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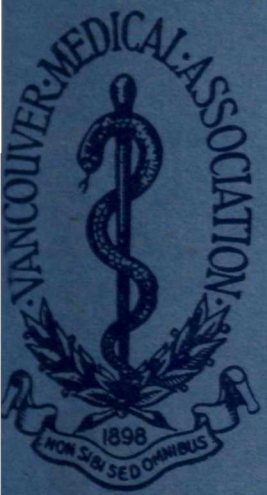
VANCOUVER MEDICAL ASSOCIATION



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Transactions of the

VICTORIA MEDICAL SOCIETY

the

VANCOUVER GENERAL HOSPITAL

and

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VOL. XXI. NO. 8 — MAY, 1945

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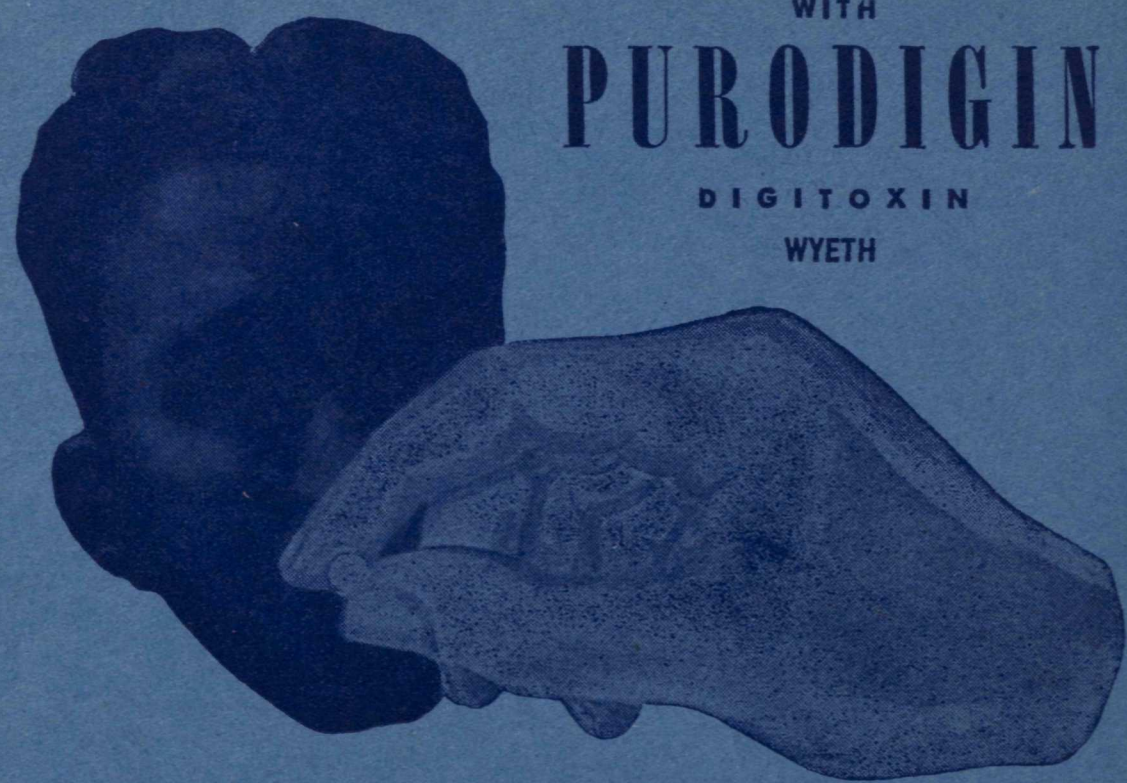

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*GOLD H.; CATTELL, McK.; MODELL, W.; KWIT, N. T.; KRAMER, M. L. and ZAHM, W.; Clinical Studies on Digitoxin; With Further Observations on its Use in the Single Average Full Dose Method of Digitalization, J. Pharmacol. & Exper. Therap. 82:187-195 (Oct.) 1944.

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BULLETIN

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

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

Vol. XXI. MAY, 1945 No. 8

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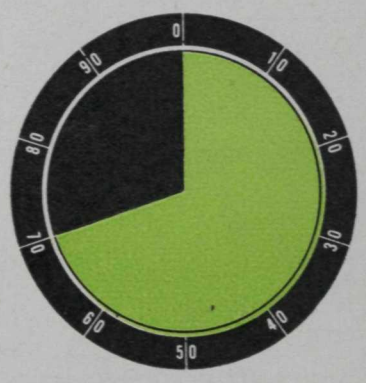
Effective, safe, LOCAL chemotherapy in oropharyngeal infections

HIGH LOCAL CONCENTRATION



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INDICATIONS: Local treatment of sulfonamide-susceptible infections of oropharyngeal areas:

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b. **septic sore throat;**
c. **infectious gingivitis and stomatitis;**
d. **Vincent's disease**

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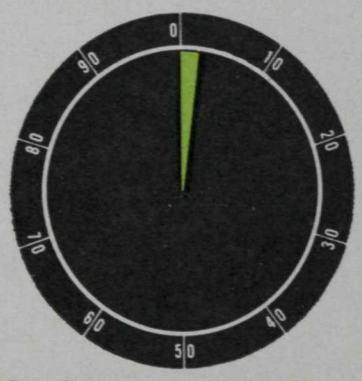

High Local Concentration: One pleasantly flavored Sulfathiazole Gum tablet chewed for *one-half to one hour* promptly provides a high concentration of locally active sulfathiazole (average 70 mg. per cent) *that is maintained throughout the chewing period.*

Low (negligible) Systemic Absorption: Blood levels of the drug, even when maximal dosage is employed, are almost negligible—rarely reaching 0.5 to 1 mg. per cent.

IMPORTANT: **Please note that your patient requires your prescription to obtain this product from the pharmacist.**

VANCOUVER HEALTH DEPARTMENT

STATISTICS—MARCH, 1945

Total population—estimated	311,799
Japanese Population—Estimated	Evacuated
Chinese population—estimated	6,395
Hindu population—estimated	335

	Number	Rate per 1,000 Population
Total deaths	320	12.1
Chinese deaths	16	29.5
Deaths—residents only	278	10.5
BIRTH REGISTRATIONS:		
Male, 332; Female, 298	620	23.4
INFANT MORTALITY:	March, 1945	March, 1944
Deaths under one year of age	16	22
Death rate—per 1,000 births	25.8	33.6
Stillbirths (not included above)	12	14

CASES OF COMMUNICABLE DISEASES REPORTED IN THE CITY

	February, 1945		March, 1945		April 1-15, 1945	
	Cases	Deaths	Cases	Deaths	Cases	Deaths
Scarlet Fever	36	0	50	0	12	0
Diphtheria	2	0	0	0	0	0
Diphtheria Carrier	2	0	0	0	0	0
Chicken Pox	54	0	113	0	11	0
Measles	349	0	415	1	190	0
Rubella	16	0	18	0	4	0
Mumps	9	0	14	0	6	0
Whooping Cough	16	0	6	0	1	0
Typhoid Fever (Carrier)	0	0	0	0	0	0
Undulant Fever	0	0	0	0	0	0
Poliomyelitis	1	0	0	0	0	0
Tuberculosis	38	6	54	20	0	--
Erysipelas	5	0	4	0	0	0
Meningococcus Meningitis	1	0	0	0	2	0
Paratyphoid Fever (Carrier)	0	0	0	0	0	0
Infectious Jaundice	6	0	5	0	1	0
Salmonellosis	0	0	6	0	0	0
Dysentery	5	0	2	0	0	0

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

	Vancouver	Richmond	North Vancouver	Burnaby	West Vancouver
Syphilis	72	1	0	0	0
Gonorrhoea	175	0	0	0	0

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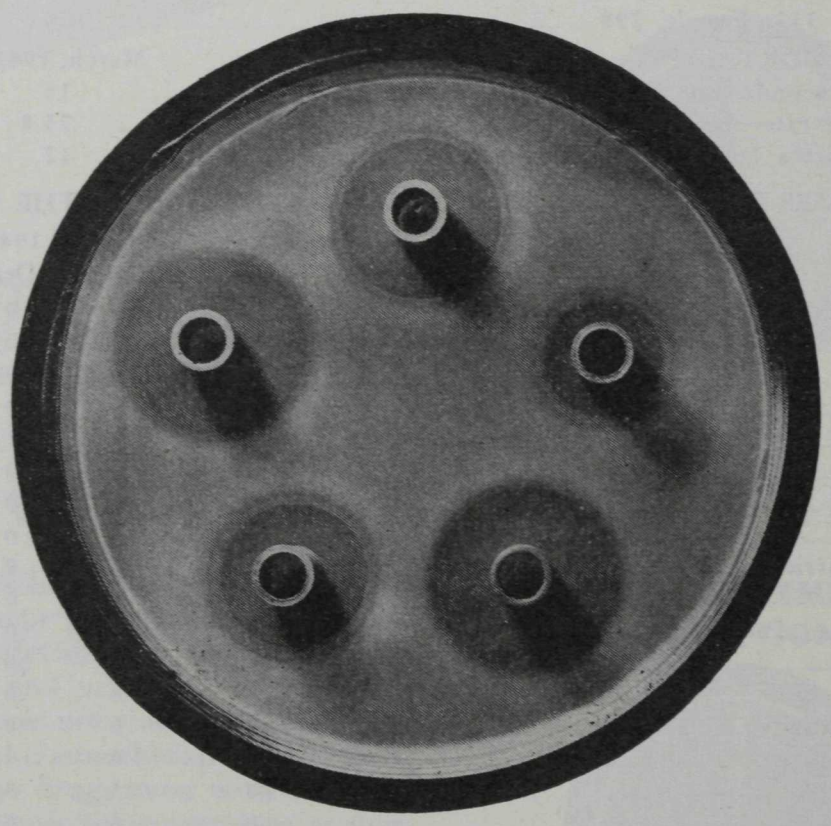
METHOD OF ASSAY

The original plate method of N. G. Heatley, colleague of Sir Howard Florey, is used in the Connaught Laboratories for the final measurements of potency. The illustration shows the striking action of penicillin in inhibiting bacterial growth, and indicates the method by which the strength of the penicillin solution to be tested is determined in terms of a standard solution.



In the assay of penicillin, an agar plate is seeded with a culture of *Staphylococcus aureus*, and cylinders set in the plate are filled with various dilutions of penicillin. The clear zones surrounding the cylinders are the areas where penicillin has inhibited bacterial growth, and potency is determined by measuring these areas.

Penicillin of high quality is NOW AVAILABLE in vials of 100,000 Oxford units.

Sterile saline solution for preparing penicillin is supplied in 20-cc. vials.

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*Murphy, W. P.: Am.J.M.Sc. **191**: 597 (May) 1936.

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MANUFACTURING CHEMISTS TO THE MEDICAL PROFESSION SINCE 1858

The Editor's Page . . .

The present epidemic of measles in Vancouver has been very widespread, and certain questions arise in one's mind as to whether we are dealing altogether wisely or satisfactorily with this situation.

Measles is often regarded as a sort of joke—at least as a mild and more or less harmless childish disease, which every child may as well have and get it over. We confess that we cannot take such a light view of this affliction. We note with regret and a certain degree of discomfiture that officially children who have had this disease are allowed to go back to school in eight days. This is approximately, of course, the period during which they are infectious to others.

But it is surely wrong to take it for granted that it is safe for the average child who has had measles to go back to school in such a short time. Those of us who are in general practise, and more particularly those who specialise in pædiatrics, cannot but agree that children, after this short period, even after two weeks, are still suffering from the secondary effects of the disease. Many of them are still coughing—many are underweight—have not yet got back their appetite or energy—have enlarged glands, and are a perfect set-up for intercurrent infections of various sorts.

We remember some years ago talking about this matter to the Head of the Public Schools Medical Department of San Francisco. She told us their experience with regard to measles. Briefly it was this:

They followed, for many years, the rule we have here now, of letting children go back to school as soon as they appeared free of infection—say within two weeks. Keeping careful track they found that these children were, in many cases, coughing, without energy or appetite, slow to pick up their work, and backward in their studies. They found a high incidence of other infections—and even a definite proportion of cases contracting tuberculosis. They lengthened the period away from school to three weeks, then to four—then to six weeks. They found that when children were kept at home for six weeks, fed up, given tonics and extra rest, and cared for, they went back to school in excellent condition—and within a very short time had caught up, and more than caught up, with their work—in other words, they lost less time than those who went back sooner. Now, we were told, the rule was definitely adopted that all cases of measles were to stay at home for six weeks from date of recovery.

We do not know if this is still a hard and fast rule in San Francisco but it would be easy to find out. We suggest to our School Medical Authorities, or to our Public Health Authorities, that they give serious consideration to this subject, and, if in their wisdom, they see fit, that they should institute a more effective set of regulations, which would avoid the dangers we refer to. As it is, people who wish to keep their children at home on their doctor's advice, are rung up by the school nurse or teacher, who wishes to know why the child cannot come back to school. The nurse or teacher is simply doing her duty, and carrying out regulations as they stand—but we suggest that it might be well to revise these regulations after consultation with leading pædiatricians and health experts, here and elsewhere. We have plenty of skilled advice available right here—and we should use it.

