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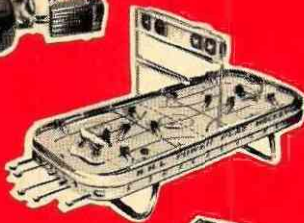
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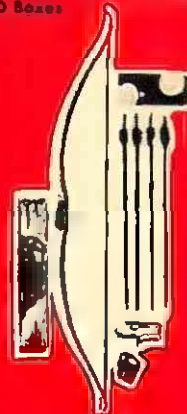
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Canadian Boy

SEPTEMBER, 1967, VOL. 4, NO. 6

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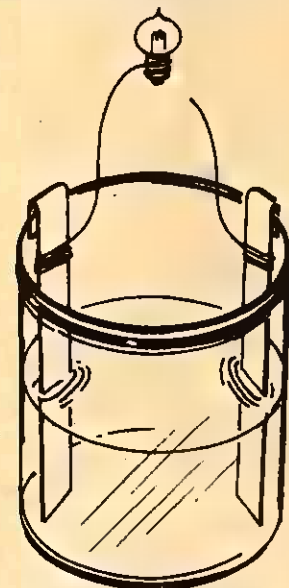
DR. ARTHUR PORTER, author of "The Next Hundred", has a list of academic credentials and achievements longer than your arm. Briefly, he holds three physics degrees from Manchester University in England, his birthplace, has studied or taught at five other colleges and universities, has worked in scientific research for three companies, and has served on many important committees, including a current stint as chairman of the Advisory Council Committee for Science and Medicine at Expo.



ELECTRICITY!

FUEL OF TOMORROW

Electricity will power most of our transportation before the year 2067. Even the fantastic computers Professor Porter tells about in this issue will still depend on electricity.



You can create your own electric power simply by following the diagram above.

1. Fill glass jar 2/3 full with water and table salt solution.
2. Bend 1" wide copper strip over jar. Also same size zinc strip (leavestrough metal).
3. Attach fine wire to both strips above water line.
4. Attach one wire to flashlight bulb as shown. Touch other wire to bottom of bulb.

Now — watch the bulb glow. You'll enjoy your experiments more if you keep some Wrigley's Spearmint Gum handy all the time.



taste that
'HAPPY GO LIVELY'
flavour



Futuramic Venturing

What's Scouting going to be like in 100 years? A little different, a lot the same.

Hi there, Leprechauns! This is your Friendly Jolly Jelly Giant fooling 'round with some question thrown at him at the recent closing meeting of one of the local Venturer Companies.

"Like Jelly, Ol' Bean," asked Alec, the Hustler, "any ideas about how Scouting is going to be fifty or more years from now?"

"Yeah," said Ricky 'Speedy Gonzales', "like what's up at the long range, Lone Ranger?"

Well, I must admit, that I never gave it much thought before, which proves one thing: don't put hot mustard on your peanut butter and jam sandwich, or else you won't be able to talk for a while.

"Cats, you're putting me on the spot! If you really, really want to know, give me a chance to snap my fingers, clap my hands and take a metapsychic trip, (which means that you mentally expand yourself without the influence of chemical substances such as root beer, Six-Down and other assorted Cool-Man-Aids) at the conclusion of which I might give a few hints on tomorrow's happenings."

Little did my trusted Venturers know that over the years in innermost secret I had perfected the separating of my thinking process from the Jelly Body and reaching far out, into the inter-connecting paths of the unknown. It is on a similar journey that I first met Batgirl, the flamboyant female figure of the future who knows more about tomorrow than the rest of us put together about past and present.

As soon as I returned home from the meeting, I retired to the inner sanctum of my den (behind an enormous pile of assorted junk, to name but a few: a genuine skunk skin hat—deodorized, of course—authentic

imitation Mic Mac powder horn with sign language type message burned into the media, the biggest and sharpest Bowie knife in existence, a shrunken head from the Amazon River tribe of "Pft" Indians—the last thing you hear is "Pft" and you're a goner, man — a "Rots of Ruck" wooden statue of the Kwai Indians living near the Angel Falls in Venezuela, and an illuminated rotating, transparent globe).

After taking up a comfortable semi-reclined position in my armchair, I switched the globe on, set it into orbit and gazed at the magnetic pole slowly revolving in a small circle around the north pole. Sure 'nuff, all of a sudden without a sound there was Batgirl standing next to me, trying on my skunk hat, asking me if I think it fits her. Typical female, I thought, then greeted her: "Welcome to my humble junkyard, Bat-O-Girl."

"Cosmic rays and salutations even, to you Jelly, Ol' Beanpole. Like what's the makings?"

"Wee problem, Batty Dearie, tossed at me by that loudmouth Alec the Sharpshooter. Wish he would stick to his pool table. My Venturer Tigercats would like to have a hint or two or three, 'bout tomorrow, after-tomorrow even, like what'll be Scouting's picture and all that jazz?"

"Read you, Jelly. Question simple, answer easy. However, be prepared that your friends will be chasing you with their cues around the pool table when you lift the corner of the jet black web covering the scene."

"Shoot," said I, and that's what transconbooborated of this session of Futuramic Venturing . . .

My name is Teefortoo. I know it sounds square, but cool it, man, be-

fore you jump without your chute. Ever since the turn of the second millenium (year of 2000 A.D., or as we now call it, 50 A.C., or 50 years After Computer) Earthlings are called according to the chemical composition of their genes on which heredity depends, also by the order the amino acids, are linked to form specific body proteins. Hence no more Mc-Flintlocks, Finkelsteins, Pumpernickels and Assarabowskys but:

ALPHABEFORNO

α B 4 NO (Alpha)

BETATOOVETO β 2 V TO (Veto)

GAMMADETEEFORTOO

γ D T 4 2 (Teefortoo)

WHYDEFORDOR Y D 4 DOR

(Fordor)

UTOORAT U 2 RAT (Ratsy)

Immediately after birth, the formula is tattooed on the skin of the left armpit, most handy in case of accident or sickness when one or several organs must be replaced.

So, as I was fooling around with my 3-D Videostereo set (man! those electromagnetic hit tunes by The Sunspots are out of this universe), my Video-phone softly called out my name. Yeah! You've guessed it; it was my intype pal Ratsy, the Shmart Shnook of our space Venturer Company "Alphacentauri". He seemed excited.

"What's up Ratsy, Old Meson?"

"Man, would you believe, my kid brother Micron found a real antique," said Ratsy. "You know, he is an Atom Cub from the Plutonium Pack. He was working on his Telstar requirements and while cleaning the attic in Grampa's old house, he found this . . ."

All of a sudden, there on my colored Videophone screen was the mysterious object, about 7.5 cm (or three inches) in diameter, made of highly polished hardwood, two flat wheels, interconnected by a small arm. The space between the wheels was about 0.3 cm ($\frac{1}{4}$ inch) and an old frayed string was attached to the interconnecting part by which Ratsy was holding the small object.

"What in Jupiter is that?" I asked.

"Haven't got a spark," said Ratsy. "It could be some old-fashioned toy."

"Crazy! How about showing it to the gang?"

"Pass on the blue alert, old Proteus. I'll see you in the Planetarium in 29 E.M.U.'s." (earth minutes, uncorrected).

