The BULLETIN
OF THE
VANCOUVER MEDICAL ASSOCIATION

UNIVERSITY OF BRITISH COLUMBIA
JUL 3 - 1935

Vol. XI. JULY, 1935 No. 10

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NEWS *and* NOTES

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THE VANCOUVER MEDICAL ASSOCIATION

BULLETIN

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

Editorial Board:
DR. J. H. MACDERMOT
DR. M. MCC. BAIRD DR. D. E. H. CLEVELAND
All communications to be addressed to the Editor at the above address

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STATISTICS—MAY, 1935

Total Population (Estimated)	244,329
Japanese Population (Estimated)	8,037
Chinese Population (Estimated)	7,803
Hindu Population (Estimated)	276

	Number	Rate per 1,000 Population
Total Deaths	225	10.8
Japanese Deaths	4	5.8
Chinese Deaths	15	22.6
Deaths—Residents only	195	9.4
Birth Registrations— Male, 159; Female, 161	320	15.4

INFANTILE MORTALITY—	May, 1935	May, 1934
Deaths under one year of age	6	9
Death rate—per 1,000 births	18.8	28.6
Stillbirths (not included in above)	3	11

CASES OF COMMUNICABLE DISEASES REPORTED IN THE CITY

	April, 1935		May, 1935		June 1st to 15th, 1935	
	Cases	Deaths	Cases	Deaths	Cases	Deaths
Smallpox	0	0	0	0	0	0
Scarlet Fever	52	0	49	0	23	0
Diphtheria	5	3	0	0	1	0
Chicken Pox	74	0	201	0	120	0
Measles	60	0	237	0	136	0
Rubella	5	0	3	0	4	0
Mumps	28	0	26	0	6	0
Whooping-cough	47	0	61	0	34	0
Typhoid Fever	0	0	1	0	3	0
Undulant Fever	0	0	0	0	0	0
Poliomyelitis	0	0	0	0	0	0
Tuberculosis	38	12	59	12	17	--
Meningitis (Epidemic)	0	0	0	0	0	0
Erysipelas	1	0	1	0	1	0
Encephalitis Lethargica	0	0	0	0	0	0
Paratyphoid	0	0	0	0	0	0

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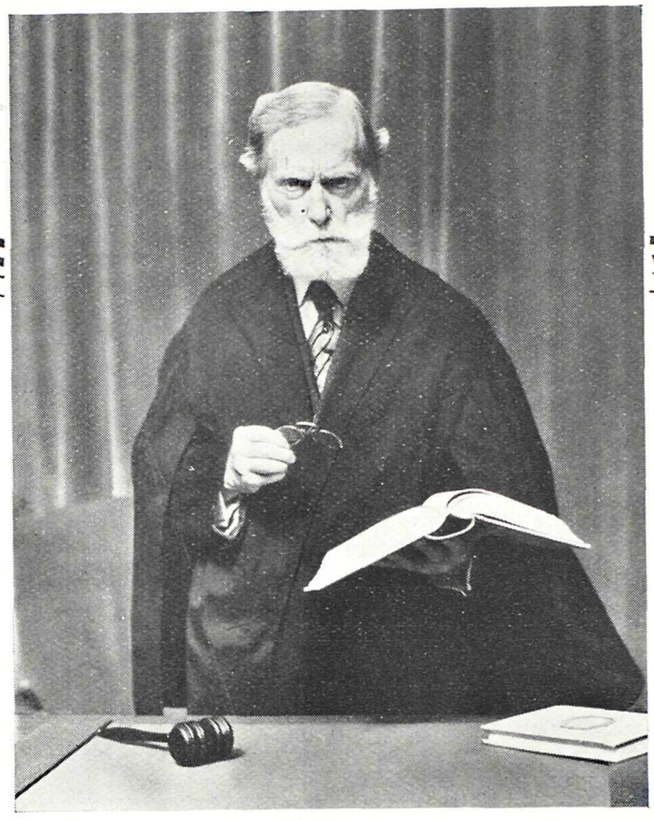

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EDITOR'S PAGE

And so ends another Summer School of the Vancouver Medical Association. The standard reached by this annual function is now accepted as a high one; it would be superfluous to say that this was a good Summer School. It is now some years since the type of School that has become so popular here was more or less standardised into its present form, and we cannot but feel that from our point of view it could hardly be improved upon.

But what a vast deal of work it represents: six men, each a leader in his subject, giving at least four papers each in the four days of the meeting. One sometimes wonders just what it is that makes such men, nearly every one of whom has had a full and busy winter and spring of university work and must be at the saturation point as regards teaching and talking and demonstrating, so willing and even eager to come here, to what is in reality a small School, and give so freely, so ungrudgingly, and with such gusto, of their very best.

It is not, of course, a financial question. We could not hope to secure such men on any such basis; and the list, year after year, shews uniformly outstanding men, men who have a long record of original work behind them —men who, their energies directed along commercial or industrial lines, could command any figure they chose to name.

Nor is it merely a "busman's holiday" for them. They come, many of them, from great distances, simply for the purpose of this School, and they come with their lectures prepared and polished to the last word and phrase—with carefully thought out series of slides and films—in fact, with a real contribution to medical knowledge. One is struck, again and again, listening to these men, with the thoroughness and comprehensiveness of their papers—there is nothing condescending, nothing slipshod or careless about one single lecture. One might be listening to papers prepared for some big national convention.

We think it is due to two or three causes. The first is the natural human instinct which leads us to do our job as well as we can: to do with all our might whatever our hand finds to do. The man who has done good work all his life cannot do slovenly or poor work: as the real musician simply cannot make himself play out of tune. We read, in the accounts of the Greek temples, that even the part of the columns that was buried underground was carved as exquisitely and as accurately as the parts that shewed; for the men who did it were artists and craftsmen, and there is nothing finer in man than this instinctive, creative spirit of doing one's uttermost, "be life's set prize what it will." In saying this we do not decry the Vancouver Summer School, which we personally think is a thing well worthy of any man's best effort, but a second-rate man might think otherwise.

Again, there is that wonderful tradition of our profession that makes every man in it not only willing, but eager to share his finds with every other brother of the craft. It is a tradition that has placed our profession *hors concours,* and one cannot think of a case, since the days of the Chamberlens, where there has been any departure from this rule by any medical man of standing who has made any discovery; though at one time a certain tendency to capitalise a great discovery was shewn in the case of a great German medical scientist.

We must all be very grateful to these men. Perhaps they find their

reward in other ways; in fact, their main reward, their real reward, does not lie even in our gratitude, though that must mean something to them.

The background, too, was excellent, the machinery all ran silently, smoothly: or did we say silently? We suggest a silence zone to be established, and maintained, if necessary, by strong men, for a distance of twenty feet in every direction from the convention hall in future, that those who came to pray may not remain to curse because they could not hear.

And what of the Committee, who worked so hard and engineered the whole meeting so well? They, too, have their reward—and they deserve it—in a big registration, 194 to be exact, and big meetings, and the keen interest of everyone concerned. We must thank them, too, and congratulate them on thier work, and hope for an equally good Committee next year.

One regret we have—and that is the impossibility of hearing all the lectures. One would not willingly have missed one of them: the exigencies of practice made us miss many. Perhaps (it is merely a suggestion) next year the Vancouver Summer School might be held in Victoria, or New Westminster, then we could all go over there and spend our whole day at the School in peace. There are, we admit, certain lions in the path and perhaps it is not a practical suggestion—but it seems a pity that we cannot attend a School in our home town without all these interruptions.

NEWS AND NOTES

Dr. F. Emmons and Mrs. Emmons are to be congratulated on the recent safe arrival of a daughter; both doing well.

* * * *

Dr. George Clement returned from Atlantic City Thursday morning last, in good time to play golf in the afternoon. That's just what one would expect of George. He reports a very successful meeting. Among those who have not yet returned at the time of writing are Dr. Carl Eaton, Dr. Spohn and others.