* * * *

Our sincere congratulations and thanks are hereby tendered to the Summer School Committee of the Vancouver Medical Association, who gave us one of the best Summer Schools we have had yet. The attendance (313) was very good indeed—and the programme was excellent. The speakers all gave notable papers—and we have been fortunate enough to secure promises of copies of most of them. Some we have already in hand—and they will be published as fast as possible.

The Annual Meeting of the British Columbia Medical Association, to be held in Vancouver in September, is the next item on the menu for 1945. We urge our out-of-

town members who plan to attend—and we hope they will be many—to secure Hotel and travelling reservations now.

* * * *

Our congratulations to the following, who have been chosen as leaders of various departments of our Canadian medical life:

Dr. Ethlyn Trapp, of Vancouver, who has been elected President of the Canadian Medical Women's Association for the following year. Nobody better could have been selected for this post.

Surgeon-Lieut. La Roche, R.C.N., of Victoria, B.C., who has been elected as President of the new Urological Society of Canada. We understand that the first meeting of this Society will be held in Vancouver shortly.

Dr. A. B. Nash, of Victoria, who has been elected as Councillor of the Canadian Society of Obstetrics and Gynæcology, whose President is John Fraser of Montreal.

* * * *

Toronto takes its time, but it gets there. In recent issues of the press, our readers may have noticed the recent conferring of the degree of M.D. (Tor.) on a good many men who started practice in Canada 50 years ago when they obtained their M.B. degree. Among these, British Columbians will be greatly interested to note Dr. W. B. McKechnie, formerly a leading Vancouver surgeon, and now living in Armstrong, B.C. Our friend and colleague, Dr. W. D. Keith, of Vancouver, is another of the number, though he was unable at the time to go to Toronto to receive the degree, and be photographed along with the others.

FROM A "GRATEFUL" PATIENT

Page Mr. Ilsley!

Dear Doctor:

In regard to that sum of $2.50 I owed you. I soon will be making out my income tax papers and will take it off the income tax and they will pay you then and you will get it soon.

Here hoping this matter is now settled to all concerns.

Thanking you for waiting for this sum so long but I couldn't afford to pay it then.

Yours truly,

_____. _____.

The BULLETIN is glad to publish the following statement, sent to us by Dr. C. E. Dolman, Head of the Department of Bacteriology at the University of British Columbia. Our readers will remember a report that we recently published of a case of Tularæmia, and B. C. is very fortunate to have available a supply of streptomycin for trial in cases of this disease.—ED.

EXPERIMENTAL TRIAL OF STREPTOMYCIN IN TREATMENT OF TULARAEMIA

The January issue of the BULLETIN published a report and a commentary on a fatal case of tularæmia. In view of the therapeutic difficulties which that case exemplified, and of the likelihood that further human infections with *P. tularense* will occur in British Columbia, it should be of interest to physicians, particularly those in the interior of the Province, to know that one of the newer antibiotics, *Streptomycin,* has been used with apparent success in the treatment of tularæmia.

A small supply of Streptomycin for trial in the treatment of authenticated cases of this infection has been made available by the pioneer commercial manufacturer of this material. As the supply is limited, the Streptomycin will only be released when the epidemiological, clinical and laboratory evidence supports the diagnosis of tularæmia, and on condition that a full report on the case is furnishing.

Any physician desiring to try out the materials under these circumstances should telegraph or telephone the relevant details to me at the Department of Bacteriology and Preventive Medicine, University of British Columbia.

June 6th, 1945. C. E. DOLMAN.

SUMMER SCHOOL

The twenty-third annual Summer School was held somewhat earlier than usual this year in order that it should not conflict with the Canadian Medical Association Convention in the middle part of June.

The sessions were well attended, and the total registration was over the 300 mark. Although this showed a decrease from the previous year, it is still well above the pre-war average of 200-250. It is interesting to note than an exceptionally large number of Americans from the States of Washington and Oregon registered this year.

The customary luncheon was held on the opening day of the School, in the Mayfair Room of the Hotel, and those attending heard an inspiring address by Major Harold Brown, who is well known in Vancouver.

Many favourable comments were heard on the speakers, all of whom presented their papers in a convincing and interesting manner.

Capilano Golf and Country Club was once more the setting for the Golf Tournament, in which many of the Summer School registrants participated. The prizes were won by:

First Low Gross (84)—Leith Webster.
Second Lo wGross (94)—Boyd Story.
First Low Net (74)—E. E. Day.
Second Low Net (77)—W. E. Milbrandt.
Long Drive—S. G. Baldwin.
Closest to the Pin—R. M. Campbell.
Highest Score—J. A. Porter.

The Summer School Committee wishes to take this opportunity of expressing its gratitude to the Naval, Army and Air Force Commands for sending us three specialized speakers—Surg. Commander Graham, Lieut. Colonel Gordon and Wing Commander Laird, and also to John Wyeth & Brother for their generous contribution toward the speakers' travelling expenses.

A complete list of those registered is given on Page 193.

LIBRARY NOTES

Recent Advances in Encrocrinology, 1945, Edited by A. T. Cameron.
Fundamentals of Internal Medicine, 2nd edition, 1944, by Wallace M. Yater.
Pathology of Internal Diseases, 4th edition, 1944, by William Boyd.
Surgical Clinical of North America, Symposium on Common Problems in General Surgery, and Symposium on Rehabilitation, April, 1945, New York Number.

New Journal Subscription—
Journal of Clincal Encocrinology (Commencing with January, 1945, issue).

MISSING

Have you any of the following journals, missing from the library shelves?

American Journal of Surgery: December, 1944; January, 1945; March, 1945.
Surgery, Gynecology and Obstetrics: February, 1945; April, 1945.
Archives of Otolaryngology, December, 1944.
The books listed below have been missing for some time:
The Story of San Michele, by Axel Munthe.
The Doctors Mayo, by Helen Clapesattle.

Please check your office and home libraries for these publications, and return to the Library without delay.

Vancouver Medical Association

SUMMER SCHOOL REGISTRATION, 1945

Agnew, A. M., Vancouver
Aikenhead, Capt. J. F., Vancouver
Alcorn, Major D. E., Vancouver
Alexander, E. H., Vancouver
Alexander, J. D. F., Vancouver
Alton, J. A., Lamont, Alta.
Anthony, A. R., Vancouver
Arber, Surg. Lt. S. R., Comox
Atkinson, J. R., Vancouver
Badre, Capt. E. J., Vancouver
Baker, H., Vancouver
Baldwin, S. G., Vancouver
Balmer, F/L I. A., Sea Island
Basted, M. R., Trail
Battle, C. E., Vancouver
Beach, D. W., McBride
Becher, J. C., Vancouver
Begg, Major H. N. G., Vancouver
Benaron, Major T., Vancouver
Benwell, C. E., Essondale
Bissett, Major G. W. C., Victoria
Blair, J. H., Vancouver
Boucher, R. B., Vancouver
Bowles, A. W., New Westminster
de Boyrie, R., Vancouver
Brason, Lt. F. W., Vancouver
Brewster, W/C W. R., Vancouver
Brogden, L. F., Penticton
Brown, Burton A., Tacoma, Wash.
Brown, C. E., Vancouver
Brown, Harold, Vancouver.
Fruce, F/L J. D., Tofino
Brydone-Jack, F. W., Vancouver
Bryson, F/L B. F., Vancouver
Buller, F. J., Vancouver
Burke, Gerald, Vancouver
Burke, Gordon, Vancouver
Burnett, J. W., Greenwood
Byrne, Major V. P., Vancouver
Callaghan, Mary, V.G.H.
Campbell, E. A., Vancouver
Campbell, R. M., Vancouver
Canfield, H. H., Seattle, Wash.
Carruthers, R. S. P., Vancouver
Cates, Capt. C. A., Vancouver
Caunt, T. G. B., Essondale
Chase, E. F., Seattle, Wash.
Chipperfield, F/L L. S., Boundary Bay
Christopher, H. C., Seattle, Wash.
Clement, G. H., Vancouver
Cleveland, D. E. H., Vancouver
Cope, G. W., Oliver
Cornish, Lt. Col. A. L., Gordon Head
Covernton, C. F., Vancouver
Cowan, F/L R. G., Vancouver
Craig, Lt. Col. K. L., Nanaimo
Danby, Surg. Lieut. C. W. E., Vancouver
Davidson, G. A., Vancouver
Davies, C. E., Vancouver
Davis, H. R. L., Vancouver
Day, E. E., Vancouver
Des Brisay, H. A., Vancouver
Dooley, S/L R. J., Vancouver
Dorrance, W. J., Vancouver
Dowling, S/L H. E., Vancouver
Dowsley, G. A., Vancouver
Drach, V., Vancouver
Dudey, H. D., Seattle, Wash.
Durkin, D. J., Victoria
Dwyer, Capt. C. H., Gordon Head
East, E. N., Qualicum
Edwardh, D E., V.G.H.
Ein, Capt. H. N., Gordon Head
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Emmons, W. F., Vancouver
Endicott, Capt. W. J., Vancouver
Fiszhaut, S. H., Vancouver
Fortin, Capt. Guy, Vancouver
Francis, Major G. H., Vancouver
Freeman, V. J., V.G.H.
Frost, A. C., Vancouver
Frost, Surg. Lt. Cmdr. J. W., Vancouver
Floren, Capt. S. A., Nanaimo
Gale, H. V., Vancouver
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Graham, H. C., North Vancouver
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Gundry, Major C. H., Vancouver
Gunn, W. G., Vancouver
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Kirk, Capt. D., Chilliwack
Knox, Capt. A. W., Nanaimo
Knox, R. E., Vancouver
Kovach, J. C., Vancouver
Laishley, W., Nelson
Laird, Major R. R., Vancouver
Lang, J. W., Vancouver
Langston, G. R., Vancouver
Lapin, S/L A. W., Vancouver
Large, S/L A. W., Sea Island
Laroche, Surg. Capt. A. G., Vancouver
Lawrence, Grant, Vancouver
Learoyd, Major D. R., Vancouver
Lee, B. H., Vancouver
Leeson, L. H., Vancouver
Lehmann, Major P., Vancouver
Leitch, Gordon B., Portland, Oregon
Lennie, T. H., Vancouver
Likely, Capt. J. C., Vancouver
Lindsay, Capt. J. H., Vancouver
Little, G. E., Vancouver
Losier, F/L P. J., Sea Island
Lovegrove, F/L W. M., Victoria
Magid, F/L L. G., Vancouver
Mallek, H., Vancouver
Mallek, J., Vancouver
Manson, Major A. B., Vancouver
Mateko, Rueben, Vancouver
Matthews, G. O., Vancouver
Mattson, J. F., Tacoma, Wash.
Melgard, J. F., Seattle, Wash.
Merheley, D. K., Vancouver
Milbrandt, W. E., Vancouver
Milburn, H. H., Vancouver
Millar, F/L D. B., Vancouver
More, G., Duncan
Morris, Wm., Vancouver
Morrison, F/L C. G., Patricia Bay
Morrison, M., Vancouver
Morrow, J. R., Seattle, Wash.
Morse, G., Haney
Moscovich, Major B. B., Vancouver
Mugan, F/L J. F. M., Alliford Bay
Murray, D. F., Vancouver
Murray, J. Scovil, West Vancouver
Mustard, Roy, Vancouver
Myers, H. A., Vancouver
Myers, Violet, Vancouver
McAmmond, E. N., Vancouver
McCaffrey, R. T., Vancouver
McCallum, D., Vancouver
MacCrostie, M. W., Vancouver
McDonald, J. A., Vancouver
McEwan, R. W., Vancouver
McGregor, R., Vancouver
McKay, Surg. Lt. Cmdr. A. L., Vancouver
McKay, S/Ldr. G., Patricia Bay
MacKechnie, H. A., Vancouver
McKinnon, Surg. Lt. Cmdr. A. G., Comox
McKinnon, C. R., Vancouver
McLachlin, Lt. J. A., Prince Rupert
McLean, J. A., Vancouver
MacLean, Major Keith, Vancouver
McLeod, E. C., Vancouver
McLeod, J. L., Vancouver
Macmillan, L., Vancouver
McNair, A. Y., Vancouver
McNair, F. E., Essondale
McNeill, Neil, Vancouver
MacNutt, L. W., Vancouver
Nash, W/C E. T. W., Vancouver
Neilson, J. R., Vancouver
Nelson, Margaret, Vancouver
Neufeld, W. P., Vancouver
Panton, K. D., Vancouver
Panton, L. A. C., Kelowna
Parlee, Capt. H. B., Vancouver
Parrott, Capt. Ross, Prince Rupert
Patten, C. G., Vancouver
Patterson, Capt. L. A., Chilliwack
Paulin, S., Vancouver
Peacock, E., West Vancouver
Peacock, K., West Vancouver
Pelletier, G. L. J., Vancouver
Phillips, Lt. D. L., Vancouver
Pipe, Lt. B. J. (U.S. Army), Seattle, Wash.
Ployart, C. H., Vancouver
Porter, J. A., Vancouver
Powles, F/L G. P. S., Comox
Rich, Major C. B., Vancouver
Roberts, G. A. C., Chilliwack
Robertson, J. G., New Westminster
Ross, S/Ldr. H. M., Vancouver
Ross, Surg. Lt. J. D., Victoria
Rotenberg, Capt. C., Victoria
Rothwell, F/L G. S., Vancouver
Roy, D. G., Vancouver
Ruskin, Capt. J. D., Vancouver
Sadler, Olive, Vancouver
Sarvis, E. S., Huntington, Wash.
Saunders, W. G., Vancouver
Sauriol, L. E., Essondale
Saxton, G. D., Vancouver
Schilder, G., Vancouver
Schori, J. W., Bellevue, Wash.
Seale, C. E., Vancouver
Seldon, G. E., Vancouver
Shandro, S/Ldr. W. A., Vancouver
Shaw, W., Vancouver
Sherban, D. A., Vancouver
Shuler, I. J. D., Seattle, Wash.
Siddall, F/O J. R., Vancouver
Sievenpiper, S. H., Vancouver
Silver, L. H., Seattle, Wash.
Simpson, R. E., Vancouver

