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BULLETIN

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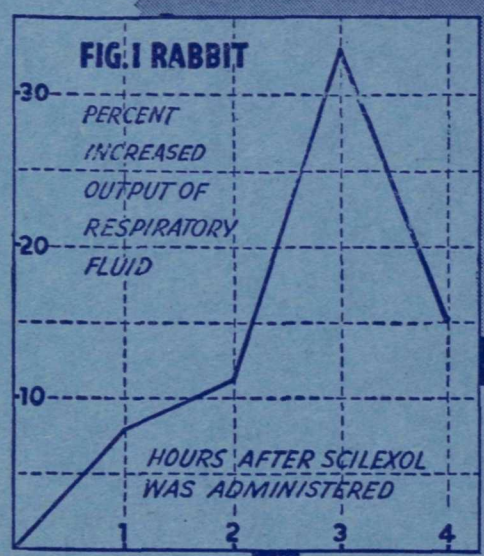
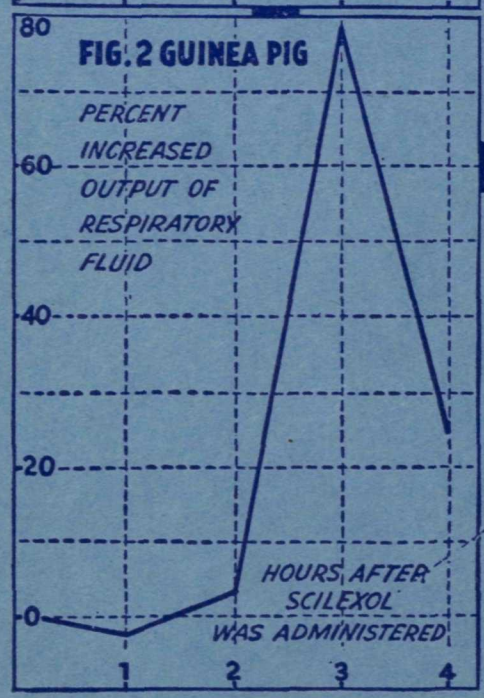
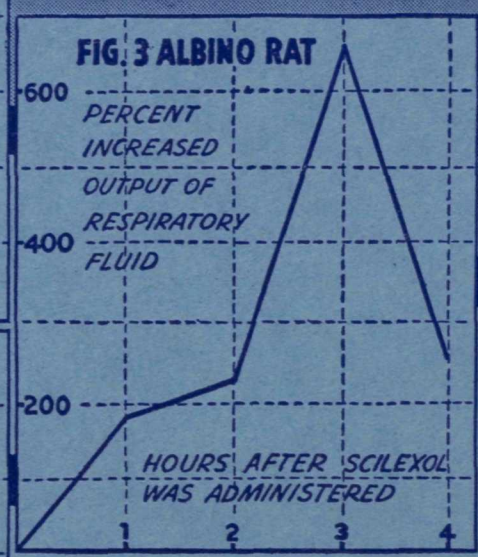
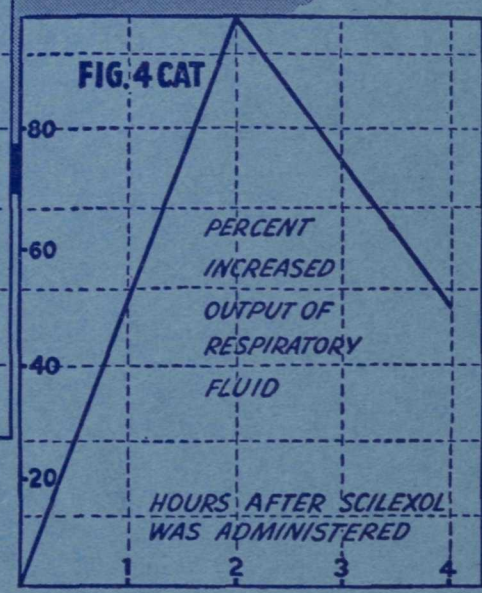
Biological Tests Confirm the Expectorant Action of SCILEXOL E.B.S.









THE ACCOMPANYING GRAPHS show pictorially, the increased excretion of respiratory tract fluid in four different species of mammals to which were administered Scilexol with Camphorated Tincture of Opium in doses of 0.1. ml. per kilo of body weight. These results, obtained in an independent laboratory, confirm our belief that Scilexol is an efficient expectorant cough preparation.

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Chloroform	2 mins.
Acid Hydrocyanic Dil.	4 mins.
Syrup Scillae	90 mins.
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1—Tincture Opium Camphorated, 80 mins. per ounce

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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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VOL. XXIII. NOVEMBER, 1946 No. 2

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VANCOUVER MEDICAL ASSOCIATION

Founded 1898 : : Incorporated 1906

PROGRAMME OF THE 49th ANNUAL SESSION

GENERAL MEETINGS will be held on the first Tuesday of each month at 8:00 p.m.

CLINICAL MEETINGS will be held on the third Tuesday of each month at 8:00 p.m.

December 3 GENERAL MEETING. Symposium on Gynecology.
Doctors Leigh Hunt and Gardiner Frost.

December 10 CLINICAL MEETING—Shaughnessy Hospital.

January 7 GENERAL MEETING—Speaker and title to be announced.

January 21 CLINICAL MEETING—Vancouver General Hospital.

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414

VANCOUVER HEALTH DEPARTMENT

Total population—estimated	323,850
Chinese population—estimated	6,566
Hindu population—estimated	361

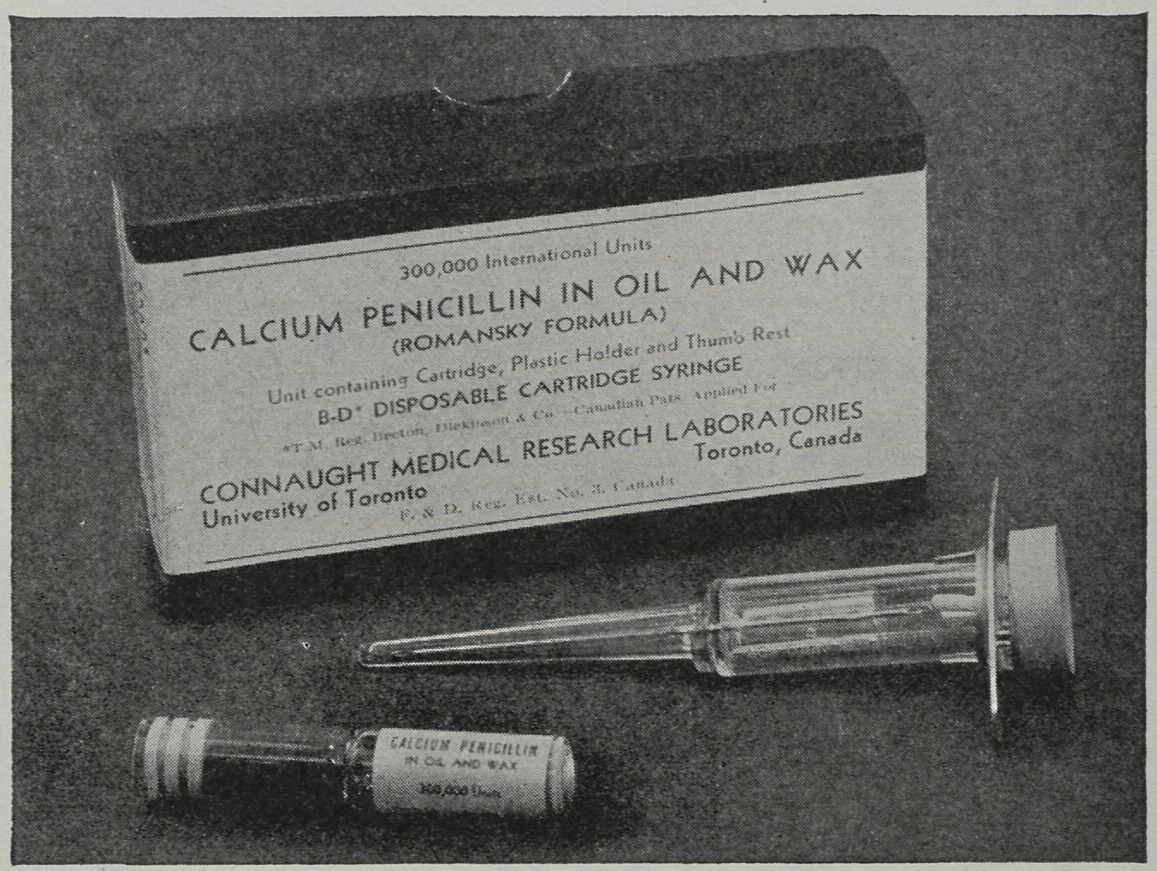
	Number	Rate per 1,000 Population
Total deaths	274	10.3
Chinese deaths	16	29.6
Deaths, residents only	229	8.6
BIRTH REGISTRATIONS:		
Male	337	
Female	381	
	718	27.0

INFANT MORTALITY:	Sept., 1946	Sept., 1945
Deaths under one year of age	15	21
Death rate—per 1,000 live births	20.9	38.8
Stillbirths (not included above)	9	15

CASES OF COMMUNICABLE DISEASES REPORTED IN THE CITY

	August, 1946		September, 1946		October, 1946	
	Cases	Deaths	Cases	Deaths	Cases	Deaths
Scarlet Fever	4	3	6	0	10	0
Diphtheria	0	0	1	1	2	0
Diphtheria Carrier	0	0	0	0	5	0
Chicken Pox	29	0	30	0	43	0
Measles	6	0	3	0	11	0
Rubella	3	0	1	0	4	0
Mumps	26	0	62	0	100	0
Whooping Cough	3	0	8	0	0	0
Typhoid Fever	0	0	0	0	0	0
Typhoid Fever Carrier	0	0	0	0	0	0
Undulant Fever	3	0	2	0	0	0
Poliomyelitis	0	0	1	0	1	0
Tuberculosis	43	22	55	7	0	0
Erysipelas	3	0	7	0	1	0
Meningococcus Meningitis	0	0	0	0	2	0
Infectious Jaundice	2	0	1	0	0	0
Salmonellosis	20	0	16	0	4	0
Salmonellosis (Carrier)	6	0	0	0	0	0
Dysentery	0	0	0	0	0	0
Tetanus	1	0	1	1	0	0
Syphilis	107	1	104	1	0	0
Gonorrhoea	261	1	210	0	0	0
Cancer (Reportable):						
Resident	122	0	60	0	81	0
Non-Resident	54	0	29	0	45	0

PENICILLIN INJECTIONS REDUCED TO ONE OR TWO IN TWENTY-FOUR HOURS



Since the first publication by Romansky of the satisfactory blood levels of penicillin obtained and maintained for a period of eighteen hours following the intramuscular injection of 300,000 units of calcium penicillin in beeswax and peanut oil, both laboratory investigations and collaborative clinical studies in the treatment of gonorrhea and pneumonia have been made by the Connaught Medical Research Laboratories. It has been widely confirmed that penicillin prepared according to the Romansky formula maintains the blood levels which are required in the treatment of gonorrhea and certain other conditions, and permits of one injection every twelve to twenty-four hours.

The Connaught Medical Research Laboratories have prepared a suitable product which can be readily administered with the use of a disposable plastic syringe provided in each package. This syringe, with sterile, built-in needle, is ready for immediate use with a special cartridge containing 300,000 units of calcium penicillin in 1 cc. of beeswax and peanut oil.

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University of Toronto **Toronto 4, Canada**

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The Editor's Page

The question of chlorination of the water supply of Vancouver is again an active one. With the cessation of hostilities, the Federal order that the water must be chlorinated in accordance with treaty obligations, became void, and it was left to the discretion of the local authorities, whether chlorination should be continued or not. Unfortunately, they saw fit to discontinue it. But the reasons that actuated the Federal Government in making this order, namely, the findings by the most competent Public Health Authorities of Canada and the United States, that the water was not safe, still are quite valid, and the ending of the war had no modifying effect on them. So we waked up one morning to find that the United States Public Health Service has given it as its considered opinion, that the water of Vancouver is not safe for drinking purposes, unless it is chlorinated—and U.S. railway lines and airlines, plying into and out of this area, have ordered their trains and airplanes to discontinue its use. It is quite on the cards that other public transportation companies will follow suit.