* * * *

Dr. H. H. Milburn and family motored East at the beginning of the month, and will be absent for some time.

* * * *

Drs. Lavell Leeson and H. A. Desbrisay have gone down to Camp Lewis in Washington to spend a week under canvas with the troops there. Whether they have gone to give or receive instruction does not yet appear—but probably a bit of each. Dr. Boulter was another member of the party.

* * * *

It was delightful to see Dr. W. A. Clarke, of New Westminster, at the Summer School. He is feeling much better, but is not yet quite fit for work.

* * * *

Dr. H. H. Caple left for Europe, with Mrs. Caple, recently. They will be gone for about a year.

* * * *

Dr. R. E. McKechnie is again to be congratulated as the recipient of marked honour. This time it the conferring on him of the order of Companion of the Order of the British Empire, as one of the King's Jubilee honours. No one better deserves it.

Dr. B. J. Harrison, too, Director of Radiology at the V. G. H., receives acknowledgment of some excellent work he has done in the methods of localization, by the award at Atlantic City of the Order of Merit, conferred by the American Medical Association.

* * * *

Dr. D. E. H. Cleveland has just returned from Atlantic City, where he read a paper before the Dermatological Section of the Conference.

* * * *

The B. C. Medical Association has just completed two postgraduate tours. One team went to the Kootenays, composed of Dr. Lyall Hodgins and Dr. L. H. Appleby.

Dr. Appleby took occasion to speak to the various meetings on Council activities—while he gave lectures on Head Injuries and Peritonitis.

Dr. Hodgins spoke on Diabetes and Anæmias.

They report a most successful tour.

The other tour took in Prince Rupert district, and the team consisted of Dr. Murray Baird and Dr. Taylor Henry.

Dr. Baird spoke on Anæmia and Treatment of Infection; while Dr. Henry spoke on Tumours of the Neck, and some conditions of the Large Bowel and Rectum.

THE 1935 SUMMER SCHOOL

The Summer School of the Vancouver Medical Association, which has just been concluded, was a very successful one, coming well up to former standards. The Chairman of the Committee, Dr. J. W. Thomson, and his Secretary, Dr. J. E. Walker, are especially to be congratulated. Everything worked with perfect smoothness, and everyone present seems to have been well satisfied with everything.

One hundred and ninety-four men registered. Of these, twenty were from points in the United States, chiefly Washington and Oregon, twenty-eight from points in B. C. outside Vancouver, leaving one hundred and forty-six Vancouver members. We feel that this is a very good showing.

And those attending all got good value for their time and money. There was something for everyone—a great deal for everyone, really; and the speakers deserve our special thanks in that their papers were all related to general practice and its problems. Occasionally, one of them would soar into levels where the average medical man began to shew signs of dyspnœa and general distress—but as a rule their addresses were thoroughly practical and helpful.

We all rejoiced to have our old friend, Dr. Chas. Hunter of Winnipeg, with us once more, and his four addresses were all worthy of him. It is hoped that we shall be able to give these at some length in future numbers of the BULLETIN. It is regretted that we cannot give all the asides and amplifications with which Dr. Hunter embellishes his lectures, and which add so much to the pleasure with which one listens.

Dr. William Dock, too, of San Francisco, lived up to his "advance notices." His talks were thoroughly good and very interesting, even if occasionally rather theoretical. This, however, added to their stimulating effect.

Dr. Steindler's addresses on orthopædic subjects were excellent, and displayed a very wide knowledge of his subject. A little difficult to hear, on

account of a rather low voice, he was yet extremely worth hearing—and his illustrations by slides were excellent.

Dr. Perry McCullagh, of Cleveland, we regard as one of ourselves. He has grown very greatly, in an atmosphere in which only the best can survive, and listening to him, one was impressed by the immense amount of work that is being done in the field of endocrinology today.

Dr. Verne Hunt, of Los Angeles, gave several interesting and valuable talks on modern surgery, while Dr. John Budd, also of Los Angeles, dwelt on the pathologist's point of view of disease, though he linked this up with the clinician's side continually. He is a coming man, is Dr. Budd, and we shall hear from him again.

Much enjoyed at the meeting were the films supplied through the courtesy of Messrs. Davis & Geck of New York, and a film showing three days' work in the Fracture Clinic of the Royal Infirmary, Bristol, England. This latter picture, showing the use of the Cellona surgical dressing, is the property of Mr. K. H. Priddie, F.R.C.S., of Bristol, and was loaned to the Vancouver Medical Association by Mr. Wisby of the Smith & Mathews Company, Montreal.

ATLANTIC CITY CONVENTION

The Atlantic City meeting was a grand gesture—a noble experiment. Lately returned from the "other side of the line," such grandiloquent epigrams emanate from us as ether wafts from a patient coming down from the O. R.

As a medical meeting something might be said by way of criticism. In spite of the marvellous organization which was reflected in the smoothness with which the various intricacies of its mechanism fitted and moved, there was something overwhelming about it. One may be quite at home repairing a radio set at one's own work-bench and feel excusably embarrassed if invited to utilize all the resources of the Westinghouse laboratories.

Three hundred members of the C. M. A. and several thousand members of the A. M. A. distributed among a dozen large hotels and a few acres of auditorium flooring (these figures are hearsay and unofficial) do not make for concentration. While the general meetings and sectional meetings were well attended and much valuable work was presented and discussed, and the scientific exhibit was as instructive as it was impressive, one could never avoid the conclusion that the great value of the meeting lay in its international character. Canadian representation on the programmes of the general meetings and sectional meetings was very generous. The address by Dr. J. C. Meakins of Montreal on "The Breath of Life" was much eulogized. Dr. B. J. Harrison brought honour to Vancouver by receiving First Class Award of Merit for his demonstration of a new method of orientation applicable to the body and the *x*-ray beam.

We cannot pass this opportunity of mentioning what most of us have had occasion to experience at various times in the warm-hearted and wholesouled hospitality which American hosts excel in displaying. We flatter ourselves—sundry kinks marking the sites of old knots in the lion's tail notwithstanding—that on no occasion is this accomplishment so well displayed nor with such gusto as when the recipients of hospitality are Britishers.

Some of the highlights of the social and fraternal character of the meeting centre about the dinner at the Traymore Hotel on the night of June 10th, at which the Council of the C. M. A. were the guests of the

House of Delegates of the A. M. A. There was an air not of national but of college rivalry about it when in various sections of the large room "Yale Boola" vied with "Old Nassau" and both were drowned by "Anchors Aweigh." With creditable feeling the Canadians gamely struggled with three verses and as many versions of "O Canada," and received more respectful attention and applause than they deserved. Everyone sang and stamped to "Dixie"—as everyone in the English-speaking world not born south of the Mason and Dixon line does; but the musical climax was "Alouette" *a le vrai Canadien,* led inimitably by Dr. Guerin-Lajoie of Montreal. The address which was delivered by Senator James Hamilton Lewis, chairman of the Senate Committee on Foreign Relations, was a piece of moving eloquence and of such evident sincerity that one might excusably feel that the bonds of British-American friendship had been made stronger than ever.

To go further in description and comment without entering into involved detail is impossible. This does not pretend to be a complete account of the convention.

In concluding, our readers will be interested in knowing that the next C. M. A. convention will be held in Victoria, the president-elect being Dr. Hermann Robertson, and that B. C. was well represented at Atlantic City by a number of members of the profession in the province, including Dr. Hermann Robertson of Victoria, Dr. W. J. Knox of Kelowna, Dr. J. H. Hamilton of Revelstoke, Dr. F. D. Sinclair of Cloverdale, and Drs. G. H. Clement, H. H. Milburn, B. J. Harrison, H. Spohn, G. F. Amyot and D. E. H. Cleveland of Vancouver.