Skinner, J. E., Tacoma, Wash.
Skinner, L. E., Tacoma, Wash.
Slade, Major H. C., Prince Rupert
Smith, J. A., Vancouver
Sparks, F/L H. D., Boundary Bay
Spiro, Capt. H., Vancouver
Stark, Capt. W. J., Vancouver
Steck, L. G., Chehalis, Wash.
Steele, D. A., Vancouver
Stephens, Lt. J. W., Vancouver
Story, Boyd, Vancouver
Strong, G. F., Vancouver
Stubbing, Sylva, Vancouver
Sullivan, T. J., Cranbrook
Swarok, E. W., Vancouver
Sylling, M. F., Vancouver
Tait, Surg. Lt. Cmdr. W. M., Vancouver
Taylor, W. H., Port Angeles, Wash.
Terry, Maj. K., Victoria
Thomas, J. C., Vancouver
Thompson, Surg. Ltd. W. J., Vancouver
Thomson, J. W., Vancouver
Thorlakson, H. F., Seattle, Wash.
Trapp, Ethlyn, Vancouver
Trites, A. E., Vancouver
Trowbridge, F/L E. B., Port Hardy
Turnbull, Frank, Vancouver
Turnbull, H. L., Vancouver
Turvey, S. E. C., Vancouver
Underhill, F. J., Seattle, Wash.
Upham, G. A., Vancouver
Van Kleeck, W., Vancouver
Virtue, Surg. Lt. J., Vancouver
Vrooman, C. H., Vancouver
Vye, J. P., Victoria
Wallace, S/Ldr. J. D., Vancouver
Walsh, W. C., Vancouver
Wannop, Lt. Col., Victoria
Warcup, L. W., Vancouver
Ward, Capt. J. G., Victoria
Waselek, Angela, Vancouver
Watson, H. N., Duncan
Webb, F/L E., Patricia Bay
Webster, L. H., Vancouver
Wilks, W. E., Vancouver
Williams, D. H., Vancouver
Wilson, G. B., Vancouver
Wilson, G. T., New Westminster
Wilson, Col. Wallace, Vancouver
Wiltsie, S. F., Seattle, Wash.
Winsor, Helen, Vancouver
Wishart, Capt. J. M., Vernon
Wishlow, M. F., Ladner
Wood, L. G., Vancouver
Wride, G. E., Vancouver
Yak, J., Vancouver
Yoerger, R. G., Vancouver

THE BERRY METHOD OF CORRECTION OF PARALYSIS

(*Contributed by* Dr. S. C. Turvey)

Since the beginning of this year, there has been an innovation in the treatmnet of paralytics in Vancouver which has been quite revolutionary. All of us have had paralyzed people under our care at one time or another, particularly the paraplegics, who have always been a hopeless problem. Usually they died of some intercurrent infection after being confined indefinitely and helplessly to their beds. A school has now been started in Vancouver in which these handicapped people are taught to walk and to attain a great degree of independence.

Milton H. Berry, Sr., was born in California and developed the idea about 1900. Through his friendship with a paralyzed person, he gradually evolved the Berry Method and had outstanding success. He later went to Chicago where he worked for fifteen years under the late Dr. John B. Murphy, rehabilitating handicapped individuals. Later he returned to California and started "The Milton H. Berry Institute" with a Board of Direcotrs of many prominent civic leaders of Los Angeles. The purpose of this Institute was not only to re-educate the paralytic but also to train other teachers in his method. He died in 1939 and since then his two sons and one son-in-law have carried on the work. They now have eleven schools in nine states. It was our good fortune in Vancouver to interest the younger son, Martin A. Berry, in starting such a school in British Columbia.

Mr. Berry has already a large class and is spending part of his time on military cases at Shaughnessy Hospital, part of his time on private cases and part of his time on patients for the Workmen's Compensation Board. A Committee of Physicians has been formed to work with Mr. Berry and to give any advice necessary concerning the medical aspect of this problem and this committee includes: Dr. H. A. desBrisay, Dr. G. A. Greaves, Dr. J. R. Naden, Dr. A. B. Schinbein, Dr. Howard Spohn, Dr. F. A. Turnbull, Dr. S. F. C. Turvey, Dr. L. G. Wood. Iit is Mr. Berry's special request that it be emphasized that he is working entirely under medical guidance, with the doctors and for the doctors. He makes no claims whatsoever to treat these patients and confines himself entirely to teaching them how to walk.

Not all cases are suitable candidates for the course. Thus, a person with advanced Disseminated Sclerosis would be unsuitable by reason of the extreme ataxia. The ideal case is the flaccid paraplegic, most of which are due to injuries of the spinal cord, but spastic conditions, involving the legs and the arms, are also quite amenable to treatment. These include the spastic paraplegics, the diplegics, and those instances where there is only partial injury of the spinal cord. Patients are fitted with braces when necessary, and the further treatment consists in educating muscle groups which are not paralyzed to perform functions for those which are paralyzed. People who have been confined to bed for months, or even years, have been taught to walk freely around their homes, to attend social gatherings and shows, and even to drive automobiles. Application forms have been prepared and they may be obtained from B. Strong, 1529 West 37th Ave., Vancouver, B.C. Any further information required by any physician about the Berry Method can also be obtained from this same source.

Mr. Berry is also interested in training young men in this method of paralysis correction, and any physician who knows of likely candidates should let Mr. Berry know. The training period of apprenticeship lasts from six to nine months and certainly would equip a young man with an excellent occupation for life. The physicians who have worked with Mr. Berry and seen some of his results have no hesitation in recommending him most highly to the profession and, in fact, they feel that British Columbia is particularly fortunate in having this venture in British Columbia.

LOW BACK PAIN

WING COMMANDER R. C. LAIRD

Read at Vancouver Medical Association Summer School, 1945.

The subject of this paper is one that is a daily problem in the professional life of most physicians, and my purpose in discussing it is to clarify the main features of the problem, and if possible to simplify our approach to it, and subsequent treatment of it. The actual site of low back pain should be limited to lower lumbar, lumbo-sacral and sacro-iliac regions.

ANATOMY

In reviewing the anatomy of this region it is evident that there are many possible sources of pain. The vertebrae are made up of cancellous bodies, and very hard processes posteriorly. Articulations vary from the intervertebral disc which acts both as a cushion and as a ball-bearing, to the fairly freely movable joints between the facets posteriorly, and to the almost completely immovable sacro-iliac joint. All these articulations have supporting ligaments of varying strength and position. Surrounding these bones and joints are the muscles which control their movements. These muscles extend from one unit to the next, or from one group to another, and there is practically no movement elsewhere in the body which is not accompanied by some tension or activity of the spinal muscles. The movements of the spine in this region are chiefly flexion and extension, with a small amount of rotation. Generally speaking the articulations are so placed and of such shape as to facilitate these movements, but there may be many slight congenital abnormalities which may interfere with perfect function. When man assumed the erect position and acquired the secondary lumbar curve above and opposite to the primary sacral curve, then he initiated the problem of low back pain. The movements and static tension of the upper nine-tenths of the spine are based on an oblique foundation, and the muscles have origin from a short handle, the sacrum, and insert diffusely along the whole upper length of the spine. These two factors may easily lead to muscle decompensation.

ETIOLOGY AND PATHOLOGY

In assessing the various possible causes of low back pain, a definite systematic approach is essential, and I have chosen the usual pathological classification of congenital anomalies, trauma, infection, and new growth. These refer to intrinsic conditions in

the spine or its associated structures. There are in addition many possible causes in the specialties of gynæcoloy and urology which will be referred to.

Congenital anomalies are fairly frequent in the lower lumbar and lumbo-sacral region, and their significance is always a problem in assessing low back pain. Such anomalies include spina bifida occulta, sacralization of the transverse processes of the fifth lumbar vertebra, transitional fifth lumbar vertebra, defective neural arch of the fifth lumber characteristic of prespondylolisthesis, irregular facets between lumbar five and sacral one, obliquity of the upper surface of sacrum, and an abnormal angle between sacrum and lumbar spine. These are all identified in a good X-ray of the area.

Trauma may be either acute or chronic. Acute trauma includes fractures, sprains, ruptured intervertebral discs, and possibly fibrositis with a fairly frequent history of recent sub-acute infection. There seems little doubt that minor trauma and the presence of infection are important factors in fibrositis. Fractures may be present either in the cancellous body or in one of the hard posterior processes, and the degree of fracture and displacement is no definite measure of the amount or duration of pain. The rupture of an intervertebral disc may interfere with the mechanics of movement at that level, but its chief disability is due to pressure on one or more of the spinal nerve roots and interference with its function.

The commonest form of chronic injury is seen in the chronic ligamentous or muscle strain. For some reason, either fatigue or inefficiency of function of the spinal muscles, recurrent strain is placed on the lower lumbar and lumbo-sacral articulations. Contributory factors are certainly overweight, long hours of standing, or one of the congenital structural abnormalities which may hinder efficient function. For a long time there are no definite pathological changes in the joints, but eventually there will appear evidences of traumatic arthritis.

The other result of chronic injury may have an early acute incident to initiate the trouble. In spondylolisthesis there is a congenital lack of fusion of the neural arch between the upper and lower articular facets. This abnormality may never give trouble, but occasionally a sudden strain will start the separation and repeated ones will continue the forward slip. This occurs chiefly with fifth lumbar on first sacral, but may occasionally be seen at one level higher up.

Acute infections are chiefly osteomyelitis and septic arthritis. These may be typical blood-borne infections, or may be the result of local infection following such things as gunshot wounds. The acute inflammatory reaction is the same as anywhere else, but being more deeply placed is more likely to give rise to difficulties in localization and diagnosis.

Of the chronic infections, tuberculosis is occassionally seen in this region, and the lesion is typical, whether it originates in bone or joint. The other important chronic lesion is arthritis, and the varied manifestations of this disease are becoming more familiar to all.

Tumours of bone which may cause low back pain are more likely to be metastatic new growths, although primary tumours are ocacsionally seen. Such a one as a hemangioma is fairly rare, but a very interesting lesion. There is also a group of tumours of spinal cord which may be responsible for local pain in this area.

It is difficult to reach any definite conclusion as to the number and importance of gynæcological and urological lesions which cause low back pain. Let it suffice to say that definitely established lesions of those groups may cause this pain, and must always be searched for and eliminated in the solution of the problem of diagnosis.

Symptomatology

The taking of a careful history and the execution of a meticulous physical examination are naturally prime essentials in any individual complaining of low back pain. Enquiry must be made into the regular work and other physical activities, with the effect of these on the pain. If there is a history of injury, it must be carefully examined and the actual relationship of injury and pain assessed. The character of the pain is

important, whether it is the dull aching pain which is present most of the time the individual is up and around, or the sharp stabbing pain which markedly increases on the slightest movement. Duration of the pain, and the factors which increase or relieve it may also be significant. Such activities as standing, bending and lifting tend to increase most pains in the back, and coughing and sneezing often give sharp exacerbations, especially in nerve root pain. Some types are relieved by lying down, while others are relieved by activity. The radiation of the pain may be indicative of such things as nerve root pressure seen typically in the sciatica of ruptured intervertebral disc.