The City Council, and the Greater Vancouver Water Board, have taken the ground that this is "an insult" to the purity of Vancouver water, and will not agree, we are told, to chlorination. They are not basing their arguments, as formerly, on any supposedly injurious effects that chlorination might have—the citizens of Victoria, Seattle, Portland, San Francisco, Montreal, Toronto, Winnipeg, and so on *ad infinitum*, are too obviously healthy for that. It is purely a matter of local pride, and the wounding of that pride. We are told that Vancouver water is the purest in the world. It is true that such competent bacteriologists as Dr. Dolman (whose word alone would be quite sufficient for us personally) and the bacteriologists of the Canadian and United States Public Health Services, all deny this, and have slides and bacterial counts and other data to back up their contention—but this does not seem to impress our Mayor and Council, nor the Greater Vancouver Water Board. As Barry Mather said in his column in the News-Herald, why do we waste money on laboratories and scientists and trained bacteriologists, when we have Mayor Cornett *et all* to protect us? We could use the money so much better, e.g. to build hospitals to cure those who do become ill. We read, too, that a well-known Senator, and candidate for Mayor, states that he has always drunk this water, and it has never done him any harm. We understand that this gentleman used, as a boy, to deliver milk in Vancouver. It was not pasteurized milk in those days, it was often very dirty milk. It does not seem to have done him any harm, though it was responsible for the deaths of many weaker children—but today, in a city of this size, we accept the fact that it is impossible to have a safe milk supply, unless it is pasteurized. The farmers of the Fraser Valley have tuberculosis-free herds; they inoculate their cows against undulant fever—they do all in their power to have safe milk; yet they agree to pasteurization because they realize that contamination is too easily possible; and our civic government enforces it.

Similarly with our water- supply. Undoubtedly, it is, at its source, absolutely pure. But there are, now, too many possible ways by which it may be contaminated. Dr. Dolman proved once, beyond any doubt, that the watershed was not, and could not be, safeguarded from trespassers. One or two typhoid carriers could cause an epidemic. We know of a case of typhoid that originated on Lulu Island. What if one of the members of that family went hiking on our vulnerable watershed? Or what is to prevent gulls and other birds from carrying contaminated material there? For instance, from the many camps and shacks adjacent to the actual watershed?

This should not be a personal matter, or a matter of civic "pride", another word for prejudice; but unfortunately, it has become so. The tragedy of it is, that while the

silly squabble goes on, at any time serious results may ensue. And Vancouver is getting a terrible black eye all across the continent. Our beaches have ben pronounced unsafe for bathers—our water is now declared, and we believe rightly so, potentially dangerous for drinking purposes, and actually unsafe; and while Rome is burning, our local Neros fiddle. We are told, constantly, how much the tourist traffic means to Vancouver. Well, we should think that the average tourist, reading in his local paper that it is neither safe to take a bath or a drink of water here, will hesitate a long time before he comes to this city next year. And once our reputation for safe beaches and a safe water supply is lost, it will be a hard job to get it back again. Humpty Dumpty has has a bad fall, my masters, and it is going to need a long pull and a strong pull, to get him back on the wall again. We appeal to the responsible administrators concerned in this matter, to deal with it, not from the angle of personal feeling, but on a coldly scientific basis, and to accept the disinterested and skilled advice of those who know the facts, and who alone are competent to judge.

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Monday, Wednesday and Friday: 9:00 a.m. to 9:30 p.m.

Tuesdays and Thursday, 9:00 a.m. to 5:00 p.m.

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RECENT ACCESSIONS TO LIBRARY:

Medical Clinics of North America, Symposium on Definite, Specific Methods of Treatment, Boston, September, 1946.

Collected Reprints, Vol. IV, 1946, by Thomas Cullen.
(Gift of Dr. Cullen).

Skin Diseases, Nutrition and Metabolism, 1946, by Erich Urbach.

Supplements to Acta Medical Scandinavica:

No. 177 Peroral and Intravenous Galactose Tests.
A comparative Study of their Significance in different conditions, by Toivo Stenstam.

No. 178 Diabetes Mellitus in Bergen, 1925-1941.
A Study of Morbidity, Mortality, Causes of Death and Complications, by Per Hanssen.

No. 179 On the Distribution of the Morbidity of Epidemic Diseases with Regard to Age.

PROFESSIONAL NOTICE

[We would like to call our readers' attention to the following notice: we are sure that all medical men will welcome this new addition to the excellent McKee-Coleman Laboratory.—Ed.]

On his return from overseas, Dr. R. J. MacDonald joined Dr. C. S. McKee, 925 West Georgia Street, Vancouver, in his laboratory practice. He is now entering full partnership and will give special attention to investigation of allergic cases, and when required, the preparation of hypo-sensitizing agents, for use by the family physician.

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PROBLEMS AND TRENDS IN MEDICAL EDUCATION

EDWARD L. TURNER, M.D., F.A.C.P.

Dean, School of Medicine, University of Washington

(Read before the Summer School Session, Vancouver Medical Association)
September 13, 1946

During the first half of the 20th Century such rapid strides have been made in medical knowledge that the panorama of medical practice has been materially altered. Greater and more significant advances in diagnostic, preventive and therapeutic technics and procedures have occurred during this period than during any similar time in the history of medicine. Diseases that were every-day-problems for the physicians practicing at the turn of the century are rarities today, and new problems have come to the forefront. The practice of clinical medicine is never static, but is continuously undergoing changes, sometimes so rapidly as to make it difficult for the clinician to keep abreast of the. During this period we have been living in the midst of social and economical readjustments which are so intimately interwoven with general health and welfare that they have introduced new and urgent problems for our profession.

Medical education has undergone many changes in the past fifty years as it has endeavoured to keep pace with these advances in medical knowledge, and confronted the problems of how best to equip its professional students for their later activities. From the dawn of recorded history medicine has been a rather curious mixture of superstition, empiricism and scientific observation, with the proportions of each varying with the passage of time. Gradually superstition has been expelled, empiricism reduced and during recent years medicine based on the results of scientific observation has developed into a genuine science, as well as an art.

Early in the century, medical education in the United States was in a chaotic condition. There were many medical schools, most of them proprietary institutions, entirely independent of affiliation with colleges or universities. There were a few

favoured outstanding schools, as a result of an association with an institution of higher learning, or because of the calibre of their faculties. Most medical schools offered training solely of undergraduate nature with no opportunity for specialization or other post graduate training. A physician who desired to specialize usually turned to European medical centres for such instruction. Teaching in all departments was usually conducted by busy practitioners who utilized part of their time in the training of medical students. Basic requirements for admission to the study of medicine were little, if any, beyond high school level in the majority of these institutions. A few of the more outstanding schools were beginning to require a certain amount of college preparatory work, and some of them had already initiated the use of full time specialties as teachers in some of the basic medical sciences.

With the appearance of the Flexner report many important and radical changes began to take place in American Medical Education. The development and activities of the Council on Medical Education and Hospitals of the American Medical Association, together with the interest and activities of the Association of American Medical Colleges led to the creation of basic standards of what medical education should strive for. Examinations of medical schools by competent representatives of these organizations resulted in their classification. The publicity associated with such examinations and classification of medical schools brought about wholesome reorganization of many of them. Others, not capable of, or unwilling to meet the standards regarding faculty, students, curricula, physical and financial requirements gradually terminated their existences. One of the most important developments accompanying this reorganization of medical educational institutions was the clear recognition of the importance of integration within a university organization. The trend has been, and continues to be, to include medical and dental schools as integral units within the organization of institutions of higher learning.

Many interesting situations were associated with these readjustments. Over-departmentalization gradually crept into many of the schools. As Victor Johnson has stated, "Departments just grow, and the departmental system of instruction just happened. There has resulted a scramble for students' time, in which every hour of students' time not specifically accounted for in the curriculum is counted as fair game. The departments with the most aggressive hunters capture these hours. The successful department is the one which has acquired the most hours into which it then crams a maximum of detail, whether or not it is relevant."

The development of such departmentalization leads many young people interested in teaching and investigation to seek higher degrees in these specialized fields, and, in many cases, eliminate clinical training. Gradually there developed many highly qualified scientists deeply interested in these special and restricted fields. Each basic science department in a university or medical school began to undertake special investigative studies within its sphere of interest, and out of these efforts has developed the greatest and most productive period of research in the history of medicine.

There are always dangers associated with over-departmentalization or over-specialization. Lack of integration frequently occurs, useless repetition will inevitably creep in, and specialists, not infrequently, are inclined to lose perspective, so that they overestimate the importance of their own field in its relation to the over-all problem. As a result undue emphasis may be placed on mastering the science in question, rather than on learning the role it plays in medicine. Over-departmentalization, in some cases has led to the inclusion of enormous amounts of petty detail, frequently of no scientific, intellectual, or utilitarian value. As a result a good deal of time needed for more useful pursuits has been wasted by medical students in some of these basic science departments.

One is reminded of the American tourists returning from a trip to Europe some years ago, shortly before the recent war. The couple became acquainted with a ruddy cheeked young Finnish girl, who told them that she was going to the United States

to seek employment. Seeing in her a potential employee in their home, the young couple became quite interested and asked,

"Can you cook?"

The young woman replied that she could not cook, as her mother always had done that for the family.

"Can you take care of the children?"

"No.," replied the young woman. "My eldest sister always took care of the other children."

"Well, can you sew?"

"Oh, my goodness no, my aunt did the family sewing."

"Do you know how to clean house?"

"Oh, mercy no, my next oldest sister always did the house-cleaning."

And finally, in rather surprised dismay, the couple asked, "Well, what can you do?"

Whereupon the young woman smilingly replied,

"I can milk the reindeer."

In recent years there has been an effort in our better medical schools to break this new tradition of over-departmentalization and seek a better integration of instruction between the basic sciences themselves, and between the basic sciences and the clinical branches of instruction. To be a success such an effort must have the cooperation of departmental groups who are sincerely interested in the problem of medical education, and who are willing to take the time needed to work out integrated programmes. There must be a willingness to delete inessential and irrelevent material so as to provide more free time for the students to utilize in reading and following lines of special interest. Certain clinical applications of the basic medical sciences should be reintroduced into the earliest phases of medical education, in an integrated effort to indicate clearly the value of these basic medical sciences to the understanding of clinical medicine. If properly done students will most surely do a better task of carrying over their basic science training and its application in clinical fields.

Conferences and discussion groups should largely replace the formal didactic lecture. Too frequently, even today, medical students sit in amphitheatres and take notes, as professors lull them with lectures from none too recently revised material. These lecture notes, rather than the perusal of recent texts and the latest current literature, all too frequently furnish the bulk of reading material for the course in question. How much more effective teaching could be if there were preliminary reading assignments, clear cut presentation of major points by the instructor and then discussion between the instructor and his students. More seminar type of instruction, guided by well qualified instructors and associated with stimulating active student discussions and participation, is essential to good medical training. It can be done, but it demands good teachers who are on their mettle, and enough of them so that teaching can be carried on in smaller groups.

Although the large majority of medical students will go on through school to eventually enter general practice or one of the medical specialties, we must continue to look to our medical schools as sources of inspiration where the research scholars of the future will be found and developed. With an enthusiastic, stimulating faculty, interspersed with good research scholars, as well as good teachers, many a young medical student will become interested in investigation. It is certainly true that medical education receives its inspiration from the sense of progress given by research. It is equally true that research precedes virtually every important advance in the control of illness and that it is perhaps the most important single factor determining the future health of the nation. Research and medicine go hand-in-hand. They cannot be successfully divorced. We must provoke the curiosity of medical students and develop the inquisitive types of mind that make better physicians, and that are absolutely essential in the search for answers to our many unknown problems.

There are still some schools where it is felt that medical staff members should be

hired to carry maximum teaching loads, and that research on their part is an unnecessary luxury. To quote Victor Johnson again, "No medical school is worthy of the name which does not carry out some significant research, even though the primary aim of the school is the training of general practitioners." Any school so self satisfied and smug that it scorns research and experimentation would, as Tinsley Harrison stated, eventually be like the Grandfather Doll who could only look backward. The faculty of such a school would soon resemble Kipling's Old Men:—

"And because we know we have breath in our mouths
And think we have thoughts in our heads,
We shall assume that we are alive
Whereas we are really dead."

I cannot over-emphasize the importance of this relationship of education and research. Look back a mere twenty-five years. As a medical student I saw the prognosis of the diabetic turn from a relatively hopeless one, to a reasonably happy outlook. During my first pre-medical year I watched my mother, a young woman of forty-two, die from pernicious anemia, and ten years later I observed patients with this condition brought from almost certain death within a short period, back to happy useful lives. You and I have watched victims of septicaemia, pneumonia, meningitis, syphilis, and many another condition, die in spite of every effort we could make a few years ago, whom we know we might have served, if we then had such tools as are available today in the form of sulfa drugs, penicillin and streptomycin. We have seen an amazingly different relationship between deaths from preventable and curable disease and the immediate casualties of war, in our military forces during the recent World War as compared to previous wars. The new antibiotics, the rational use of plasma, whole blood and blood substitutes, new surgical technics, improved sanitation, and advanced prophylactic measures have together decreased mortality to a point almost unbelievable, in spite of the exposure of military forces to almost every conceivable health problem in the world.