MEDICAL RELIEF

COPY OF ARTICLE BEING SUBMITTED FOR PUBLICATION IN THE CANADIAN MEDICAL ASSOCIATION JOURNAL

By Dr. E. S. Moorhead

Operation of Winnipeg Relief Plan

In view of the interest throughout the Dominion on the question of Federal or Provincial Health Insurance, the following record of the operations of the Winnipeg Relief Plan, for a period of one year, will probably prove to be of extreme value.

When the Winnipeg plan was adopted, the only figures available led us to express the view that a relief medical service could be provided on a modified scale of fees for $1.75 per head per annum. The marked discrepancy between theory and fact suggests the scale of fees submitted in the various Provincial Health Insurance Plans may also be very wide of the mark, and the profession must be warned about entering on a course which will prove to be detrimental, in its present form, to their interests.

This report is submitted in the hope that every doctor who is interested will study and analyse it before endorsing or even accepting terms about which he knows little. It is believed that it is the only report of its kind available in the Dominion and possibly in the North American continent. The figures for an additional ten thousand relief cases in the suburbs of Winnipeg do not materially alter the picture.

SUMMARY OF MEDICAL CHARGES FOR SERVICES TO PATIENTS ON RELIEF FROM MARCH 1, 1934, TO FEBRUARY 28, 1935 (12 MONTHS)

			Per-centage	Average month over a 12-month period	
Calls—					
House	15,987	$ 23,992.75		1,332	$1,999.40
Office	22,265	22,448.25		1,855	1,870.69
Hospital	8,065	5,185.70	50	672	432.14
Operations—					
Major	519	20,533.00		43	1,711.08
Minor	900	7,580.73		75	631.73
T. and A.	727	10,852.50		61	904.38
Fractures	33	671.66	37	3	55.97
Maternity—					
Hospital	702	6,994.75		59	582.90
House	137	2,600.00	9	11	216.67
Sundries—					
Special Exams	243	1,198.50		20	99.88
X-rays	193	1,677.33		16	139.77
Anæsthetics	234	825.58		20	68.80
Dental	1	1.25		....	.10
Consultations	266	792.00	4	22	66.00
Gross Total		$104.647.00			$8,720.58
Net Total		93,890.89			7,824.24
Number Doctors Rendered Accounts				2,590	216
Net Average Cost per Doctor					36.25
Cases Reported Hospitalized				2,029	169
Average Number of People on Relief per Month				34,040	
Average Gross Cost per Person for 12 Months				$3.07	
Average Net Cost per Person for 12 Months				$2.76	

After reading the above figures there are many points to be considered. The percentages show what a large proportion of treatment is provided by the general practitioner, which is interesting in view of the fact that the patient is entitled to choose his doctor.

The scale of fees is as follows:

All major surgery, which includes a reasonable amount of post-operative care, $25.00. Tonsillectomy, $15.00. Confinements in Hospital, $10,00; in home, $20.00; both to include ante- and post-natal care in a normal case. House calls, $1.50. Office calls, $1.00. Eye, Ear, Nose and Throat specialists get a somewhat higher fee for office consultations, but a certain list of minor operations and treatments may have to be performed at this consultation. Hospital visits are 50 cents, but only one visit every second day is paid for, unless the patient is shown to be suffering from an acute and serious ailment. Consultations are $3.00 and *x*-ray work is done on an agreed schedule.

It is not claimed that these fees are remunerative. There are several factors which reduce the cost to the City. Two whole-time and two part-time doctors, employees of the City, treat relief cases; the salaries of these medical officers are not included in the summary. The difference between the gross and net totals is due to the fact that, with few exceptions, no doctor is paid more than $100.00 in one month, though his earnings may be considerably above this figure. The City undertakes all administration.

Before the gross total is reached, all bills submitted are taxed. Visits to note progress, or for minor treatments, either of which could have been done

by a visiting nurse, are refused. If the number of visits appears to be excessive, the medical referee, a City official, reduces them, and the practitioner may submit his case for redress to a Medical Board.

All emergencies can be treated without written authority from the Medical Referee. Chronic cases requiring surgical or prolonged and sometimes expensive treatment are frequently referred to the Medical Advisory Board for an opinion as to necessity for treatment or likelihood of benefit. For reasons of economy, tonsillectomies in adults and refractions are rarely authorized.

It will be seen that all these restrictions are intended to reduce the cost of supplying medical service to the unemployed on relief. The service is complete insofar as relief of pain, protection of life and prevention of disability or death, are concerned: but the reader must ask himself, would people under a Health Insurance scheme be satisfied with such a modified service.

An efficient but restricted service should have cost the City of Winnipeg $3.07 per head per annum. If the patient, under a Health Insurance plan, accepted all the treatments recommended by his doctor and insisted on the employment of the modern aids to diagnosis and treatments, it seems certain that the cost would be very much higher than the estimates frequently put forward, that is, if the doctor is to receive a reasonable remuneration.

PHYSIOLOGICAL OBSERVATIONS IN THE PUERPERIUM*

Dr. E. Murray Blair

It is my intention tonight to digress somewhat from the usual diet of this association and offer a paper based chiefly on physiological and obstetric observations. In doing so I well realize that the paper may prove a disappointment to a good many, in that the usual clinical description, diagnosis and treatment will be conspicuous by their absence. I also realize that the clinician who delves in the field of physiology is of necessity on foreign soil and any conclusions based on such observations are probably not only valueless but foolhardy.

I shall confine the discussion to those observations which are an everyday occurrence to those who visit the pregnant patient during her puerperium.

Involution. I believe that no one can palpate the fundus of the uterus each day *post partum* while it is still palpable, without being filled with wonder at the vagaries of that organ. It lies sometimes on the right side of the abdomen, sometimes on the left. It sometimes presents its left cornu anteriorly, or it may present the right cornu, all seemingly without rhyme or reason. We have checked these positions with the positions which the fœtus adopted while in utero and are satisfied that the one holds no relation to the other. We find that the anterior surface of the uterus faces the right groin three times in four. The descent of the fundus *post partum* showed a wide range of variations without any accompanying clinical change that we could find. We have records of the fundus at the umbilicus ten days *post partum*, and of others that we could not find on abdominal palpation four days *post partum*. We have observed patients with a variety of sys-

*Presented before the Vancouver Medical Association February 5th, 1935.

temic diseases, such as pyelitis, pneumonia, anæmia, intrauterine infections and generalized septicæmia, tuberculosis, pre-eclamptic toxæmia, eclampsia and chronic nephritis. We have carefully measured and graphed the descent of the uterus in these cases, and in most patients it seemed apparent that the infection had little if any effect on the involution. We have observed and graphed the involution in cases that have undergone the marked uterine trauma of cæsarean section and are satisfied that in the majority of cases involution is little if at all disturbed.

Finally I want to report the autopsy findings of three maternal deaths during the year, each at least attributable to the delivery.

No. 72617 S, V.G.H., cæsarean section, marked febrile course, died on the 7th day *post partum*. The fundus was found at the umbilicus.

No. 87010 S, V.G.H., ruptured uterus, cæsarean section, marked febrile course, died on the 7th day *post partum*. Autopsy findings, egneral plastic peritonitis with ileus. Fundus the size of two fists.

No. 87039, V.G.H., sharp painless hæmorrhage at about full term. Cæsarean section, followed by marked febrile course, death on the 13th day. Autopsy findings, general peritonitis, purulent metritis, multiple mural abscesses in the uterus. Uterus the size of one fist.

In the first case there was apparently little involution. In the last two, despite a most acute intercurrent infection causing death, the phenomenon of involution seemingly went serenely on. Such observations are surely of interest and worthy of our thought and consideration.

I have been making some attempt to observe the involution of the uterus a little more carefully during the past two or three years. An attempt has been made to ascribe some degree of accuracy to our observations by means of repeated measurements. The work has kept sustained the interest of the housemen in the apparently normal parturient patient. It has kept the young doctor in close physical touch with the patient throughout, and has seemed to add a distinct interest to his work generally. It has supplied us with a mass of data which we think is of some interest.