The examination of the patient begins with observation of the gait as the individual enters the room. Limp associated with a complaint of low back pain may be due either to the pain or to weakness in the extremity. A marked deformity like a scoliosis will be noticed at once, and must be checked for location and degree. It is interesting that most scoliotic deformities in the erect position due to spasm in ruptured disc lesions will disappear when the patient lies down. Less obvious deformities are those of spondylolisthesis, and of ankylosing spondylitis. Spasm of the sacro-spinalis muscles is seen generally when the pain is acute, and is largely a protective reaction to limit the painful movements. Local tenderness should always be checked, as well as the presence of firm nodules in soft tissue areas. The movements of the spine are normally free and painless, although the degree varies in each individual. Any limitation of these movements should be observed, as well as any limitation of straight leg raising. This latter can be compared, one side with the other, both actively and passively, and likewise the effect on the pain. A careful neurological examination will check sensory, motor, and reflex changes in the extremities. There are unlikely to be neurological findings in low back pain alone, but with an associated sciatica they are recognized quite frequently. Finally good X-rays must be taken, antero-posterior, lateral, and occasionally oblique in order to outline the prespondylolisthesis. Special radiological investigation such as a myelogram may be indicated by history or examination.

Diagnosis

Following such an investigation one can readily determine whether the condition is acute, chronic, or acute followed by chronic. There is little problem in the individual who, following an attempt at lifting a very heavy object, gets a sharp stabbing pain in the soft tissues between the spine and iliac crest, has muscle spasm and localized tenderness, and recovers completely with one to two weeks rest in bed with heat. Similarly the individual with dull aching pain in the lower lumbar region, slight kyphosis of one spine and limited spinal movements, and an X-ray positive for tuberculous disease of a lower lumbar body, offers no particular problem either in diagnosis or disposal. Many of the complaints of low back pain can be diagnosed as readily as this. There is, however, a large group of cases with a rather indefinite history, a completely negative physical examination, and a negative X-ray, or an X-ray showing one of the many congenital structural abnormalities. Many of these, and in fact, I believe the majority of these must be classed as chronic lumbar or lumbo-sacral strain. They are the result of muscle decompensation, and if allowed to progress, will eventually show positive findings of arthritis in both examination and X-rays.

Treatment

The problem of treatment of the individual complaining of low back pain resolves itself into two parts. Depending on the diagnosis, there is specific treatment directed toward the individual lesion, and non-specific treatment, in the way of general principles applicable to many lesions. A fracture should be immobilized until union occurs, a ruptured intervertebral disc may be removed; a definite spondylolisthesis may require fusion; and an acute infection may be benefitted by penicillin. Of the general principles underlying treatment, rest is probably the most important. This may vary from relative rest to complete rest, and there are many stages in each. Along with or immediately succeeding rest comes the important principle of exercise. Graduated back exrcises will build up the spinal musculature which has been inactivated by acute injury, or which

has never been strong enough to carry the load of body or of work. These principles have been demonstrated for some years in fractures of spine immobilized in plaster, with constant exercises to keep up the muscle tone. They can also be demonstrated in the cases of chronic lumbo-sacral strain, and I believe many of our mos tdifficult problems can be solved in this way. There will remain a small number of individuals who have persistent low back pain unrelieved by any conservative measures. If no lesion is demonstrable for which specific treatment is indicated, and presumably with a diagnosis of chronic strain unrelieved, it is possible that local spinal fusion will come to the assistance of the spinal musculature, and eliminate the decompensation and the pain.

PUBLIC HEALTH SERVICES IN THE UKRAINE

By Illarion Kononenko

People's Commissar of Health of the Ukrainian S.S.R.

Built up during the years of socialist construction, the public health network of the Ukrainian S.S.R. had by the beginning of the present war developed into a powerful state organization. Its work was based on the principles of concentration on prophylactic measures to prevent disease, free medical treatment for all, and the enlisting of wide cooperation of the general public.

An idea of the scope of these services may be seen in the fact that in 1941 the medical institutions of the Ukraine were staffed by 93,900 people, including 29,700 doctors. Corresponding figures shortly before the great October Socialist Revolution were about 5,000 doctors and 10,000 other medical personnel.

The Ukrainian Republic had a chain of medical schools and universities for training medical workers. In 1941 there were nine medical institutes, two pharmaceutical and two stomotological colleges with 25,700 students. The annual contingent of graduates exceeded 3,500. In 1941 more than 45,600 students were attending 199 medical schools, which graduated 21,000 specialists annually. The vast number of medical workers trained in these schools made it possible to satify fully the demands of the health service in the Ukraine, and also to send a considerable number of trained nurses and other personnel to other Republics.

The Ukraine's 49 scientific research institutes successfully solved problems of urgent importance for medical theory, clinical practice and war surgery.

Functioning in Ukrainian towns and villages in 1941 were 1,932 hospitals with 129,000 beds, some 6,000 dispensaries and polyclinics and more than 10,000 minor dispensaries and health centers. There were 2,445 rural medical centers in the Republic and the majority could serve as models in the organization of medical and sanitary service in the countryside under collective farm conditions.

A tremendous decrease in tuberculosis, skin and venereal diseases was achieved. Chancroid completely disappeared, cases of syphilis declined by 90 per cent as compared with 1913. Fresh cases of syphilis were very few and were rapidly disappearing. Important successes were achieved in the struggle against the spread of gonorrhœa.

The Ukraine and the entire Soviet Union were justly proud of the network of organizations built up in the Republic during the years of socialist construction for the protection of mother and child. In 1941 the Ukraine had 1,647 mother and child health centers; 632 milk kitchens, maternity homes with a total of 31,000 beds, 2,700 permanent nurseries with accommodations for 130,100 youngsters, 25,200 seasonal nurseries, etc. This development was fully in line with the exceptional attention paid in the U.S.S.R. to mothers and to the bringing up of the young generation.

A large number of sanatoriums and rest homes were built; by 1941 the Republic had more than 400 sanatoriums and 173 rest homes maintained by health authorities, trade unions and other organizations. Every year mare than 100,000 working people availed themselves of the facilities for treatment offered by the Ukrainian health resorts,

and more than 300,000 spent their vacation in Ukrainian rest homes. Some 900,000 children were accommodated annually in Ukrainian sanatoriums and rest homes.

Statistical data showed a continuous improvement in public health protection. The rate of disease was declining steadily and the demographic indices of physical development pointed to great improvement. Illustrative in this respect are the figures on the growth of population in the Ukraine. The increase from 1919 to 1941 was 21.6 per cent (and 22 per cent for the whole of the U.S.S.R.

Effects of German Occupation

The German invaders caused great damage to public health in the Ukraine. Hundreds of thousands of civilians were murdered or deported for slave labor. The spread of tuberculosis, skin and venereal and highly infectious diseases attained exceptional proportions.

The network of medical and prophylactic institutions almost completely ceased to exist during the occupation period, and a considerable section of it was destroyed. The remaining medical institutions introduced payment for treatment. Prophylactic vaccinations against smallpox and diphtheria were not practiced. According to preliminary estimates, the material damage caused to the public health services in the Ukraine exceed two billion rubles.

The invaders also caused heavy damage to the municipal and public utility services. All this brought about a drastic deterioration in sanitation on occupied territory. In all liberated cities and districts of the Ukraine, highly infectious diseases were rampant.

Restoration of Health Services

That is why rehabilitation in every liberated city and village began with the restoration of health services. So far, 766 sanitation and epidemiological centers, 4,500 dispensaries and polyclinics and 6,000 gynæcological and first-aid stations have been restored. The public health network is being steadily expanded and now has more than 86,400 hospital beds.

One hundred and ninety-six dispensaries and wards with 3,790 beds, and sanatoriums with about 4,000 beds have been set up for the treatment of tuberculosis. Special country schools for children suffering from this disease and homes for tubercular invalids have been opened. Institutes engaged in the study of tuberculosis have been restored in Kiev, Kharkov and Odessa. Together with scientific research and clinical treatment, these institutions are helping to improve and expand the network of institutions combatting tuberculosis.

The Republic now has 701 child helath centers and 344 milk kitchens; nurseries with 57,300 beds and many other health institutions for children in both town and country. Last year, 721,400 children were accommodated in 20,700 seasonal nurseries. The number of beds in maternity homes has been brought up to 8,800. All organizational and material requisites have been created for the complete restoration and further improvement of the network of services for mother and child.

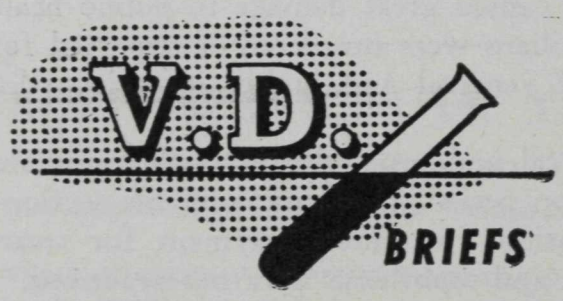
Much effort has been put into the restoration of the educational and scientific-medical institutions in the Ukraine. As a result, eight medical, one stomatological and three pharmacy institutes, three post-graduate institutes for doctors and one for pharmacists have already been restored. The medical colleges in the Republic now have a student body of more than 16,000, and a further 16,000 enrolled in 75 reopened medical schools. Forty-six restored scientific research institutes are working on urgent problems of wartime sanitation, theoretical and clinical medicine, and aiding the public health authorities with advice in this restoration period.

The greatest attenton is being paid to sick and wounded soldiers and commanders of the Red Army. Hospitals are provided with the best equipment, housed in the best buildings and staffed with the most efficient personnel.

The Ukraine is well on the way to complete restoration of its public health services, but the damage caused to the health of the Ukrainian people and the medical network is enormous and will require considerable effort on the part of the Republic, and further fraternial aid from the peoples of the U.S.S.R. The Ukrainian people appreciate mightily

the aid rendered by our great Allies which is striking an expression of solidarity in the struggle for complete victory over the enemy of mankind. Contact between the scientists and medical institutes of the Ukraine and the Allied countries will doubtlessly help in a further and even more successful solution of the urgent problems of medicine for the benefit of mankind.

I am convinced that in this field, too, the peoples of the Soviet Union, the United Kingdom and the United States of America will display unity in the pursuit of their progressive aim.



PENICILLIN — VENEREAL INFECTION

This information supplements package instructions provided with each vial of penicillin. It is a tentative guide in a rapidly changing field of new therapy.

Gonorrhoea—Office Treatment of Proven and Suspected Infections.

1. Shortage of hospital beds merits trial of ambulant therapy.
2. Institute therapy IMMEDIATELY in all instances where clinical and/or epidemiological (named as contact) evidence exists.
3. Take specimens for smear examination but do not hold up treatment pending return of laboratory report.
4. Ambulant treatment for males and females is suggested as follows:
   (a) Two injections of 100,000 units each (total 200,000 units) dissolved in 4 c.c. of diluent, administered four hours apart, injected in the upper outer quadrant of the gluteal muscle.
   (b) If clinical and/or bacteriological response unsatisfactory after 5 to 7 days, repeat course as above—4. (a).
   (c) If failure after second course, admit to hospital for continuous, intramuscular (pectoral) drip of 200,000 to 400,000 units.
   (d) Observe all patients carefully for recurrence and instruct re "masked syphilis." (See Appendix "A" attached.)

Syphilis

1. Penicillin therapy for syphilis is still EXPERIMENTAL.
2. It is *always* a HOSPITAL PROCEDURE.
3. Use should be limited to EARLY SYPHILIS (less than four years in duration—primary, secondary, early latent, and congenital infection in infants.)
4. Use should be limited to the following EXIGENCIES:
   (a) Serious reactions to routine arsenic-bismuth therapy.
   (b) Relapsing, resistant or fulminating forms of early infection.
   (c) Early syphilis in asocial promiscuous persons.
   (d) Early syphilis in persons unable to obtain regular weekly treatment (remote rural areas, certain seamen, fishermen, loggers, miners, etc.).
   (e) Elderly persons with early infection.
   (f) Persons with "difficult" veins—addicts, obesity.
5. *Plans of Treatment.*
   Always a continuous hospital procedure lasting 7 to 10 days.
   I. *Continuous Intramuscular Drip Plan*
      (a) Daily administration of 300,000 units dissolved in 600 c.c. normal saline—adjusted for continuous absorption over 40-hour period.

(b) Site of injection—pectoralis major.
(c) Continue 8 days for a total of 2,400,000 units.
(d) Bismuth salicylate intramuscular (gluteal) in doses of 1.0, 1.5 and 2.0 c.c. on 1st, 4th and 8th days respectively and 2 c.c. weekly for seven weeks after completion of penicillin therapy.

II. *Multiple Intramuscular Injection Plan*
(a) Daily administration of 300,000 units in 8 equal divided doses administered every 3 hours day and NIGHT.
(b) Injection site—upper outer quadrant gluteal muscle.
(c) Continue 8 days for a total of 2,400,000 units.
(d) Bismuth salicylate intramuscular (gluteal) in doses of 1.0, 1.5 and 2.0 c.c. on 1st, 4th and 8th days respectively and 2 c.c. weekly for seven weeks after completion of penicillin therapy.

6. All patients treated with penicillin should be followed closely for evidence of relapse (clinical, serological, neurological). Observation should extend for a five-year period! Penicillin treatment for syphilis is EXPERIMENTAL!!

For further advice please write Provincial Board of Health, Division of V. D. Control, 2700 Laurel Street, Vancouver, B.C.