These things did not just happen. They were the results of the patient and painstaking investigative activities of scientific scholars. Most of the investigations leading to these developments were begun in medical school laboratories. Recall the story of the discovery and development of insulin, the history of liver therapy for pernicious anemia, the early observations on penicillin and the initial studies on the sulfa drugs. Penicillin, the use of plasma and whole blood, new surgical technics, etc., have developed unusually rapidly because of the urgency created by the recent war. War needs placed huge financial resources and marvelous facilities at the disposal of investigators so that large scale coordinated research developed on an unprecedented level. It has demonstrated the possibilities of adequately financed research in producing destructive agents more terrible than the world has ever thought possible, and which make our efforts at saving lives and endeavoring to relieve human suffering seem at times a bit futile.

With such rapid advances in medical knowledge it is essential that any programme of medical education be designed so as to meet the needs of graduate and post graduate training as well as the basic undergraduate requirements. Unless he has nothing to do, or is a genius, a clinician cannot possibly keep abreast of all that goes on in medical advances, or even in some of the specailties. Thus there is need for a continuous educational programme in medical centres. The best internships and residencies are conducted so as to offer the best possible supervision. Individuals seeking such training have the opportunity in such locations to utilize basic sciences as well as supervised clinical departments. Post graduate instruction for clinicians in practice can be designed so as to integrate the various departments into a useful intelligent programme of maximum value.

Twenty-five years ago pre-medical students were frequently advised to cram their programmes with as much science as possible. As a result many students entered medical school with more than adequate basic training in chemistry, physics and biology,

but having experienced little, or no exposure to some of the humanities that are so important in relation to the practice of medicine. Unfortunately, although there has been much discussion against the advisability of such narrow and badly balanced programmes there are still advisors who have kept pre-medical programmes entirely too narrow. A physician should have a good basic educational background in such fields as phychology, economics, sociology, history and philosophy. Besides being a physician the average practitioner has to conduct the business side of his activities, and physicians have, on the whole, had little or no exposure to the fundamental principles of conducting a business. There should be enough of such training in the educational programme so that it is not necessary to learn solely through the "school of hard knocks." Individuals entering the field of medicine should certainly know and endeavour to understand the social and economic situation and trends to which they and their patients are exposed and which play such important roles in the health and welfare of human beings. Public Health activities have been steadily increasing as a result of logical needs. Such activities will undoubtedly increase rather than decrease, if one properly interprets the trends. Close cooperation between physicians and the various agencies concerned with public health, social and economic problems is essential. Intelligent study on the part of our profession will continue to do much to maintain the kind of cooperation that will leave the medical profession in the position of determining how it will function, rather than being in the position of being told how it must function. The medical profession must have social insight and aggressive leadership in helping to mould the opinion of the public in the problem of how best to answer the question of adequate medical care for all of the people.

Medical education has not included adequate presentation of the social problems of medical practice, or the social responsibilities of physicians. A reasonably complete medical education today must include sufficient information to help the physician of the future meet these problems. As President Allen has so aptly stated, "It must educate physicians to meet the problems of the future as well as those of the present in order to close the social gap between medical technology or the "know-how" and the medical service or "doing" for the benefit of all mankind. It is the responsibility of the school and university system to educate physicians so that they will be as proficient in meeting and solving social and economic problems of medical service as they are in handling the professional and technical problems of the practice of medicine."

Medical education is the most expensive field of activity in which a university may engage. A well integrated programme necessitates not only adequate physical facilities for the teaching and research programmes of the basic sciences, but also hospital facilities controlled by the medical school. Wherever population is adequate and transportation facilities can be reasonably assured, the chief clinical teaching hospital of a medical school should be located on the university campus. The desirability of such a physical integration for maximum functional integration of the over-all medical school program has been so amply demonstrated during recent years that it is beyond question. The separation of basic sciences and clinical facilities is universally recognized as being undesirable and a great handicap to a thoroughly good programme. The development and maintenance of a teaching hospital is a highly costly venture . . . for today it is safe to estimate that it will require approximately $10,000 per bed to build and equip such an institution. Four hundred beds which represents a desirable functional teaching unit will therefore be a major capital investment.

Furthermore, there has been a steady trend towards more full time clinical teachers who can give their entire time to teaching, research, the supervision of medical students, and possibly a minimum of consultation work. It is generally conceded that any school with all, or nearly all, of its clinical staff on a part time basis is obsolete. Since clinical teaching in many institutions has been largely conducted by busy practitioners who have given their time, the introduction of at least some full time clinical teachers has added another costly item to modern medical education. It is perhaps trite to state

that the possession of an M.D. degree and even a record of successful practice does not necessarily imply that an individual is qualified to be a satisfactory teacher of medical students, even in clinical subjects. A hospital may be adequately equipped to provide medical care, and even satisfactory for internships and residencies, without being satisfactory from the standpoint of undergraduate medical student teaching.

Let us pause briefly and survey what costs have been, and now are, in this field. When the University of Rochester School of Medicine and Dentistry was developed in the twenties, they possessed seventeen million dollars for building and endowment. Their school and hospital represents an investment of about eight and a half million dollars. The medical school portion of their plant was constructed at a cost of approximately forty cents per cubic foot as compared to a dollar to a dollar and a quarter today. Vanderbilt University Medical School and Hospital represents, as it stands today, an investment of around eight million dollars.

Medical Centre developments are going on in various parts of the United States and their estimated costs show the trends in general. New York University and Bellevue Hospital have outlined a $27,500,000 developmental project. Wayne University, the municipal university of Detroit, has a $50,000,000 medical centre programme as an objective. The California legislature recently allocated $11,100,000 for the medical school program of the University of California. The M. D. Anderson Foundation in Houston has recently given $20,000,000 toward what will ultimately be an estimated hundred million dollar medical centre development in the Texas area. Northwestern University has recently announced plans for additional developments that will ultimately involve the expenditure of from $63,000,000 to $95,000,000 in its projected final medical centre development.

Suffice it to say that professional education in the fields of medicine and dentistry is an ever increasingly expensive venture, and those of us interested in developing new medical centres must have full realization of the financial implications. The most recent report of the Council on Medical Education and Hospitals of the American Medical Association has pointedly stated that, "Unless the necessary resources, including plenty of money, are available, only harm results from misguided efforts to embark on adventures in medical education."

In this brief presentation I have endeavored to review with you the changes and trends in medical education during the past fifty years. I have pointed out that because of the continuous changes taking place in our knowledge in medicine, education in this field can follow no static pattern, but must continuously adjust itself to new requirements. The development of departments in medical schools has been outlined and an attempt made to indicate the importance of specialization, as well as some of the dangers inherent in over-specialization, if the perspective of the relative importance of specialty fields is not adequately appreciated. Basic medical educational programmes must be patterned so as to integrate departmental activities in an effort to secure a solid foundation upon which higher degrees of specialization can be adequately developed. The desirability of deleting the long, detailed didactic lectures and largely replacing them with conferences and discussions in small groups has been mentioned.

The importance of an active, intelligent and productive research programme in association with medical education has been emphasized.

I have also attempted to indicate that medicine is not changing alone, but that its place in our social and economic pattern is changing with the upheavals taking place in these fields. It seems that it is a function of medical education to keep fully aware of social and economic problems as they affect medical practice, and that students should be made fully aware of their obligations to society as practitioners. Our failure in medical education to give time to the study and discussion of such problems has made it more difficult for our profession to take the lead in developing new patterns. It is important that the medical profession maintain the dominant role in determining how medical care is to reach everyone, and how medicine is to be practiced.

I have also indicated the importance of complete integration of basic sciences with clinical teaching and research, and reviewed the role of the teaching hospital and the trends towards more full time clinical staff members. And finally, the costliness of adequate facilities and faculties for the training of professionals in medicine and allied fields has been indicated to be so great that new developments in these fields should be undertaken only if it is possible to finance them adequately.

We have willingly faced the enormous costs of destructive warfare in the hope that it would lead to peace and greater happiness for mankind. We should be willing to face the relatively small cost, comparatively, of programmes whose primary objective is constructive, for the relief of human suffering and for the improvement of human health and happiness.

Gentlemen, in medical education we have a continuous and glorious challenge.

CHEMOTHERAPY IN INFECTIONS OF THE EARS AND PARANASAL SINUSES

By J. R. LINDSAY, M.D.

Presented before the Summer Session of the Vancouver, British Columbia, Medical Association, from September 9 to September 13, 1946.

The management and prognosis of infections of the ears and sinuses have undergone great changes since the introduction of sulfonamides, tyrothricin and penicillin.

The same general factors apply to the use of these drugs in ear, nose and throat disease as in other parts of the body. A favourable effect can only be expected when the infecting organism is sensitive to the drug being used. Hence cultures are essential, and the degree of sensitivity of the particular organism to the drug is a valuable guide in treatment.

It is fortunate that those infections of the upper respiratory tract and its connecting air spaces which have caused most of the serious complications have been due to organisms which are susceptible to sulfonamides and penicillin.

Toxicity

The toleration of the drug by the individual and the possibility of serious toxic effects and damage to the kidney has required the greatest care in the administration of sulfonamides. In the case of penicillin serious toxic effects appear to be less common and the drug is usually tolerated without disagreeable symptoms. However, the appearance of a sensitivity reaction apparently involving the skin and mucous membranes chiefly, has been in our experience fairly common. None of these reactions has proven to be fatal, but in all cases the use of the drug has been discontinued promptly.

Most of these reactions have appeared during the use of penicillin by mouth, by its local use in sinuses, and by inhalation. Four patients out of a series of thirty receiving penicillin by mouth in our Otolaryngologic Clinic developed a reaction involving mucous membrane and skin. The skin reaction affected chiefly the "butterfly" area of the face, the groins and genitalia, while the mucous membrane became red and oedematous in the mouth and pharynx. In a series of approximately 50 cases treated in the Student Health Department* with penicillin troches (penicillin in wax) a reaction involving the oral mucosa occurred in three. Some of these patients have been found afterwards to exhibit a skin reaction on receiving penicillin by injection. Most of them exhibited the sensitivity on their first experience with penicillin, but in one there had been a previous administration of penicillin by injection with the skin reaction appearing on the fourth day.

*Verbal communication with Dr. John Gordon.

While these reactions have in no case proven serious the further use of the drug in these patients is effectively prevented. Fortunately in most instances there is a choice of drugs available and a substitute may be used.

Development of Resistance or Fastness

Another actor which has been shown to be worthy of consideration in the administration of these drugs is the tendency of the organism to develop resistance or "fastness" to the drug. This has been demonstrated in the case of sulfonamides, penicillin and streptomycin.[1] Therefore the general principle which was found on practical experience with sulfonamides is equally important in the use of penicillin and streptomycin, that care should be taken to make the dosage or concentration adequate and maximum at the beginning. A dosage which is below the adequate level may partly control the infection for a time but decrease the probability of obtaining an ultimate cure.

This principle would seem to be a contraindication to the common practice of using small dosage of these drugs as intranasal or intraoral medication.

Masking

One of the common objections which were frequently raised to the use of sulfonamide preparations in treatment of middle ear suppuration was that danger signs were thereby masked while the underlying infection had not been eradicated. In many such cases the signs of a complication reappeared after the drug had been discontinued and could not then be brought under control. These objections have now been mostly removed with the introduction of penicillin, large doses of which may be given without danger of toxicity at the beginning of treatment. The better understanding of the indications for surgical drainage as influenced by the effect of chemotherapy has also been a factor in improving the treatment.

Middle Ear Suppuration

The use of newer antibiotics has resulted in a drastic reduction of surgical operations for accute suppuration in the air spaces of the mastoid and temporal bone. It can probably be said that when these drugs are adequately utilized from the onset of infection surgical intervention will be rarely required. However, all cases do not present themselves for treatmnt at the beginning of the infection, and in those sections of the population where medical care is less adequate suppuration in the bone may have progressed to the point where treatment demands surgical intervention as well as maximum drug therapy.

The common pathway of infection to the middle ear is by way of the Eustachian tube. While this structure is endowed with a very good defense mechanism against invasion in that it is physiologically closed to passage of air most of the time, and is protected by a ciliated epithelium and a blanket of mucus moving constantly toward the pharynx, the same is not true of the middle ear proper. As soon as infection has gained entry to the middle ear it is free to spread to all parts of the air cell system. The Eustachian tube becomes blocked off by inflammatory swelling and the only defense is that which can be mobilized by way of the blood stream. Because of the anatomical arrangement there may be accumulations of pus in fairly large cells and blockage of the outlets of these cells to the middle ear and thence to the outside through the perforated or incised drum. This may lead to breakdown of bone and formation of foci of suppuration which are partly or even completely blocked off from any exit.

