of stimulation could thus be read off the graduations with a fair degree of accuracy. This was later modified in many ways.

To avoid several obvious fallacies in the original evapouration method, Allison and Katz in 1919 employed an "odiometer" of considerably greater accuracy. In principle it consisted of flow-meters arranged so that a measured volume of air could be passed over or through the test material at a uniform rate. The concentration of the odour is measured by determining its loss of weight after a known volume of air has passed over or through it. From these data can be calculated its concentration in mgm/litre of air. The mixture of air and odour is finally passed through a glass funnel fitted over the nose of a person, who by a single inhalation tests the mixture.

In 1924 Proetz produced a more exact system for the investigation of olfactory acuity. Accurately measured amounts of the odiferous substances were placed in a series of bottles in graded strengths. The patient was allowed to smell through one nostril at a time the odours of each series and the strengths noted at which each odour was first perceived and first recognized. But this did not carry our knowledge much beyond the point it had already reached.

The most recent methods have been worked out by Elsberg, Levy and Brewer of the New York Neurological Institute. They have circumvented one great fault of all the previous methods—that is, the fact that the odour was made to enter the nose by a voluntary inhalation, obviously a source of inaccuracy.

They have found that there are relatively few pure olfactory stimulants and they believe that many substances at present thought to stimulate the sense of smell will be shown also to stimulate the endings of the trigeminal nerve. But it is admitted that the identification of many odours necessitates the activation of both sets of nerve endings. They found that the "olfactory coefficient" of substances varied as the boiling point, and that given one the other could be calculated fairly accurately, a point favouring their suggested new classification.

As regards methods, they employed two forms of test. The first of these was for determining the lower threshold of olfactory stimulation, and this they called, for each substance, the M.I.O. (minimum identifiable odour). The apparatus in this case consisted of bottles of a specified size and shape. Each bottle had a tight rubber stopper through which passed a short glass tube connected to the nose pieces, and a long glass tube to one end of which was attached a glass syringe. This syringe was used for pumping through the system measured amounts of air. Various nose pieces were made, so that one or both nostrils could be tested as required. The test substance occupied the 30 cc. at the bottom of the bottle, and had 500 cc. of air space above it. The test was carried out by pumping the required 5, 10, 15 or more cc. of air into the bottle, and maintaining the positive pressure within the system by the closure of two pinch-cocks. In making the test, the pinch-cock on the nose piece connection was released while the patient held his breath. The current was directed into the nose in an upward direction. The "*olfactory coefficient*" was taken to be the smallest volume of air thus delivered birhinally which was necessary for the identification of an odour. It, like the M.I.O., for which only one nostril is used, is expressed in terms of cc. of air injected. This is termed the Blast Injection Method. See Fig. IV.

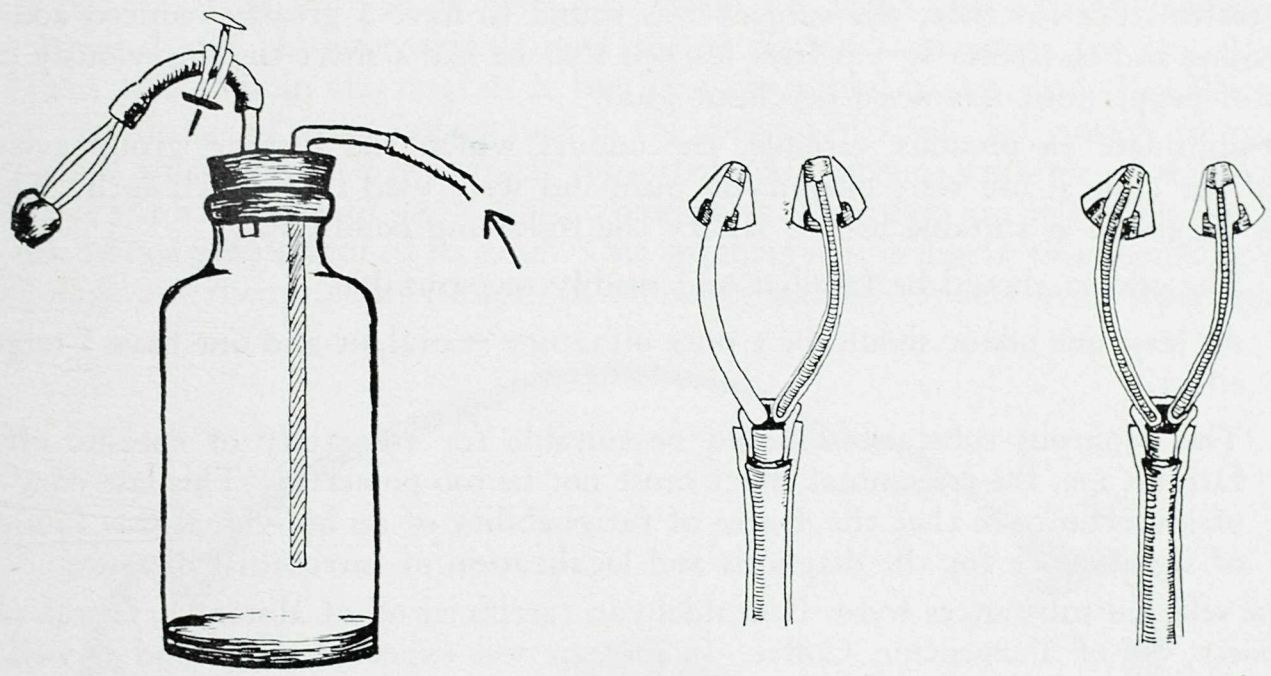

FIG. IV.

The second form of test was for investigating the fatiguability of the sense of smell and for separating the olfactory and trigeminal factors. The apparatus was very similar, but instead of the syringe and the pinch-cock, the inlet side of the system was attached to a compressed air cylinder with a flow-meter and valve, so that the rate of flow through the system could be accurately controlled. Thus this was called the Stream Injection Method.

These investigators, as did Proetz, found that there was surprinsingly little variation in olfactory acuity among normal individuals. In fact this group felt that the variation was a matter of experimental error. That there should be so little variation from one person to another is in itself rather extraordinary when it is considered how many apparent variables there are and how many different factors must be involved in the making of a single test. Looking at it quite superficially the following at once are thought of: Variations in the anatomical conformity of the nose might be expected to produce variations in the air currents within the nasal cavities. The condition of the sensory epithelium itself must vary from time to time, and, one would think, from person to person.

Within the brain very little is known of the connections of the rhinencephalon. However, the olfactory and trigeminal centres must be closely linked with memory, the development of which areas is unquestionably dependent largely on individual experiences and training. In turn, the appropriate word must be produced as speech to indicate recognition of the odour. And yet we are told that normal individuals vary very little in their olfactory acuity.

