

# NEWS BULLETIN



## The Sanatorium Board of Manitoba

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### *A Christmas Seal Project To "Turn Off" Smokers*

Kicking the habit . . . giving up the weed . . . for the confirmed addict it's subjecting yourself to the cruelest torture, short of rats clawing at one's stomach and the cute Chinese water trick.

In store are all kinds of hardships . . . beginning with the loss of the first cigarette that helps a body into the upright position mornings; and the second that relieves tension in traffic and prevents you from screaming obscenities at the thousand half-witted drivers barring a straightforward path to work.

Then there's the all-important cigarette that accompanies a steaming cup of coffee on arrival at the office — the comforting cigarette that for a while takes one's mind off the surrounding mob and the phone calls that will come, just as surely as the next cigarette.

It's a fact that the first few days of not smoking are the hardest. One girl who tried to abstain for a while,

virtually found it impossible to put on eye make-up without annointing the bridge of her nose.

Another noted that while she had certainly stopped coughing and hopping around nights with cramps in her legs, she was slowly but surely turning into a sausage.

Still another friend — in order to get away from smoking in the evening — walked his retriever so long

and so far that the dog, out of utter exhaustion, frantically sniffed around and brought his master a package of stale weeds, buried under some hunting gear.

And, of course, there are the two former room-mates who replaced their leisurely "cigarette life" with neglected household chores. By the time they were down to scrubbing out the garbage pails, they glared at each other and vehemently announced that neither should have been born.

ALL OF THIS is leading up to the fact that smoking is a habit which over the years becomes engrained into an individual's pattern of living (not to mention personality), and that if a person really wants to live without the threat of an untimely, possibly agonizing death, the pattern must be changed.

For this reason, as a Christmas Seal health service, a Behavior Modification

sion. Hundreds of chemicals have been tried, none with success. "It's up to you."

The success of the Christmas Seal program to help 26 addicts give up smoking will be reported in the next Bulletin issue . . . with all of the brutal details.

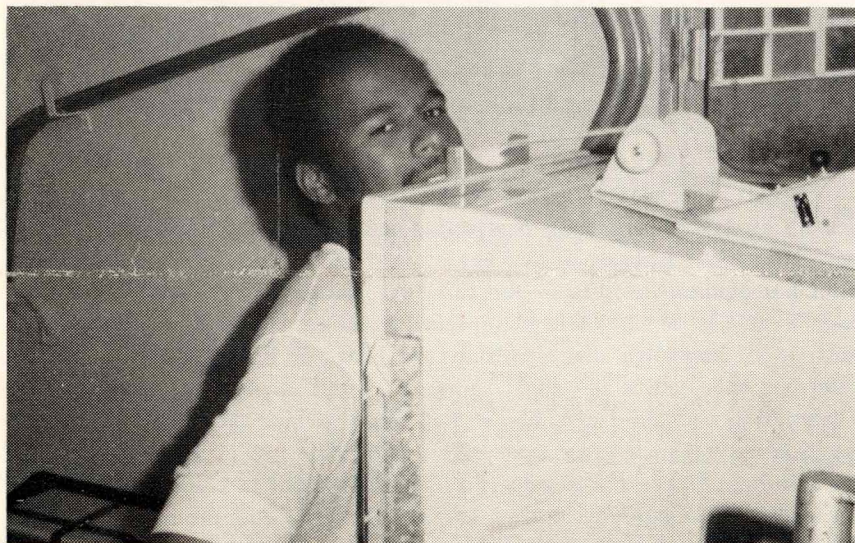
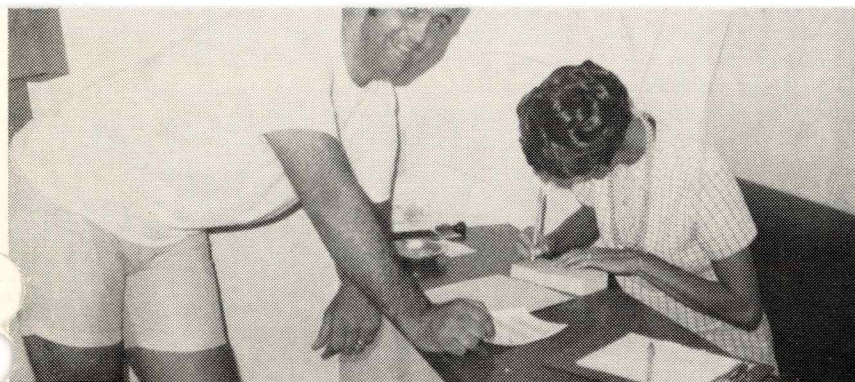
If it works . . . further programs will be held in the fall for other people.