Collections of infected necrotic material within the bony structure are particularly resistant to the effective action of antibiotic agents, but respond well to a combination of surgical drainage and chemotherapy.

Because of the particular anatomic arrangement of the temporal bone the use of chemotherapeutic agents is more effective when given in the invasive stage of the infeciton. Hence in the acute non-suppurative stage of otitis media it is generally preferable to use chemotherapy at once rather than to wait for suppuration to develop, although

recognizing that many such cases might subside spontaneously. An acute non-suppurative otitis media is also often caused by virus infections with temporary tubal blockage and will not go on to suppuration, but rather than lose a day waiting for a culture it is often wiser to give a drug at once. As penicillin becomes less expensive it may become the drug of choice for ambulatory treatment because of the greater margin of safety.

Some of the limitations of sulfonamide therapy have been best illustrated by those cases of complications of otitis media in which the suppurative process could be held in check temporarily but could not be eradicated. The most striking examples in my experience have been afforded by one case of infected thrombo-phlebitis, with localized suppuration within the lumen of the sigmoid sinus, and several cases of closed abscess of the petrous apex which became temporarily asymptomatic under heavy sulfonamide therapy but eventually required surgical drainage. Also one case of osteomyelitis of the petrous apex with sequestration which became asymptomatic for one year following heavy sulfadiazene therapy, only to produce a fatal meningitis,[2] and two cases of chronic osteomyelitis of the petrous pyramids and sphenoid base which have continued to be active following sulfonamide, penicillin and surgical therapy.[3]

The local use of penicillin as ear drops has been suggested for acute middle ear suppuration but an understanding of the anatomy of the air cell system and the extent of the pathologic process illustrates the futility of such a method.

Our experience with orally administered penicillin shows that good therapeutic levels may be reached and maintained by this method. The fact that several times the quantity of penicillin is necessary to maintain adequate levels by this route introduces an economic factor which has yet to be overcome.

In chronic suppuration of the middle ear the local use of certain chemotherapeutic agents has a beneficial effect in selected cases. The effect is mainly that of allaying or preventing secondary infection of the middle ear from the external canal. The systemic use of these drugs has its special value in the localization of the infection during the acute exacerbation at which time the invading organism is usually a susceptible one. The nature of the pathological process in a large proportion of the chronic cases is such that a chemotherapeutic agent is not curative in its effect. For example the cholesteatomas, the chronic osteomyelitis cases and many of the simple chronic suppurations which are based mainly on impaired Eustachian tube function and disease in peritubal cells. Chronic impairment of Eustachian tube function which develop usually in childhood years and leads to later hearing impairment is not relieved by chemotherapy.

It is reasonable to expect that the use of antibiotics should reduce the frequency of certain types of chronic otitis media. The incidence of attic cholesteatoma seems less likely to be affected however since the great majority of such cases develop as a complication of chronic tubal obstruction.

Upper Respiratory Tract Infection

The treatment of the general upper respiratory tract infection comes under the field of the general practitioner perhaps more often than the specialist.

Besides the systemic use of sulfonamides and penicillin literally dozens of preparations have been distributed for local treatment of the common cold.

Results of treatment have shown very definite limitations for which the most obvious reason has been the nature of the infecting agent. There is evidence to indicate that in the majority of cases of the so-called common cold the infecting agent is probably some type of virus and these have not been susceptible to sulfonamides, tyrothricin or penicillin. While it is undoubtedly true that sulfonamide or penicillin therapy will reduce the length of illness by its preventive effect upon secondary pyogenic invaders, the incidence of colds is not reduced and the virus stage not shortened.

The local use of sulfonamides, tyrothricin and penicillin preparations during the common cold has proven to be disappointing in our hands. Such medication has usually been combined with a vasoconstricting agent, which aids in its distribution, on the mucous surfaces. Although such vasoconstrictors provide temporary symptomatic relief they are not fre from an irritating effect and subsequent increase of vaso-dilation.

It is therefore dubious as to whether the local use of vaso-constrictors is desirable, except when blockage of sinus ostia might be suspected because of localized discomfort or pain. The use of ephedrine, benadryl or some similar compound by mouth will give a more lasting symptomatic relief and avoids local irritation of the nasal mucosa. Prolonged use of vasoconstrictors in the nose may actually produce the symptoms they are supposed to relieve.

The results of a long series of clinical observations on the use of sulfonamides and tyrothricin locally in the nose were published in 1943[4] and our unfavourable report at the time has been substantiated by further observation.

Acute and Chronic Sinus Suppuration

The paranasal sinuses are dependent for their first line of defense upon the maintenance of normally functioning cilia which constantly move their covering mucous blanket into the nose and pharynx, and the presence of an adequate outlet. The secondary line of defence is represented by factors of immunity local and general, and the effect of antibiotic agents which may be conveyed by the blood stream to the lining mucosa.

In the uncomplicated sinus infection it is usually possible to obtain a rapid return to normal ciliary function and emptying of the sinus. In the case of chronic suppuration, however, there is always a factor of inadequate drainage, due in most cases to irreversible pathologic changes in the sinus mucosa or to obstruction at the ostium which interferes with the ciliary function. Also in the case of chronic suppuration a great variety of infecting agents is found, many of which are not affected by the antibiotics in present use. Hence th effect to be obtained from these substances is limited.

Acute sinus suppuration is in the majority of cases due to organisms which are susceptible to sulfonamide and penicillin. A few exceptions do occur.

The possibility of local treatment has received much attention and varying reports have been made.

Acute suppurative disease is, however, rarely limited in its extent to one sinus. Most frequently the whole anterior group of sinuses is involved to some degree and the problem of securing and maintaining contact between the antibiotic agent and the infected mucosa is practically insurmountable.

Our experience with placing sulfonamide suspensions and tyrothricin directly into acutely suppurating sinuses has been definitely disappointing.

Since penicillin became available it has also been placed in the maxillary sinus after washing out the pus but results have been variable. Definite improvement sometimes occurred, but often the course of the disease was not appreciably altered.

It has been our experience that systemic administration of the drug is the only reliable type of management and that the measured sensitivity of the organism to the drug provides a helpful guide to dosage.

The same principle holds true for the use of antibiotics in chronic sinus suppuration. In this condition, however, the problem of drainage is a primary factor and surgical procedures are frequently necessary in order to effect a satisfactory cure.

Penicillin used locally in chronic empyema of the maxillary sinus has occasionally given striking improvement in our hands but has usually not produced a cure, probably because of the existence of irreversible changes in the mucosa preventing a return to the normal capacity of the sinus to empty itself.

The most striking effect of sulfonamide and penicillin therapy in sinus suppuration has been evident in the treatment of the complications.

Acute fulminating osteomyelitis of the frontal bone, in the early stage, due to hæmolytic staphylococcus aureus, has been localized and cured by the combination of drug therapy and simple drainage of the sinus in two of our recent cases. Several others in which osteomyelitis could not be proven but was suspected because of extensive orbital and frontal swelling also subsided completely. Comparing results with former years it appears that adequate treatment during the initial stage of osteomyelitis of the

frontal bone gives definite promise of preventing the wide extension of the disease which was formerly common despite heroic surgery.

Osteomyelitis of the maxilla has also been controlled in some cases. One recent case of a fulminating osteomyelitis following a simple antrum window operation which has heretofore carried a high mortality was successfully controlled. Three months after the acute symptoms had been controlled the removal of a sequestrum was followed by a complete cure. Our experience with these severe complications corresponds to several reports from military services.

Summary

Our experience with the local administration of sulfonamides and tyrothricin in acute upper respiratory and sinus infections has been generally unsatisfactory. We were able to demonstrate no appreciable alteration in the cultures and no definite shortening of the period of illness. In certain chronic ear infections and in the postoperative care of mastoid operations sulfonamides and penicillin locally have been useful. In chronic sinus infections the application of these drugs has been less feasible. Beneficial effects have been limited mainly to postoperative care following radical sinus surgery.

This definite limitation of the usefulness of the local method of administration in the nose and sinuses finds its explanation mainly in the complex anatomy and the physiologic activity of the lining mucosa.

Penicillin by local administration in the sinus has also proven in our experience to have a limited application.

For most infections which are not of sufficient severity to demand hospitalization it is now possible to obtain effective concentrations of penicillin by oral administration as well as by injection once or twice daily of large amounts in beeswax and peanut oil.

The oral route is, however, an uneconomical method of administration since three to four times the dosage is required.

In the more serious infections, where high concentrations are demanded, the parenteral routes of administration are essential.

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RHEUMATOID ARTHRITIS

DR. RUSSELL L. CECIL

(Given at V.M.A. Summer School)

The following are the main features of this disease.

It affects *joints*. It is not a disease of muscles or fascia. The *etiology* is unknown. It is a *deforming* disease. The distribution of the lesions is *symmetrical*.

The disease is fairly common in the temperate zone. In many of its features it resembles rheumatic fever, but there are very important differences, in that in the infectious nature of its origin have never been demonstrated. Dr. Cecil does not like the term "chronic infectious arthritis," which has been given to it by some writers, since, as said above, it has never been shown that infection plays any part in its causation, though infection may supervene. It is really an *allergic* condition, which leads to a hypersensitive condition of the joints, making them specially sensitive to bacterial infection, which may supervene later. So far, it has been impossible to prove the presence of any infective organism, or even of a virus. We do not know the etiology, though, as will be shown later, there as psychic and nutritional elements in its causation.

Rhematoid arthritis is one of a group of diseases. It occurs in a number of forms or variants.

1. *Still's disease* is one of these. This is a rheumatoid arthritis of childhood. Many children show enlargement of the spleen, and even a general adenopathy. There is often a febrile course to the disease.

2. *Felty's synodrome*. This resembles rheumatoid arthritis in every particular, but has fever, palpable liver and spleen, and enlargement of lymph nodes. It occurs in adults. It should, in Dr. Cecil's opinoin, be called rheumatoid arthritis, and is an *active* form of the disease.

3. *Marie-Strumpell disease*. This is an ankylosing spondylitis, and occurs in two forms, of which one occurs almost exclusively in young men, in contradistinction to the classic rheumatoid arthritis, which is found mostly in women between the ages of 30 and 50. Marie-Strumpell disease is found in men under 30, and is very rare in women.

4. *Psoriatic arthritis*. This occurs in conjunction with psoriasis. The pathology is slightly different from that of rheumatoid arthritis.

5. *Secondary infections* (polyarthritis) coming on after acute fevers, and showing no response to salicylates, therefore not rheumatic in nature.

6. *Chronic rheumatic fever*, both in children and adults. These patients give a history of several attacks of rheumatic fever, each of which has been checked by salicylates. Then comes a phase when there is no response to this drug.

7. *Reiter's syndrome*—a form of polyarthritis associated with non-specific urethritis and conjunctivitis. It clears up rapidly, and is often associated with rheumatic arthritis. Sometimes skin-rashes appear in the course of the disease.

Classic rheumatoid arthritis shows the following features:

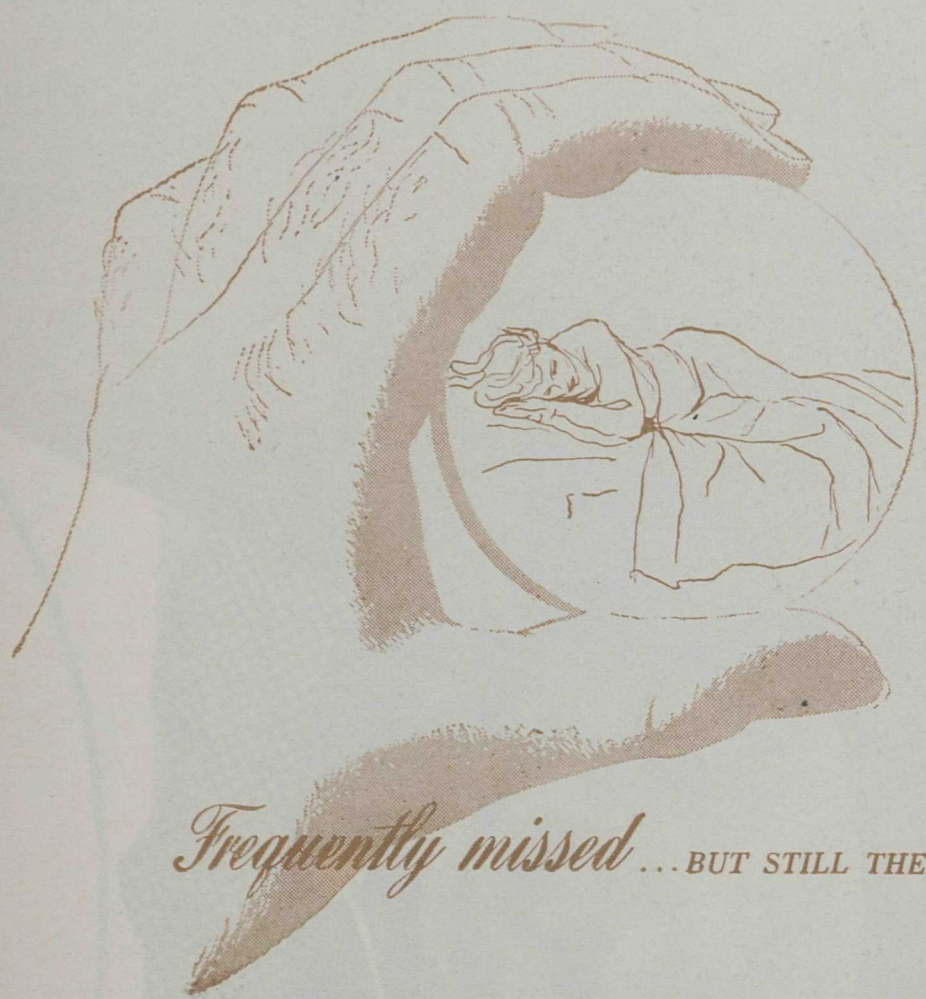
1. It occurs chiefly in females, 75% of the cases being in this sex. The age incidence is commonly between the ages of 30 and 50.