APPENDIX "A"

Sample of Instructions Given to Provincial Board of Health Clinic Patients

SPECIAL INSTRUCTIONS TO PATIENTS

1. YOU HAVE JUST HAD ONE INJECTION OF PENICILLIN, THE NEWEST TREATMENT FOR URETHRITIS OR GONORRHOEA. To complete this treatment you must have a second injection in four hours. You will wait in the clinic until the time comes for your second injection and then you will be told when to return for tests to determine if you are cured. While waiting you will be given some pamphlets to read so that you may know more about venereal disease and may be able to avoid catching it. Read them carefully.

2. If you take all your treatment in four hours you may not need any further care but it will pay you to report back as required for your tests of cure.

3. WHEN YOU GOT THIS DISEASE, YOU MAY HAVE CAUGHT SYPHILIS AT THE SAME TIME. Penicillin may hide or delay the appearance of syphilis in your body, therefore, it is absolutely essential that you have a blood test either here or from your private doctor in three months. This is the only way you can know for sure that you haven't got syphilis. *Don't forget. A blood test in three months is your only way to be sure.*

4. Watch your body carefully during the next three months and if you notice any sore on your genitals, or should a skin rash appear, see your doctor, or go to your clinic IMMEDIATELY.

5. DON'T DRINK ANY FORM OF ALCOHOLIC BEVERAGE UNTIL you have completed your tests of cure.

* * * *

BABIES SAVED FROM SYPHILIS

Syphilis extends to the fœtus about the fifth month of pregnancy. Prior to that, spirochætal invasion of the fœtus has not occurred in most cases. If maternal syphilis is discovered before the fifth month—invasion of the fœtus can be checked. If treatment is continued till term, the baby has a 95 per cent chance of being normal and non-syphilitic.

"Blood Tests for Every Expectant Mother Before the Fifth Month."

* * * *

"Find V.D. Contacts — Report V.D. Cases."

Vancouver General Hospital

REPORT OF A CASE OF TETANUS WITH RECOVERY

ERNEST A. BOXALL, M.D., C.M., and GORDON W. PRUETER, M.D.

A white male, age 58, was admitted to the Hospital on August 10, 1944, because of painful spasms of his muscles. He was well until fourteen days before admission when he was building a house on a cattle ranch where there was "cow-dung everywhere." While working on a roof he slipped and saved himself by grabbing the jagged end of a broken two-by-four, contaminated with cow-dung. This gashed the distal two-thirds of the palmar surface of his right little finger. He immediately washed the wound with tap water and applied a bandage. Within two hours from the time of injury a doctor cleaned the wound with Metaphen and inserted three sutures. No anti-tetanic serum (A.T.S.) was given. He was advised to stop work temporarily and every second day reported to the doctor's office to have the wound inspected and painted with Metaphen. At no time did the wound bother him except for slight itching. On the fourth day the sutures were removed, leaving a wound which, although the edges were not well approximated, was well scabbed over and symptomless. On August 6, thirteen days after the injury, he noticed a feeling of tiredness, a stiff neck on waking in the mornings, and spells of stiffness and tremor in the limbs. When he turned over in bed at night his heels would "beat a tattoo" on the mattress for a brief moment. He also noticed difficulty on boarding a streetcar, due to stiffness and inability to control the direction of movements of his limbs. By August 9, sixteen days after the injury, his throat was sore and he could not swallow well, his limbs would "tremble and jerk" and he had trouble keeping his balance. There was anorexia, sweating and slight fever. That night true, tonic painful spasms began so he was sent to the hospital.

He described the spasms: "They feel like you were on a rack and your muscles were being stretched. They were exceedingly painful and my toes would point and my back stiffen off the bed. They seemed to build up in the stomach and spread from there. I could feel them coming and had to turn violently to get relief. If I lifted my body off the bed so that I rested on my heels for a few minutes I could get some relief." There was no history of previous tetanus or toxoid immunization.

On physical examination he was lying flat in bed with a drawn anxious look. Eyes, ears, and nose were negative. The masseters were tense and the mouth could be opened only half an inch. Heart and lungs were negative. Pulse was 95, blood pressure 135/85. The abdomen was tense and board-like and palpation caused a generalized contraction of the whole abdominal musculature. There was an increase of tonus and of the deep reflexes of the limbs. The right thigh muscles were contracted with frequent twitchings. There was stiffness of the neck and a bilateral Kernig's sign. There were no sensory signs.

Laboratory Work:

August 11—Lumbar puncture: Initial pressure 195 mm.

Cerebro-spinal fluid.
Protein 24 mg.%.
Chlorides 772 mg.%.
Kahn and Wasserman Rate negative.
Colloidal gold curve 111000.
Culture showed no growth in five days.

August 16 and 23—Urinalysis negative.

Progress in Hospital:

The spasms increased in intensity and frequency, being most painful in the legs and back. Marked sweating was a prominent feature. Retention of urine required catheterization. At no time did trismus progress to such an extent that he could not open his

mouth, but moderate opisthotonus appeared with the spasms. Intellect remained unimpaired. Pulse remained good throughout but rectal temperature would rise to 102° after the administration of intravenous and intramuscular antitoxin. From August 12 to August 17, the spasms were severe and frequent, each lasting about two minutes, being entirely tonic with no clonic element and exceedingly painful, causing him to scream with pain and swear violently. A spasm could be initiated by any slight stimulus such as opening the door quickly or speaking to him in a low voice, when he was unaware of anyone being in the room. Intravenous and intramuscular injections always caused a spasm. Gradually they became less frequent and of shorter duration. Towards the end of his illness he developed a few moist rales at the right lung base for which he was given sulphadiazine, and also a stomatitis caused by mouth breathing while under heavy sedation and atropine, which aided in drying out the mouth; otherwise recovery was uneventful and he was discharged well on the twenty-third hospital day.

Treatment:

A total of 853,000 units antitetanic serum given as follows:

Aug. 10—	100,000 intravenously	Aug. 17—	20,000 intravenously
Aug. 11—	100,000 intravenously	Aug. 17—	20,000 intravenously
	15,000 intrathecally		40,000 intramuscularly
Aug. 12—	100,000 intravenously	Aug. 18—	20,000 intravenously
Aug. 13—	60,000 intravenously		40,000 intramuscularly
Aug. 14—	20,000 intravenously	Aug. 19—	20,000 intravenously
	50,000 intramuscularly		40,000 intramuscularly
Aug. 15—	20,000 intravenously	Aug. 20—	20,000 intravenously
	40,000 intramuscularly		40,000 intramuscularly
Aug. 16—	20,000 intravenously	Aug. 21—	20,000 intravenously
	40,000 intramuscularly		20,000 intramuscularly
	8,000 locally		

A preliminary serum sensitivity test was done intracutaneously which was negative. All intravenous antitoxin was given diluted in 500 cc. of 5% glucose in isotonic saline followed by 500 cc. of 10% glucose in isotonic saline for its caloric content. Parenteral vitamin B complex was added to the latter solution. During convalescence the patient received a multivitamin preparation by mouth.

On August 12, the wound on the finger was opened, some dead tissue excised, and 5% magnesium sulphate compresses applied until August 14 when the wound was again opened and syringed with hydrogen peroxide followed by compresses of Dakin's solution. This was repeated on August 16 when about 8,000 units of antitoxin was injected around the wound edges and a loose dressing applied, allowing free access of air.

Heavy sedation was maintained with sodium amytal intravenously and intramuscularly in doses of 3¾ grains and 7½ grains. In addition avertin by rectum in doses of 75 mgm./kg. body weight was given on August 12, 14, 15, 16, 17, and lateral phenobarbital, ½ grain three times a day, with nembutal, 1½ grains at bedtime.

Atropine sulphate 1/100 grain every six hours was given from August 11 to August 18, inclusive. Sulphadiazine, 2 grams *stat* and 1 gram every four hours in tragacanth for slight bronchopneumonia from August 18 to August 23. Sodium perborate mouth washes every hour and mouth and tongue painted with 2% aqueous gentian violet twice a day for stomatitis.

Comment:

The incubation period of this case was fairly long (thirteen days), which is said to carry a favourable prognosis. Most authorities agree that the mainstays of treatment are heavy sedation to control the spasms and intravenous and intramuscular antitoxin, although the value of the latter is doubted by some. Otherwise, therapy consists in maintaining an adequate fluid and caloric intake, with care of the bladder and bowels. The value of local treatment of the infected wound is still debatable. Most authorities are against such radical measures as amputation of a digit, if such be the offending focus, but re-opening the wound and the use of oxidizing agents and antitoxin locally would

seem rational. The intrathecal administration of antitoxin would seem of little value in this disease according to work by Sohier and Jude[1], who found an antitoxin titre of 0.1 unit/cc. in the spinal fluid of a patient at a time that the blood concentration was 50 to 100 units, in spite of the fact that 50,000 units had been injected intrathecally sixteen hours previously. The modern view is that the tetanus toxin is blood borne and this, plus the fact that there are no changes in the spinal fluid in tetanus other than increased pressure, would leave little argument for the use of antitetanic serum (A.T.S.) intrathecally. Recent work by Cooke and Jones[2] has demonstrated that a clinical case of tetanus confers little or no immunity to subsequent infection because the amount of toxin absorbed during an attack is too small to produce a primary antigenic stimulus in the body. The above case shows the ineffectiveness of ordinary antiseptics in killing tetanus spores in a wound and that there is still a place for the prophylactic administration of 1500 units, or, better still, 3000 units of antitetanic serum (A.T.S.) in the treatment of wounds sustained in places where there are likely to be tetanus spores.

We would like to thank Dr. W. G. Morris for permission to publish this case report from his service.

REFERENCES:

1. Bull. et mem. Soc. med. d'hop. de Paris, 1 : 80 (Jan. 14), 1938.
2. J.A.M.A., April 10, 1943.

Military Medicine Section

ACTIVITIES OF A FIELD SURGICAL UNIT

By Lieut.-Colonel Rocke Robertson, R.C.A.M.C.

During the four years of the last war great strides were made in the treatment of wounds—methods of first aid were revised; a satisfactory technique of wound excision was evolved; abdominal injuries, treated expectantly at first following the practice of the Boer War surgeons were, in the last three years, operated upon, with a considerable reduction in mortality. Anti-tetanic serum was introduced and the incidence of tetanus decreased rapidly. In this war, too, advances have been made—penicillin, blood and plasma transfusions, the recognition of immobilization as one of the essentials in the management of a wound, refinements in plastic surgery and in the other specialized branches—and so on. Besides these, changes have been made in the Medical Service itself. They have been made necessary by the transformation that has come about in the style of warfare. Just as Reconnaissance and Armoured units have been added to the strength of an Army so have Mobile Unit sbeen included in the Medical Corps. It is with these Mobile Units that we are particularly concerned tonight.

You must all be familiar with the system prevailing in the first World War. It was designed to care for the wounded evacuated from a static or slow moving front and for this it was quite adequate. The C.C.S. could be moved up to within a few miles of the trenches without risk of being overrun, and the Field Ambulances could deliver the patients along well established lines of communication with the least possible delay. But, sufficient as it was to satisfy these conditions, this system would obviosuly have broken down in a war of movement. The C.C.S., the focal point of surgery in the last war, could not have kept up with a rapid advance, for it is a large unit and cannot be packed and moved with rapidity.

To meet the demands of mobile warfare Field Surgical Units were developed. It must be pointed out that they were first used in the Spanish Civil War in which, on the Republican side at least, they were found to be of great value. There is an excellent

description of the field surgery in that war written by a British surgeon, D. W. Jolly. In his book he gives a complete picture of this type of surgery together with a detailed outline of the equipment and personnel required. His work must have been most useful to those responsible for the planning of our own Field Units.

So far as I know the first Mobile Units in the British Army were organized early in the North African Campaign. Here, where the armies moved at a tremendous pace, the need for highly mobile units was great. At the outset the surgery was performed by units composed of personnel borrowed from hospitals and C.C.S.'s, using borrowed and ill-assorted equipment and vehicles. Later, when these teams had proven their usefulness they were organized as distinct independent entities and were called Field Surgical Units.

The first Canadian Surgical Units were formed in the latter part of 1942 and two of them were sent out with the First Canadian Division to Sicily in July, 1943. In the Canadian plan a Field Surgical Unit consisted of 11 men—a Surgeon, an Anæsthetist, 5 orderlies, 3 drivers and a batman.

Its transport comprised 3 vehicles. A surgical van designed to carry the surgical equipment (operating tables, instruments, etc.), and an electric generator; a 3-ton truck to carry the large volume of other materials such as tents, personal kit, etc., and 8 cwt. vehicle to carry the personnel.