### **Nurses' Fellowship**

In recent weeks the Canadian Tuberculosis and Respiratory Disease Association has established its first nursing fellowship to be awarded this fall.

The fellowship is for a minimum of \$5,000 per year for two years and will go to an applicant with a basic





WHEN THE BLUE BOMBERS lined up for full physical examinations at St. John's-Ravencourt School on June 18, the familiar white Christmas Seal van was on hand to provide free chest x-ray examinations for the 75 players, their coaches and executive members. The fitness program — conducted by the "Big Blues" medical staff (including Dr. E. S. Hershfield, medical director of the Sanatorium Board's Tuberculosis Control Service) — is a yearly prelude to the opening of the football season. At top, Mrs. Bill Walker, president of the Ladies' Auxiliary of the Associated Canadian Travellers of Winnipeg, registers Chuck Harrison for a chest x-ray, and in the bottom photo Jim Thorpe, a flanker, steps up to the machine.

tion Program began at the Sanatorium Board of Manitoba on June 12. Some two dozen members of the public are participating in this pilot project — and the director who is going to show people how to turn off is Dr. G. R. Norton, an ex-smoker and assistant professor in the Department of Psychology at the University of Winnipeg.

The program consists of five two-hour sessions, principally involving "aversion therapy", designed to change smoking from a pleasurable pastime into a sickening one. Dr. Norton plans to use a rapid smoking technique . . . plus forms to keep track of the participants' smoking (when and how much) at home and at work.

Above all, the subjects must want to quit and begin immediately to think of themselves as non-smokers. For example: "Smoking has controlled me for a long time. Now I will control my own behavior and be master of my fate."

There are no miracle cures, Dr. Norton stressed at the opening ses-

ter's level in a clinical nursing specialty in respiratory disease at the University of California — the only university offering this post-graduate program.

According to the CTRDA's Nurses' Advisory Committee, the successful candidate must agree to work at least two years in Canada, to equal the bursary period. It is also their feeling that once the master's course is completed, the clinical specialist should have a joint appointment with a respiratory disease service unit and a school of nursing. This dual role would not only entail technical functions, but also teaching, research, consultation and participation in educational workshops and institutes.

The master's program is comprehensive, encompassing all aspects of pulmonary nursing care — including the study of normal and abnormal physiology of the cardio-pulmonary system, natural history of diseases affecting lung function, assessing lung function, current medical thera-

Continued on Page 4

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# PORDU Moves Forward With Myo-Telemetry Implants

Although the system is far from perfected, many prosthetics engineers feel that implantation of micro-electronic devices in the human body will one day provide the most effective and direct method of controlling intricate movement in artificial arms. Experiments covering various aspects of this concept are being conducted in several parts of the world — including Winnipeg where some particularly promising work is being done by electrical engineer Peter Nelson, of the Sanatorium Board's Prosthetics and Orthotics Research and Development Unit.

Mr. Nelson — who received his B.Sc. in electrical engineering from the University of Toronto in 1964 and his M.Sc. in bio-engineering shortly afterwards from the University of New Brunswick — has concentrated mainly on an encapsulated radio transmitter, which can be implanted next to a voluntarily contractible muscle to provide a strong myoelectric signal. The transmitter is inductively coupled to the same battery

Mark II unit was developed at U.N.B. — then came the Mark III, which is one-tenth the size of Mark I.

Because of its small size, the new transmitter can be implanted not only in bony sites in the body, but also in soft tissue — a significant advance that greatly simplifies the surgical procedure for implantation as no drilling or reaming of bone is required.