2. The onset is gradual. In the early stages there is pain and swelling in the affected joints.

3. The joints present a typical fusiform appearance, especially the fingers. The wrists, knees and feet are involved. The disease may begin anywhere. Involvement is symmetrical.

4. An important feature of this disease is the appearance of subcutaneous nodules, in about 10% of the cases.

5. Ankylosis supervenes after some time, and flexion deformities come on gradually, and become more and more marked. This is especially true of the fingers, where a characteristic ulnar deflexion is found. These signs appear in the later stages of the disease.



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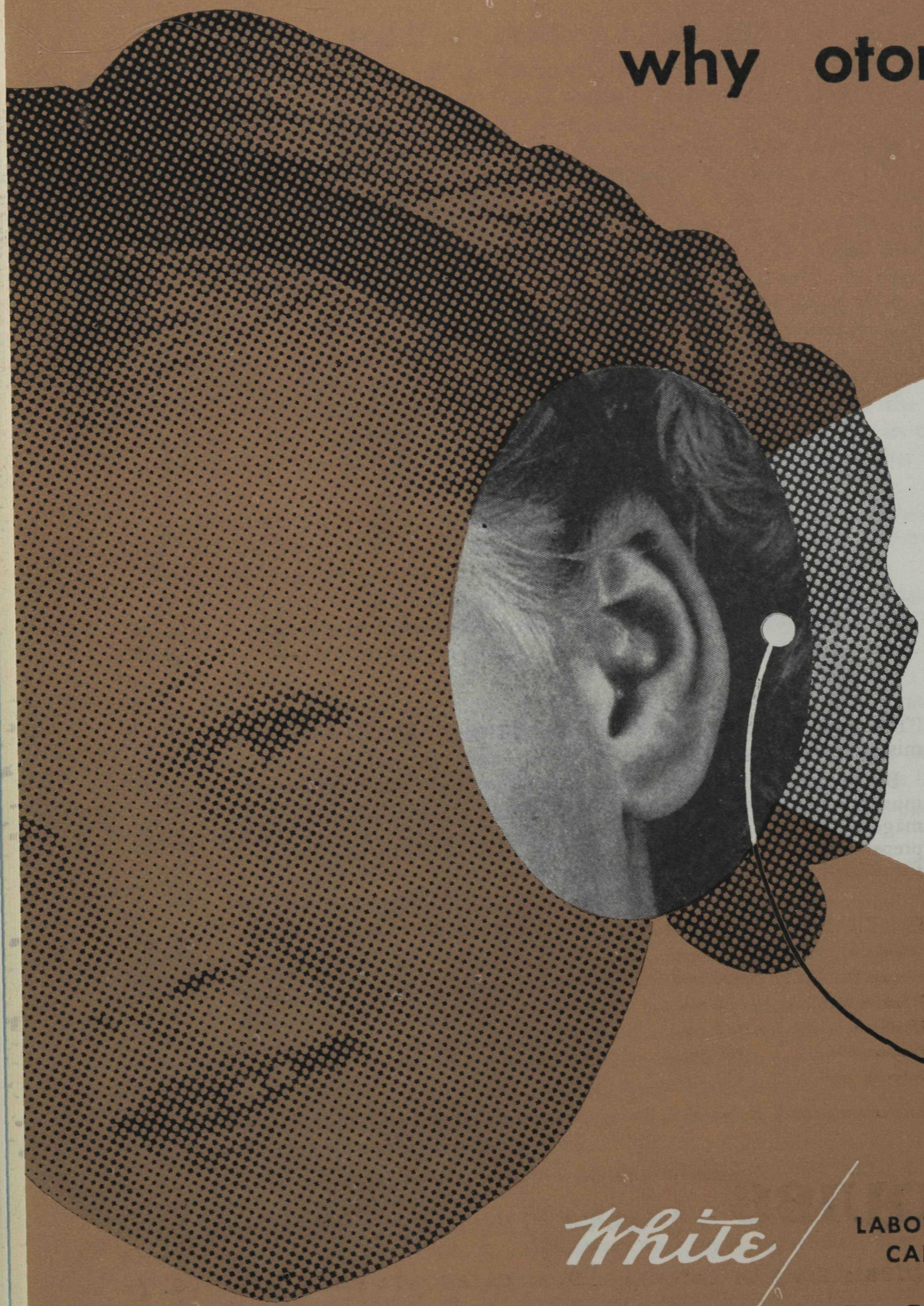

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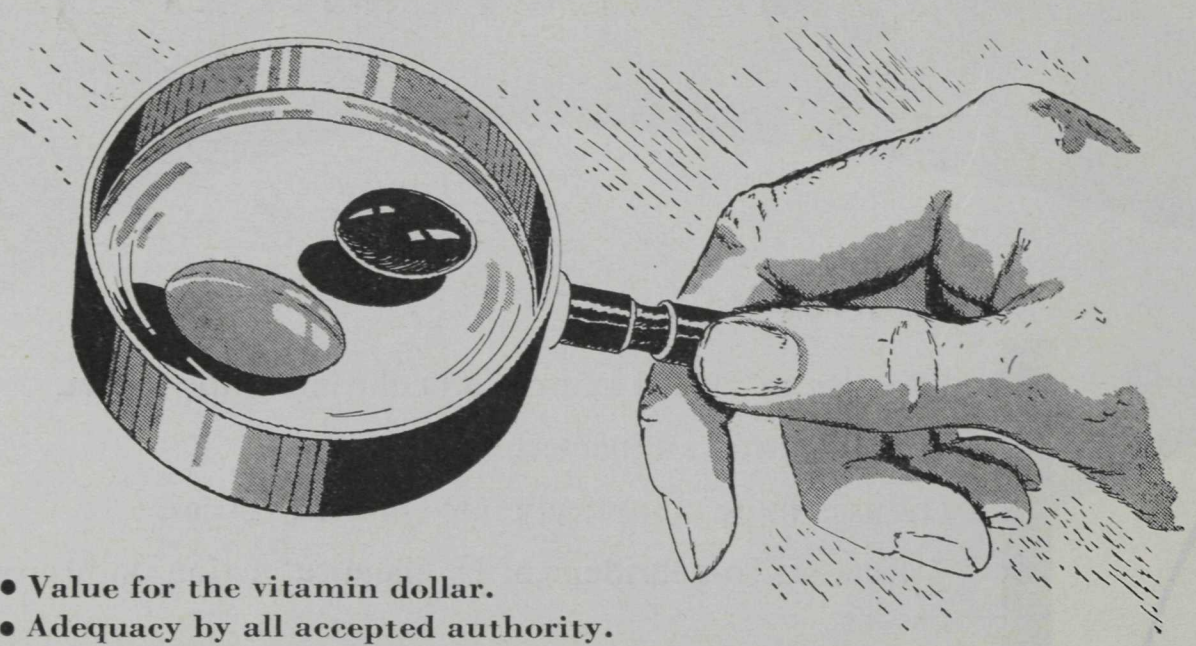

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Vitamin A.....	1,500 int. units
Pro-Vitamin A Beta-carotene..	1,500 int. units
Vitamin D.....	600 int. units
Thiamin Hydrochloride (Vitamin B_1)...	1.2 mgm.
Riboflavin (Vitamin B_2)...	1.0 mgm.
Nicotinamide.....	10.0 mgm.
Ascorbic Acid (Vitamin C)....	25.0 mgm.

MINERALS

each tablet contains:

Ferrous Sulphate Exsiccated B.P..	2.0 grains
Calcium Phosphate B.P.....	2.0 grains

To preserve the thiamine hydrochloride from the known destructive action of iron salts, Dietary Supplement B.D.H. is presented in two parts, the vitamins in capsules and the minerals in tablets.

Continuous and conscientious effort directed towards the improvement of nutritional products is the responsibility of the pharmaceutical manufacturer. New products are developed to meet the needs as revealed by progressive nutritional research; formulae are revised to assure adequacy of essential nutrients without wastage of valuable materials; constancy is assured by rigid laboratory control.

Recent investigations *have established the importance of carotene in maternal nutrition. Hence, one-half the vitamin A content of Dietary Supplement B.D.H. is supplied in the form of Beta-carotene.

Essential minerals and vitamins are combined in proportions believed to be of greatest value as a dietary supplement for the prevention and correction of common nutritional deficiencies.

**Lund, Curtis J., Kimble, Marion S: Amer. J. Obs. & Gynec. 46:207, 1943 (August)*

Issued in cartons, each containing one bottle of 100 capsules and one bottle of 100 tablets.

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67B

6. We find in many of these cases anxiety syndromes, and there is an element of worry. The disease is definitely associated with psychic and emotional factors in the patient's makeup and surroundings. Dr. Cecil regarded this fact as one of great importance, both in diagnosis and treatment, especially the latter, as will be seen later.

7. The white blood count is normal or slightly higher than normal. The sedimentation rate is considerably higher than normal, and this is a very important point. It may run up to 100 or more.

8. In 75% of cases the blood gives a positive agglutination with streptococcus haemolyiticus, though blood cultures are invariably negative, and the joint-fluids show no growth on culture. In this particular, the disease resembles hreumatic fever, where a haemolytic streptococcus is very often associated with the disease.

9. X-rays show osteoporosis of bone, thinning of cartilage, and haziness of joint outlines.

Dr. Cecil referred again here to the subcutaneous nodules of which he had previously spoken. We do not, he said, know the nature of these, but if we did, we should probably have the answer to the enigma of rheumatoid arthritis.

(Slides were then shown, of rheumatic joints, especially the hand and elbow. These showed the deformities, the ulnar deviation, with the atrophy of the interossei. The deformities become very marked, and it takes usually at least two years for them to develop, though the speaker referred to one case of almost fulminating character, where they developed in a few months from the time of onset of symptoms. The ankylosis appears later, and there are the changes that one would expect in the muscles, atrophy and fibrosis. Dr. Cecil made the remark that the behaviour of the muscles in this condition resembles that in anterior poliomyelitis. The slides showed these changes, and one could see in one slide the nodules of the disease. Microscopic section of these nodules shows an appearance very similar to that of a giant cell of tuberculosis.

A characteristic of the disease is that a very slight trauma will cause trouble out of all proportion to the severity of the injury, and the results of this will disappear very slowly.

Slides were shown of enlarged microscopic studies of the synovial membrane of affected joints. These showed collections of lymphoid cells in nodular form—a condition never seen in other forms of arthritis.

Experimental arthritis has been produced in animals. A rabbit injected with streptococcus haemolyticus gives a good imitation of rheumatoid arthritis, with deformities and ankylosis. These changes can also be produced by the pneumococcus and pleuropneumococcus. Only these three organisms will produce these changes. Other bacteria will produce sepsis.

This condition in animals is suggestive, but does not progress in the same way as rheumatoid arthritis in the human being.

Investigation into the changes in muscular and nerve tissue by Freund, examining the major muscles and nerves, has shown large collections of lymphocytes. This would explain the muscular pains, and the atrophy found in the disease.

Focal infection has for a long time been considered to have an etiological connection with this disease. Dr. Cecil pointed out that while there is a connection in some cases, these are in the minority. He classified the causes as follows:

1. Definite foci present (a total of 200 cases were studied):
   Tonsils, 27 cases; Sinuses, 11 cases; Teeth, 2 cases; Total 40, or 20% of the whole.
2. Doubtful—10%.
3. No demonstrable foci—70%.