The recognizable variables, apart from the test methods, are confined almost entirely to the nose, and I propose to mention a few of those which may commonly, temporarily alter the sense of smell.

During the menstrual period there has been found to be a definite diminution of acuity. In the light of the recent work of Percy Wright and his co-workers this is quite to be expected because of the turgescence of the nasal mucosa at these times.

Acute rhinitis may greatly diminish the sense of smell. This effect is found not only during the acute stages but may last for several weeks. This was found sometimes to affect all odours and sometimes only a few. It was much more evident in testing fatigue than the M.I.O.

Sinusitis itself was not found to have much effect on olfaction. The factors of importance were such, for instance, as the hyperlastic changes which accompany some cases of chronic sinusitis.

Certain drugs, such as cocaine and probably tobacco, have a similar action. The easy fatiguability of olfaction is well known and great care must be used in making tests to eliminate all possibility of the patient's having unwittingly exhausted his sense for the odour tested. For instance, one subject was found to have a greatly reduced acuity for peppermint and sassafras. It was later learned that he had a short time previously chewed a stick of peppermint-flavoured Beechnut gum.

To eliminate an obvious variable, the odours which the Elsberg group eventually selected for clinical use were chemically pure and were used in full strength. The substances suggested as suitable had to satisfy the following conditions:

1. The odours should be familiar and readily recognizable.
2. At least one odour should be a pure olfactory stimulant and one have a trigeminal effect.
3. The odourous substances should be suitable for the study of specific olfactory fatigue, *i.e.*, the trigeminal effect must not be too powerful. This last condition is of importance in that the degree of fatiguability of an individual was found to be of significance for the diagnosis and localization of intrcranial diseases.

The selected substances were: Benzaldehyde (artificial oil of almond), Citral (essence of lemon), Oil of Turpentine, Coffee. If anosmia was expected, they used as well as the above: Benzine, Menthol, Xylol, Ammonia, and made the recommendation that the test should be made by sniffing.

Until very recently the site of olfactory fatigue was generally thought to lie in the olfactory mucosa of the nose, and was regarded as some sort of chemical exhaustion of the end organ. A typical test which seemed well controlled was, for example, the sampling of two bottles by sniffing. In the first bottle was placed the substance A. In the second were placed the substances A and B in such strengths that B was completely eliminated by the presence of A but was in sufficient strength to be identifiable when smelled alone. The first bottle was smelled for about five minutes. When the second bottle was smelled the substance A could not be detected but B was easily recognized. Here the only factor taken into consideration was the specific fatigue for the odour A. Elsberg and his co-workers have shown that there is at least a second factor and that is the much less evident general fatigue of the olfactory system as a whole. For instance, if fatigue is produced for citral it is found that besides this specific fatigue there is also a slight reduction of the acuity of smell for coffee. Furthermore, their technique is such that the variable factor, sniffing, is replaced by their more exact injection methods. Also their technique allows of exact measurements of the amounts of each of the odiferous substances used for testing. Thus, using a standard stimulus, they are able to determine with a fair degree of accuracy the duration of olfactory fatigue so produced. They have found that the duration of fatigue is proportional to the duration of the injection, whether it is given by the blast or stream injection methods. It was also found that the time for recovery from bilateral fatigue was greater than that for unilateral fatigue, and that fatigue produced unilaterally caused fatigue not only on the side stimulated but also, to a very definite degree, on the opposite side as well.

They discuss at some length the arrangement of the fibres and the functions of the different parts of the olfactory pathways. I shall do no more than mention a few of their more significant conclusions.

They confirmed the findings of Luciani and Sepilli (1886) that the olfactory centre has connections with both olfactory membranes in the nose, the homolateral being the predominant ones. They feel that the anterior commussine, generally accepted to be an important olfactory pathway, probably contains both direct and crossed fibres from each peripheral sense organ, that is that it is a true chiasma. Pressure on one or other part of the anterior commusine must interfere with the transmission of olfactory impulses, and therefore should produce an alteration of olfactory acuity different from that caused by a block in the pathways in the olfactory bulbs and tracts. So far, these investigators have not succeeded in demonstrating this.

They affirm that the areas concerned in fatigue of the sense of smell lie in the brain itself, and in the parts that have to do with the perception and memory of olfactory impressions—and further that the connections between the receptors and the olfactory centres are predominantly, but not entirely, homolateral.

Facts indicate that, just as in binocular vision for sight and binaural audition for hearing, birhinal and bisynchrorhinal smell are of distinc tadvantage for the olfactory sense. I may add that in the dogfish it has been definitely shown that that element in olfactory function is of great importance in the seeking of food. Its powers are presumably enhanced when the nares are widely separated. An extreme example of this is found in the case of the hammerhead shark, both whose nostrils and eyes are placed far out on the remarkable lateral projections of its head. One wonders if it is due to this focussing power that bird dogs can always point straight at a bird instead of vaguely in its direction. See Fig V.