Two Mark III capsules have been implanted in dogs for up to 10 months and have shown good performance, Mr. Nelson says. Now work is going ahead on a Mark IV unit, which will be even smaller than the Mark III. This further reduction in size will be achieved by redesigning the electronic circuitry to eliminate some of the larger electronic components and at the same time give better electrical performance. Specifically, the amplifier gain will be increased and the transmitter carrier will be synchronized with the induction power frequency.

With the development of Mark IV, our research engineer predicts that the performance of myo-telemetry systems can be evaluated in human subjects sometime next year.

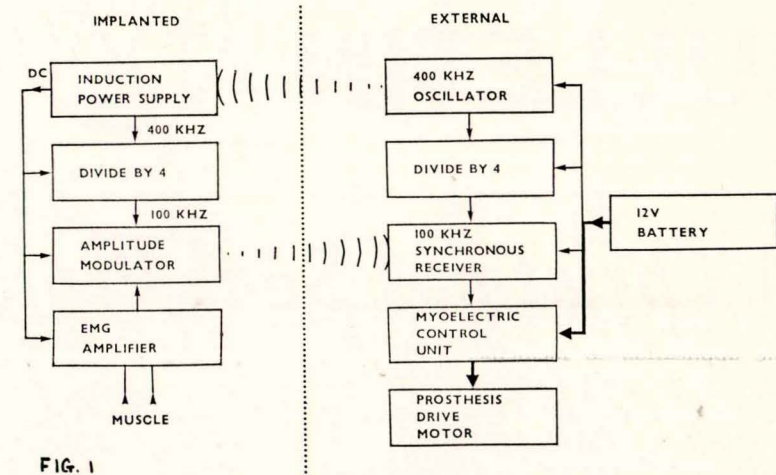
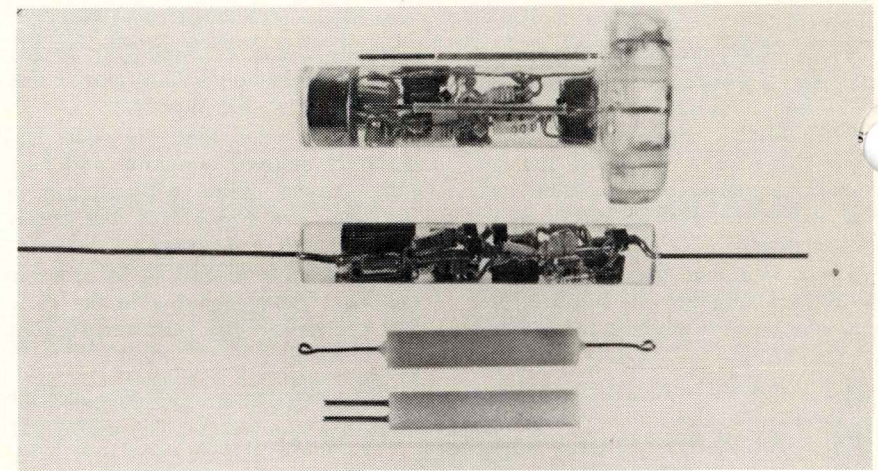


FIG. 1



1. During the past few years, Pete Nelson has collaborated with other members of PORDU on a number of other projects ... including a powered alignment unit







PETER NELSON

outside the body which powers the motorized parts of the artificial limb.

In collaboration with the Bio-engineering Institute of the University of New Brunswick — and with funds from the Medical Research Council of Canada — Mr. Nelson has spent a good part of four years investigating the use of implantable electronic units for telemetering myo-electric potentials<sup>1</sup> . . . and at the end of July he is flying to Goteborg, Sweden, to present the results of his work to the *Third International Congress on Medical Physics and Medical Engineering*.

Since Mr. Nelson's arrival in Winnipeg in 1966, three units have been designed. The first, named the Mark I, was a rather cumbersome device compared to the most recent invention, and it had to be surgically inserted into the marrow cavity of bone. The Mark I had its use in testing the feasibility of the idea, and it did work well in both dogs and sheep. (In fact, one of these original units has now been implanted in a dog for four years and continues to work.)