Continued on page 33

Norman Brown
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Margaret Large
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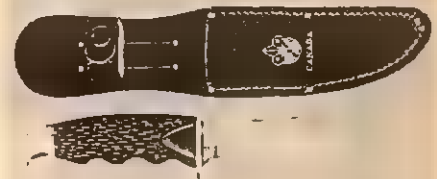


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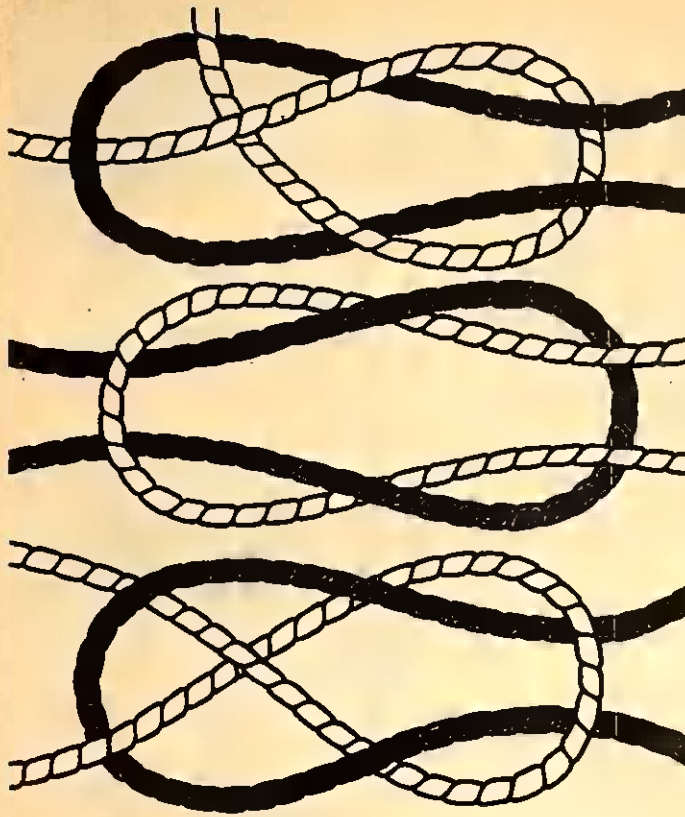
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**Bat radar has nothing to do with caped crusaders!
And porpoises' pimples make submarines go faster!**

Science



BIONICS

In our space-age world of rockets, space capsules, and transistors, it is easy to forget the amazing world of living plants and animals, surrounding us since the beginnings of history.

Today, scientists are looking to animals for answers to problems in the design of electronic equipment and new machines. The study of animals for this purpose is called "bionics."

Insects' eyes, bees' honeycombs, moths' ears and porpoises' skin might sound like ingredients for a witch's brew! But, for scientists, they are providing the answers to some tough problems. For example, insects have compound eyes; that is, their eyes are made up of thousands of tiny lenses the outer shape of which is six-sided. Now it so happens that the cells of a bee's honeycomb are also six-sided.

Nature's problem is to get as many lenses as possible into a compound eye and as many cells as possible into a honeycomb. Why not make their shape round, or square, or even eight-sided? Because, as scientists have discovered, you can pack more six-sided objects into a given space than you can of any other shape! This principle has been put to work recently in a new camera used in aerial photography.

Thirty years ago, the study of a bat's cries led to the development of modern radar! Yet, even today's scientists have not produced a radar system as sensitive as the bat's, which can pick up echoes from a mosquito even though there are sounds two thousand times greater in the background!

The humble firefly is still baffling science. The firefly's "cold" light is produced by chemical action. The ordinary lights in your home waste most of their electricity by turning it into heat, a fact that you well know if you've ever touched a lighted bulb! If scientists could produce light like that made by fireflies, a five-watt bulb could generate light equal to today's 100-watt bulb!

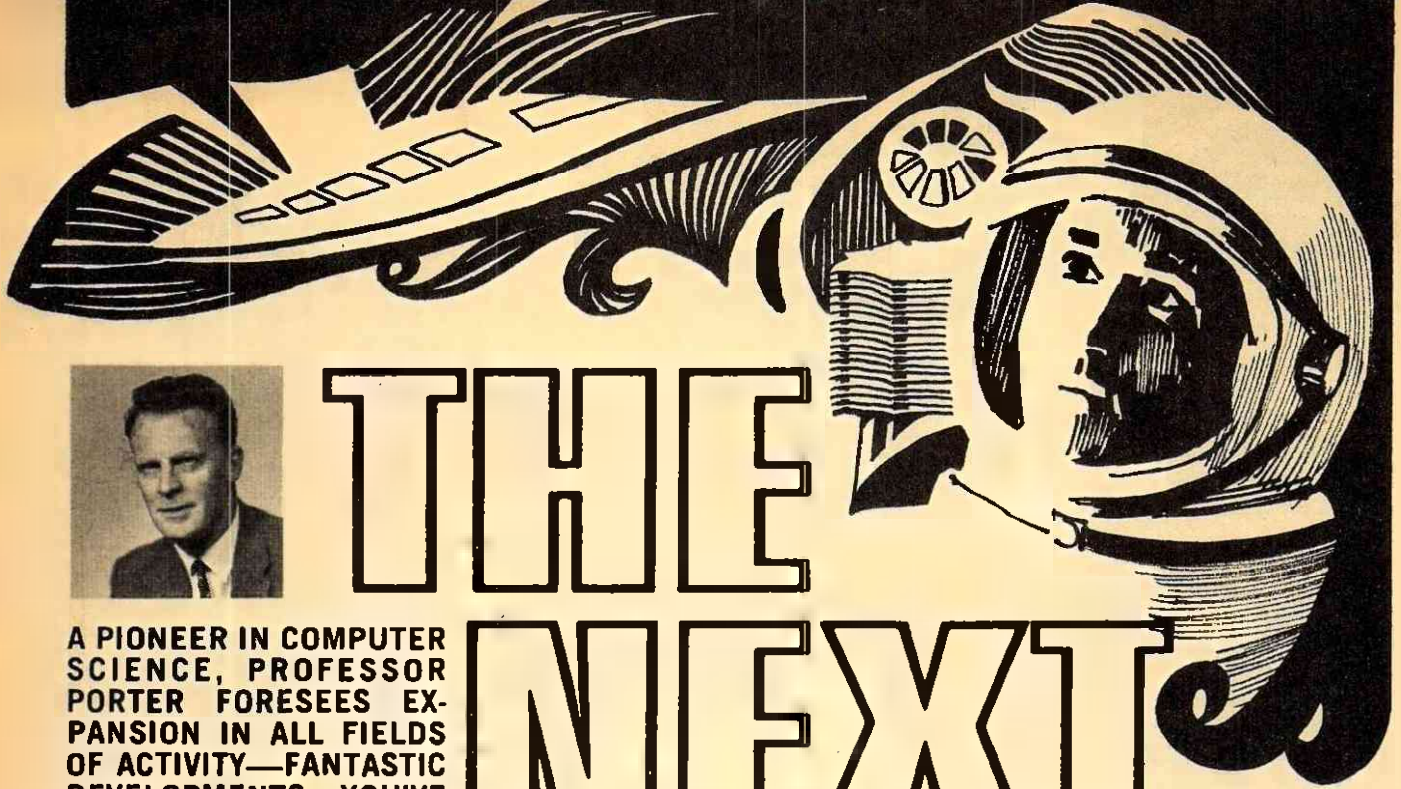
Ever since man has taken ships to sea, he has copied the streamlined shapes of fish when designing the hulls of his watercraft. For years, naval architects have studied porpoises and whales as a guide for the shapes of submarines, to get the highest possible underwater speeds. Yet, no matter how precisely they copied the forms of these animals, they could never get the high speeds that a whale has with its low horsepower.

It wasn't until the skins of these animals were examined that they found the answer! The oily skin of whales and porpoises, with its thick layer of blubber, is flexible and elastic. This elasticity reduces the resistance of the flow of water that tends to slow down forward motion.