Removal of infected teeth, tonsils, etc., is useless as regards improvement or cure of the disease.

Prognosis. This is never very good. This is a chronic disease. We find remissions, regardless of therapy employed. Many recover from the first attack, but there are subsequent elapses, and each one is harder to recover from, till finally the condition becomes permanent. We should, therefore, not be too optimistic about therapy. There is, however, much benefit and relief to be gained from treatment. Dr. Cecil laid down the chief lines of therapy that should be followed.

1. *Rest.* This is of first importance, and must include rest of body, mind, and emotions, if the maximum benefit is to be obtained. The patient should be removed from work for at least a year. In men, this means giving up their occupation, whatever it may be; in women, it means freedom from childbearing, as well as freedom from housework, etc.

It is of great advantage—even essential—to spend a few weeks or even months in a hospital or sanitarium, before the treatment is undertaken. In this way we may get a rapid improvement. Most of these people are anaemic, and the anaemia is of a type this is not benefited by iron or liver. *Only rest* will improve the anaemic condition.

Transfusions of whole blood are of great value, even if the red blood count is normal.

These patients must not be kept in bed. Exercises must be given every day—they will stiffen up if kept in bed. Deformities will need splinting and sometimes extension. Passive movements and physiotherapy should be used freely.

2. *Heat.* This comes next to rest. Never allow the patient to get cold. Joint pains can be treated by heat. Dr. Cecil said that he was disappointed in the results from the use of short wave and diathermy. He has found that these sometimes increase the pain.

Bathing in warm pools, exercise in hot baths, swimming, etc., are of value in keeping the joints active and avoiding stiffening. Vapour baths are also beeficial.

3. *Climate.* A warm, dry climate is of great value. Arizona, the British West Indies, and similar regions, are good climates to which to send patients.

Fever therapy is of little value in the treatment of this disease, except in the febrile forms of arthritis. Typhoid vaccine injections Dr. Cecil has found to be of considerable value, or the hot cabinet. These things should not be used as a routine, but in selected phases of the disease.

4. *General.* We must build up the general morale—and improve the general physical condition. High calorie diets, with adequate vitamin therapy, are very good—but Dr. Cecil was emphatic in stating that he does not believe in massive doses of Vitamin D, such as have been so widely advocated recently. Exercise is of great importance—it must be practised every day—even in bed patients. Passive exercises and massage must be used, but not on joints in the painful stage.

Fusion of joints is sometimes necessary. Besides arthrodesis, other methods may be used, such as the insertion of a vitallium cup in the hip joint.

Sympathectomy has been discarded.

5. *Drug therapy.* Salicylates and codeine are useful to relieve pain—as aspirin is often very useful. The sulphonamides have no place in the treatment of rheumatoid arthritis. Vaccines are occasionally of value, but are no longer widely used. Iodides, Dr. Cecil finds, are quite useless.

Gold therapy. Dr. Cecil dealt with this at some length. Its use began about fourteen years ago, and it has been of considerable value as a treatment for this disease. The dosage must be most carefully regulated. The patient with rheumatoid arthritis does not tolerate gold as well as do other people. One must be constantly on the watch for untoward reactions—among these we must specially look for rashes. Heavy metals are all apt to produce a typical dermatitis. There is itching, often very intractable, and they are apt to become exfoliative. They are very rarely fatal. Dr. Cecil's experience is that patients who show these rashes do better than others.

Othr things to look for are, first, *albuminuria.* We may also have thrombocytopenic purpura supervening, and Dr. Cecil cited two cases in his own experience—of these two, one died. The other was cured by splenectomy. Endocarditis may also develop.

In giving gold, it is important to clean up foci of infection in the mouth, teeth, etc., before it is started.

Dr. Cecil gave the results in 184 cases of rheumatoid arthritis treated by other methods. Of 92 treated, 86 showed no benefit, 4 showed temporary relief, and there were two exacerbations. Of 235 cases treated with gold, there was remission in 62 cases, or 31%, 68 showed great improvement (35%), moderate improvement was obtained in 39 cases, while the balance showed no improvement.

Relapses occurred as follows—34% of the remission group, 50% of those "greatly improved," and 36% of those "moderately improved."

One great cause of unsatisfactory results to be obtained from treatment is that there is not sufficient control of patients after they have obtained improvement. It is not possible for them to get enough rest—they have to go back to their work and their worries, and it is very hard for them to maintain adequate treatment and hold any gains they may have made.

Dr. Cecil gave the following general rules for the administration of gold. He starts with a dosage of 10 milligrams, and increases this gradually, never exceeding 50 milligrams. The doses are given weekly. After relief is obtained, regular weekly doses are discontinued, and a dose of 50 mg. is given every three or four weeks. Certain things must be borne in mind about gold in the human body. It is excreted to a certain extent in the urine and faeces, the largest excretion being evident immediately after administration. The greater amount of the drug, however, remains in the body, some 75% being retained, so that there is a very definite cumulative effect, and this must always be allowed for.

Gold remains in the blood plasma, sometimes for as long as a year, and can be found in the urine during that time.

OBIT

R. A. WALTON

There passed away in Vancouver recently, Dr. R. A. Walton, at the early age of 50 years.

Roy, as he was affectionately known to his many friends, was a good example of what can be achieved by determination and ability in overcoming hardships.

His medical studies were interrupted by the First Great War and he was sent overseas with a University battalion, later to become attached to the "Princess Pats" as a bomber. During the attack on Vimy Ridge in 1917, he was blown up by a shell and severely wounded, losing a leg, and an eye, as well as suffering some hearing loss and a badly wounded right arm. After several months in hospital fighting the dreaded gas gangrene and other infections, he recovered sufficiently to resume his studies at McGill from where he graduated in 1921.

Undaunted by physical handicaps he took up general practice at Stoney Plain, Alberta, where he carried on successfully for some 15 years, often battling severe weather conditions in his efforts to save human life.

His interest in disease prevention finally led him to Toronto University where he took his D.P.H. course at the School of Hygiene and Connaught Laboratories. Since 1938 he has been a very valued member of the Vancouver Metropolitan Health Committee staff. His judgment was always sound, his outlook broad, and his kindly and sympathetic interest in humanity made him belovde by all. He served on numerous committees and could always be depended upon to do well whatever was required of him.

He was a member of both B. C. and Vancouver Medical Associations, of the Masonic Lodge and Kiwanis Club.

Sincerest sympathy is extended to his wife and daughters in their bereavement.

Vancouver General Hospital Section

PROGRESS IN THE TREATMENT OF MENINGITIS

N. CHIVERS AND K. VICKERS

History

Cerebrospinal Fever was first recognized as a clinico-pathological entity by Vieusseaux[1] of Geneva, in 1805 and Danielson and Mann[2] of Medford, Massachusets in 1806. Not for a hundred years was any effective treatment discovered. Then, in the New York epidemic of 1905, Flexner[3] developed and used intraspinal serotherapy. This was a great advance but the mortality rates for the country as a whole were not appreciably reduced. The explanation for this statistical failure is that the prerequisites for successful serotherapy—early diagnosis plus prompt and expert treatment—were frequently not realized in practice.

For a few years after Ferry[4] discovered a specific antitoxin in 1932, some workers claimed exceptionally favourable results, but here again the average mortality rates were disheartening. In the United States in 1917 the mortality rate for 28 states was 71.9% and in 1935, for all 48 states, it was still very high—47.5%.

Chemotherapy has almost completely superseded the use of serum and antitoxin. In 1944 the Council on Pharmacy and Chemistry of the United States voted to drop both the serum and the antitoxin from New and Non-official Remedies. Reimann, who headed the investigation, stated that for the few patients who are sensitive to sulphonamides and for the still rarer instances of infection with sulphonamide-resistant meningococci, the available antimeningococcic serum should be used intravenously but never intrathecally in adequate dosage with promptness and decision. He felt that there was no firm evidence in support of the use of antitoxin; further, that there was no evidence to prove that combined chemoserotherapy was superior to chemotherapy alone.[5]

The dramatic drop in mortality rates for meningococcic meningitis since sulphonamide therapy was instituted is shown in the figures from U. S. Army reports. In 1943, during the most extensive outbreak in United States history, the mortality in soldiers training in the country at he time was held down below 4% compared with the mortality of 39% in World War I soldiers.[5]

Penicillin also has given good results. Reports such as that of Rosenberg and Arling[6] are available. In their series 76 cases were treated with but one death, that being a patient who was admitted in a moribund condition. Nevertheless, as will be pointed out later in this paper, the sulphonamides continue to be the drug of choice.

Present Day Chemotherapy of Meningitis

To date, most authorities agree that sulphonamide drugs are to be preferred in the treatment of meningococcic meningitis. For example, Meads[7] of Harvard University concludes that the clinical response to penicillin is slower, abnormal spinal fluid findings persist longer, there may be recurrence, the meningococcic carrier state may persist, treatment is difficult and sulphonamides may have to be resorted to for cure. Keefer[8] of Boston, who has had extensive experience, concurs in this opinion and considers that sulphadiazine has given the most satisfactory results. He states further that pneumococcic meningitis responds best to a combination of sulphadiazine and penicillin and that penicillin continues to be the drug of choice in all streptococcic and staphlococcic infections. Stainsby[9] also recommends sulphadiazine but believes that penicillin should also be used in the extremely ill and those who do not respond to sulphadiazine.

There is some laboratory experimental evidence to support the combined use of sulphonamides and penciillin. Bigger[10] of London, working with sulphathiazole and

penicillin found that there was a definite synergistic action of the two drugs against staphylococci and streptococci pyogenes.

There is difference of opinion regarding the proper dosage of the sulphonamides in the treatment of meningitis. Sweet[11] concluded that there is no relationship between the concentration of the sulphonamide in the blood and the outcome in meningitis and that massive doses of the drug are not necessary. Most workers attempt to obtain a blood level of 10-15%, but some consider a value of 15-25% advisable, a few aiming at levels of 20-40%. With the dosage required to obtain the latter levels especially, an adequate fluid intake becomes imperative, sufficient to maintain a twenty-four hour output of 1500 c.c. of urine. A further safeguard is alkalinization of the urine. This can be accomplished by giving sodium bicarbonate gram for gram with the sulphonamide.

As is well known now, there is no indication for administration of sulphadiazine intrathecally, as the drug given orally or intravenously will reach a concentration in the cerebrospinal fluid of two-thirds to four-fifths of that found in the blood.

When penicillin is used it should be administered both intrathecally and extrathecally according to Kinsman and D'Alonzo[12], reporting in a recent issue of The New England Journal of Medicine. From their experimental studies and from a review of the literature, they conclude that there is adequate proof that extrathecal therapy is not effective in meningitis. The four main points of their argument are as follows:

1. Pneumococcic meningitis has developed in patients receiving extrathecal penicillin for pneumococcic pneumonia.
2. Many patients with pneumococcic and meningococcic meningitis have failed to respond to penicillin until it was administered intrathecally.
3. In the spinal fluid of patients with meningitis following extrathecal administration alone penicillin appears irregularly and in low concentration.
4. Many cases of meningitis are caused by meningococci that are relatively resistant to penicillin.

The further concluded that when doses of 10,000 units of penicillin were injected intrathecally in patients with meningococcic meningitis who were also receiving moderately large doses extrathecally, therapeutically effective amounts were still present in the spinal fluid sixteen hours later.

In practice one intrathecal injection in each twenty-four hour period has given satisfactory results. Appelbaum and Nelson[13] consider that the injections should be continued until there is definite clinical improvement or the spinal fluid no longer shows organisms. This precaution is considered necessary because of the frequency of relapses. Rosenberg and Arling[6] arrived at a similar conclusion from their study of 76 cases.

Since this paper was presented there have been cases at the Vancouver General Hospital in which a definite irritative effect of penicillin administered intrathecally has been noted. Pleocytosis in the spinal fluid has been perpetuated by intrathecal injections and has disappeared when they have been discontinued. Evidence also comes from the literature to support this observation as well as other case reports indicating that damage to nerve structure can result from the use of penicillin.

A Suggested Outline of Treatment for Adult Cases of Meningitis

1. Meningococcic meningitis, not seriously ill:

Sulphadiazine 4.0 gm. stat., then 2.0 gm. every four hours for two or three days or until definite clinical improvement is evident, then reduce to 1.0 gm. every four hours. Continue the drug until the temperature has been normal for three days. If necessary soluble sulphadiazine may be given as one 2.5 gm. ampoule intravenously every six hours until oral medication is tolerated.

Give sodium bicarbonate gram for gram with the sulphadiazine.