From these early studies, Mr. Nelson has proceeded to develop smaller implant units with lower power consumption and higher induction coupling efficiency (see illustration). A

prosthetist's work in the final stage of fitting artificial legs by allowing the amputee to use a special hand control to obtain a comfortable alignment of his prosthesis . . . and a powered vehicle that provides indoor and outdoor mobility for a young victim of the "thalidomide tragedy". (This vehicle includes power steering, smooth speed and braking control, a self-contained charger for batteries, and a powered seat that can be adjusted to any height from ground to table level.) On his own, Mr. Nelson has also produced an international Prosthetics and Orthotics Research Reference Catalogue, a computerized system that provides easy access (with detailed cross reference) to up-to-date information on world-wide investigations and studies in the field of artificial limbs and braces.

## DIVE CAREFULLY

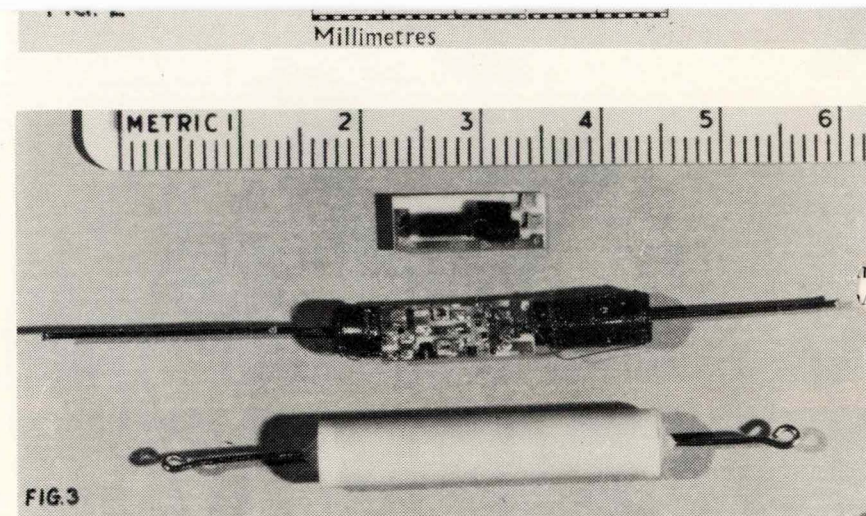
While automobile accidents continue to be the major cause of all spinal injuries sustained in Canada, six percent are the result of diving accidents, according to statistics from the Canadian Paraplegic Association.

More publicity, the CPA feels, should be given to the consequences of diving into too shallow water, diving too deep . . . or, in fact, diving into water where the depth is not familiar to the individual.

And with the hunting season just around the corner, extreme care should be taken with the handling and storing of rifles and shotguns. Gunshot wounds also account for new cases of paraplegia or quadriplegia each year.

According to the Central Western Division of the CPA, 31 people with new traumatic spinal cord injuries were referred for treatment and rehabilitation in this area last year.

Fourteen were due to motor vehicle accidents; two to gunshot wounds; and one to a diving accident.



Present myoelectric systems use electrodes on the surface of the skin to pick up electric signals from contracting muscles for the control of artificial limbs. But these systems, according to electrical engineer Peter Nelson, have a number of disadvantages — the chief one being that they rely on comparatively weak electric signals from superficial muscles just under the skin. Radio transmitters implanted deeper within the body, on the other hand, offer a better, stronger source of "emg" signals . . . and accordingly, Mr. Nelson, in collaboration with the University of New Brunswick, is developing an intricate synchronized myo-telemetry system for controlling useful movement in artificial limbs. *Figure I* illustrates the system whereby a coil in an implanted transmitter picks up power from a rechargeable battery outside the body. *Figure II* shows the progressive development of PORTU'S implant unit, beginning with the original Mark I (at the top) to the Mark II and then to the tiny Mark III, which can be implanted in bone or muscle. In *Figure III* the various assembly stages of the Mark III are shown. At the top is the underside of a thick film supporting foundation, showing three electrolytic capacitors. In the centre is a completed implant showing the topside of the microcircuit, with the "chip" components, coils and electrodes attached. At the bottom is the encapsulated unit in a ceramic housing, sealed with a medical grade of epoxy resin. In Mr. Nelson's opinion, body tissues will accept this implant for a reasonable length of time . . . but further tests are continuing.