Thus equipped, the team can move itself and set up in almost any situation that may arise and function as an operating team. It is responsible for the actual operations—the preoperative and post-operative care are the duties of the Field Transfusion Unit and the Field Dressing Station respectively. The former consists of the Officer and 3 other ranks who travel and carry their wares in a truck fitted with a refrigerator for preserving whole blood. The Field Dressing Station is a larger unit organized to provide postoperative care for anything up to about 60 patients. They provide the Medical Officer and orderly personnel for this purpose in addition to the cooking and Quartermaster facilities for the smaller Surgical and Transfusion Units. These three units (F.D.S., F.T.U., F.S.U.), which are usually grouped together and called an Advanced Surgical Centre, have been inserted into the old lines of evacuation composed of R.A.P. Field Ambulance, C.C.S., and Hospital, and they have been introduced in order to supply early surgery for those cases whose chances of recovery would be jeopardized by delay.

Let us now examine the position in line which these new units take by tracing the course of a casualty at the front. He is picked up by his regimental Stretcher Bearers and passed through the R.A.P. and thence to a Car Post of a Field Ambulance which is, as a rule, situated at about Brigade Headquarters level. Up to now his course is similar to that of a casualty in the last war and the first aid treatment that he receives follows closely that laid down in 1916—the same dressings and splints are used. The only new practices are the introduction of Sulphonamide into the wound, the giving of Plasma to the severely shocked in the R.A.P. and the transportation of the patient on a stretcher-bearing jeep. From the Car Post he will be taken back to the Main Dressing Station of a Field Ambulance and here his condition will be reviewed. If it is judged that he is seriously ill he will be directed to the A.C.S., where he will receive treatment. If, on the other hand, it is considered that he is fit to travel on, he will be put back into an ambulance and sent to a C.C.S. and thence to a hospital.

The siting of the A.S.C.'s is important. It must be close enough to the front so that cases can reach it without too much delay—say not more than an hour's trip in an ambulance. At the same time it should be far enough back so that it is out of range of field artillery. These conditions are not always easy to satisfy, particularly when the roads are bad and the ambulances are forced to travel slowly. This A.S.C. must also be placed close to the M.D.S. where the triage is carried out in order that the patients may be transferred from the main line of evacuation with the least possible loss of time. As a rule it was usually possible in the Sicilian and early part of the Italian Campaigns to house the M.D.S. and the A.S.C. in the same building or in adjacent houses in a village or, failing buildings, in adjoining tents in a field.

Admitted to the A.S.C., he will be treated there and retained until he is fit to travel on back. He may remain at this level for a period varying from 12 hours to 3 weeks, depending upon his condition and the general situation at the time. A man with a compound femur, for example, injured during a large scale attack when there are many other casualties, may be operated upon in the A.S.C. and evacuated in a matter of hours if he is in reasonably good shape. If, on the other hand, he is ill, he will be retained. He may develop a wound infection and not be fit to be moved for days. Abdominal cases are routinely kept for a minimum of a week no matter how well they seem—chest cases are not moved until they are free from dyspnœa at rest regardless of how long this may take—and so on. It is, thus, quite impossible to predict how long a man may stay once the treatment is commenced—hence the system must be an elastic one to handle the numerous difficulties that arise. Picture an A.S.C. in action with, say, 30 bed patients. The army advances—the F.S.U. and F.T.U. are moved ahead to set up with another F.D.S. and the patients remain behind with the original F.D.S. One by one as they become fit they are evacuated to the base, but it may be a long time before all 30 have moved on. Meanwhile the F.D.S. may be needed forward. In such a case the main body will move ahead, leaving behind a medical officer and orderly personnel and cooking staff sufficient to care for the remaining patients. Such a group is called a "Nest" and it is not uncommon, in a rapid advance, to find several "Nests" scattered along the lines of communication, providing a problem of supply and administration to tax the best brains.

Time	Admission	Operation
3 hrs.	27.7%	4.4%
4 hrs.	46.6%	13.3%
5 hrs.	56.6%	23.3%
6 hrs.	66.6%	32.2%
10 hrs.	88.8%	60.0%
15 hrs.	93.3%	85.0%
20 hrs.	97.7%	94.4%
30 hrs.	100.0%	98.8%
35 hrs.	100.0%	100.0%

This table is produced to show how the time intervals between wounding and admission to an A.S.C. and between wounding and operation. It will be noted that the average interval between wounding and admission was in the neighbourhood of 5 hours. This seems long but it must be realized that the greatest and most variable factor is the time elapsing between the wounding and the arrival at he R.A.P. Frequently conditions are such that it takes many hours to carry a man from the point at which he was hit to this Medical Officer—it may not be possible to reach a man during daylight—or it may take time to find him in the dark—the carry may be long and difficult. Once in an ambulance his progress is steady and relatively rapid.

So much for the administrative side. Let us now turn to a consideration of the manner in which these units function and of the types of patients which they are called upon to treat. I can speak only of the situations in Sicily and Italy up to Rome—having no first hand knowledge of the experiences of the teams in Northern Italy or in France, though I imagine that the picture is essentially the same in every theatre.

We considered ourselves fortunate that in 8 months of this type of work we saw a fair variation—variation in the type of warfare and in weather—the two factors which mainly govern the numbers and condition of casualties, and variations in working conditions. Of the actual warfare we saw but little in spite of the fact that we were never very far behind. We were, however, in a position to be interested spectators and were able to learn something of the art both from what we saw and from what we were told by those actively engaged. This was not the least attractive feature of the job. We took part—a very inactive part I should say—in two assault landings, and we followed behind the troops in their rapid advances and camped behind them when they were temporarily halted by the enemy. During the advances we would travel sometimes for days without having to stop to work—the casualties would be light and the morale high. A most pleasant existence. How different it was when the going became hard, the movement

would slow down and finally stop and the number of wounded would mount as the artillery and mortars came into action. As a rule these rude interruptions would be short-lived and the chase would be on again, but on those occasions when the enemy made a real stand we had a taste of the work of the last war—casualties coming in in large numbers during attacks, with a steady flow in between from patrols. This life was very trying for all concerned and one often marvelled at the patience that those who experienced years of it in the last war must have shown. Just as moving ahead was exhilarating—new scenery—new markets, and above all a feeling of accomplishment—so was standing still dull and depressing.

The weather had a great influence upon our activities. At the moment we need not consider its effect upon the movement of troops—which has been as evident in the Italian as in any other campaign—but mention should be made of both the seasonal diseases and the difference noted in the condition of the wounded with changes in the temperature.

So common were malaria and dysentery in the summer months and infectious hepatitis in the autumn and winter that all the medical officers were affected to some extent by having to lend a hand in treating the cases and by falling victims to one or another of the diseases themselves. Then again these illnesses were complicating factors in many of the wounded. A man with a subclinical malaria would as likely as not upon being wounded develop the full blown disease; and occasionally (particularly early in the game) his fever would be ascribed to some complication of the wound rather than to its proper cause. Similarly an individual might develop jaundice after being wounded and in such cases the jaundice was often a more serious affair than it otherwise would have been. Indeed there were several deaths from hepatitis recorded amongst our wounded.

The effects of dysentery were probably less important. Certainly it was a great inconvenience to a man to be encased in plaster and to have diarrhœa at the same time but it is unlikely that his chances of recovery were seriously affected. It is not, however, unreasonable to assume that one so unfortunate as to sustain an abdominal wound whilst he was suffering from a bout of diarrhœa would be more liable to a widespread peritonitis —although I cannot recall any cases to support this assumption.

Another byproduct of the weather was the fly problem. The flies during the hot weather would appear in such numbers as to form a real nuisance. They would swarm about a wound in clouds and drive a patient to distraction. In an operating theatre that was not adequately screened and sprayed they would collect in such quantities as to render useless any effort at asepsis. In the early part of the campaign when we lacked a lot of essential equipment we used to have to employ one of our men full time to combat the flies. He would spent most of his time waving a magazine over the field of operation to prevent the flies from landing on the wound. If one could compute the number of organisms introduced into wounds and carried from one wound to another by these creatures the result would doubtless be most impressive.

As regards the effects of heat and cold upon the condition of the casualties one has little to add to the observations of the workers in the last war. We had ample opportunity to confirm the fact that shock is more prevalent and more severe during cold weather. In this connection one new feature has crept in during recent years. It concerns the treatment of the cold shocked patient. Heretofore it was customary to apply external heat in the form of hot water bottles and heat cradles. Not long ago it was pointed out that such efforts would, by producing a peripheral vasodilatation, tend to nullify the other measures such as blood and plasma transfusions designed to restore the volume of circulating blood. Thus the present attitude is to take steps to prevent the patient's losing heat by placing him in a comfortably warm room, removing his wet clothing and wrapping him in warm dry blankets—but not to overheat him. It is difficult to escape the feeling that this treatment, while theoretically sound, is not always for the best. Time and again one sees men with a variety of wounds complaining of only one thing—cold. They are not impressed by passive measures and they cannot be per-

suaded that the ice-cold blood pouring into their spastic veins is really doing them any good. They invariably ask for heat and will not settle down until they get it. It was amusing to see, once the first burst of enthusiasm for the new theory had passed, hot water bottles being brought back into use and the oil stoves being moved closer and closer to the stretchers.

We came to the conclusion that gross overheating was a bad thing but that rigid restriction of heat was equally bad and that one should be guided by the patient's comfort more than anything else.

Perhaps one of the most interesting features of this field surgery is the constant changing of location. In peacetime or in a base hospital in wartime, one is brought up to operate in a proper operating theatre and one becomes accustomed to and somewhat dependent upon its fixtures and conveniences. In the field it is different. There are no fixtures and the conveniences are sometimes very scarce. This is not to deny that field surgery is pleasant—for it is undoubtedly enjoyed by all those who take part—nor is it to say that it is not efficient—for it often is. But it does mean that a certain amount of ingenuity is required to produce satisfactory surgical conditions on all occasions.

During the Sicilian campaign, which lasted only 31 days, we set up our equipment in seven different places along the line of advance. We worked first in a barn near the landing beaches, next in a wine cellar, then in a farm house, then in tents in an orchard, moved on to a school, back to tents in a field and finally in a school. One would not dare claim that we did create proper conditions at each side—in fact, in the early days particularly, our arrangements were at times very poor. This was due to two factors—first and foremost our own inexperience and second our lack of equipment at the outset. We had had adequate time for training in England but, as is the case in most branches of the army, it was difficult, almost impossible, to reproduce in training the proper set of circumstances. Time and again we had set up and taken down our equipment, but we hadn't foreseen many of the difficulties that arose when we were faced with the actuality. Furthermore we had never had the opportunity to treat injured people under the conditions in which we later found ourselves. It is understandable that the hospitals would not hand over their patients to us to operate on because we could not hope to attain the standard of a hospital operating room and it did not seem fair to the patient. It is amusing to recall that the only actual operations we performed as a team using our own tables, instruments and sterilizers, etc., before being launched into the full stream of battle casualties, were circumcisions.

We tried to make the exercises as realistic as possible. We would clear out one of the regular theatres in the hospital, drive up in our fully loaded vehicles, install ourselves and when all was ready send a stretcher for the patient who was, as a rule, somewhat surprised by the handling he received and the things he saw. The anæsthetic and operation were carried out with as much ceremony as possible—we even used to administer plasma—but we achieved little in the way of training. Not until we had been doing the real thing for some time did we learn how to pack our equipment efficiently, nor did we find out how best to employ our men and ourselves. Thus we made many mistakes at the beginning, some of which we were able to rectify as time went on. Having gained experience we found that we could convert almost any decent sized room into a satisfactory operating theatre in a remarkably short space of time, we knew which articles we needed in the room at all times and which were better left in the truck until required and we had learned to combat the flies and the elements. After a short period of excitement we became accustomed to the fact that every case we dealt with was more or less of an emergency. While we had adequate tentage to enable us to be independent of buildings we soon came to the conclusion that almost any building is preferable to a tent —a conclusion which is not, I understand, generally shared. I am told that the teams in Normandy preferred their tents, their reason being that if they stuck to tents all the time they always knew what o expect. Perhaps Italy was different. Generally we could find buildings to work in and often we were grateful to Mussolini's Educational Programme which had provided large spacious schools in every town, which structures

suited our purposes admirably. We would use a schoolroom for an operating room and open as many others as we needed for resuscitation rooms, wards and quarters. Sometimes there was water laid on in the building, but as a rule the water had to be carried in by hand from the water trucks. Generally speaking and with few exceptions the operating theatres and wards were good. Our instruments and utensils were of the first order, the lighting was satisfactory and the wards were well equipped with beds and other paraphernalia.

The two Surgical Units performed during an eight-month period some 700 operations—not including the numerous incisions of abscesses, changes of dressings and other minor procedures. These 700 cases represented the bulk of the seriously wounded men evacuated from the divisional front during that time except for those with head wounds or facio-maxillary wounds, who were sent on to the specialist teams in the rear if their condition permitted. Occasionally the A.S.C. would become overrun with cases and it would be necessary to send on patients who ordinarily would have been retained for treatment—but this was not the rule. The two teams would work in shifts—we finally settled on 24-hour shifts—and only during the busiest periods would both teams be working at the same time.