Scientists duplicated this skin condition by covering the entire hull of a submarine with a thick sheet of rubber, with thousands of "pimples" on it, like those found on the surface of a ping-pong racket. As a result, they found they could increase the speed of a submarine by 50 percent!

These are just a few cases where animal systems are found to be better than man-made systems. Next time you use a microscope, have a look at a bee's leg, or a butterfly's wing. Perhaps you may become a scientist who was taught by animals!

By D. A. Coburn



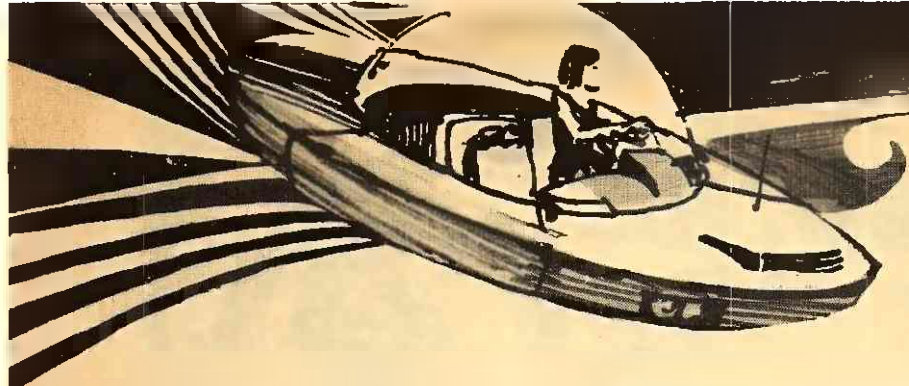
A PIONEER IN COMPUTER SCIENCE, PROFESSOR PORTER FORESEES EXPANSION IN ALL FIELDS OF ACTIVITY—FANTASTIC DEVELOPMENTS YOU'VE NEVER DREAMED OF!

THE NEXT HUNDRED

THIS YEAR, THE YEAR OF CANADA'S HUNDRETH BIRTHDAY, IS A GOOD TIME FOR US TO CRYSTAL GAZE AND TO SPECULATE ON WHAT THE FUTURE MAY HOLD IN STORE FOR CANADA AND FOR THE HUMAN RACE AS A WHOLE. AS A SCIENTIST, MY GLIMPSE INTO THE FUTURE WILL BE BIASED IN THE DIRECTIONS OF SCIENCE AND ENGINEERING. BUT THESE ARE EXCITING FIELDS WITH BOUNDLESS POSSIBILITIES, ESPECIALLY FOR THE YOUNG CANADIAN NOW LIVING IN A COMPARATIVELY YOUNG COUNTRY. SCIENCE AND ENGINEERING ALREADY AFFECT THE LIVES OF ALL OF US AND THEY WILL DO SO MORE AND MORE IN THE FUTURE. □ JUST TO GIVE YOU AN IDEA OF HOW DIFFICULT IT IS TO PREDICT WHAT MAY HAPPEN IN THE FUTURE, I'D LIKE TO MENTION THE PAST. WHEN I WAS 12 YEARS OLD, IN 1923, HOW WOULD I HAVE REACTED IF A VERY IMAGINATIVE SCIENTIST HAD ACCURATELY PREDICTED WHAT WOULD HAPPEN DURING THE NEXT FORTY-

ODD YEARS OF MY LIFE? I DOUBT WHETHER I WOULD HAVE BELIEVED HIM WHEN HE TOLD ME THAT DURING THE 1960s MAN WOULD BE EMBARKING ON MORE AND MORE AMBITIOUS SPACE PROBES—THAT ASTRONAUTS WOULD BE ENCIRCLING THE WORLD IN ABOUT AN HOUR-AND-A-HALF, AND THAT SOME OF THEM WOULD BE "WALKING IN SPACE". I WOULD BE ASTONDED TO HEAR THAT HUGE JET AIRLINERS WOULD CROSS THE ATLANTIC IN ABOUT FIVE HOURS WITH 150 PEOPLE ON BOARD. AND MY CREDULITY WOULD BE STRETCHED TO THE LIMIT WHEN I WAS TOLD THAT MAN WOULD BE ABLE TO DESTROY HUGE COUNTRIES WITH A FEW NUCLEAR BOMBS DELIVERED BY ROCKETS. □ MORE HAPPILY, I WOULD HEAR ABOUT NUCLEAR POWER STATIONS WHICH USE NUCLEAR ENERGY RATHER THAN CHEMICAL ENERGY TO GENERATE ELECTRICAL ENERGY. THIS SCIENTIST WOULD ALSO HAVE TOLD ME ABOUT THE GREAT DEVELOP-

MENTS IN PLASTICS, IN REPLACEMENT PARTS FOR THE HUMAN BODY, ABOUT MIRACULOUS SURGICAL OPERATIONS INVOLVING PENETRATING DEEP INTO THE HUMAN BRAIN OR OPENING THE HUMAN HEART. AND OF COURSE I WOULD HEAR ABOUT COLOR TELEVISION AND ABOUT TELECOMMUNICATIONS SATELLITES WHICH MADE POSSIBLE THE PRACTICALLY SIMULTANEOUS RECEPTION BY TELEVISION OF EVENTS IN EUROPE AND OTHER CONTINENTS AT THE TIME THESE EVENTS ACTUALLY HAPPENED. □ IMAGINE ALSO MY BEWILDERMENT WHEN I WAS TOLD THAT LARGE COMPUTERS WOULD BE DEVELOPED WHICH WOULD HAVE THE CAPABILITY OF CARRYING OUT TENS OF MILLIONS OF ADDITIONS IN A SINGLE SECOND—IN OTHER WORDS, COMPUTERS CAPABLE OF WORKING AT SPEEDS AS HIGH AS ONE HUNDRED MILLION TIMES MY OWN ARITHMETICAL SPEED! □ I'D BE SURPRISED TO LEARN THAT THE PRODUCTION OF GASOLINE WOULD BE CARRIED OUT AUTO-



MATICALLY WITHOUT HUMAN INTERVENTION AND THAT THIS WOULD BE REFERRED TO IN THE FUTURE AS AUTOMATION. AND THAT THE MAIN OBJECTS OF AUTOMATION WOULD BE TO RELIEVE MAN OF A GREAT DEAL OF BORING AND HEAVY PHYSICAL LABOR AND SOME MENTAL LABOR — MAN WOULD HAVE AT HIS DISPOSAL A VAST NUMBER OF LABOR-SAVING DEVICES AND TOOLS THAT HE REGARDED AS HIS SLAVES.

AT THE AGE OF 12 I AM SURE I COULD NOT POSSIBLY APPRECIATE THE SIGNIFICANCE OF THE GREAT ACHIEVEMENTS WHICH I WAS TOLD WOULD HAPPEN IN MY LIFETIME. BUT I WOULD BEGIN TO REALIZE THAT THE GREAT ADVANCES IN FIELDS OF HUMAN ACTIVITY RESULT FROM APPLYING KNOWLEDGE GAINED IN ONE SUBJECT, SAY PHYSICS, TO ADVANCING ANOTHER SUBJECT, LIKE ENGINEERING. THIS IS A MOST IMPORTANT CONCLUSION BE-

CAUSE IT IS AT THE VERY CORE AND SUBSTANCE OF THE HUMAN LEARNING PROCESS. WE LEARN BY RECOGNIZING PATTERNS AND LIKENESSES. MODELLING IS WHAT WE DO WHEN WE TRY TO SIMULATE THE BEHAVIOR OF A COMPLEX SYSTEM — PERHAPS A SUPERSONIC JETLINER.