A few simple rules were devised to assist in the accuracy of these observations. The patients were kept from becoming constipated by means of the generous exhibition of liquid petrolatum, and all were "panned" at a certain time each morning in order that the bladder might be emptied immediately before measurements were taken. We had the same houseman carry out the measurements each morning as far as it was practical. The measurements were taken with calipers from the superior edge of the symphysis to the top of the fundus. While the actual measurements may not be very accurate, yet repeated measurements done each day in the same manner by the same individual will show a relative accuracy in the degree of change from day to day. Each case was graphed from the second day *post partum* until the uterus could not be palpated or the patient discharged. The experiment was carried out routinely on each parturient patient and this in a rather large and active obstetrical service gave us opportunities to observe all types and conditions. We have 245 such graphs.

By a purely arbitrary ruling the first and eighth day measurements were joined and the angle so formed with the perpendicular was measured. I have termed this the angle of descent.

Our first experiment attempted to find if any later treatment affected the progress of involution and if so to what extent. The following procedure was instituted. Taking each patient in rotation 24 hours after she came down from the case room, the first was given an ice bag applied continuously to the fundus; the second a tablet of ergot, quinine and strychnine, three

times a day; the third nothing. Ninety cases were so observed, showing 30 graphs in each of the above groups. The results were, we thought, of distinct interest in that the graphs of all three groups were essentially the same. While the angle of descent varied in the individual case, the average angle in each group was practically the name. In other words, nothing seemingly was gained by the use of an ice bag or ergot, quinine and strychnine *post partum* from the standpoint of involution. Indeed, the nursing observation was that the exhibition of ergot, quinine and strychnine increased after-pains and general discomfort very appreciably. The continuous application of an ice bag to the abdomen is added labour that is apparently without reward as regards involution.

We find that the height of the fundus 24 hours *post partum* is, generally speaking, in a direct ratio with the weight of the baby. The larger the baby the higher the fundus.

36% of our series weighed over 8 lbs.
10% weighed less than 6 lbs.
54% weighed between 6 and 8 lbs.

The interesting observation was that the angle of descent was the same within reasonable limits in those cases with babies weighing over 6 lbs.

In those cases where the babies weighed less than 6 lbs., practically all of them being premature, the fundus took almost as long to reach the symphysis, but having a much shorter distance to go, the angle of descent was decidedly greater.

There were three cases of babies weighing 10 lbs. or over, the largest 13 lbs. 8 oz. In each case the fundus has not reached the symphysis in ten days.

Two cases of twins were observed and graphed, and here too the fundus was distinctly slow in its involution. In these few cases I think it is suggestive that overstretching of the uterine muscles may cause delayed involution.

It should be pointed out that the angle of descent was somewhat increased but the fundus had a greater distance to descend in the same period of observation.

Prolonged Labour. Among the ninety-two cases most recently graphed there were thirteen labours of more than 24 hours duration. It was interesting that apparently neither the weight of the baby, the age of the mother, the degree of parity, or the laxity of abdominal musculature, all of which were carefully noted, seemed to have any particular bearing upon cases. Four of these long labours were premature. The impression was again gained that the fundus of the premature baby displays prolonged involution.

There were ten patients graphed whose temperature placed them in the uterine morbidity class. The definition of morbidity in this hospital is a temperature reaching 100° on two successive 24-hour periods, not including the first twenty-four hours. From this group we have excluded those morbidities which were apparently due to any other cause than uterine infection. In five of these ten the angle of descent was distinctly increased; in the other five there was a normal angle.

As has already been said, systemic diseases played little if any part in the progress of involution as far as could be observed. Cæsarean section with its gross trauma to uterine musculature both by incision and handling, together with added anæsthetic and peritoneal shock, have influenced *post partum* involution only mildly if at all.

The presence of intramural fibromyomata have been observed only four times in cases that could be graphed. In one of these with a large fibroid in the posterior wall of the lower uterine segment there was apparently a very definite delay in involution. In the other three the fundus was barely palpable at the symphysis ten days *post partum*.

We have graphed six cases of anæmia, i.e., Hgb. 65% and under and down as low as 42% and there seemed little if any change in the rapidity of involution.

Finally the autopsy findings already described, presenting as they do, in one case in particular, about all the inter-, intra- and extra-uterine infection that one could conceive of with practically complete involution when death intervened on the 13th day, was enough to make me look further afield for an explanation of this phenomenon. I know that every text book on obstetrics describes intrauterine infection as a common cause of delayed involution; this I am in no position to refute, but in my own limited observations I can only say that it has been by no means a constant finding.

In the *post-partum* clinic where patients are seen six weeks after delivery, delayed involution in its more prolonged state can best be studied. My experience in *post partum* examination there is limited. There are those here much better qualified to discuss this phase of the work because of a wider experience. My own idea is that retroposition, marked cervical lacerations and cellular inflammation about the uterus are conducive to delayed involution.

In order intelligently to understand something of this itneresting phenomenon it would seem necessary to study not so much involution *per se*, but rather the whole question of uterine contractions and those factors which directly or indirectly bear upon such contractions. I assume that uterine contractions have an important bearing on involution as well as labour.

Before doing so I am reminded of an old dictum to the effect that "In order to hope to understand function, the first requisite is a knowledge of structure." I shall discuss briefly the pregnant uterus under two headings, the muscle and the nerve supply, and each purely from the standpoint of function.

Muscle. It seems advisable to discuss uterine musculature as having two coats:

1. An outer or longitudinal coat, covering the fundus, the lower segment and the cervix, and comprising about one-tenth of the musculature of the uterus.
2. A circular layer, by far the more extensive. It carries most of the circulation, supports the decidua and the gestation and makes up about nine-tenths of the uterus.

Myogenic Innervation. Purkinje in 1839 demonstrated special systems of muscle fibres in the heart and non-pregnant uterus. Not until 1929 were his observations on the uterus confirmed by Hofbauer. The latter describes in detail a distinct conducting system situated in the longitudinal muscle layer. He has shown by experiment that the longitudinal layer contracts much more markedly in response to stimuli than the underlying layer of the uterus. The longitudinal layer responded to small abounts of pituitary extract much more markedly than the circular layer. At cæsarean section the stimulus of the incision caused a more marked retraction of the superficial layer than that lying in a deeper plane.

Hofbauer's conclusion is interesting: "I am inclined to assume that a

specialized system of the human uterus may represent an analogue of the His Bundle in the heart."

Many interesting experiments have been carried out to show that the uterus is not dependent upon its nervous attachments for either contractility or tonicity. It has been noted by many observers that the uterus, severed from all its attachments, undergoes rhythmic contractions if kept moist at body temperature. It must then be accepted that the theory of myogenic systols and diastole of hollow smooth muscle is a factor which must not be lost sight of.

Nervous Innervation. The nervous innervation of the uterus follows very closely the innervation of any smooth muscle organ in the body. In all instances the autonomic nervous system primarily governs their activity. Indeed the nervous control and regulation of all vital functions in the body are carried out by the autonomic nervous system. It should also be made plain at the outset that though there is no proven direct relation between the central nervous system and the autonomic nervous system, yet the one is in no sense functionally independent of the other. It is not my intent to discuss in detail the autonomic nervous system which has indeed been attracting the attention of the medical world for the last several years. It does seem reasonable, however, that if we are going to discuss involution we must consider the nervous innervation of the uterus as a primary factor and that innervation as far as is known is wholly autonomic.

In 1871 Sir James Simpson found that parturition was normal in sows from which he had removed the dorsal and lumbar cord with the interesting exception that the last fœtus of the litter in each case was undelivered. Routh reports more than one observation on the course of labour in women suffering from paraplegia, and in more modern times the profession is well aware that parturition progresses quite normally with complete intra-thecal anæsthesia. We may then assume that the central nervous system is in all probability not a factor in the uterine contractions of labor and the puerperium.