## R. M. Cherniack Off To London

*The hurrier I go . . . the behinder I get.*

This quaint complaint might well be posted in the jammed waiting rooms of overwrought clinicians who spend most of the day rushing from hospital to office, and from one examining room to another . . . with the result that by nightfall they have little time or strength to keep abreast of technological advances and their possible application to medicine.

The same *maxim* also applies to investigators and educators who encounter all kinds of frustrating obstacles to acquiring, absorbing, and keeping track of information pertinent to their specialties.

The problem, as one physician put it, is that technology has rapidly outpaced medical utilization of the vast amount of knowledge that accumulates here, there, everywhere . . . from day to day, around the world. And even though today's MD seems to be surrounded by awesome paraphernalia, he is nevertheless hamstrung by his lack of knowledge about (or inaccessibility to) complex engineering systems . . . specifically, the computer.

Computer systems — with their speed, completeness, instant accurate information and reduction of paper

## Sanatorium Board News Round-up

The past few weeks have seen the coming and going of staff members to various scientific meetings, visits from an old friend and a distinguished British radiologist, the publication of a book or two . . . plus a noteworthy wedding.

\* \* \*

The wedding took place in Hyderabad, India, on May 25 and the principals were *Dr. M. Govind Reddy*, resident physician at the Manitoba Rehabilitation Hospital since last October, and *Chi Sow Kamini*, daughter of *B. Ganza Reddy* of Banswada in the Nizamabad District. *Dr. Reddy* returned to Winnipeg with his bride shortly afterwards . . . and we extend to them both our warmest wishes for happiness.

\* \* \*

*Dr. Arun J. Mehta*, who hails from Bombay and has been a member of our active medical staff since 1969, is representing the Manitoba Rehabilitation Hospital at the International Congress of Physical Medicine in Barcelona, July 2 to 6. *Dr. Mehta* is presenting a paper on rehabilitation following total replacement arthroplasty of the hip (Charnley - McKee - Farrar - Mueller method), which a number of patients have undergone in Winnipeg and were admitted for rehabilitation programs at the MRH.

\* \* \*

Again in the news — *Dr. F. D. Baragar*, clinical director of Winnipeg's new Rheumatic Disease Unit, who attended the annual meeting of the American Rheumatism Association in Dallas, Texas, June 7 to 9. *Dr. Baragar* was accompanied by *Dr. J. B. Frain*, a member of the MRH active medical staff, and *Mrs. Larry*

On a recent visit to Winnipeg, *Dr. Wherrett* told us about another project: a history of the anti-tuberculosis movement in Canada, which is being financed by a grant from the Canada Council and so far has occupied 18 months of his time as principal investigator.

In the beginning of this century, when many voluntary tuberculosis organizations were formed, public measures to emphasize and do something about the maintenance of health and the prevention of disease and disability were negligible and as a consequence people were often penalized for illness for which they were not responsible, *Dr. Wherrett* remarked.

The anti-tuberculosis movement was born out of an ideal — to diminish

distress and preserve life — and our nation-wide organization can be proud of its long record of leadership in this field, and of the philosophy and spirit it continues to carry into the "new era of medicine".

\* \* \*

The diagnosis of emphysema by means of the chest x-ray can be effective and reliable if radiologists follow certain strict criteria, according to *Dr. George Simon*, visiting professor of radiology from Brompton Hospital, London, England. *Dr. Simon* was a guest lecturer at a chest conference at the Manitoba Rehabilitation Hospital - D. A. Stewart Centre on May 24th — and close to 100 physicians, students, nurses and therapists crowded into the auditorium to hear this noted radiologist speak. His views, presented in a strong, impressive way, contradict the thinking of some chest experts who feel that the chest x-ray is of little value in detecting obstructive lung disease, particularly in the earlier stages.

\* \* \*

Other people in the news — *Dr. Terry Hogan*, consultant in clinical

(Continued on Page 4)



medicine, and in a few years will be the way of all health programs.