Keep the fluid output at approximately 1500 c.c. daily.

Secure adequate sedation.

2. For seriously ill cases of meningococcic meningitis, and all cases of pneumococcic, streptococcic and staphycoccic meningitis:

Sulphadiazine as above.

Penicillin intramuscularly, 30,000 units every three hours.

If prompt improvement does not occur, the use of penicillin intrathecally should be considered. The recommended dosage is 10,000 units in ten c.c. of normal saline, to be injected after withdrawal of at least fifteen c.c. of fluid, this procedure to be carried out daily until a satisfactory clinical response has been obtained.

Each case must be treated individually, of course, adjusting therapy in conformity with clinical progress of the patient and the laboratory findings.

In pneumococcic meningitis some observers feel that chemotherapy should be continued for about three weeks because of the frequency of relapses around the second week of illness. In this disease the importance of treating primary pneumococcic infection is to be stressed.

In the Waterhouse-Friederichsen type of meningococcic meningitis—the fulminating cases characterized by septicaemenia, prostation and circulatory collapse, i nwhich hemorrhage into the adrenals is known to occur frequently—shock must be combated by the use of blood plasma transfusions, and an attempt made to overcome the effects of possible adrenal insufficiency by the injection of adrenal cortex extract, desoxy-corticosterone and adrenalin.

3. Good results have been reported from the use of penicillin intramuscularly alone in cases of syphilitic meningitis.

4. Reports on the treatment of influenzal meningitis are meagre. Sulphadiazine must be used, but there is doubt that penicillin is of value. Serum has proved to be helpful in capable hands.

5. In the treatment of tuberculous meningitis, there is a ray of hope in the experimental work being done with nwe drugs such as promin and streptomycin.

STATISTICS FROM THE VANCOUVER GENERAL HOSPITAL FOR THE FIFTEEN-YEAR PERIOD—1931-1945

Meningococcic Meningitis

	1931-1939 (incl.)	1940-1945 (incl.)	Best Year (1945)
Total Cases	22	172	15
Deaths	6	26	1
Average Mortality	27.2%	14.5%	6.6%

Pneumococcic Meningitis

	1931-1939 (incl.)	1940-1945 (incl.)	Best Year (1945)
Total Cases	56	51	13
Deaths	55	25	3
Average Mortality	98.2%	49.0%	23.0%

A study of the last fifty fatal cases—excluding those due to tuberculosis—reveals that over 75% fell into the upper or lower age groups (over 50 or under 3 years of age) indicating the greatly increased hazard of the extremes of age. The importance of early diagnosis and treatment is emphasized by the fact that over 50% were listed as being seriously ill on admission. There is evidence that in some cases inadequate sulphonamide therapy prior to admission obscured the diagnosis and handicapped treatment. Lastly, in cases of pneumococcic meningitis, one is impressed by the urgent need for effective treatment of the primary complicating condition.

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News and Notes

Dr. J. F. Haszard was signally honored late in October when he was invested at Ottawa with the "Order of the White Lion" of Czechoslovakia. By this award the Czechoslovakian Government has recognized and honored distinguished services performed by Colonel Haszard as Officer Commanding No. 16 Canadian General Hospital, R.C.A.M.C., in the North-West European Theatre of War.

Colonel R. J. (Bob) Nodwell, R.C.A.M.C., was a recent visitor to Vancouver while on leave following his return from overseas. Col. Nodwell is remaining with the Permanent Army and will soon return to Toronto as Officer Commanding, Chorley Park Military Hospital.

Dr. Ethlyn Trapp, President of the British Columbia Medical Association, has left for a visit to Havana. She is to be one of the speakers at the Inter-American Congress of Radiologists which is being held there lat ein November.

Doctors G. S. Purvis, Frank Bryant, and H. H. Milburn have recently enjoyed a holiday in the Bridge River area.

Officers of the recently organized Medical Staff of the Royal Columbian Hospital, New Westminster, are: Dr. H. H. McKenzie, President; Dr. George T. Wilson, Vice-President; Dr. W. Brewster, Secretary-Treasurer; and Doctors W. A. Clarke, B. Cannon and J. Margulius, Executive.

Arrangements have been completed for the Upper Island Medical Association meeting to be held November 21st. Speakers will be Dr. H. H. Pitts and Dr. J. C. Thomas.

Dr. W. W. Stewart has commenced practice in Port Alberni.

Congratulations on the birth of daughters to Dr. and Mrs. C. A. M. Cawker, Dr. and Mrs. A. J. Stewart, Dr. and Mrs. J. A. McNab. Congratulations also to Dr. and Mrs. R. D. MacLaren on the birth of a son.

Dr. G B. Wilson and Mrs Wilson (Dr. Winnifred VanKleeck) are commencing practice at Harrison Lake and Agassiz.

Word has been received from Capt. C. J. Reich, Overseas, that he has been discharged and will remain in London for a period of Post Graduate study.

Dr. P. G. Margetts, formerly of Yellowknife, is commencing practice in Campbell River in association with Dr. N. B. Hall.

Capt. K. M. Telford has recently been discharged from the R.C.A.M.C., and is practising in Vancouver.

Dr. R. J. A. Hogg has recently been discharged from the R.C.A.F. and is entering practice in White Rock.

Dr. D. M. Boyd, Lake Cowichan, is back from the services and spending a holiday at home before commencing practice.

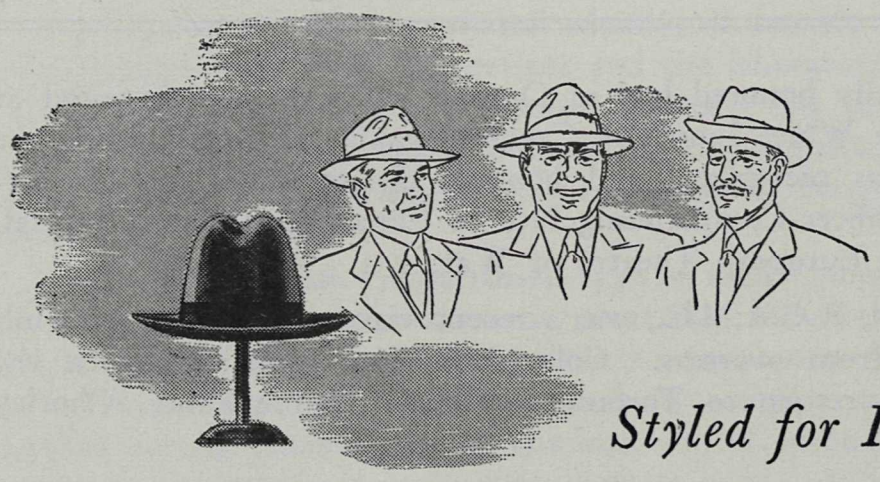
Dr. R. A. Farquharson has recently completed registration in the Province on his discharge from the R.C.A.M.C. and is assisting Dr. Paul Phillips in practice at Princeton.

The Medical Services Association have recently moved from the Medical Dental Building to commodious new quarters at 423 West Broadway. (Telephone—FAirmont 8211).)

Dr. L. C. Grisdale has recently completed registration and is entering practice in Langley Prairie in association with Dr. A. O. Rose.

Dr. Harvey Agnew, Secretary of the Canadian Hospital Council, was a recent visitor in Vancouver.

While in Vancouver, Dr. Agnew addressed meetings of the B. C. Catholic Hospitals Conference and of the B. C. Hospitals Association.



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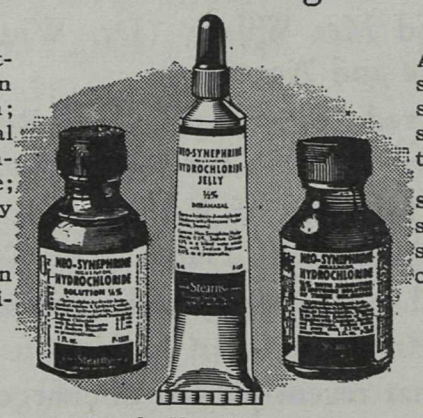

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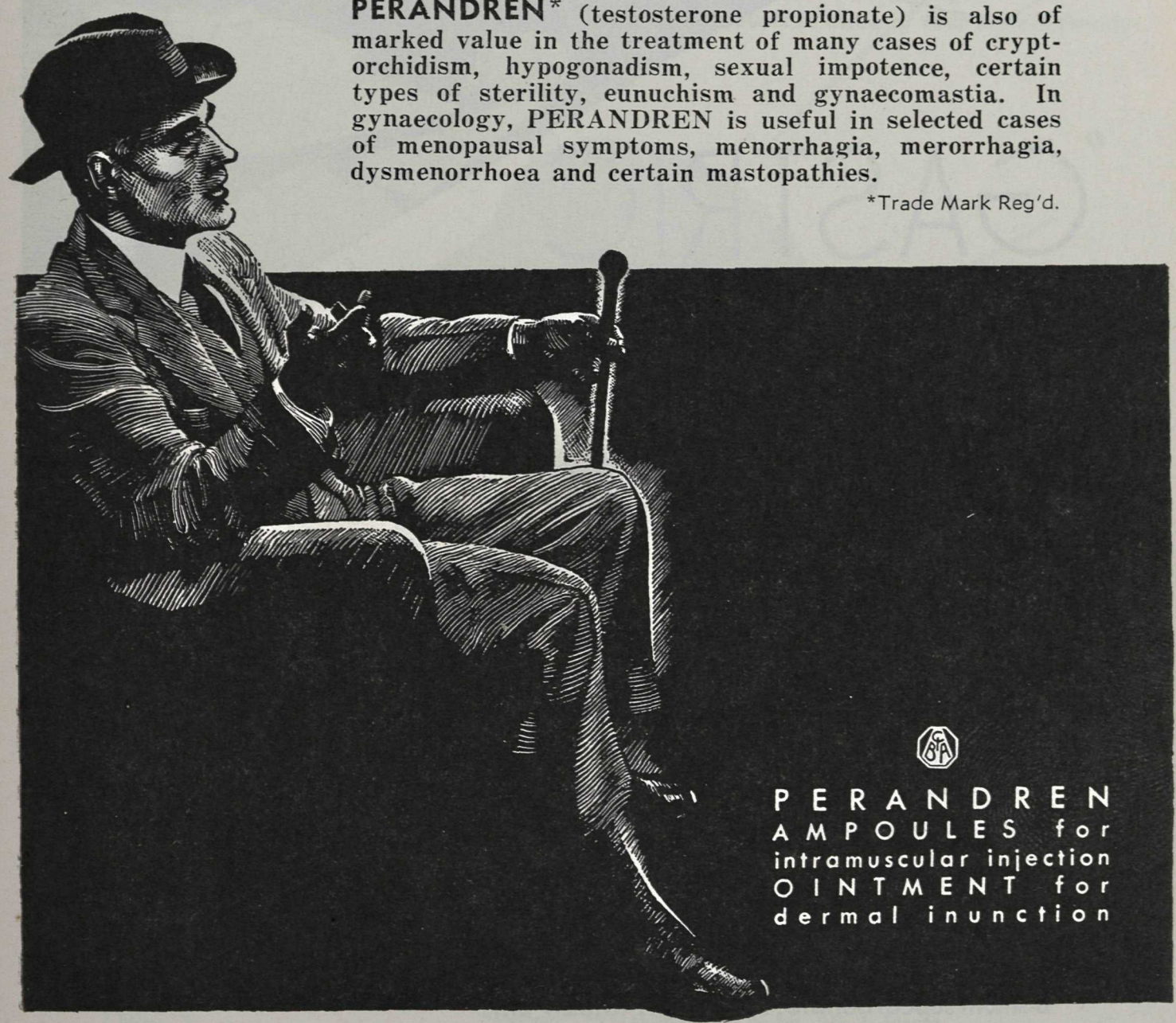

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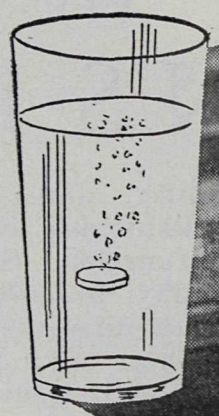

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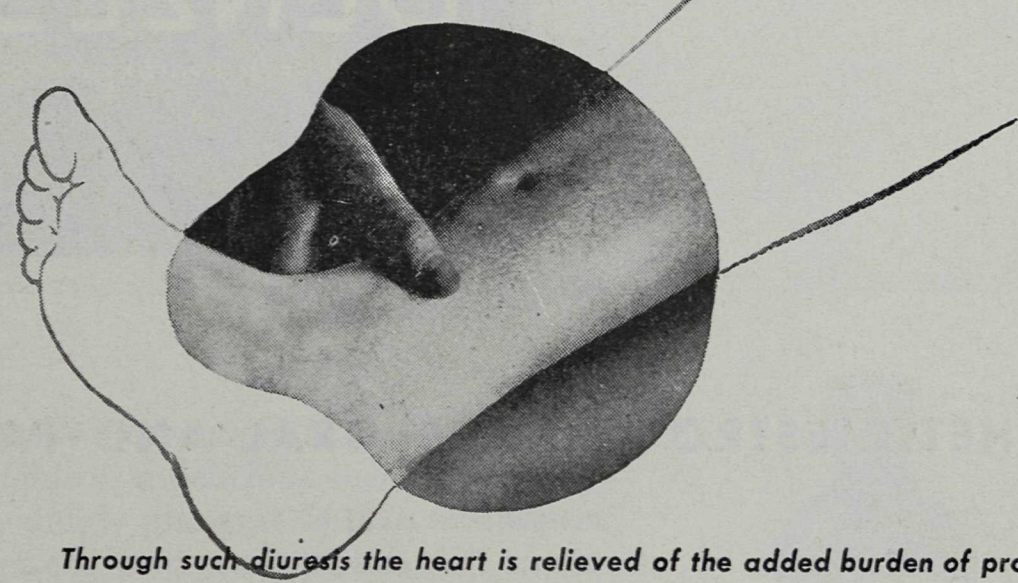

Through such diuresis the heart is relieved of the added burden of propelling the blood through the compressed blood vessels. The blood volume is decreased, and in all probability the efficiency of the heart is increased by elimination of myocardial edema.