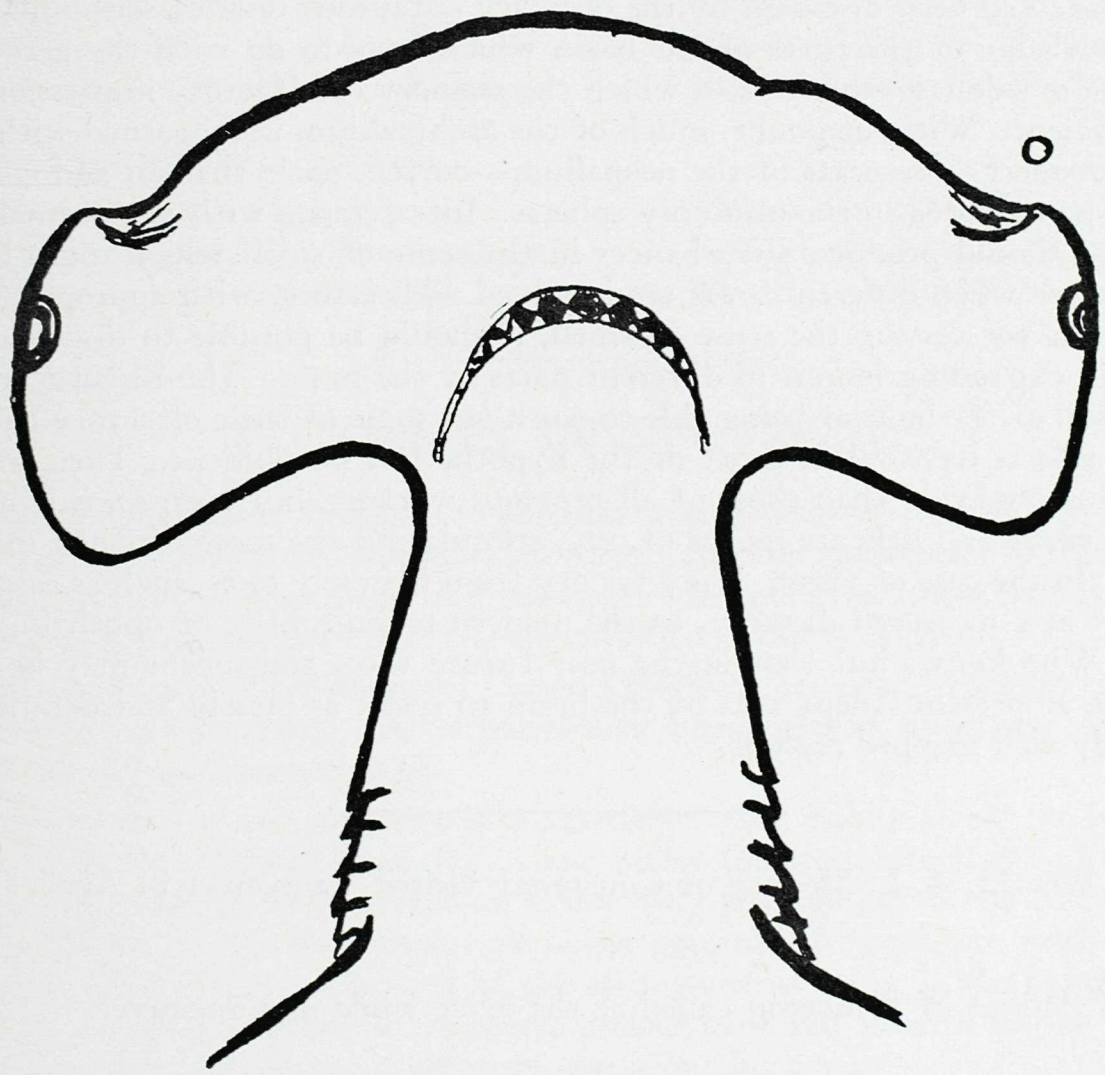

Fig. V.

As regards the experiments of Elsberg, Levy and Brewer on the localization and diagnosis of intracranial lesions, only a few remarks will be made. Tumours beneath the frontal lobes of the brain make direct pressure on one or both of the olfactory bulbs and tracts,

and therefore they must interfere more or less with the impulses conducted by these structures. The block in these olfactory pathways is demonstrable by the tests of these observers.

118 patients with suspected brain tumours were examined. Of these, 52 comparable cases remained in whom the existence and situation of supratentorial growths were verified by operation, autopsy, etc.

The figures in the six cases of pituitary tumours show that from the olfactory tests it is possible to determine whether or not the growth has extended through the diaphragm of the sella turcica. Apparently in conditions of increased intracranial pressure there is often a heightened irritability of some part of the olfactory pathway as shown by the lowered values of the M.I.O.

Expanding lesions on the under surfaces of the frontal lobes of the brain regularly showed a heightened M.I.O. for one or both sides, according to the areas involved, the greatest increase being on the side of the greater involvement. Fatigue was not prolonged.

In tumours buried within the substance of the brain, the greater the depth to which they extend the longer the duration of the fatigue. The M.I.O. is not altered.

The combination of unilateral high M.I.O. and prolonged fatigue on the same side is characteristic of tumours which lie within the substance of one frontal lobe, and which extend to near the under surface of the affected lobe, and which directly or indirectly exert pressure on the olfactory nerve, bulb or tract on one side. If the duration of the ipsilateral fatigue is greatly prolonged, the growth not only lies near the under surface but extends to near the mesial surface of the affected frontal lobe.

In tumours in or under one temporal lobe, a diminution may be found in the trigeminal sensibility of the nasal passage on the same side as the neoplasm. In several instances a diminution in the trigeminal sensibility on the affected side was found by this intranasal test when none had been disclosed by the ordinary cutaneous tests of sensibility.

Our knowledge of the parts of the brain which have to do with the perception and identification of odours—the areas in which the memory of olfactory impressions is stored—is still deficient. Without doubt, much of the archipallium is concerned with olfaction, but in the broadest sense parts of the neopallum—cortex, optic thalami and corpus callosum—must be included in the olfactory spheres. Interference with the normal functions of these areas should produce disturbances in the sense of smell which must have a different character when different areas are involved. Therefore, with appropriate and sufficient methods for testing the sense of smell, it should be possible to discover olfactory "patterns" in expanding lesions in different parts of the brain. The Elsberg group began their work full of the hope of being able to work out some of these olfactory patterns, but so far their efforts have fallen short of the hypothetical possibilities. Their methods are certainly far more exact than those of all previous workers, but even so, is it not possible that a more exact and delicate means of, say, stimulating the sense of smell may one day be evolved? In the case of vision, it is a far cry from the early tests, such as reading letters and numbers at a measured distance, to the modern technicalities of ophthalmoscopy and perimetry. Who knows but that in the near future ways and means may be found for inducing the at present, silent area of the brain to speak as clearly and definitely as any of the already well mapped regions.

Dr. and Mrs. H. A. L. Mooney of Courtenay visited Vancouver in April.

* * * *

Dr. Paul Phillips of Princeton called at the office while in Vancouver.

* * * *

The speaker for the May meeting of the Victoria Medical Society was Dr. Herbert E. Coe of Seattle, who presented a paper on "A Survey of Congenital Defects."

* * * *

Dr. G. B. Helem of Port Alberni paid a flying visit to Vancouver.

Vancouver General Hospital

VANCOUVER GENERAL HOSPITAL OUTPATIENTS' DEPARTMENT

GENERAL MEDICAL CLINICS

Recently, circulars have gone out to the medical profession regarding the establishment of general medical clinics to be held six days a week in the Outpatients' Department. Previously medical clinics were only on Monday, Wednesday and Friday, and in the new set-up there will be three additional clinics, thereby relieving the load on other days. Theoretically all cases will go through the general medical clinics, but cases with obvious diagnoses will go direct to the special clinics. The responsibility for the diagnoses and disposition of the cases referred to the general medical clinics will rest with the man in charge that day.

The policy of discharging patients to the attending doctors with a report of our findings will still be carried out as far as possible. Only on the request of the attending doctor and when specialist's care is required will patients be retained for treatment in the Outpatients' Department.