"Hey, buddy, did you hear? . . . now gives one a picture of horse-and-buggy medicine, for in the estimation of Dr. Reuben Cherniack, professor of medicine at the University of Manitoba and physician-in-chief of the Sanatorium Board's Respiratory Disease Service, the computer will encompass every aspect of medical management, the control of illness, research and education.

Research endeavors are already becoming intimately involved with computers, he said. "I see the future in medicine embracing a vast network of communications and dissemination of information — and there is no way I can see the future practitioner knowing all he needs to know and getting ready help without the aid of computers."

For this reason, Dr. Cherniack is taking a sabbatical year, beginning July 20, to study bio-engineering in medicine at the Imperial College of Science and Technology at London University. His expenses will be covered in part by a grant from the Medical Research Council of Canada.

On his departure for England, Dr. Cherniack can look back on a year of achievement in the respiratory disease field. Last fall he was appointed to a special Task Force, set up by the U.S. National Institute of Health, to determine the problem of acute and chronic respiratory disease in the community and to make recom-

(Continued on Page 4)

reumatoid arthritis floor at the MRH. The meeting featured a number of workshops, followed by scientific sessions at which rheumatologists exchanged information on advances in treatment and investigation into the cause of this curious disease. Mrs. Jones, who participated in sessions for allied health professionals, came away with a wealth of information on immunosuppressive drugs and the effect of rheumatoid arthritis on human relationships.

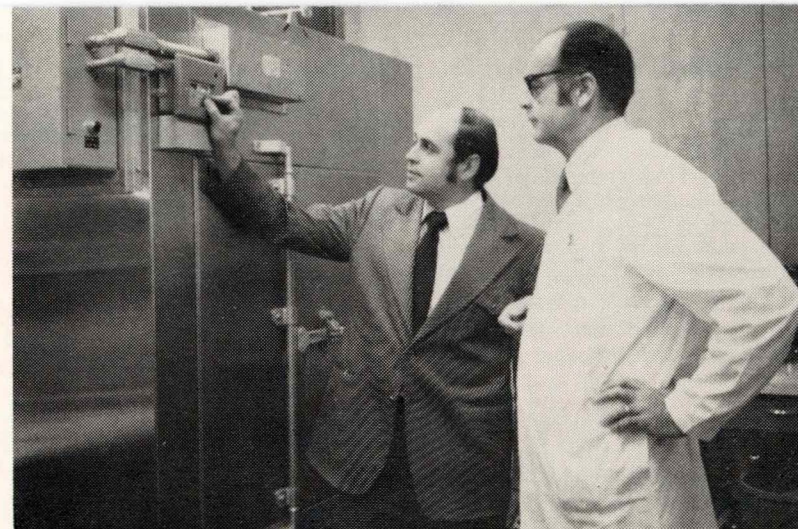
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Sir William Osler had a number of humorous "fixed ideas" — the first of which was that all of the "effective, moving, vitalizing work of the world" is done (by men, of course) between the ages of 25 and 40.

It naturally follows that his second "fixed idea" had something to do with the uselessness of men of 60, and the benefits to commerce, politics and other professions if they stopped working at this age.

One wonders what Sir William would have to say about Dr. G. J. Wherrett, who retired as executive secretary of the Canadian Tuberculosis Association in 1962 (after 35 years of outstanding leadership), and in the years since has taken only a few brief golfing holidays to warmer climes.

During the first five years of his "retirement", Dr. Wherrett worked as a consultant in the far north for the Medical Services of the Department of National Health and Welfare, conducting surveys and collaborating with respiratory specialists in drug prophylaxis trials among the native population.



**HEARTY CONGRATULATIONS** to Reinhart Daher (left), design engineer in our Prosthetics and Orthotics Research and Development Unit, who received his M.Sc. in mechanical engineering (his thesis: Centers of Rotation for an Artificial Polycentric Knee Joint) at the spring Convocation of the University of Manitoba on May 26 . . . and to Ian Cochrane, who is now a certified prosthetist after successfully passing the examinations of the Canadian Board for the Certification of Prosthetists and Orthotists.