NOW LET ME RETURN TO THE SITUATION I FIND MYSELF IN TODAY. INSTEAD OF BEING AWED, AND PROBABLY MYSTIFIED, BY THE SCIENTIFIC SAGE AND PROPHET IN 1923, THE ROLES ARE NOW REVERSED. MY TASK OF ANTICIPATING FUTURE DISCOVERIES AND DEVELOPMENTS IS MORE DIFFICULT TODAY THAN IN 1923 BECAUSE LIFE IS SO MUCH MORE COMPLEX. I WILL TRY TO DO IT BY SELECTING A FEW FIELDS IN WHICH THE PATTERNS FOR THE FUTURE APPEAR TO BE A LITTLE MORE DEFINITE THAN IN ANY OTHER FIELDS WE MIGHT THINK OF.

☆ ☆ ☆

RESEARCH IN SCIENCE

THE MAIN GUIDELINES WE HAVE TO THE FUTURE TECHNOLOGICAL SOCIETY ARE PROVIDED BY RESEARCH PROGRAMS GOING ON NOW IN THE UNIVERSITIES. IN INDUSTRY AND IN GOVERNMENT RESEARCH DEPARTMENTS. IN THE UNIVERSITIES THIS WORK IS USUALLY FUNDAMENTAL RESEARCH, WHILE IN INDUSTRY AND GOVERNMENT LABORATORIES THE PROGRAM FOR THE MOST PART IS APPLIED RESEARCH (e.g. APPLIED TO THE GENERATION OF ELECTRICAL ENERGY, TO THE DEVEL-

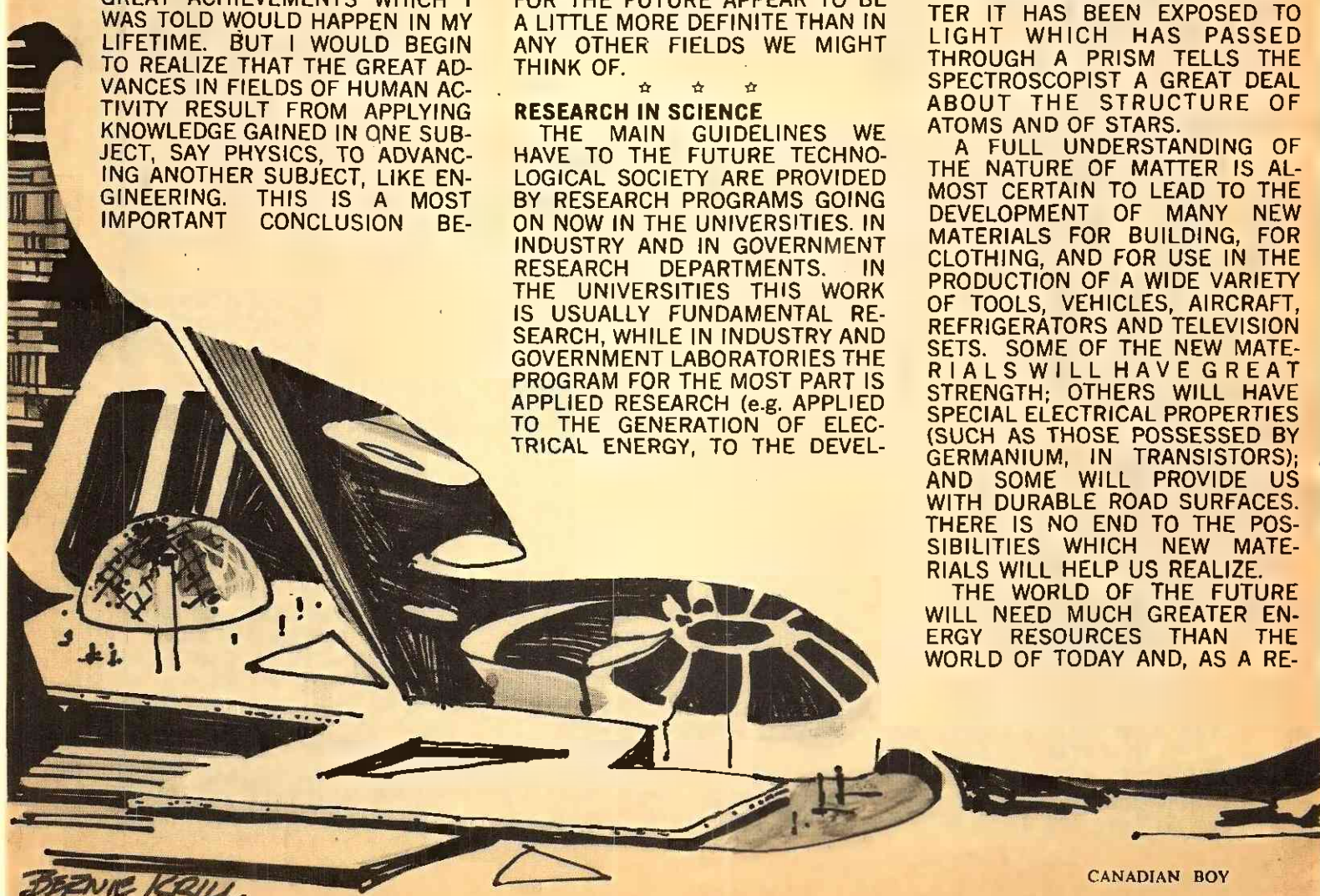
OPMENT OF NEW MATERIALS AND NEW MACHINES).

FUNDAMENTAL RESEARCH IS CONCERNED WITH THE ACQUISITION OF NEW KNOWLEDGE AND THE ESTABLISHMENT OF NEW LAWS WHICH HELP US TO DESCRIBE AND TO UNDERSTAND THE UNIVERSE AND THE WORLD AROUND US. FOR EXAMPLE, TO CARRY OUT ASTRONOMICAL RESEARCH, WE NOT ONLY NEED LARGE OPTICAL AND RADIO TELESCOPES, BUT WE MUST ALSO BE FAMILIAR WITH THE PRINCIPLES OF MECHANICS AND DYNAMICS WHICH APPLY TO PLANETS LIKE OUR OWN AS WELL AS TO FABULOUSLY LARGE STELLAR GALAXIES WHICH MAY CONTAIN BILLIONS OF STARS — THE BASIC LAW CONCERNED IS THE LAW OF GRAVITATION, FIRST STATED BY SIR ISAAC NEWTON.