•

Salyrgan-Theophylline is available in ampuls of 1 cc. and 2 cc. for intramuscular or intravenous administration . . . For oral use (as an adjunct to decrease the frequency of injections and when parenteral therapy is impracticable) tablets in bottles of 25, 100 and 500.

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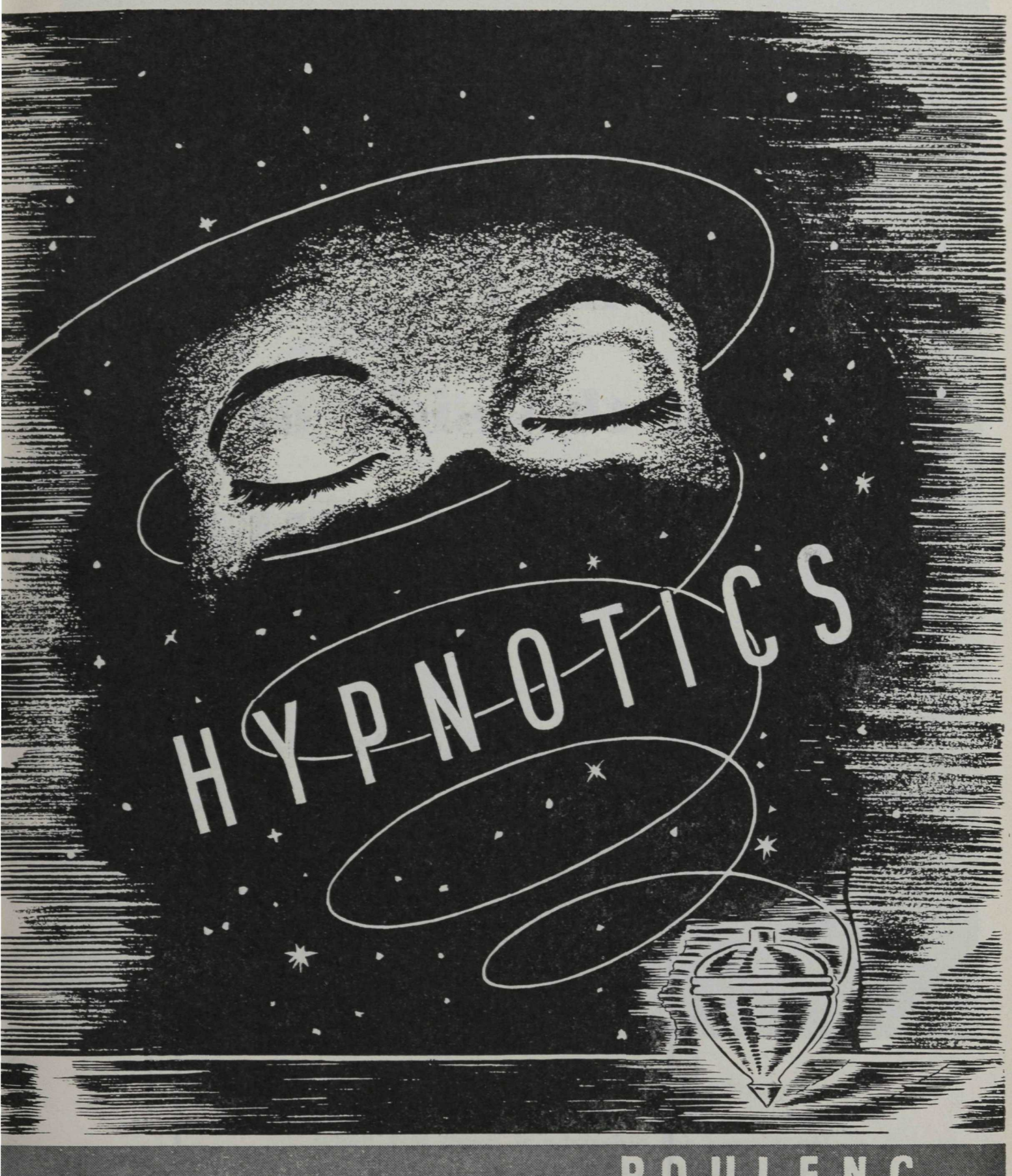

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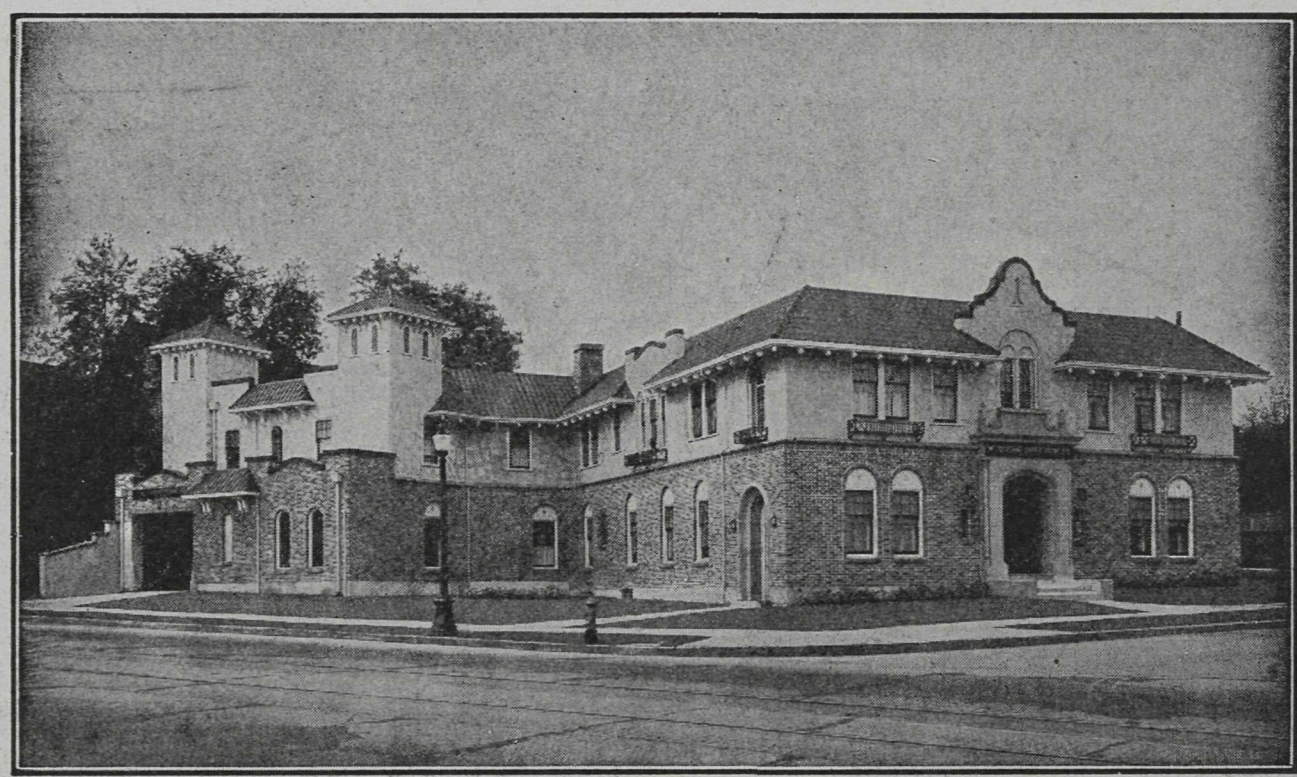

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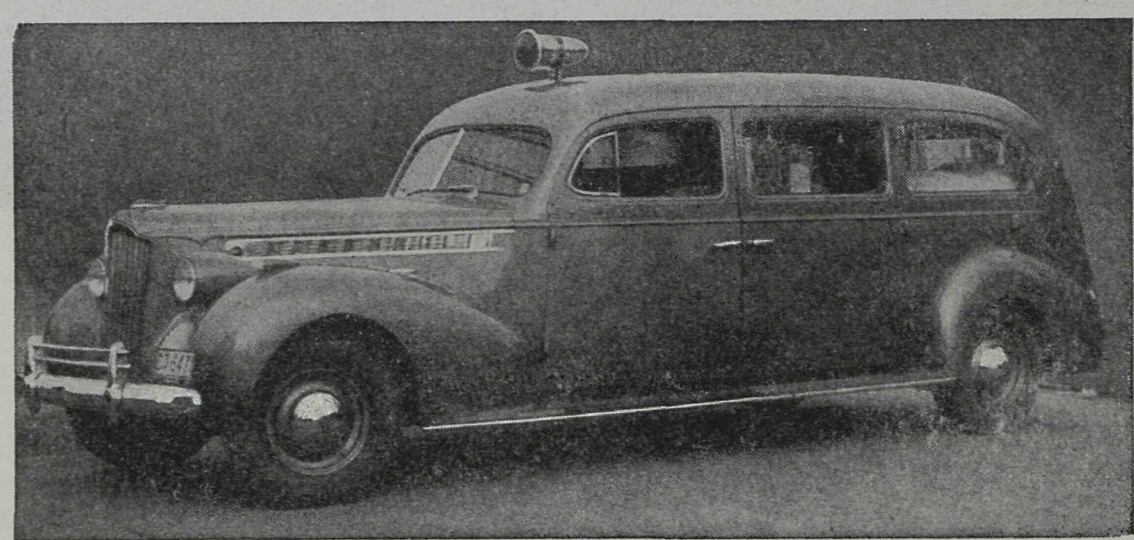

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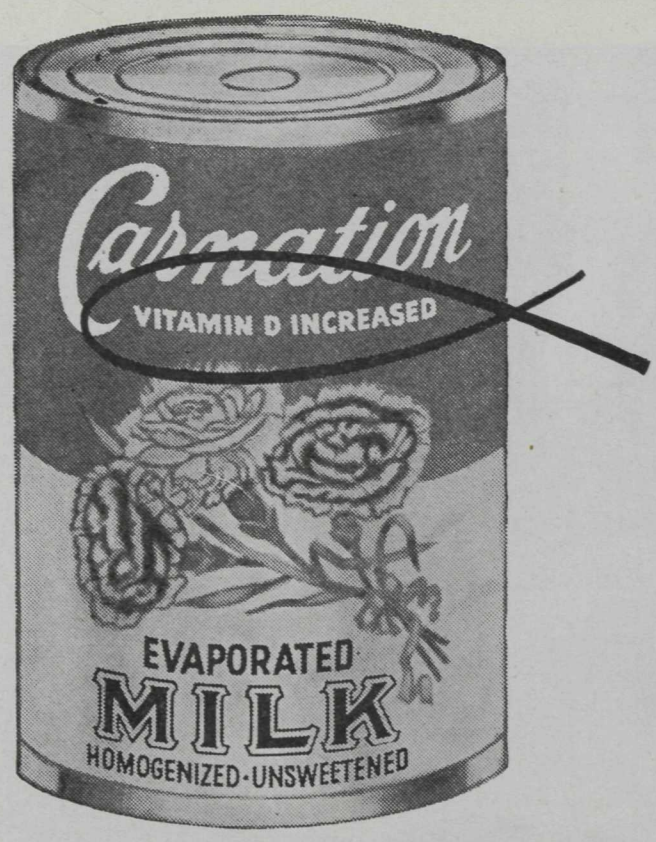

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