The autonomic nervous system is divided into a sympathetic and parasympathetic system. For our purpose it will not be necessary to delve too deeply into the origins of these two systems. It will be necessary, however, to remember the following facts:

(1) There is a sympathetic and parasympathetic innervation to every plain or smooth muscle organ in the body.
(2) The actions of these two innervations on the one organ are exactly opposed.
(3) The actions of the two are in general antagonistic to each other. These facts obtain in the sympathetic innervation of the eye, heart, stomach, intestine, uterus, bladder, and to some extent the blood vessels.
(4) It is generally accepted that the sympathetic nervous system supplies the innervation to the circular muscle coat of the uterus and the parasympathetic system to the longitudinal coat.

It will be simpler to follow the automatic innervation of the uterus by means of diagrams, one showing the sympathetic innervation and the other the parasympathetic innervation.

Sympathetic Innervation. This system is described beginning at the solar plexus at the first lumbar vertebra. From thence downward are the intermesenteric nerves, the superior, middle and inferior hypogastric plex-

uses. From the superior hypogastric plexus down, the sympathetic chain bifurcates to form the presacral nerves. The inferior hypogastric plexuses are then two in number, situated on either side of the mid-line, and are here joined, as will be shown later, by the parasympathetic system. Together they enter the uterus via the utero-sacral fold.

PARASYMPATHETIC INNERVATION. This system apparently has its origin within the spinal cord. The nerves proceed through the second, third, and sometimes the fourth sacral foramina in conjunction with and as part of the sacral nerves similarly numbered. They pass forward to join with the sympathetic chain at the inferior hypogastric plexuses. They used to be known as the "Nervi Erigentes."

As has already been pointed out, the sympathetic nerves are motor to the circular muscle coat of the uterus and the parasympathetic or "Nervi Erigentes" are motor to the longitudinal coat. As was also pointed out, these nerves are antagonistic one to the other. In other words, local paralysis of the lumbar cord affecting the parasympathetic, whether permanently by trauma or temporarily by spinal narcosis, produces marked contractions of the circular muscle fibres of the uterus owing to uncontrolled sympathetic impulses. The expulsive power is largely lost owing to paralysis of the innervation of the longitudinal fibres.

One can readily see the clinical importance of these physiological findings if true:

(1) That in spinal anæsthesia in cæsarean section the uterus should be found in a state of extreme contraction. The inhibitory fibres to the sympathetic chain, the "Nervi Erigentes," have been paralysed by intra-thecal medication, hence the extreme contraction of circular fibres.

(2) In spinal anæsthesia for normal delivery, the nervous innervation of the longitudinal or expulsive coat is lost, hence though labour may go on and doubtless does go on normally to the end of the first stage, the expulsive power of the uterus should be in great degree lost. Beckwith Whitehouse of Birmingham says that this is his observation and experience both in cæsarean sections and normal deliveries with spinal anæsthesia.

Having discussed uterine structure from the standpoint of musculature and nervous innervation, we should now be in a position to discuss those factors which bear upon uterine contractions. They consist in great part, I believe, of the sex hormones.

I approach a discussion of the sex hormones with some misgivings. During the past six years the literature has been filled with articles about their action in almost every field of medicine. Despite the fact that the whole matter is still in a state of flux, the commercial drug houses have apparently the situation well in hand and are on the highway to another bonanza. We have passed through the Barbiturate Era, the iniquitous Vitamin Era, and are now as a profession playing the same unsavoury part as a medium whereby commercialism is exploiting the public in the field of the female sex hormones. We all realize that these hormones will play an important and permanent part as therapeutic agents in the gynæcology and obstetrics of the future and indeed in every branch of medicine, but I feel that we shall deal with this intelligently only through a knowledge of basic physiologic study.

The factors which bear upon the contraction of uterine muscle, as far

as I am able to gather, are œstrin, progestin, prolan, infundibulin, adrenalin, acetyl-cholin, calcium and magnesium.

OESTRIN is the hormone of the follicle of the ovary; it is also formed in the corpus luteum, the placenta, and is found in the amniotic fluid. It is also found in such foods as potatoes, sugar beets, yeast, rice and wheat.

Its functions are:

(1) It directly controls uterine growth, both in the non-pregnant and pregnant uterus.

(2) It increases sensitivity of the uterus to pituitrin.

(3) It initiates the secretion of pituitrin and so indirectly increases the activity of uterine muscle.

Oestrin gradually increases in amount during pregnancy until it is found in greatest quantity in the circulation at the beginning of labour. It rapidly diminishes during the puerperium and has disappeared at about ten days *post partum*. It has a direct relation to pituitary activity. In rats its injection will invariably produce abortion. In humans great quantities would be necessary and such experimentation has not been successful. Its principal sources for commercial production are the urine of pregnancy of women and mares.

PROGESTIN is the hormone of the corpus luteum and is not found, as far as I know, elsewhere in either the animal or vegetable kingdom. It is extremely unstable and has never been produced commercially.

Its functions are:

(1) It prepares the endometrium for the reception of the fertilized ovum.

(2) It apparently supervises the nourishment of the fœtus during the first three months of intrauterine life.

(3) It inhibits uterine activity and is, generally, an antagonist to œstrogenic activity.

Progestin appears just before implantation, increases in quantity in early pregnancy, then gradually decreases until at labour it has almost, if not entirely, disappeared from the circulation. In early pregnancy progestin, the inhibitor of uterine activity, is the dominating factor, but gradually œstrin overcomes it until at labour the latter is the dominating factor.

PROLAN. It has long been known that hormonal activity of the ovaries is dependent on the anterior pituitary. The ovary itself is apparently a passive factor and is activated to produce its own hormones (œstrin and progestin) by the anterior pituitary. Much has been said about two hormones formed in the anterior pituitary, Prolan A to activate the follicle and Prolan B to activate the corpus luteum. The two have not been satisfactorily separated, and there are those that doubt that they exist as two distinct entities. For our purpose we will discuss only the hormone of the anterior pituitary, proland.

Were we dependent upon anterior pituitary glands for the hormones it would not be a commercial product as progestin is not, but in 1928 Zondek found a substance in the urine of early pregnancy which very closely resembled it. Collip and others later found the same thing in the placenta. The resulting commercial product is called anterior-pituitary-like (APL).

Zondek's findings became the well known test for pregnancy, the Aschheim-Zondek Test. Prolan is found in quantity only in the early months of pregnancy. Its action on the uterus is to inhibit activity.

INFUNDIBULIN. Hormone of the posterior pituitary is a normal constituent of the body. There is ample evidence that it is secreted in large amounts toward the end of pregnancy. It may be the most important single factor in initiating labor and involution. Its gradual increase is apparently directly attributable to the corresponding increase in œstrin. The question of the action of pituitary on the pregnant uterus is well known as an activator of muscle contractions, and it is now believed by many that it only acts in the presence of œstrin. The degree of activity is directly dependent upon the amount of œstrin present in the circulation.

SUPRARENAL. There is reason to believe that there is increased activity of the suprarenals during pregnancy. Adrenalin is believed clinically to inhibit expulsive contractions in labor. A full hypodermic administration during labor has been shown to inhibit all contractions for as long as twelve minutes. Williams Text Book (1930) advises the injection of five minims of adrenalin to control the excessively violent contractions of the uterus in labour. Other authors advise the use in eliminating the so called Bandl's Ring. I have used the drug for such a purpose a number of times and so I think have many of you. It has been accepted for many years that stimuli carried by the sympathetic fibres of the autonomic nervous system will activate the smooth muscle which they innervate only in the presence of adrenalin.

ACETYL-CHOLIN. In 1931 Dale was able to isolate a substance called acetyl-cholin, which he has proved performs precisely the same duties for the parasympathetic nerves as adrenalin does for the sympathetic nerves; in other words, the stimuli carried by the parasympathetic fibres of the autonomic nervous system will activate the smooth muscles which the innervate only in the presence of acetyl-cholin.

Each branch of the autonomic nervous system is dependent, then, for its function upon the presence of its chemical transmitter. It is an interesting and I think significant fact that acetyl-cholin is found, according to Sir Henry Dale, in the spleen and in only one other tissue, the human placenta.