ANALYSIS OF CASES

Type	Percentage	Type	Percentage
Minor Wounds	5%	Head—Cerebral injury	0.3%
Multiple Small wounds	3%	Eye	3.0%
Abdominal Wall	22%	Jaw	3.0%
Abdominal Visceral Injury	17%	Burns	2%
Chest Cases	8%	Buttock	6%
Lower Extremity	28%	Appendicitis	3%
Upper Extremity	11%	Arterial Lesions	6%
Spinal Cord	2%	Gas Gangrene	5%
Neck	2%	Amputations	10%

Table 2 shows the types of cases that were treated. It will be understood that the majority of patients had multiple wounds and that thee diagnosis here records only the most important wound.

The operative mortality in this group was about 15%—but in view of the fact many cases were operated on more than once the case mortality was higher—in the neighbourhood of 20%. This does not include a considerable group of patients who were admitted to the A.S.C. and died without being operated on. I have no record of these patients but I think it would be fairly near the truth to say that about 25% of all cases admitted to an A.S.C. die of their wounds.

These figures are given to provide a picture of the work that is being done by Field Surgical Units. Obviously the standard of surgery which these small units provide is not always, for one reason or another, of the best, but, taking all in all they do offer a fair chance of survival to the man who is so seriously injured that he may not stand the trip back to the realms of the fully equipped hospital.

NEWS AND NOTES

It is with deep regret that we record the passing of Dr. M. J. Keys of Victoria, who had practised there since 1915, specializing in eye, ear, nose and throat. Doctor Keys has left many friends throughout the Province, Canada and the United States.

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Congratulations are extended to Capt. and Mrs. D. W. Moffatt on the birth of a daughter on June 12th, and to Flight-Lieut. and Mrs. G. S. Rothwell on the birth of a son on May 28th.

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Dr. J. S. Daly of Trail has just returned from a week's holiday in Vancouver.

A son was born to Dr. and Mrs. C. E. Davies of Vancouver on May 26th, and daughters were born to Dr. and Mrs. G. D. Saxton and Dr. and Mrs. K. H. Wray-Johnston.

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Dr. Francis E. McNair of Vancouver was married to Miss Margaret G. McKenzie, daughter of Dr. and Mrs. G. E. McKenzie of Vancouver, on June 9th.

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Major K. J. Haig and Major J. W. Shier, both formerly in practice in Vancouver, have returned from service overseas, and are posted for duty in the Pacific Command.

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The following Medical Officers have returned from service overseas, and are at present on leave: Major L. W. Bassett of Victoria; Major J. Ross Davidson, Vancouver; Major J. A. Ireland; Major Henry Scott, Vancouver; Major J. A. Wright, Vancouver, and Capt. C. C. Covernton, Vancouver.

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Capt. G. E. Langley, R.C.A.M.C., has returned to civilian life and will practise in Vancouver.

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Dr. T. J. Sullivan of Cranbrook attended the Summer School Sessions in Vancouver, and then went o nto spend a holiday on Kootenay Lake where he hoped to catch some of those large Rainbow trout.

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Dr. M. R. Basted of Trail spent a week in Vancouver during the time of the Summer School Sessions of the Vancouver Medical Association.

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Dr. F. M. Auld of Nelson has gone East to attend the meetings of General Council of the Canadian Medical Association in Montreal.

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We are informed that Dr. L. E. Borden of Nelson has retired from active practice.

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We are pleased to hear that Dr. E. W. Boak of Victoria has returned to practice after an illness of many months.

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Doctors P. A. C. Cousland, F. M. Bryant and A. B. Nash of Victoria attended the meeting of the Canadian Medical Association in Montreal.

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Dr. G. A. Wright, formerly in practice in California, has opened an office in Victoria.

* * * *

Dr. W. H. Moore of Victoria, who has had a protracted convalescence from an operation and an illness, is at present on a short fishing trip to Great Central Lake, and will be back at work very soon.

* * * *

Dr. R. B. Robertson has returned to his practice in Victoria after a well-earned but brief rest in Portland.

* * * *

The staff of the Victoria unit of the Department of Tuberculosis Control made a presentation to their retiring chief, Dr. Frederick Kincaid, recently, and expressed the wish that the gift would be enjoyed by him for many years to come.

* * * *

Colonel C. A. Watson has arrived back in Victoria after four years' service in Europe.

* * * *

The following doctors from British Columbia travelled to Montreal to serve as members on General Council of the Canadian Medical Association at the meetings held in June: Doctors F. M. Bryant and P. A. C. Cousland of Victoria, F. M. Auld of Nelson, A. H. Meneely of Nanaimo, G. O. Matthews, H. H. Milburn, A. H. Spohn and Ethlyn Trapp of Vancouver.

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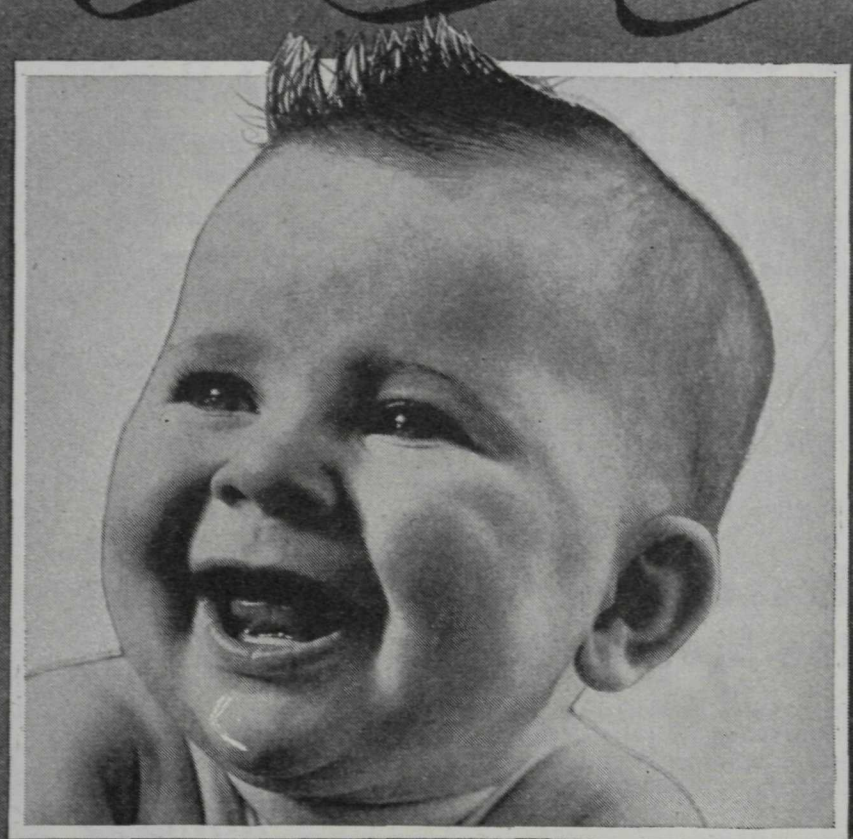

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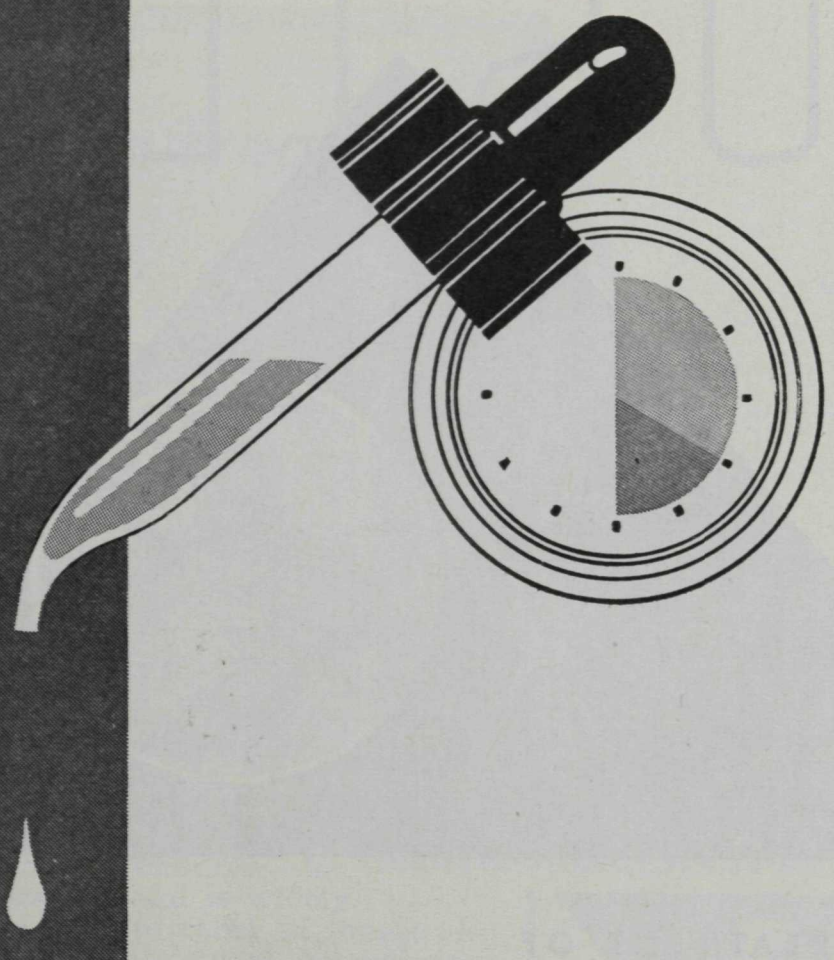

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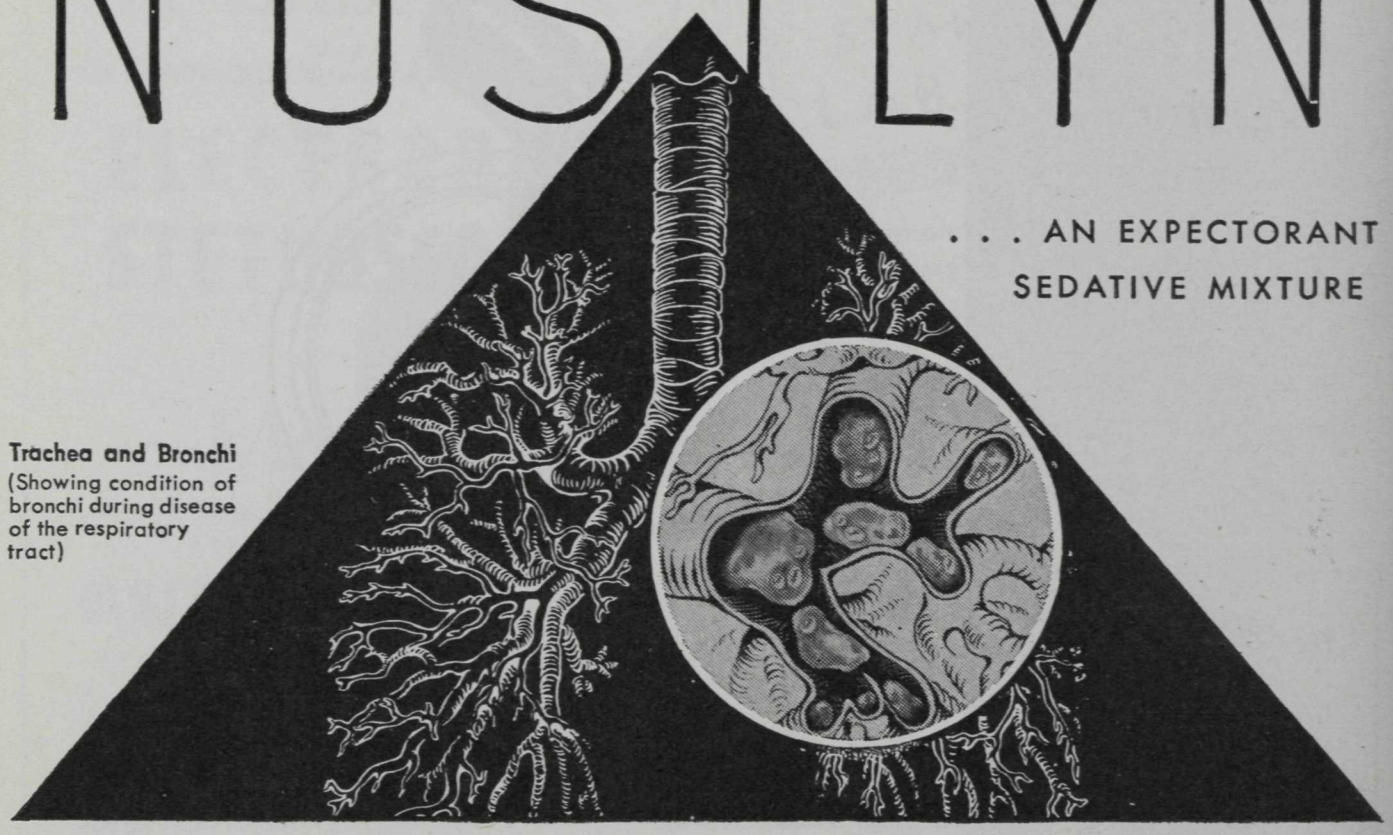