General medical clinics are as follows:

Monday—Dr. G. F. Strong.
Tuesday—Dr. R. A. Palmer.
Wednesday—Dr. M. McC. Baird.
Thursday—Dr. W. W. Simpson.
Friday—Dr. J. E. Walker.
Saturday—Dr. W. T. Ewing.

Special clinics will be as follows:

Monday—Cardiovascular.
Tuesday—Neurology, Dermatology.
Wendseday—Gastro-intestinal.
Thursday—Diabetic.
Friday—Anæmia and Endocrine.
Saturday—Arthritic.

AUTOPSIES IN STATISTICS

That the relationship of autopsies to efficient interne training in a general hospital is an important factor is shown by the request for information on the subject in the report forms of the Canadian Medical Association and American College of Surgeons, used in their review of the Standard Hospitals and Hospitals approved for Interne Service.

For some years past the Vancouver General Hospital has tried to secure the maximum in post-mortem examinations, the responsibility being placed upon the shoulders of a member of the Administrative Staff.

The falling short of our objective is unavoidable. Our public wards are both "closed" and "open." For the "closed" cases (*i.e.*, those under the attending staff) direct access by the administrative officer to the relatives is not only possible but is the rule; but for the "open" (or private) cases the private physician becomes the medium, with results that, often enough, are pointedly in favour of the arrangements being in the hands of the hospital official. Gradually, however, doctors, undertakers and general public are showing less aversion to and more understanding of the scientific aspect.

From a statistical viewpoint the subject is not entirely quantitative. The true reflection of the effort expended is manifest in the percentage table. For several years we have carefully compiled our figures, but fair comparison with other hospitals has been difficult because of the variations existing between our own and the methods of some other institutions.

The several points in the evaluation of this service to internes comprise:—

1. The number of deaths in the hospital;
2. The number of stillbirths (where applicable);
3. The cases controlled by (a) city or county coroner, (b) inspector of anatomy;
4. The cases left available for possible autopsy;
5. The actual number of autopsies done and the percentage to 4;
6. Cases done by the Hospital Pathologist for other institutions or by special request from outside sources.

All of the foregoing, divided into separate categories of "Private" versus "Staff" patients, reveals all that is essential from a "standardization" aspect. That it is, nevertheless, incomplete is revealed by the question recently asked, "How many males and how many females?" But most statistical departments will agree that the "smashing of the atom" can be carried to extremes and that even the best staffs and equipment have their limitations.

If, however, the plan shown in the accompanying tables could be introduced into the majority of our hospitals, not only would it provide better facilities for more equitable comparison, but there might result a greater urge to the securing of more autopsies.

FREDK. J. FISH, *Director of Medical Records.*

VANCOUVER GENERAL HOSPITAL.

REPORT ON AUTOPSIES, 1938.

— HOSPITAL DEATHS —

	— PATIENTS —			— STILLBIRTHS —			Total	Outside Cases	Total Autopsies
	Priv.	Staff	Total	Priv.	Staff	Total			
Deaths	449	679	1128	32	10	42	1170		
Referred to Coroner	49	29	78				78		
Available for Autopsy by Hospital Pathologist	400	650	1050	32	10	42	1092		
Autopsies done by Hospital Pathologist	141	509	650	12	7	19	669	65	734
Percentage of Autopsies to Available Cases	35.2	76.8	62.	37.5	70.	45.2	61.3		

CLINICAL PATHOLOGICAL CASE REPORT

DR. D. S. MUNROE and DR. EVELYN GEE.

In presenting the following case, the writers realize that they are offering a puzzle which may or may not be properly solved. The pathologist considers that the various clinical findings are explained by the pathological ones.

An attempt has been made to analyze the somewhat complex bacteriological and pathological observations, but the conclusion is finally theoretical. We ask the reader to consider it in this light.

Married female, aet 16.

She was well until the day prior to admission to the hospital, when she was slightly dizzy. On the day of admission, she was nauseated, vomited once, and noticed weakness of the right arm and right leg, spasms of the right quadriceps muscle and blinking of the right eyelid, and increasing difficulty in speaking.

Past History: There was a discharge from the left ear a few months ago, but no definite account of this could be obtained.

Physical Examination: The patient appeared acutely ill. Pulse 116, respirations 20, temperature 100 degrees. She was three months pregnant, but general examination was otherwise negative.

Nervous System: Cranial nerves: Blurring of nasal edges of fundus oculi, with some venous congestion. Eyes could not be turned to the right. The right lower face was paralyzed. Motor System: Neck moderately rigid; flaccid paresis of right arm and leg.

Reflexes: Absent in right arm. Knee and ankle jerks present. Plantar extensor on right. Sensory: Unsatisfactory, but questionable diminution to pin-prick and wool on right side.

Laboratory: Leucocyte count, 11,800. Spinal fluid: cell count 2150, mostly polymorphs; Kahn negative; cultures negative. Blood cultures, negative. Blood Kahn, negative.

Treatment: Blood transfusion, prontosil, parenteral fluids.

Progress: She became more restless and weaker, the right arm and leg became rigid, and on the sixth day of her illness her temperature rose to 107 degrees and she died.

Autopsy Report:

Brain: Appears congested and weighs 1500 grams (normal). The convolutions are flattened but there is no free fluid at the base of the brain. On section, in the right parietal lobe there are innumerable pin-point sized hæmorrhages. A similar area is noted in the left cerebellum.

Microscopic sections show degeneration of the nerve cells and perivascular cuffing with large plasmocells and lymphocytes. Small areas of hæmorrhage are present in the brain and meninges.

Cultures: From base of brain, softened areas and right middle ear show non-hæmolytic streptococci, possibly viridans type.

Right middle ear contains pus and there is some sanguineous material in the right mastoid.

Uterus: Intact gestation sac, containing a three months fœtus undergoing autolysis. The amniotic fluid is cloudy but cultures were sterile. Surrounding the sac is a mass of blood clot which fills the uterine cavity and the placenta is separated by it over a small area at one pole. Neither the uterus nor the uterine cavity appear infected or lacerated; the non-hæmolytic streptococci taken from the fundus at autopsy may be simply secondary invaders of dead tissue.

Spleen: Cut surface normal. Cultures are negative, indicating the absence of septicæmic process.

The organs and tissues generally are stained pinkish in color due to prontosil therapy. The lungs are congested and the bronchioles contain purulent material. The heart is dilated, the musculature soft and flabby. The liver shows extensive fatty metamorphosis and the kidneys are also congested.

Summary: It is suggested that the process in the brain is secondary to an infection of the right middle ear, while the uterine findings are irrelevant.

Diagnosis:

Non-suppurative localizing hæmorrhagic encephalitis (non-hæmolytic streptococcus, possibly viridans).