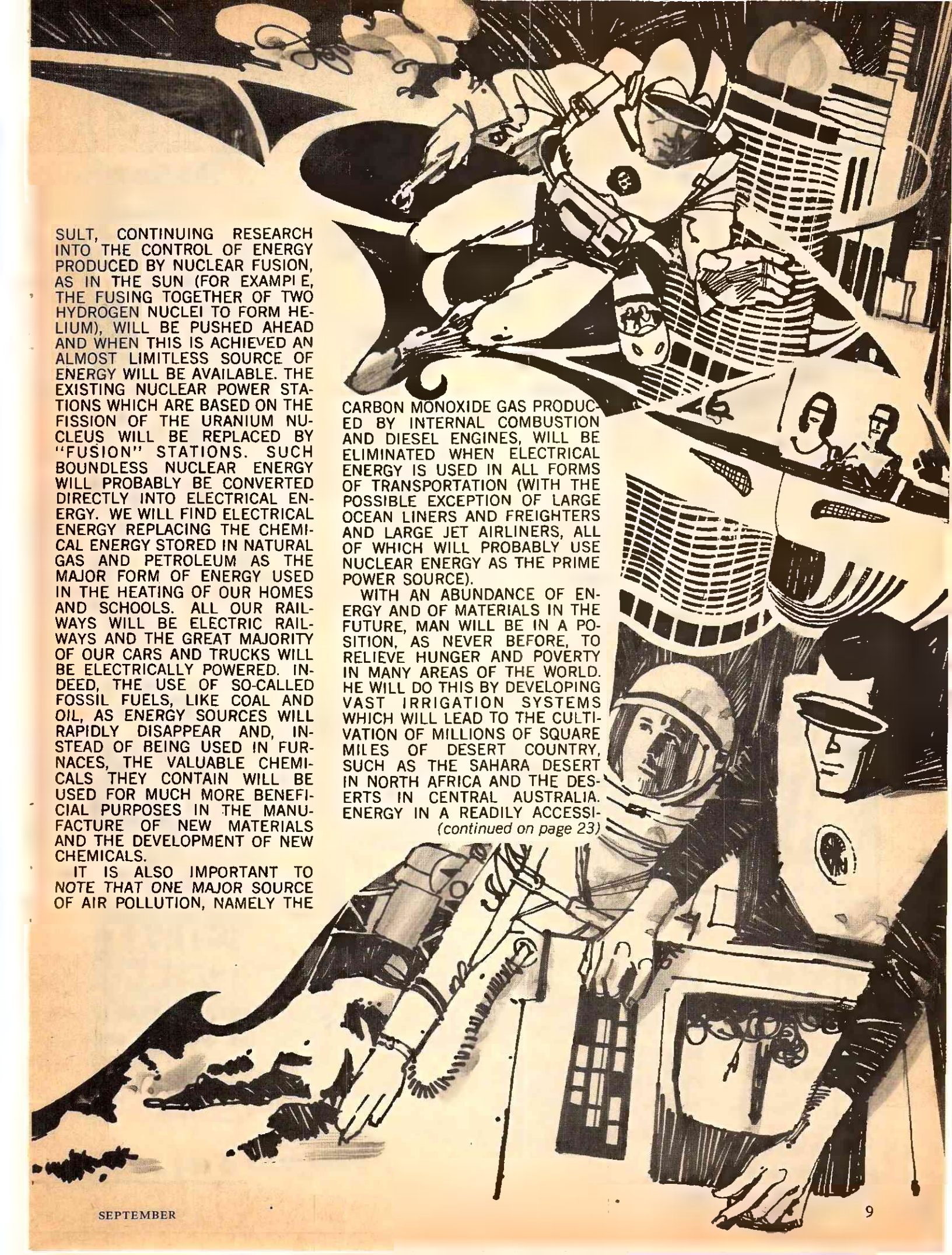
WHAT THE SCIENTIST NORMALLY DOES IS LOOK FOR PATTERNS. FROM THESE PATTERNS HE DEVELOPS LAWS AND PRINCIPLES LIKE THE LAW OF GRAVITATION. FOR EXAMPLE, THE PATTERN WHICH SHOWS UP ON A DEVELOPED PHOTOGRAPHIC PLATE AFTER IT HAS BEEN EXPOSED TO LIGHT WHICH HAS PASSED THROUGH A PRISM TELLS THE SPECTROSCOPIST A GREAT DEAL ABOUT THE STRUCTURE OF ATOMS AND OF STARS.

A FULL UNDERSTANDING OF THE NATURE OF MATTER IS ALMOST CERTAIN TO LEAD TO THE DEVELOPMENT OF MANY NEW MATERIALS FOR BUILDING, FOR CLOTHING, AND FOR USE IN THE PRODUCTION OF A WIDE VARIETY OF TOOLS, VEHICLES, AIRCRAFT, REFRIGERATORS AND TELEVISION SETS. SOME OF THE NEW MATERIALS WILL HAVE GREAT STRENGTH; OTHERS WILL HAVE SPECIAL ELECTRICAL PROPERTIES (SUCH AS THOSE POSSESSED BY GERMANIUM, IN TRANSISTORS); AND SOME WILL PROVIDE US WITH DURABLE ROAD SURFACES. THERE IS NO END TO THE POSSIBILITIES WHICH NEW MATERIALS WILL HELP US REALIZE.

THE WORLD OF THE FUTURE WILL NEED MUCH GREATER ENERGY RESOURCES THAN THE WORLD OF TODAY AND, AS A RE-



BERNIE KRILL



SULT, CONTINUING RESEARCH INTO THE CONTROL OF ENERGY PRODUCED BY NUCLEAR FUSION, AS IN THE SUN (FOR EXAMPLE, THE FUSING TOGETHER OF TWO HYDROGEN NUCLEI TO FORM HELIUM), WILL BE PUSHED AHEAD AND WHEN THIS IS ACHIEVED AN ALMOST LIMITLESS SOURCE OF ENERGY WILL BE AVAILABLE. THE EXISTING NUCLEAR POWER STATIONS WHICH ARE BASED ON THE FISSION OF THE URANIUM NUCLEUS WILL BE REPLACED BY "FUSION" STATIONS. SUCH BOUNDLESS NUCLEAR ENERGY WILL PROBABLY BE CONVERTED DIRECTLY INTO ELECTRICAL ENERGY. WE WILL FIND ELECTRICAL ENERGY REPLACING THE CHEMICAL ENERGY STORED IN NATURAL GAS AND PETROLEUM AS THE MAJOR FORM OF ENERGY USED IN THE HEATING OF OUR HOMES AND SCHOOLS. ALL OUR RAILWAYS WILL BE ELECTRIC RAILWAYS AND THE GREAT MAJORITY OF OUR CARS AND TRUCKS WILL BE ELECTRICALLY POWERED. INDEED, THE USE OF SO-CALLED FOSSIL FUELS, LIKE COAL AND OIL, AS ENERGY SOURCES WILL RAPIDLY DISAPPEAR AND, INSTEAD OF BEING USED IN FURNACES, THE VALUABLE CHEMICALS THEY CONTAIN WILL BE USED FOR MUCH MORE BENEFICIAL PURPOSES IN THE MANUFACTURE OF NEW MATERIALS AND THE DEVELOPMENT OF NEW CHEMICALS.

IT IS ALSO IMPORTANT TO NOTE THAT ONE MAJOR SOURCE OF AIR POLLUTION, NAMELY THE

CARBON MONOXIDE GAS PRODUCED BY INTERNAL COMBUSTION AND DIESEL ENGINES, WILL BE ELIMINATED WHEN ELECTRICAL ENERGY IS USED IN ALL FORMS OF TRANSPORTATION (WITH THE POSSIBLE EXCEPTION OF LARGE OCEAN LINERS AND FREIGHTERS AND LARGE JET AIRLINERS, ALL OF WHICH WILL PROBABLY USE NUCLEAR ENERGY AS THE PRIME POWER SOURCE).