CALCIUM. Much has been written of late concerning the exhibition of calcium salts in late pregnancy. The supposed depletion of maternal calcium by the growing fœtus will not be discussed here. It has been shown fairly conclusively that an optimum of calcium content in the blood is necessary for an optimum of uterine motility, and that any amount below that lessens uterine contractions, and indeed may be a factor in uterine inertia and subinvolution.

MAGNESIUM. Magnesium salts are apparently directly opposed to calcium salts in their reaction to uterine motility. Magnesium salts tend to inhibit uterine contractions.

In summing up the interaction of these various factors, all of which may and most of which probably do have a direct relation to uterine involution, it seems fair to offer the following:

(1) An increase of progestin in the circulation above normal might well cause a slowing up of involution.

(2) A too rapid decrease of œstrin content, while in itself having no direct action on the uterus, would nevertheless call out a smaller quantity of pituitrin and decrease the sensitivity of uterine muscle to the action of pituitrin, thus delaying involution.

(3) An increase in prolan would be an inhibiting factor to normal involution. Although the anterior-pituitary-like hormone decreases in the urine as pregnancy progresses, it is still found in some degree in the circulation during the puerperium. An anterior-pituitary-like substance is also present in the placenta, as Collip has shown.

In the same manner it can be argued that the varying presence of infundibulin, adrenalin, acetyl-cholin, calcium and magnesium all enter into the mechanism of uterine involution.

I am unable to relate these factors to the uterine innervations which we have discussed earlier in the paper. Two thoughts might well come to one's mind:

(1) How do these hormones circulating in the blood stream act upon the muscle fibres? Haxe they a myogenic or a neurogenic action, or both?

(2) What factors, if any, play upon the autonomic nervous system, causing it to stimulate the organs which it innervates?

It is my feeling that the factors above described act upon the uterine muscles through the medium of its autonomic nervous system. Is it any wonder, then, that our experiments on involution bore such little fruit? Is it not reasonable that the phenomenon of involution goes on according to the hormone balance in the circulation, with its resulting reaction on the autonomic innervation? Is it not reasonable that this innervation is only to a minor degree influenced by systemic disease or even local infections?

Strangely enough I have found nothing very definite concerning autonomic stimulation, and so it is pure presumption on my part to offer this postulate, that the chief and perhaps only innervation of the uterus is autonomic in origin and that the factors which play upon its autonomic mechanism are hormonal in character.

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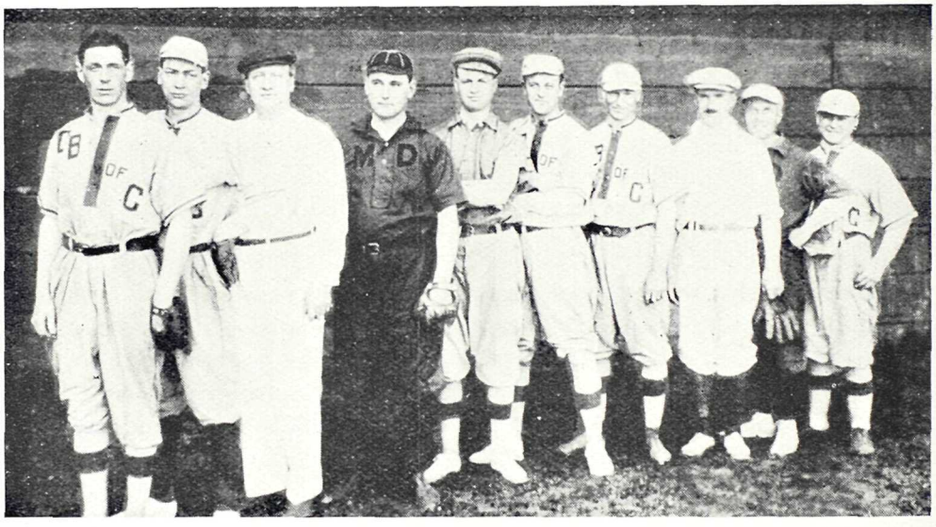
HISTORIC BASEBALL "LINE-UP"

We present in this number a picture of a group of our members taken twenty-five years ago, with an accompanying letter from Mr. Leslie Henderson, of the Georgia Pharmacy. Mr. Henderson was inspired to send this along by a note in the "Twenty Years Ago Today" column of the *Vancouver Daily Province* of June 20, 1935.

Of those in the picture, only Dr. J. H. Carson is absent from our number. The others are all alive and well, and we have no doubt could give a good account of themselves today in a baseball game. The mystic letters C. B. of C. appearing on the sweaters of some of them, are there because they were borrowed from a Bank of Commerce team, and have no medical significance. It is delightful to see the carefree expression on these faces, the expression of happy youth.

"No fear have they of ills to come
Or thoughts beyond today." . . .



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Having read in last night's *Province*, under the "Twenty Years Ago" column, a reference to the Medical Baseball Team of twenty years ago, and having had a picture of the team for many years, I thought you might be interested in same in regard to the MEDICAL BULLETIN.

Should any of the members of the team care to have a complimentary copy of the picture, I have a negative and will be very glad to send them one upon request.

Yours very truly,

LESLIE G. HENDERSON.

PRESENT STATUS OF PROSTATECTOMY

Notes from Address by Dr. Verne Hunt

There would seem, said the speaker, to be some doubt about the value of prostatectomy at the present day. As one of the older generation of surgeons he felt that we should not lightly discard the general principles which have guided us in the past in the treatment of enlarged prostate.

Modern methods have been introduced and popularized; to some extent advertised. Dr. Hunt felt that there had been a rather overwhelming degree of propaganda, and in his mind there was room for some doubt about certain things in connection with these.

We must not, he felt, be swept off our feet by the newer methods, which have been adopted mainly by a younger generation of urologists, who perhaps have not had the experience and knowledge of past methods which have been the lot of former surgeons. They may perhaps lack perspective for this reason, to some extent. The speaker made it plain that he was not trying to discourage these methods, when rightly used by competent men.

History. The speaker briefly reviewed the history of the evolution of Prostatic Surgery.

First, there was the pre-surgical era, or rather the era before asepsis made surgery at all possible, when the surgery of the prostate was very crude, removal was seldom if ever practised, and merely some form of incision, as by lithotomy, was practised.

Prostatic surgery developed from lithotomy, and at first was done by the perineal route.

The early surgical era from 1885-1895 was coincident with Listerism.

The first prostatectomy was done by Billroth in 1887 (perineal route) for carcinoma.

In 1889, Watson operated for hypertrophy. The perineal operation was popularised by Goodfellow of San Francisco, but Bellfield in Chicago did the first suprapubic prostatectomy in 1887.

In 1890, the world's entire literature showed only 133 cases where the prostate had been removed, all being done for complete obstruction; 68% of these had voluntary micturition afterwards, and the mortality was only 10%, though higher by the suprapubic than by the perineal route.

Other methods were tried: e.g., bilateral castration, ligation of afferent vessels, etc. None of these were effective.

The method of operation was chiefly nibbling and no complete enucleation was tried till Fuller, in 1900, introduced this.

Freyer did much, as we all know, to make the operation a sane one and to bring the profession back to prostatectomy, but it was left for Hugh Young in 1903 to provide a method of open and accurate visualisation by adequate exposure through the perineum, and this was a noteworthy contribution to this work.

Later Judd and Thomson-Walker introduced a light into the bladder for suprapubic removal.

Gradually the suprapubic method became the method of choice, though as regards results and mortality there was little to choose between the two routes.

Transurethral removal. In one way this is nothing new. One hundred years ago (1834) Guthrie first operated with a catheter and concealed blade; in 1836 Mercier devised another instrument.

McKee in 1873 reported a transurethral operation.

Young (1909) found certain types of small glands and those with contractures of neck (the so-called "bar"). He devised an instrument known as "Young's punch."