Purulent otitis media, right, with extension to mastoid (non-hæmolytic streptococcus, possibly viridans).

3½ months pregnancy, missed abortion (non-hæmolytic streptococcic invasion).
Purulent bronchitis.

Myocardial degeneration.

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SYMPOSIUM ON CARCINOMA OF THE CERVIX

The regular meeting of the staff of St. Joseph's Hospital was held on Tuesday, January 10th, at 12:30 p.m. Following the business meeting, a symposium on Carcinoma of the Cervix was presented. The subject was discussed by the following physicians

DR. A. NASH—Clinical Diagnosis.

DR. D. B. ROXBURGH—Pathology.

DR. H. ROBERTSON—The Status of Surgery in the Treatment of Carcinoma of the Cervix.

DR. A. TURNBULL—Treatment by Radium and X-Ray.

The Status of Surgery in the Treatment of Carcinoma of the Cervix

DR. H. ROBERTSON

I was asked the other day to speak on the subject of carcinoma of the cervix. If I may be allowed, I would like to enlarge upon this title and include the general subject of carcinoma of the uterus.

The question of the diagnosis of carcinoma has been covered by the previous speaker, so that when one considers carcinoma of the fundus, the findings obtained by curettage, etc., and microscopy, will indicate the line of treatment. It may be said that carcinoma of the fundus demands hysterectomy and pan hysterectomy, providing there is no involvement of the parametria.

Years ago the Wertheim operation was in vogue, but, as this is such a radical procedure, the results altogether have not justified the operation. The treatment of carcinoma of the cervix is altogether a different matter.

The day has passed when vaginal hysterectomy, etc., is advocated for the treatment of this lesion, so that one may say that unless surgical treatment is followed by irradiation in a selected case, the latter therapy is the accepted form of treatment today.

Treatment by Radium and X-Ray

DR. A. TURNBULL

The development of the radiation treatment for cancer of the cervix embodies the whole history of radiation, from the discovery in 1895 of X-rays and in 1898 of radium. The time since the discovery of this source of radiation is filled with advances and new discoveries with changing techniques in the application of these forms of treatment.

As early as 1902, interabdominal and vaginal cancer was being treated by X-ray with varying modes of application, including treatment with especially designed tubes and vaginal speculums. About 1906, the first report of cases of treatment for gynæcological

cancers by radium was made. Among the first reported series of cases treated by radium were those by Dominici, who laid down the standard principle of radiation technique by filtered radium to which we still adhere.

Following the development of the Coolidge tube in 1913, Roentgen therapy became more standardized, due to ability to control the output and dosage, and except for the years of the war, when development was at a minimum, the story of the radiation has been one of continued progress. By 1914 the number of investigators in radiation therapy were many, and a considerable number of clinics were commencing to discard surgery for gynæcological conditions in favour of radiation therapy.

Through the work of various radiation therapists, radiation treatment of cancer of the cervix has at last become more or less standardized. For a time there were two schools of thought, one believing in large massive doses of radium and others holding to the fractional method. Although these two methods were varied in their application, the total number of milligram hours considered necessary for the treatment of cancer of the cervix became more or less standardized, and now has gradually risen until an aggregate of 5000 to 10,000 mg. hours is used, depending on the method of application. The fractional method has largely superseded the more massive dose technique, and now is in more general use. Each case of cancer of the cervix must be considered as an entity of its own, and treatment varied according to the considerations necessary for that particular case. Various forms of applicators are now used, that most generally used being the Colpostat, developed in the Paris Radium Institute and used largely in this continent. However, other similar applicators are available, along with various methods of treatment to be employed.

The most common, immediate complications of radium therapy have been pelvic cellulitis, pyometritis, development of vesical-vaginal and recto-vaginal fistulæ and illitis and colitis. It is considered that by the fractional method the majority of these complications may be avoided or controlled to a greater extent.

As an adjunct to radium therapy, it is now generally admitted that external radiation therapy directed to the parametrium is necessary in order to increase the percentage of five-year cures. This radiation is either by telecuritherapy (radium bomb) or roentgen therapy. The order of the two procedures varies, some favouring external radiation preceding local treatment of carcinoma of the cervix by radium, others giving this external radiation following local treatment. The method which I will now outline is that which I have been most familiar with and is a modification to some extent of that treatment used in various centres. It is used by Drs. Bowing and Fricke. (Dr. A. Turnbull outlined with diagram this treatment.)

In a recent report of Drs. Bowing and Fricke of 1491 cases covering a period of 15 years, although 91% of their cases were in advanced stages, 26.8% were alive and well after five years. Of the cases seen early, 69.2% were well at the end of five years, whereas of the border-line, or moderately advanced cases, some 60% were well at the end of five years. These figures clearly show the importance of early diagnosis and adequate radiation treatment for this condition.

Dr. T. W. A. Gray

I am aware that the widely accepted treatment of cervical carcinoma today is radiation, but the general trend is to regard treatment by radium locally and deep X-ray therapy to the gland areas is preferable.

Radium can remove a tumour with less operative risk but with less certainty, for any hiatus in the field of irradiation will allow cancer cells to survive.

By many capable men Wertheim's extensive abdominal hysterectomy is still considered to be the method of choice. However, as Victor Bonney intimates, one should compare the results from radiation of all cases with those obtained from a judicious selection between irradiation and operation.

The annual report on the results of radiotherapy in cancer of the uterine cervix (League of National Publication III) —*Health*, 1938—of 5672 cases treated with radium, 26.3 were alive without recurrence five years from date of treatment.

In carcinoma of the cervix Victor Bonney's surgical result over a period of twenty years shows a total of 27% of all cases cured for five years and more. Among those in which the disease was limited to the uterus there were 51% of five-year cures. Where the pelvic glands were involved by cancer, 24% were cured five years after operation.

Comyns Berkely gives a total five-year survival rate of 36.8% of all degrees of severity.

Schweiter has a five-year survival rate of 47.8% cases treated by hysterectomy.

Clinical Diagnosis of Cancer of the Cervix

A. B. Nash, M.D., C.M., M.R.C.O.G., F.A.C.S.

In speaking on the subject of the Clinical Diagnosis of Carcinoma of the Cervix, I merely wish, in the very limited time available, to emphaszie the great importance of early diagnosis.

I believe that the diagnosis of a moderately advanced lesion of this type presents no great difficulties, and I would like to stress the fact that, even when made at such a stage, the diagnosis is followed by a cure in a relatively small proportion of cases, regardless of the apparent thoroughness of the treatment applied. There is ample support for such a statement in the published results of all large treatment centres.