Mr. Cochrane, senior prosthetist in our Prosthetics Services, has made many contributions to patient care since he joined our staff 10 years ago . . . and among his achievements is a cable recovery unit for artificial arms, which is now being produced in quantity for patients at the Manitoba Rehabilitation Hospital and for other rehabilitation centres in Canada and the United States. The unit is designed to recover the cable excursion required to raise the forearm or open the terminal device in artificial limbs for high level amputees . . . thus providing sequential operation of the activated parts of these prostheses. There are two models: one for children, the other for adults.

In the photo above, Mr. Cochrane and Mr. Daher inspect an oven designed by Mr. Daher for the uniform heating of various thermal plastics and for accelerated post-curing of plastic prosthetic components. The oven — a major PORTU project in 1971 — is also used extensively for coating metal with nylon.



## THIS 'N THAT

**WHERE THERE'S CIGARETTE SMOKE**, there's . . . among other things . . . carbon monoxide. And where there's a fairly heavy concentration of carbon monoxide, non-smokers as well as smokers are affected.

Recent experiments in Canada and the U.S. have found that the level of carbon monoxide in smoke-filled rooms may equal and at times exceed the acceptable limit for carbon monoxide pollution in heavy traffic.

This may have a deleterious effect on non-smokers in terms of physical and mental coordination . . . especially on those suffering from respiratory disease.

As for the smoker, the effects are, of course, much worse, as one puff of inhaled cigarette smoke puts the level of carbon monoxide in the lung far in excess of the acceptable limit . . . and as one Winnipeg chemist claims, the grogginess a heavy smoker experiences after a bout of drinking is more likely to be caused by an overdose of carbon monoxide than by the consumption of alcohol.

Carbon monoxide is a colorless, odorless gas, which results from incomplete combustion of carbonaceous material, and the thing about it is that it has 200 times the affinity of oxygen for combining with hemoglobin and

Indoors, the smoker is the chief polluter . . . a threat to the health of the non-smoker as well as to himself.

\* \* \*

**TB OUTBREAKS SUPPOSEDLY** occur nowadays in socially and economically deprived areas (such as Indian reserves, city ghettos . . . and so on).

But the fact is that TB can break out anywhere . . . including the zoo.

At a zoo in Tennessee, for example, a female rhesus monkey recently died from tuberculosis.

As a result all of the primates (including the zoo workers) were tuberculin tested. These skin tests showed that TB had spread to five other monkeys (including a ringtail type who died while being tranquilized for the test) . . . and that four of the zoo personnel had positive reactions but no active disease. A fifth person converted to positive when retested months later.

As a result of this episode, all of the primates will be tested for tuberculosis two or three times a year . . . and a glass partition has been placed between the monkeys and the public.



THE 27th CLASS TO GRADUATE from the Nurses' Assistants and Nursing Orderlies Training Program at the Manitoba Rehabilitation Hospital - D. A. Stewart Centre are shown here with their instructors. Standing from left to right are Greg Thomas, Brian Austman, James Selinger, J. D. Dupont, Azam Syne, Robert Farmer, Brian Fortnam, R. H. Chan and Craig Aikman. Seated, left to right: Mrs. Patricia Eadie, nursing instructor, Miss Janet Good, Mrs. Vera Popescu, Miss Carol Hoskins and nursing instructor, Mrs. Dorothy Ramsay.

(Photo by Portage)

## People in the News

(Continued from Page 3)

psychology at the MRH - DASC, and coordinator of the Ph.D. program in clinical psychology and director of the Psychological Service Centre at the University of Manitoba. Along with Professor Gerald Erickson of

## COMPUTERS

(Continued from Page 3)

mendations with respect to research and patient care.

In recent weeks a revised edition of the textbook, "Respiration in Health and Disease", has come off the press of the W. B. Saunders Com-



are concerned with the usage of oxygen. Thus, when carbon monoxide displaces oxygen in the blood, the oxygen supply to body tissues is reduced . . . and when the oxygen supply is reduced, the heart, the brain, the central nervous system and other parts of the body suffer.

In a smoke-filled room, carbon monoxide levels may build up to 20 to 80 parts per million (parts per air). In heavy Winnipeg traffic, it can build up to 70 parts per million, or more.