In 1918 and 1926 other instruments were introduced.

Then came the modern operation, preceded by the Davis resection. Unfortunately, in Dr. Hunt's opinion, Davis (of Carolina), who was extremely enthusiastic about this method, spoke of it as a *minor* surgical procedure. Most emphatically, Dr. Hunt said, it is not a minor procedure. With this report of Dr. Davis, a great deal of enthusiasm was engendered, and an intensive campaign by instrument-makers started.

"I know that the transurethral method, properly and capably done, in skilled hands, is an excellent operation."

But its ease of operation and results in skilled hands have led to its adoption by men who are not skilled, and so to results which would not have occurred in the right hands.

It is not a procedure which a man merely skilled in cystoscopy can safely undertake; nor can it be used in every case.

Indications. Dr. Hunt took the stand that whatever procedure is adopted, we must have definite indications, and follow these closely, otherwise we court disaster.

(1) *Prostatic age.* Few men under 60 have true prostatic obstruction. More than 50% of men over 50 have some enlargement of prostatic tissue.

There must be obstruction to the urinary output. This is a fundamental

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indication, irrespective of the size of the gland. As long as the patient is emptying his bladder, operation is not called for.

(2) Very few men less than 60 years old require removal of any part of gland on account of retention or difficulty in emptying bladder.

The average age is 63 years plus. Many men are doing transurethral resections in patients under 60, for what they call prophylactic reasons, *to prevent trouble*. Hunt does not subscribe to this. He needs definite indications for what is a major, and not a minor, surgical procedure.

The indications, to his mind, are exactly the same for transurethral as for any other type of prostatectomy.

Alcock of Iowa has, he thinks, the best list of indications, based on honestly collected and honestly interpreted statistical material.

We must not emphasize success and ignore failures. We must expect that results will not be good in every case, and we must admit and record our poor results. The integrity of the surgeon, his experience and skill are the test as regards results.

Many complications may arise, and just as many, and the same complications, by the one method as by the other.

When definite indications are observed, and skill is adequate, mortality may be less than 5%, but can go up to 15 or 20%.

Dr. Hunt shewed slides which shewed the importance of age as a factor in the results.

The causes of death: in 150 cases, 28% were due to pyelonephritis, 15% to sepsis, and 15% to bronchopneumonia, a total of 58% due to infection.

Uræmia caused only 6½% and hæmorrhage 3½%.

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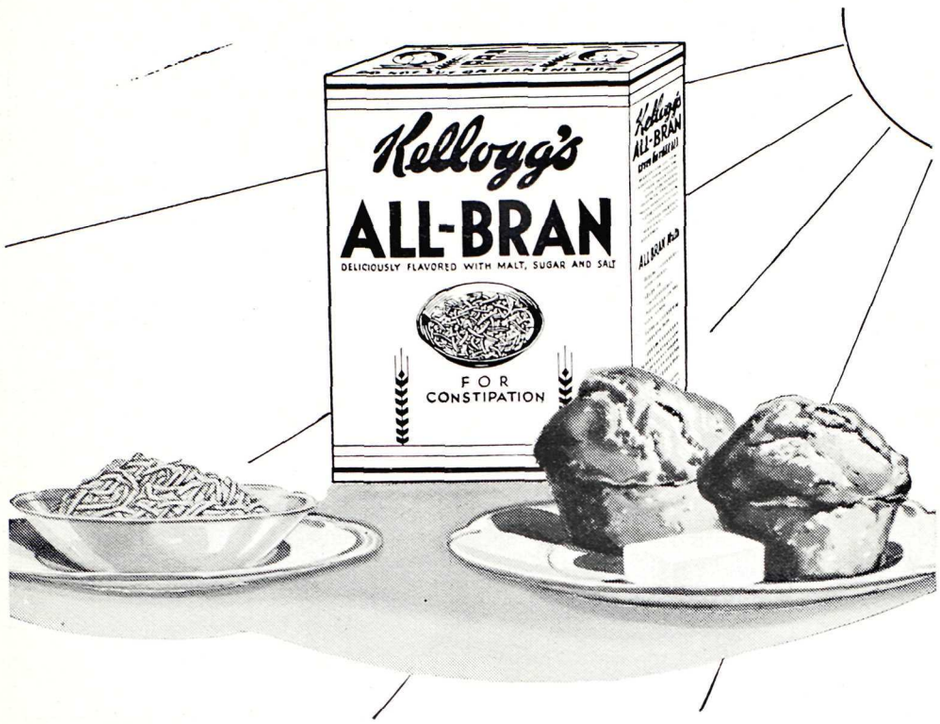

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This natural laxative food may be served as a cereal with milk or cream, or cooked into appetizing muffins, breads, waffles, etc. Made finer, softer, more palatable, it blends better with other ingredients in the recipe. ALL-BRAN may also be taken in orange juice, sprinkled in soups, over salads or other cereals.

Kellogg's ALL-BRAN supplies gentle "bulk" to aid regular habits. Within the body, this "bulk" absorbs moisture, and forms a soft mass. Gently, this sweeps out the intestinal wastes. ALL-BRAN also furnishes vitamin B and iron, an important element of the blood.

Except with those few individuals who suffer from diseased or highly sensitive intestines, where "bulk" in any form is contraindicated, you may safely recommend Kellogg's ALL-BRAN. Sold by all grocers in the red-and-green package. Made by Kellogg in London, Ontario.

MILK PROBLEMS

TUBERCULOSIS

PERHAPS the earliest health problem recognized as closely connected with the milk supply was that of tuberculosis. The certified milk movement was largely directed toward this menace. A little later pasteurization came in as a protection and the time and temperature of pasteurization has been fixed at a point where all germs of tuberculosis, which may have found their way into the milk, will be destroyed with certainty. This organism was selected as a test object because it proved to be more heat resistant than the germs causing other milk borne diseases. Accordingly, proper pasteurization of milk makes it safe from all forms of disease-producing germs.

SUMMER COMPLAINT

At about the same time raw milk was recognized as an avenue through which tuberculosis might be carried; it was also noted that it had a close connection with the frequency of diarrheal disturbances among the smaller children.

Perhaps the most gratifying result of pasteurization, from the standpoint of the pediatrician, has been the almost complete disappearance during the hot months of diarrheal outbreaks, such as was experienced in the days of the universal use of raw milk. It is now known that these severe diarrheas of small children are due to a variety of organisms which find their way into the milk and are destroyed by pasteurization along with the other disease producers.

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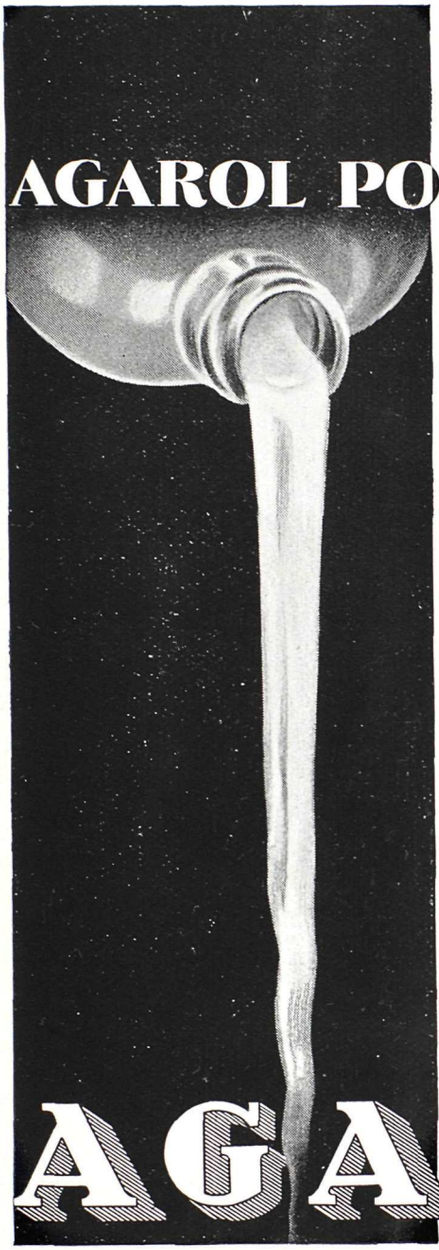

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A good emulsion should pour freely. Agarol does. It is a mineral oil and agar-agar emulsion with phenolphthalein that mixes thoroughly with the intestinal contents, supplies unabsorbable moisture, lubricates the tract and gently stimulates peristalsis. And, of course, it may be added to water, milk, or to any other liquid. Agarol is emulsified to such exceptional fineness that it will not be broken down in any dilution.