As a general rule, it will be found that in patients who have experienced symptoms arising from carcinoma of the cervix, the lesion will be moderately or well advanced, with a consequent expectation of cure in but relatively few of such cases. In the remainder, the most that can be said for the results of treatment is that they probably benefit by an appreciable prolongation of life.

In patients where the presence of a really early lesion has been detected—that is, at a stage before symptoms might be expected to present themselves—adequate treatment will effect a cure in a proportion approaching one hundred per cent so closely as to startle those whose custom it is to regard cancer at this site as a more or less hopeless condition with an inevitably fatal outcome, and deserving, at the most, whatever palliation the radium and X-ray therapist can offer.

Such an attitude, which I believe to be extraordinarily common, is neither fair to the diagnostic or therapeutic methods at present available.

I consider that until and if some other and more effective means of treating the moderately advanced case is found, there is no other practicable means of increasing the rate of permanent cure than early diagnosis.

In the following remarks concerning the methods employed in early diagnosis, I wish to make it clear that I am excluding adenocarcinoma of the cervical canal, a lesion which comprises only about 5 to 10% of the total cases of cervix cancer

To begin with, it must be clearly recognized that an epithelioma or squamous cell carcinoma of the vaginal portion of the cervix may progress to a considerable extent before giving rise to ulceration of the squamous cell mucous membrane covering the portio. This is of tremendous importance, because of a somewhat prevalent tendency to believe that unless there is a visible lesion presenting, and if the mucous membrane is intact, carcinoma is not likely to be present. Such a belief is both incorrect and dangerous and, if applied in practice, will rob a certain proportion of carcinoma victims of their chance of a cure.

To my mind it is advisable that the majority of early diagnoses, if they are to be made, will result from the performance of careful and conscientious examinations by general practitioners, who can, if they are prepared to devote a relatively small amount of enquiry and study to the subject and a relatively greater amount of time and trouble to the patient, succeed in giving to the therapist an encouraging number of cases where the expectation of cure is considerable.

With a view to the foregoing, I would add, in the order of their practical application, the methods to be employed to attain the desired end: (1) Careful, detailed visual inspection of the vaginal portion of the cervix in a good light; (2) systematic and thorough

palpation of the *surface* of the portio; (3) the use of the colposcope; (4) Schiller's test; (5) biopsy.

I now wish to amplify upon the foregoing in the order of their enumeration.

Adequate visual inspection necessitates the use of a suitable speculum to expose the cervix adequately and, for this purpose, the ordinary bi-valve is generally preferred, with the patient in the dorsal position. Sufficient light is essential, and, since good daylight is so infrequently available, this is best provided by either a headlamp or head mirror. Any inequalities on the surface of the portio should be observed and their position noted, as with any evident colour changes. The latter need only be of slight degree to have important significance. Particular attention should be paid to the areas in proximity to the edges of the external os, the borders of an apparent erosion and evident old laceration scars. An area of denudation, ulceration or evident absence of mucous membrane is of the greatest importance, regardless of how small it may be. In this connection, the presence of a so-called erosion should not, as a rule, cause confusion or difficulty. This lesion usually surrounds the external os in a more or less regular manner and its surface is most commonly covered by a downward growth of the columnar-celled mucous membrane of the cervical canal. There is no resemblance between this and the small, circumscribed, discrete lesion on one or other lip which represents the early carcinoma for which one is searching.

Palpation of the vaginal portion of the cervix requires little or no elaboration, save to suggest that minor differences in the consistency of its surface are much more readily and accurately determined with the ungloved finger. An area of greater firmness which imparts a sensation of localized induration should be viewed with suspicion as it may represent an inverting type of carcinoma which has already invaded the substance of the cervix and is yet, on its vaginal aspect, covered with what appears, to the unaided eye, to be an intact and normal squamous epithelial layer.

The use of the colposcope I will not refer to in detail. There is no doubt that, in the hands of those who employ it continuously and are familiar with the magnified appearances of both the normal epithelium and abnormal lesions, it is a valuable aid in determining the presence of suspicious lesions not evident to the naked eye. It is a relatively expensive and slightly cumbersome instrument, with which the average general practitioner cannot be expected to equip himself, nor, if he does, will he find it easily possible to acquire sufficient experience and skill in its use to render its possession worth while.

Schiller's test seems to me to be generally and quite seriously misunderstood, in that many regard it as a more or less positive means of detecting the presence of an epithelioma of the cervix in any or all stages. Such is distinctly not the case. The test does serve to indicate the presence of suspicious areas on the cervix which *may* represent a carcinomatous zone in a layer of otherwise apparently normal epithelium. It is of no value, for example, in distinguishing between an ulcerating carcinoma and an erosion. The suspicious area indicated by this test may be carcinomatous or may be due to some other cause, benign in nature. Only competent histological examination of a biopsy specimen from the suspected area can serve to make the diagnosis. Thus it is clear that the Schiller test is not diagnostic, but its value lies in the fact that it is capable of arousing suspicion and pointing to the site from which diagnostic biopsy is made. This it is apparently capable of doing at a stage in the development of carcinoma of the cervix in which the expectation of cure is good and in which biopsy would not otherwise be made in the absence of the suspicion which it arouses.

As you are aware, the test is dependent upon the fact that the normal intact squamous epithelium of the vagina and vaginal portion of the cervix in the adult female is rich in glycogen. The application of a solution of Gram's iodine thereto results in the absorption of the iodine and the production of a characteristic, dark brown, mahogany stain. Glycogen is absent in carcinoma cells, but, as Schiller himself states, "not only in cancer." Lack of absorption of the stain in any given area, therefore, does not necessarily mean cancer, but may be due to (a) erosion; (b) so-called "eversion," due to the presence of a columnar-celled epithelium on an "eroded" area; (c) Nabothian follicles; (d) leukoplakia; (e) recent abrasions of the superficial layer of epithelium resulting from trauma, such as

might be produced by the introduction of the speculum, rough wiping with a sponge, digital palpation, etc., or resulting from inflammation or maceration; (f) keratinization associated with procidentia and exposure of the cervix to the air.

Not all of the foregoing are likely to be regarded with real suspicion because of the failure of the iodine to absorb, and one may, with a little experience, often exclude from suspicion, without biopsy, perhaps all but leukoplakia. The latter is often multiple and scattered irregularly over the surface of the cervix.

The small cancerous lesion is most often found on one or other lip, with its inner or central periphery in contact with the borderline or junction between the columnar-celled epithelium of the canal and the squamous-celled surface of the portio at the external os. It is white in colour and exhibits a sharply demarcated outline. Once seen it is not readily forgotten.

Such an area may be removed for biopsy by a sharp, spoon-curette or by the use of the cauterodyne loop, and should preferably include a portion of normal tissue and should be immediately fixed.