WITH AN ABUNDANCE OF ENERGY AND OF MATERIALS IN THE FUTURE, MAN WILL BE IN A POSITION, AS NEVER BEFORE, TO RELIEVE HUNGER AND POVERTY IN MANY AREAS OF THE WORLD. HE WILL DO THIS BY DEVELOPING VAST IRRIGATION SYSTEMS WHICH WILL LEAD TO THE CULTIVATION OF MILLIONS OF SQUARE MILES OF DESERT COUNTRY, SUCH AS THE SAHARA DESERT IN NORTH AFRICA AND THE DESERTS IN CENTRAL AUSTRALIA. ENERGY IN A READILY ACCESSI-

(continued on page 23)

OTTO Matic

By DOUG & DON MACMILLAN

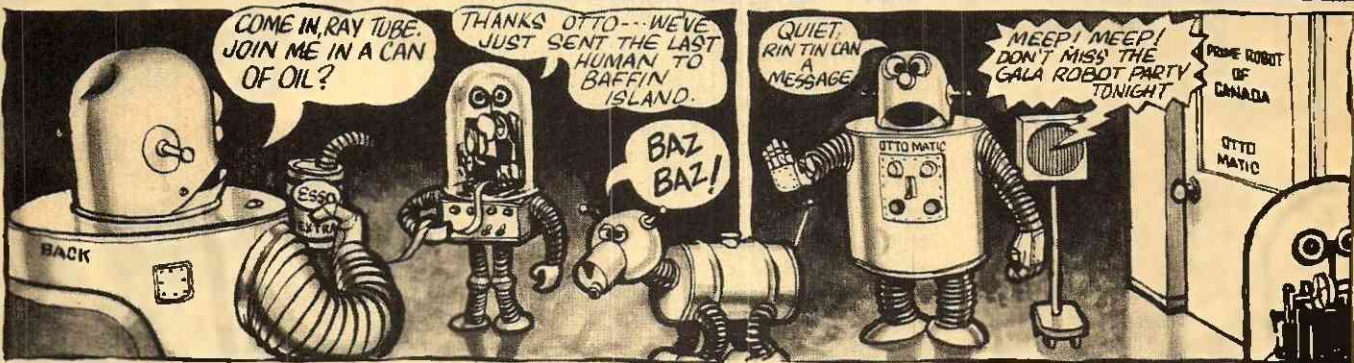
...AND I NOW DECLARE THIS DAY INDEPENDENCE DAY FOR ALL ROBOTS...

YAY!

RAH!

BAZ BAZ!

THE ROBOTS MAY TAKE OVER IN 2067, BUT CAN THEY LAST ?



COME IN, RAY TUBE. JOIN ME IN A CAN OF OIL?

THANKS OTTO---WE'VE JUST SENT THE LAST HUMAN TO BAFFIN ISLAND.

QUIET, RIN TIN CAN. A MESSAGE.

MEEP! MEEP! DON'T MISS THE GALA ROBOT PARTY TONIGHT

PRIME ROBOT OF CANADA
OTTO Matic

BAZ BAZ!



I START MY HOLIDAYS AT AN OIL REFINERY NEXT WEEK

SO HOW'VE THEY BEEN TREATING YOU, AL?

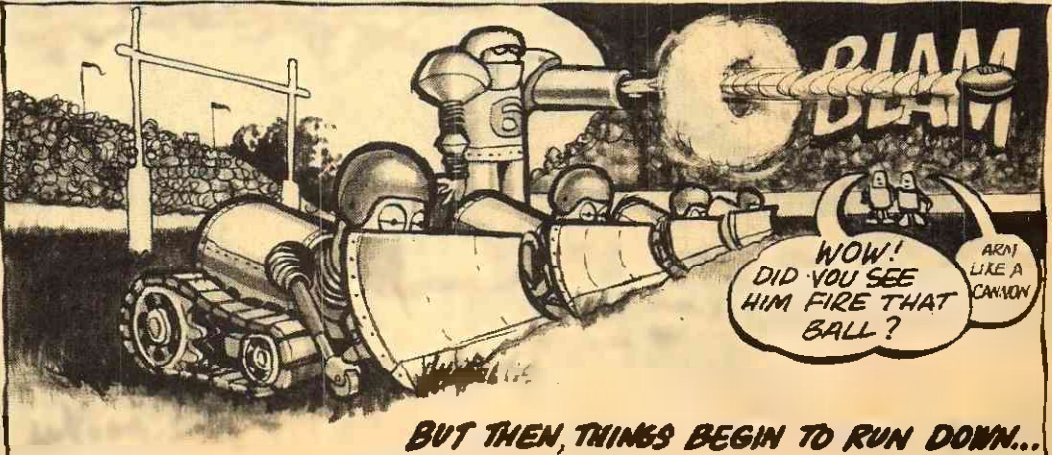
GREAT! JUST HAD AN OVERHEAD CAM INSTALLED TO-DAY

YOU DON'T NEED TO THANK ME NOW THAT WE'RE FREE!

ANYONE HERE FOR TV?

THANKS FOR THE GARBAGE

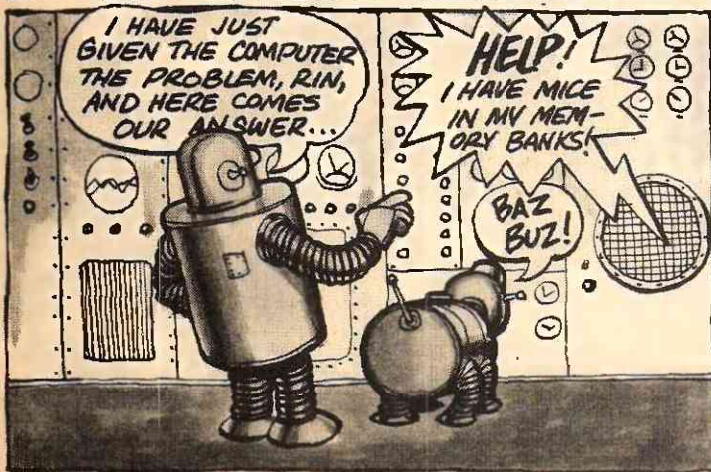
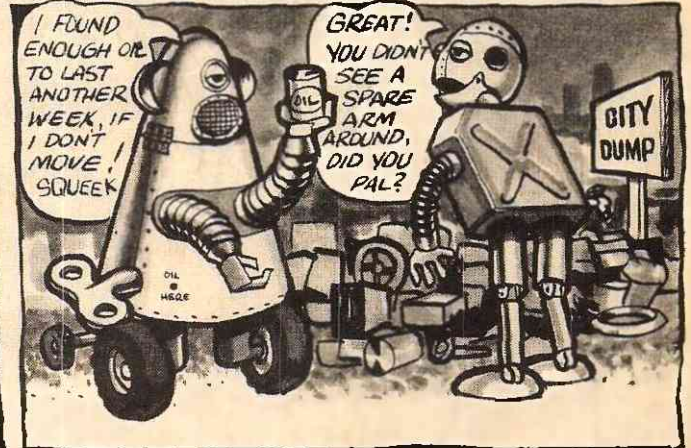
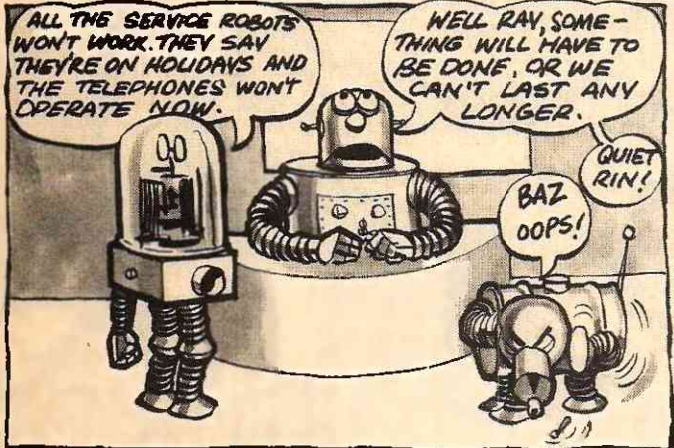
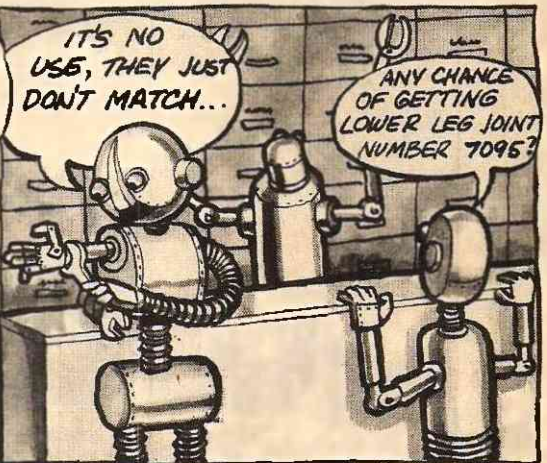
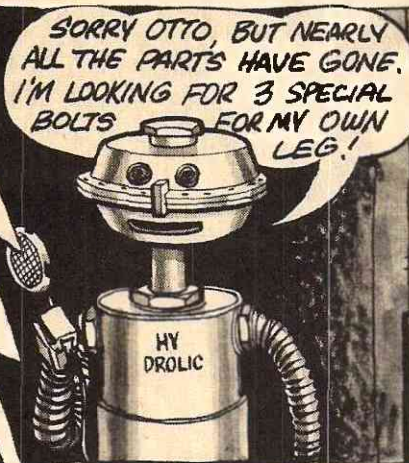
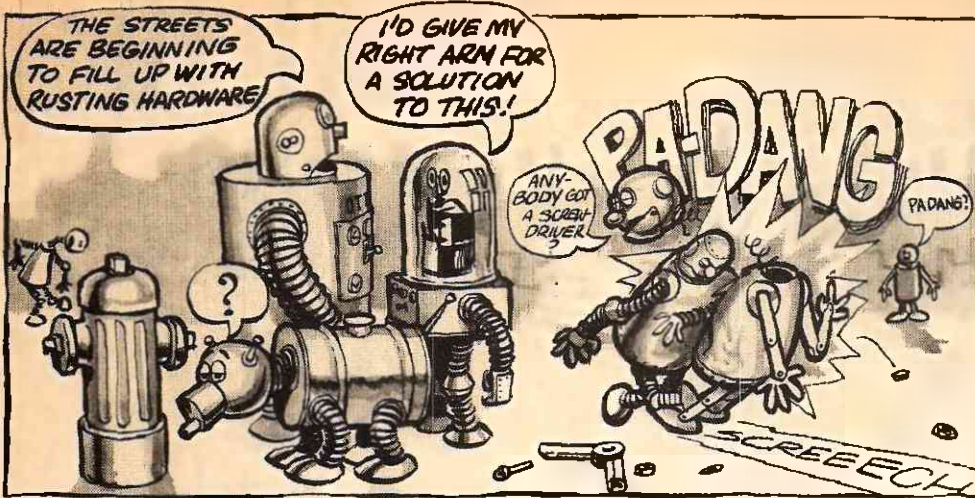
For a while everything goes well... PARTIES, GAMES LIKE THE GREASE CUP GAME BETWEEN THE TORONTO HALFTRACKS & THE VANCOUVER CATERPILLARS.