Outdoors, the gasoline-run engine is the main cause of carbon monoxide pollution. (And although no conclusive studies have been made, it is thought that high concentrations in traffic have a psychological effect and cause headaches — which in turn may well be a causative factor in accidents.)

## NAMED TO COUNCIL

Dr. C. B. Schoemperlen, associate medical director of the D. A. Stewart Centre and associate professor of medicine, University of Manitoba, was appointed to the six-member Council of the American Broncho-Esophagological Association at their annual meeting in Palm Beach April 24 and 25.

Dr. Schoemperlen is the only Canadian serving on this advisory body, which draws up plans for scientific meetings and reviews and approves applications for grants for post-graduate study in broncho-esophagology.

The Council meets twice yearly.

**INTENSIVE RESEARCH** will hopefully supply the ammunition to fight the ever increasing death and morbidity rates of chronic lung disease.

For example, the treatment of pulmonary emphysema — which destroys air sacs in the lungs and turns the normal act of breathing into a frightful struggle — could be improved if lungs could be made to grow bigger and work better.

Normally, lungs grow at about the same rate as the body. Between infancy and adulthood the surface of the lungs increases 20 times (roughly the same as body weight) — and the number of air sacs in the lungs, where carbon dioxide and oxygen are exchanged, increases about 10 times. At adulthood, each person has about 300 million air sacs in his lungs.

Two American researchers are currently engaged in a project to increase the size of lungs in rats by injecting growth hormones.

In six weeks, they succeeded in increasing the total lung capacity of the rats by 41 percent and stepping up lung weight by 28 percent. The number of lung cells did not increase, but the average size did. And there was also a significant increase in the size of the air sacs.

The researchers — Dr. J. S. Brody and Dr. W. J. Buhain of the Philadelphia Veterans Administration Hospital — speculate that similar growth can take place in humans.

Only further research will tell.

has recently compiled a textbook for graduates, entitled *Family Therapy — An Introduction to Theory and Techniques*. The book is published by Cole Publishers of Monterey, California . . . and it is available at the university book store.

Mrs. Linda Norman, senior occupational therapist on the neurology service of the MRH - DASC, attended the First International Workshop for Rehabilitation Personnel in Sensorimotor Treatment Techniques, held at the University of Missouri in St. Louis, from June 13 to June 17.

And Dr. E. S. Hershfield, medical director of our tuberculosis control service, participated in a panel on multi-phasic screening at the recent annual meeting of the Canadian Public Health Association in Saskatoon. Multi-phasic screening, in the opinion of Dr. Hershfield, does not appear feasible at this time, as trials have shown the program to be very expensive and the follow-up and findings poor.

## FELLOWSHIP

(Continued from Page 1)

pies and a variety of subjects related to patient problems at home and in hospital, intensive care units, clinics and the like.

For further information and applications, please write: Nursing Consultant, Canadian Tuberculosis and Respiratory Disease Association, 343 O'Connor Street, Ottawa, Ontario K2P 1V9.

Cherniack, his brother Dr. Louis Cherniack, and Dr. Arnold Naimark, Dean of the Faculty of Medicine of the University of Manitoba. Special assistance was also given by Dr. Victor Chernik, professor and head of the Department of Paediatrics, University of Manitoba.

## ROADRUNNERS ... OUT TO WIN

The Rehab Roadrunners — captained by Barry McDermott — are out to capture the winner's trophy in this year's fastball competition between Winnipeg hospitals, the Manitoba Hospital Commission and the Manitoba Hospital Association.

After concluding a series of exhibition games with only one loss to Misericordia Hospital (last year's champions), the team representing the Manitoba Rehabilitation Hospital-D. A. Stewart Centre got off to a fine start by defeating Grace Hospital on May 9 and the Manitoba Hospital Commission, June 6.

The game against Misericordia represented a slight setback on June 12 . . . but the team remains optimistic, dismissing the defeat as "slight error in judgment" in the last few innings when Misericordia pulled ahead by four points.

The players, in addition to Barry, include Dr. E. S. Hershfield, Brian Fortnam, Rick Wardell, Brian Philpott, Roland Darel, Bill Wiseman, Ray Fortnam, Len Williams, Lou Sanche and Frank Rietz.