Unfortunately, the Schiller test is of no value in adenocarcinoma of the cervical canal, the early diagnosis of which can only be made by gentle dilatation and curettage of the canal with a small curette. Especially should this be done when the introduction of a sound or a cotton applicator into the cervical canal gives rise to bleeding, and, in my opinion, one or other of these measures should be employed in the examination of any cervix to exclude the presence of carcinoma.

As a final plea for the early diagnosis of this disease, I would like to emphasize that the routine and systematic employment of the methods to which I have made reference should form an essential part of the complete physical examination of every adult female who consults her physician, regardless of whether she has symptoms referable to the genital tract or not. Again, may I repeat that such symptoms, if due to carcinoma of the cervix, probably indicate that the disease is well advanced and the probability of cure not very great. I am convinced that, for the present at least, we must seek cures by earlier detection of the disease.

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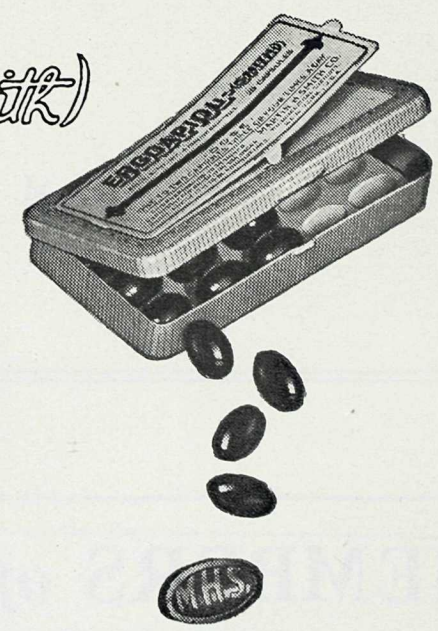

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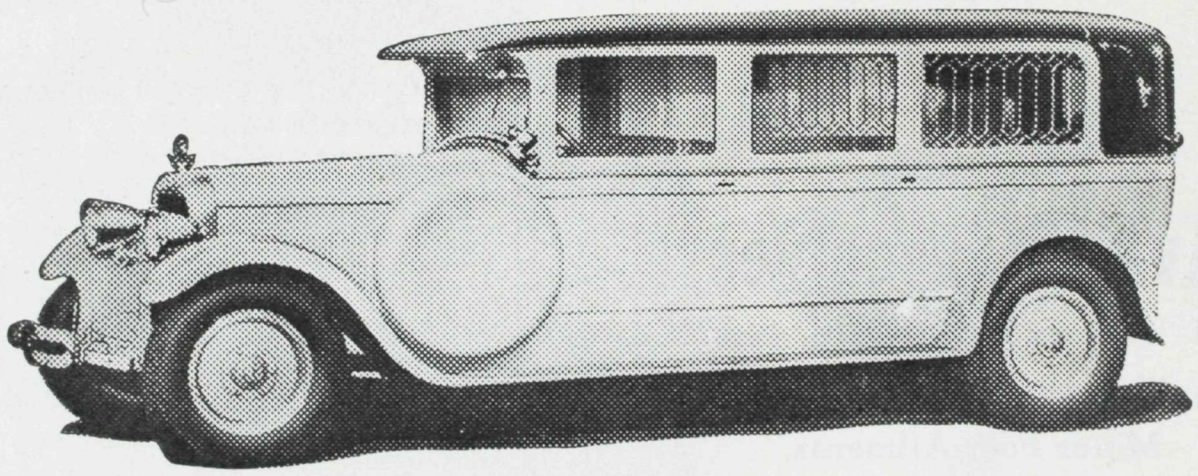

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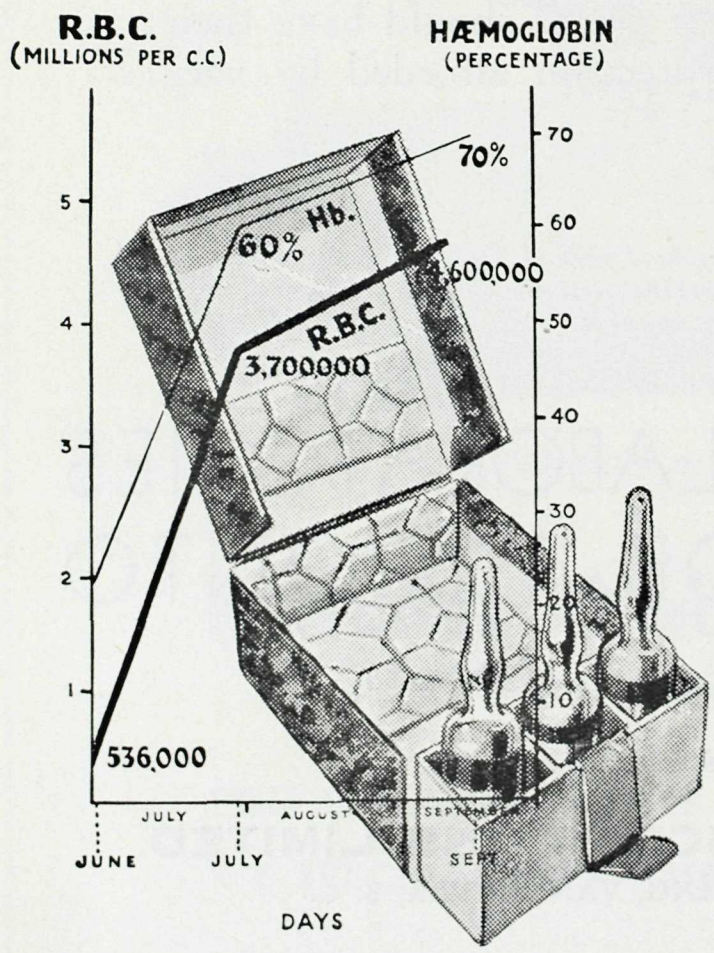