WOW! DID YOU SEE HIM FIRE THAT BALL?

ARM LIKE A CANNON

BUT THEN, THINGS BEGIN TO RUN DOWN...



WITH THE FAILURE OF THE GREAT COMPUTER, EVERYTHING FALLS APART. WHAT TO DO? YOU GUESSED IT! HEADING FOR BAFFIN ISLAND THE HARD WAY, ARE OUR INTREPID HEROES.





JUST TO MAKE SURE

BY ENOLA CHAMBERLIN

A boy scientist creates an army of miniature monsters, then faces the problem of controlling them!

I can't do it now, out here in the street. But when I get home and can stand over a piece of paper, I roll up my trousers, look at my socks, then turn my trouser cuffs down to see if any little brown crawly living thing falls out of them. It probably won't but it pays to be on the safe side.

It all began because Dad was a dedicated scientist. Dying, he handed me a torch to carry on. I couldn't take over where he left off because I wasn't fitted for it. But I could do something on my own. Even at that I might not have had what it takes to keep on keeping on had not Jim Reiser made so much fun of me, belittled me in my attempt to bring animate life to inanimate matter.

"And of all things, cockleburrs," he sneered. "What you going to do with them if you get 'em to burring around?"

I turned away from him and went with renewed determination back to my experiments. He wasn't a scientist. He simply couldn't understand that it wasn't what you did with a thing. It was whether or not your experiments were successful.

And I was sure mine would be. I'd already, by keeping the burrs in a liquid that was Dad's secret and mine, and prodding them with electric shocks, got a slight response. All I needed was time and for Jim to continue needling me to keep my ambition going. I told him I'd call him no matter what time of night it was when I'd succeeded.

"I'll sleep for a lot of nights yet," he snorted.

How little he knew. That night I couldn't sleep myself. There seemed to be an urgency in the air. I got dressed and came downstairs to the lab. I lived alone in the home where Dad and I had lived. It was a big old house set a long way away from any other house so I didn't disturb anyone no matter what I did.

Downstairs I went over to my burrs in liquid, picked up my electric pointers and touched two of the spiny things as I did about six times every day with nothing ever happening. But this time without my being wide enough awake to give a hope, something did happen.

The two burrs moved, actually rolled over and I was rubbing my eyes, thinking I must be dreaming. But no, they were rolling around, making little

scratchy noises against the sides of the pan.

I jumped to the downstairs phone and called Jim. When his grunt came through I was so excited I couldn't talk. All I could do was tap out our SOS signal. I knew that would bring him when nothing else would.

And it did. But while he was getting there I activated all the burrs I had in solution. So when he arrived I had fifty cockleburrs bumping into each other in the dishes.

"Well," he said, scornful as ever, "you did it. You proved you're a big shot. Now take the blasted things out and crush them! They could multiply and take over the earth!"

"You just go jump off for Mars," I stormed. "I've made them come alive. Now I've got to foster them, see what they'll do."

"Well, you can carry on alone," Jim slung at me. "I won't stay in the house with those horrors another minute!" He barged out, banging the door behind him.

I let him go. If a friend can't rejoice at your success, he isn't much of a friend.

I dipped the burrs out of the solution, put them on the table. In a frenzy of motion they rolled over and over until they fell off the edge to the floor. The continued rolling until they bumped into each other. Some continued rolling, others snuggled up together.

They will live or they'll die, I thought, and I went upstairs to bed.

When I got downstairs late the next morning twenty pairs of burrs rolled at me! They hooked themselves onto my pants and began to climb. A number lay unmoving, their hooked thorns broken off around them, evidence of fights.

I brushed the climbing burrs from my clothes and, thinking how I felt, decided they must be hungry. I got bread, dropped pieces of it to the floor. Instantly the burrs were on it. They scratched at it, ground out pieces but didn't leave any crumbs.

Since it was mid-morning I decided to call my professor, give him the glad news. He cut me off.

"Yes, yes, I know. Reiser told me. But so what? I expected something better from your father's son! Something that would aid humanity! Something to aid us in our colonization of Mars. Something to advance us in our fight against death. Not just fooling

around!" The phone clicked.

Well, the old dodo! Jealous, that's all! Not even generous enough to admit I'd performed a miracle. So I didn't call him or Jim either when I found two cockleburrs hovering over twenty-four tiny ones in a corner of the lab. But Jim found out because he called and I was so excited I had to tell him.

"Crush them, crush them all!" he yelled at me. "I tell you they're a threat to humanity!"

I hung up on him. Little cockleburrs a threat to humanity! How could anyone be so silly. But I did have more food for them.

Three mornings later I finished dressing and hurried downstairs. Something was wrong. It was too light down there. I'd kept the drapes drawn ever since I'd been working with the burrs. Then from the bottom step I saw. There were no drapes. The cockleburrs had eaten them. There was no floor! The whole area was moving towards me in waves of brown.