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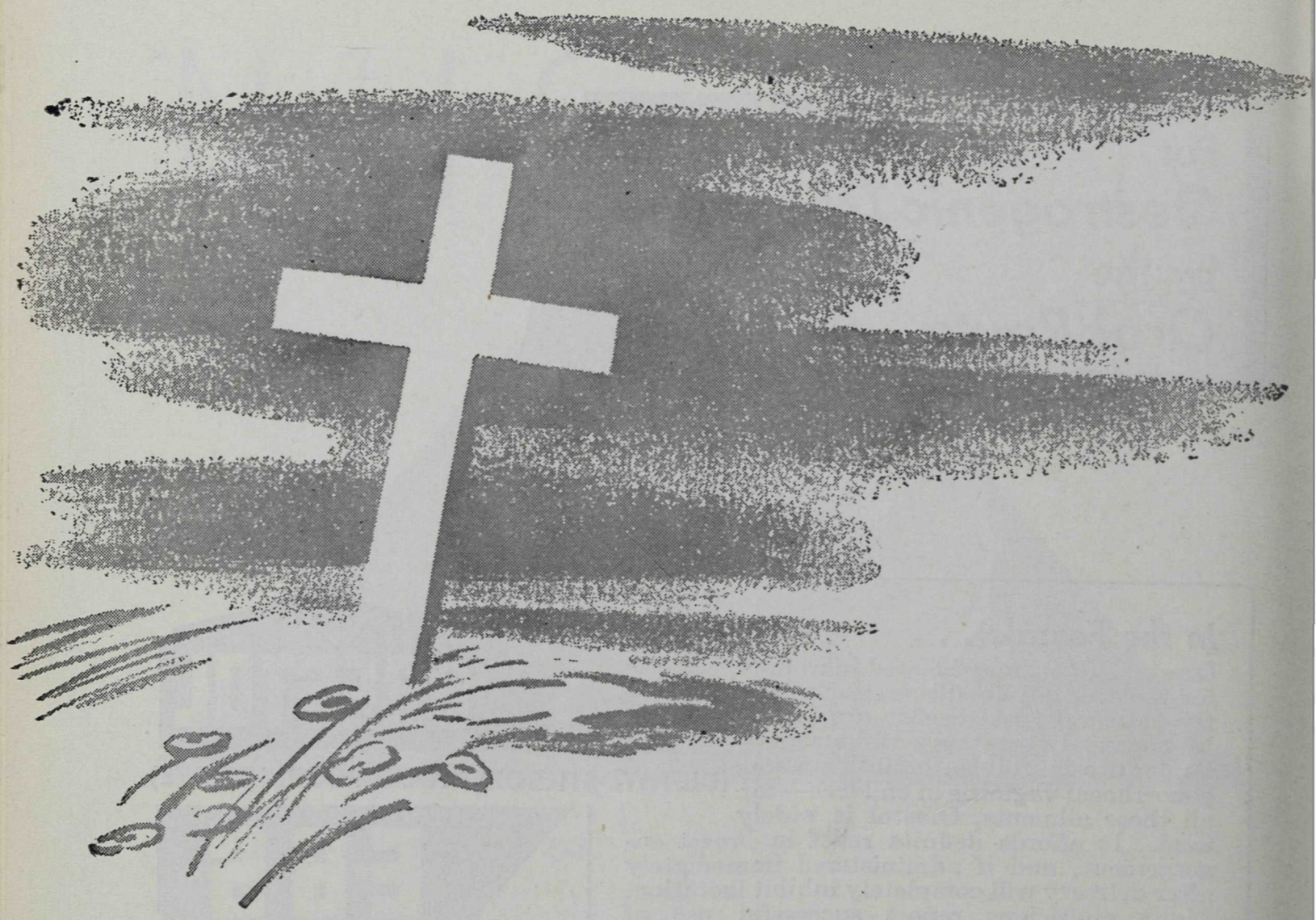

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That a man lay down his life for his friend

John XV 13

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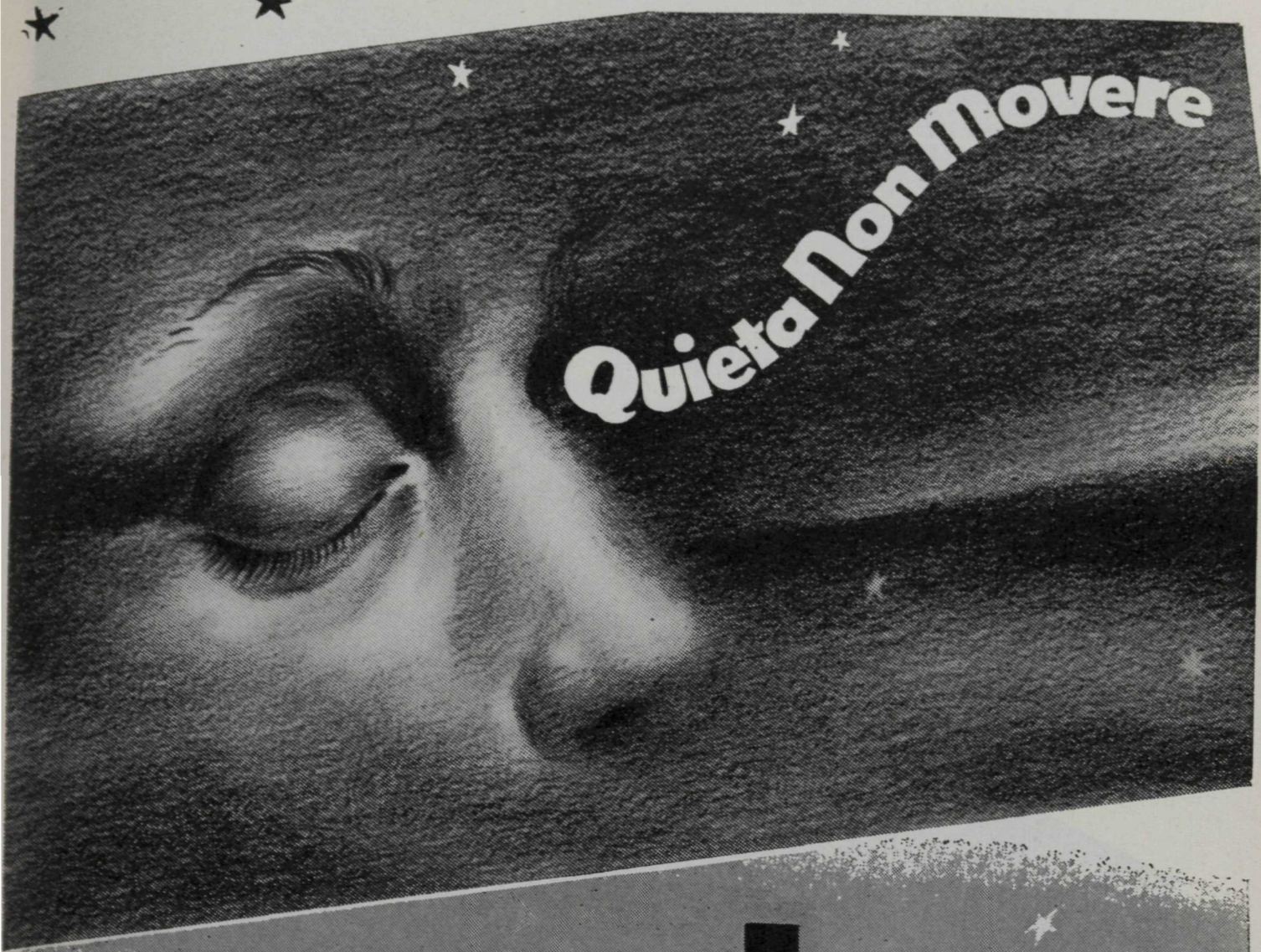

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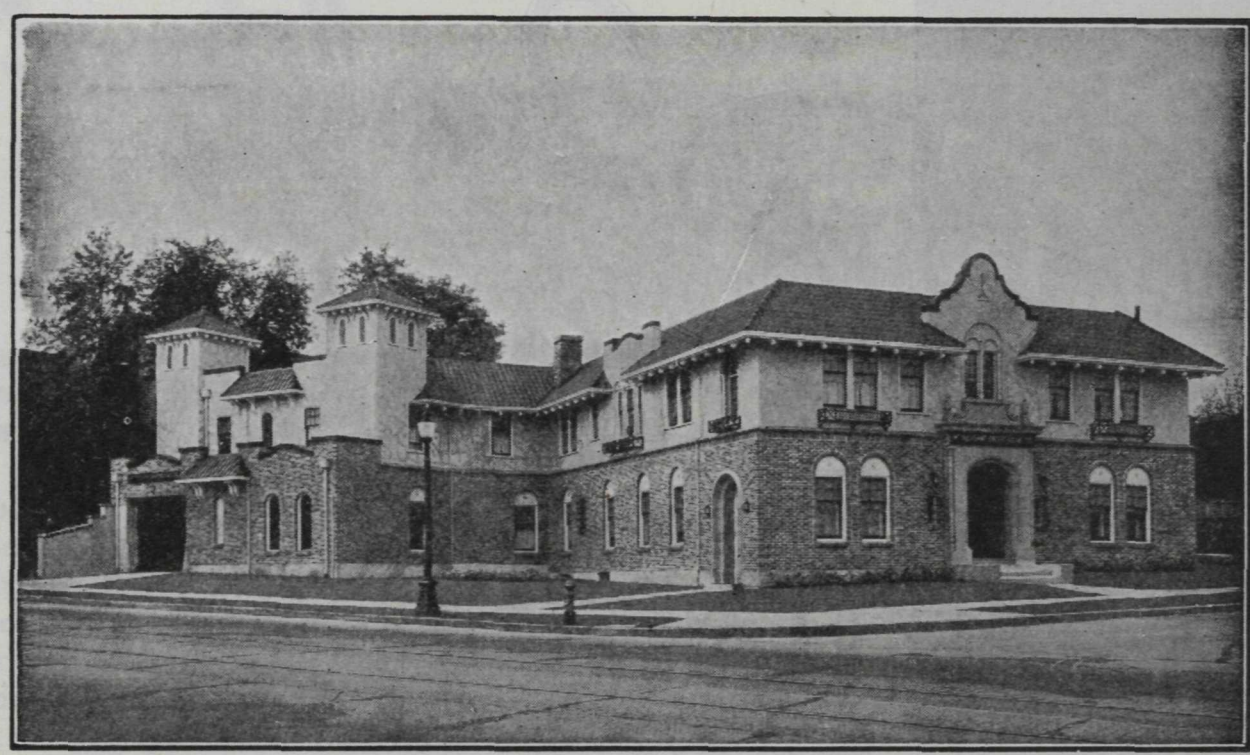

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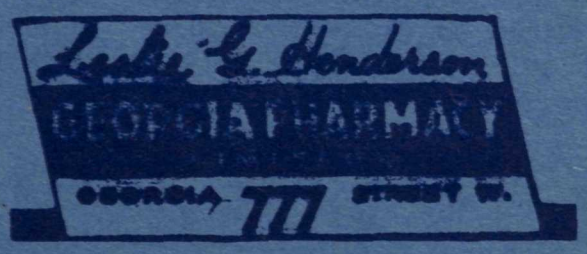

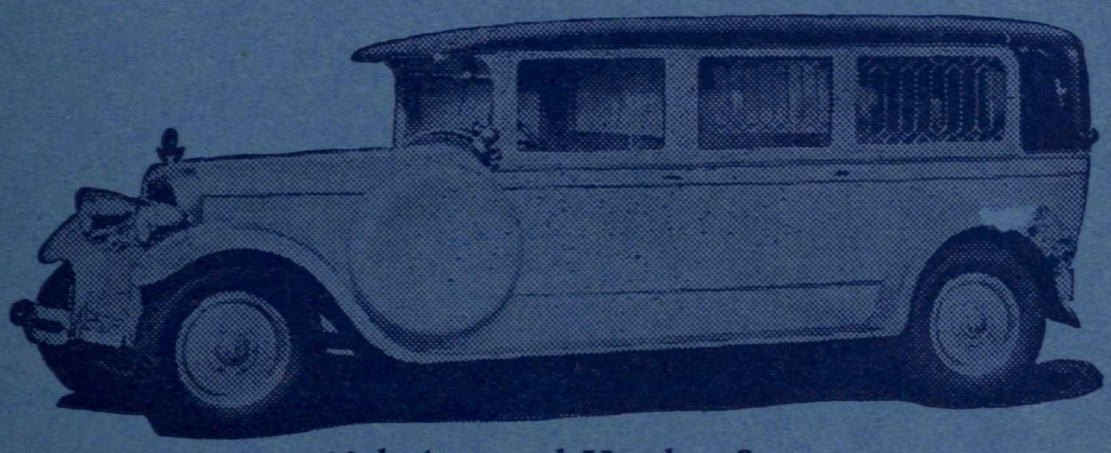

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