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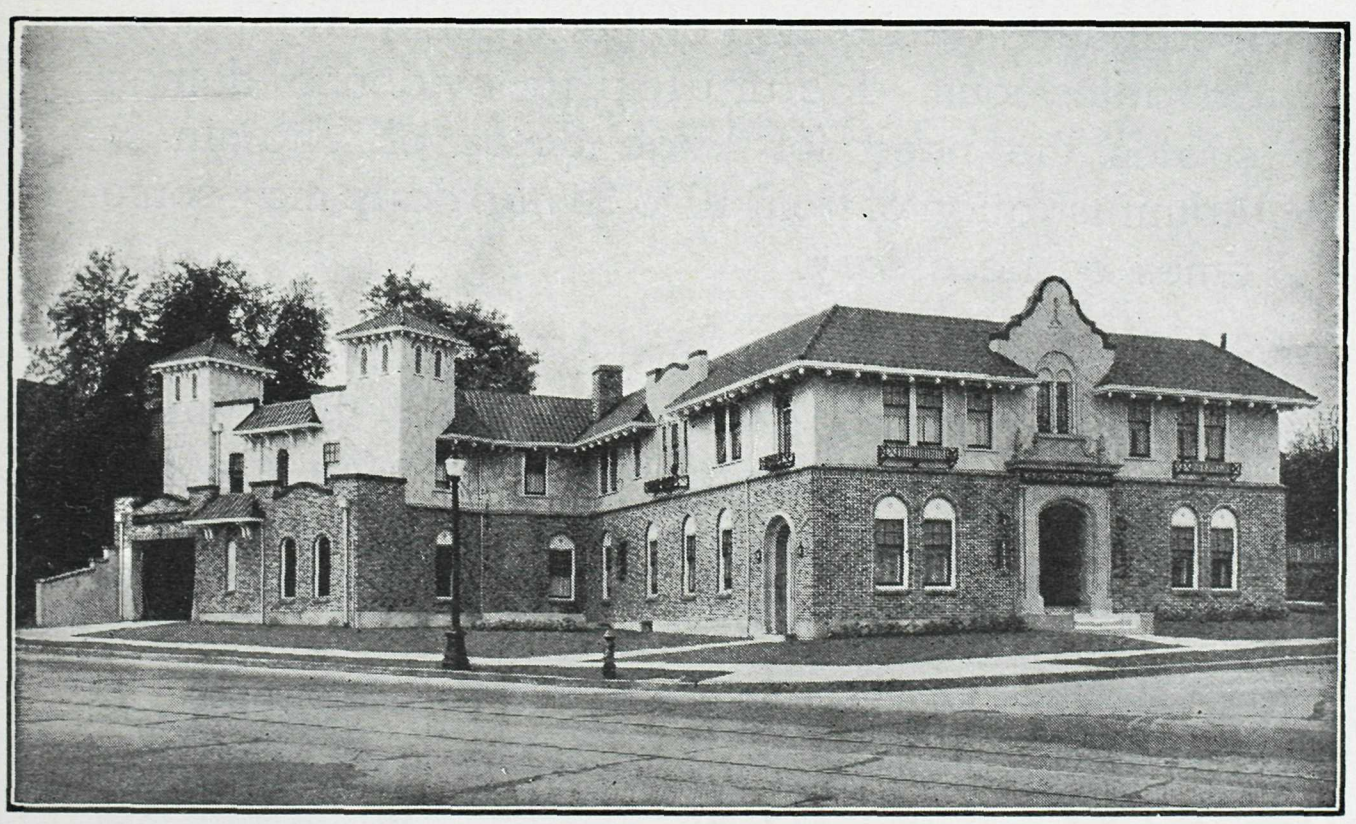

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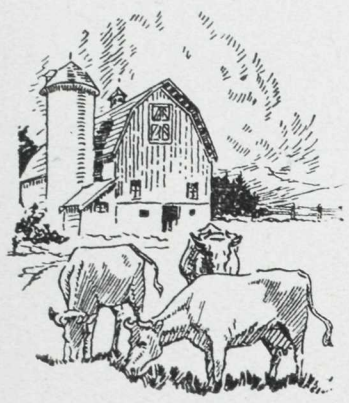

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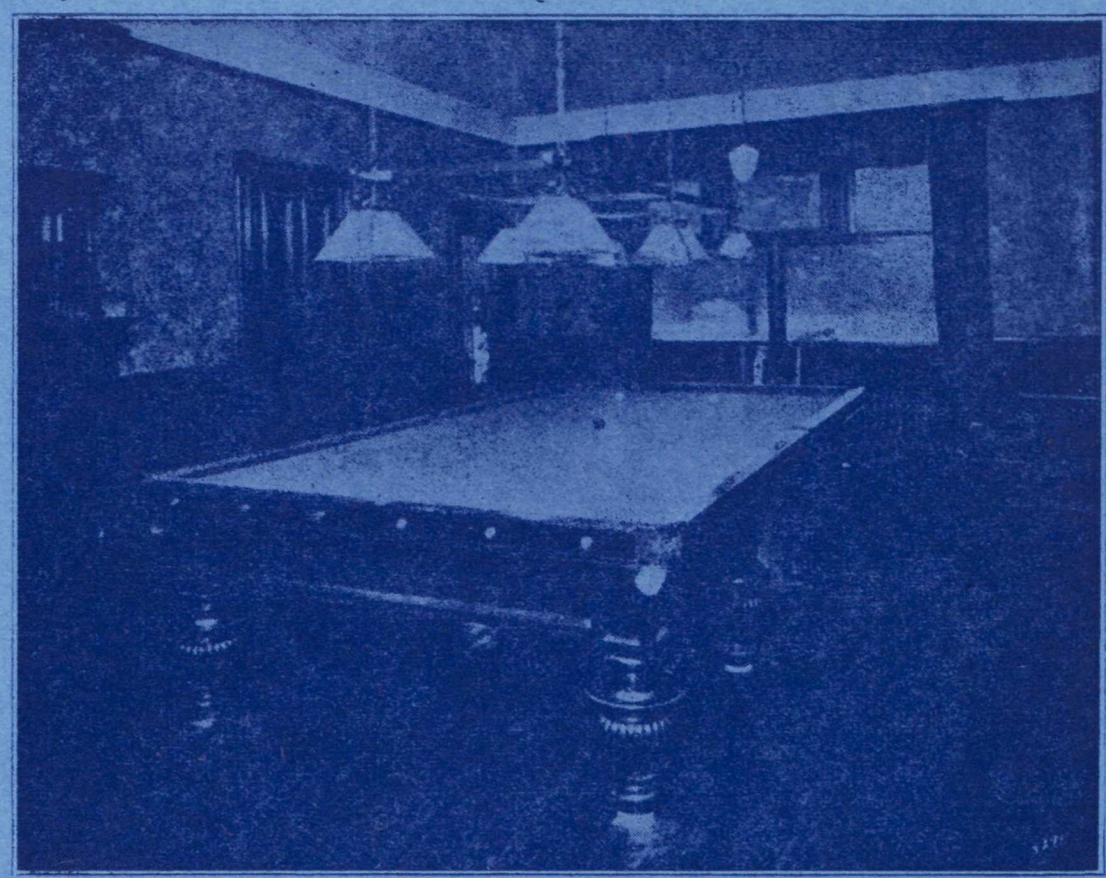

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