Agarol is palatable without artificial flavoring, because highly purified ingredients impart no taste that needs disguising. It contains no sugar, alkali or alcohol—suitable for any age period, under any condition, for the relief of acute constipation and in the treatment of habitual constipation. . . . Trial supply gladly sent on request.

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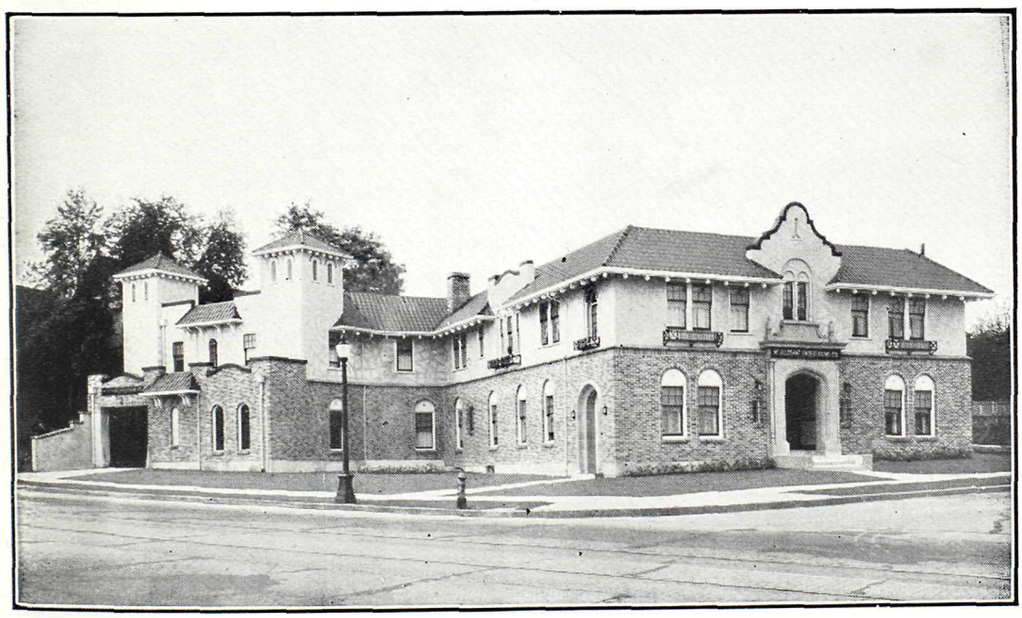

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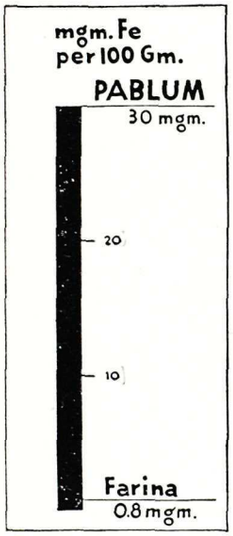
For bland diet therapy, especially ULCER cases – PABLUM

FAR too often the bland diet prescribed for gastric ulcer, colitis, and similar gastro-intestinal disorders is a deficient diet. An analysis made by Troutt of ulcer diets used by 6 leading hospitals in different sections of the country showed them to be "well below the Sherman standard of 15 milligrams" in iron and low in the water-soluble vitamins.[1] "Vitamin B would appear to be represented at a maintenance level in most cases," writes Troutt, "but the possible relation of vitamin B to gastro-intestinal function and appetite should make one pause before accepting a low standard."



Although Pablum has a low fiber content it is 37 times richer than farina in iron and in calcium, 4 times richer in phosphorus, and 4½ times richer in copper.

Low in Fiber — High in Iron

Pablum is the only food rich in a wide variety of the accessory food factors that can be fed over long periods of time without danger of gastro-intestinal irritation. Its fiber content is only 0.9%. Yet Pablum contains 37 times more iron than farina and is an excellent source (+ + +) of vitamins B and G, in which farina is deficient. Supplying 8½ mgms. iron per ounce, Pablum is 8 times richer than spinach in iron.

Rich in Vitamin B

The high vitamin B content of Pablum assumes new importance in light of recent laboratory studies showing that avitaminosis B predisposes to certain gastro-intestinal disorders. Apropos of this, Cowgill says, "Gastric ulcer is another disorder which can conceivably be related to vitamin B deficiency. Insofar as the treatment of this condition usually involves a marked restriction of diet the occurrence of at least a moderate shortage of this vitamin is by no means unlikely. Obviously the length of the period of dietary restriction is an important determining factor. Dalldorf and Kellogg (1931) observed in rats subsisting on carefully controlled diets that the incidence of gastric ulcer was greatly increased in vitamin B deficiency. Observations of this type merit serious consideration."[2]

Requiring no further cooking, Pablum is especially valuable during the healing stage of ulcer when the patient is back at work but still requires frequent meals. Pablum can be prepared quickly and conveniently at the office or shop simply by adding milk or cream and salt and sugar to taste. Pablum has the added advantage that it can be prepared in many varied ways—in muffins, mush, puddings, junket, etc. Further, Pablum is so thoroughly cooked that its cereal-starch has been shown to be more quickly digested than that of farina, oatmeal, cornmeal, or whole wheat cooked four hours in a double boiler (studies *in vitro* by Ross and Burrill).

Pablum consists of wheatmeal, oatmeal, cornmeal, wheat embryo, alfalfa, yeast, beef bone, iron salt and sodium chloride.

[1-2] Bibliography on request.

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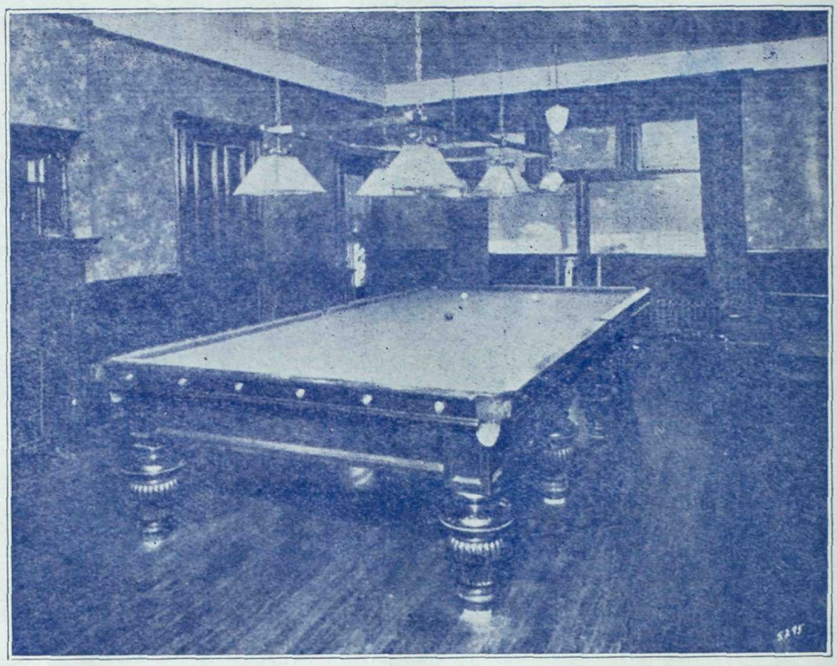

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