Before I could stir they were onto me, climbing up from my shoes to my socks, to my bare legs. They bit into me with their myriad of little thorns.

Kicking madly I raced up the stairs, crunching cockleburrs with my feet as I slapped them down from even as high up as my waist. I looked down. Horror gripped me. The whole mass was slowly but inexorably scratching its way up the stairs.

I dashed into my room, slammed the door, wedged a rug against the opening at the bottom. Then, being thankful I had a phone there, I called Jim. All the time I was picking cockleburrs out of my flesh where they were making ugly bleeding places.

"Bring a long strong rope, come to under my window." I chattered to Jim. "Whatever you do don't open any outside doors! And hurry!"

Jim got me out, good old Jim. We immediately set fire to the house. However, I never can be sure all those animated horrors died in the blaze.

That is why I always shake my trouser cuffs when I come in from the street to see if anything falls out of them. Anything brown and prickly that will go rolling off across the floor.



THE BACK SEAT DRIVER By Brian Hagell, Age 11

One of the causes of automobile accidents on the highway in Canada are people known as Back Seat Drivers.

One variety of back seat driver is the Expert Driver. You agree to take him on a fishing trip with you. He can't stand the way you drive. He hopes you get seriously ill so he can do the driving.

Don't stay in the right lane, he warns you. That is only for slow drivers. Pull over to the left lane. Which you do and almost smash into the car beside you. You drive in this lane a few minutes and the expert warns you. Don't stay in the left lane. That is only for passing the drivers in the other lane. So you pull over to the right lane. This keeps up for a half an hour. You are now going from lane to lane. Slow down, he warns you. You are going too fast. You go slower and slower until you hear horns behind you. So you press down on the accelerator and you smash into a big trailer truck. Nobody will ever know just what happened. No survivors.

A second variety of back seat driver is the ex-bus driver who got fired. He insisted on always driving at a speed of seventy or eighty miles per hour. He has only one remark to make.

Come on, slow-poke! Step on the gas! The only reason you invited him is that he is a cousin to your wife.

"There is a nice stretch of road ahead," he says. "Step on the gas." Which you do. You hit seventy, then eighty. Up a hill you go. You never see the warning signs, that the bridge has been moved. When they fish you out of the river, not one person will know what really happened. They will blame you for reckless speeding driving.

The third variety of back seat driver is your son! He has just taken a course on how to drive properly. He has one constant plea to make: Hey Pop, let me drive! Just once?

This is enough to get on your nerves, because he knows every page of the Drivers Education Book he studied under Mrs. Gomet in school. She is 69 and ready to retire. She doesn't even own a car.

You gotta keep your eyes on the road, he constantly repeats. Mrs. Gomet says that an accident starts when your eyes wander.

Shut up! you tell him. Just wait till I get home. No going out at nights with girls. I will cut your allowance in half.

He will never keep these promises because he turns around to show the displeased look on his face. At that moment the car jumps into the wrong lane and hits a truck marked EXPLOSIVES.

What can be done about this? Make a car without a back seat?

I think that I have a better idea!

Sell the car and buy a skateboard.

FUTURE WRITERS STORIES BY OUR READERS

You've been asking for stories by young writers. Canadian Boy is proud to publish the six stories on these pages, all written by Canadian Boy subscribers.



CANADIAN COUNTRYSIDE By Sandy Boyd, Age 12

I have been in Canada only one year. And I have been told many stories about "up north" in fall, and how beautiful it is. So last year I persuaded my father into taking me up there.

And all the stories were true!

It was the most lovely sight I have ever seen in my life, even more beautiful than old Scotland, where I was born.

While we drove around, I saw all the colors of the leaves, especially the ones on the maple trees.

Later we went on a tourist flight in a three-seater plane. From the sky the leaves looked like a carpet of green, brown, yellow and red patterns.

But when I went back to school on Monday and told the fellows about it, they could not care less. They are like most Canadians, who don't realize what a wonderful and free country they live in.



SOMEONE CANADIAN

By Gary Gillies, Age 13

The wind sighed softly into the face of vacationer Tom Peters as he stood atop a hillock on Lake Ottermere in Canada's northland. As speculation on the pleasures in store for him drifted by with the breeze, he perceived an irregularity on the far shore of this wilderness lake.

Through the misty dusk-haze he envisioned, where the "lunker" bass leap on crisp mornings, the bent figure of a Salteaux brave staring intently into the black pool at his feet. This first Canadian's deerhide breeches were covered with finely sewn beads and fringe. His black hair fell carelessly to his shoulders, while the long nose and stern, proud jaw told of a fierce love of Indian life. The co-ordination of muscles when he loosed the spear would give credit to his wily ancestors.

Tom was still gazing at the brave when strains of *Alouette* drifted from the fallen trees by the marsh. There, in three long wooden canoes, kneeled a score of gay French-Canadians. Brightly colored toques and sashes set off their fine homespun shirts and tanned leather moccasins. The dark locks of hair danced as they swung their heads in time to the rollicking chorus. Above the broad shoulders stood their leader, taking readings on his sextant to the sinking summer sun. It was hard for Tom to imagine how these later Canadians found the courage to brave the Indians, the unpredictable weather, the loneliness for distant Québec or France, the meagre rations, and still remain strong in spirit.

As the mist of distance at dusk closed over the canoes where lesser men aspired to be, Tom suddenly sensed a building tempo of song. Yes, it was beyond a doubt "... marching to Pretoria, Pretoria ..."

As he glanced south, he discerned on the burned-out hill a platoon of the cream of the corps. Canadians holding out in their battered fortress against hundreds of enemy troops. The figures charging up the hill with bayonets fixed were met by a wall of bullets, cold steel, and cheers of "God save the Queen!" The exhausted Canadians fought furiously; surrounded, outnumbered, and overrun. They twisted, and plunged, and struck blow after blow on the astonished Boers. Tom was ready to dash to the hill in aid when into sight came the owners of the proud voices. The Boers fell back as fresh troops forged forward in a solid line to recapture the hill, and take vengeance for their casualties.

At the Corps marched away, the *voyageurs* pushed on, and the Indian disappeared; Tom felt a growing might in his chest. He knew the glorious glow of power, of freedom; of a precious inheritance bought by many deaths, and by many hardships. That glow, that feeling he wanted to shout to the very heights of the heavens, was his pride in being Canadian, through and through.

And as he slowly turned to face again the modern world, he had trouble seeing the ground before him: there was something in his eye.



THE BIG DAY

By Robert Ellis, Age 8

The big day has come at last. The big round top circus is here. There is a merry-go-round with horses, elephants and steers. There are posters all over town. There are horses to ride half a mile for ten cents. There is Horror House for two cents.

You can go up in a helicopter for 25 cents. You would like the Ferris wheel. You can go around 12 times for 15 cents.

The merry-go-round was fun. It was going faster and faster all the time. Then I went to the fish pond. I got a toy truck but I gave it to my brother. I went up in the helicopter.

My brother was afraid. Then we went into the Horror House. There was a dummy witch on a broom. I heard a scream. It was my sister. She had seen the dummy witch on the broom.

You can buy hot dogs and root beer. The popcorn is only five cents. You can get prizes for duck-shooting and dart-throwing. There is a fish pond for ten cents. My friend and I went on the merry-go-round and took another ride on a helicopter. Up in the helicopter was fun. Then we took a boat ride in the pool. The horse would not stop when we were riding him.

Then we took another ride on the merry-go-round. I rode on a horse and my brother Willie rode on an elephant. My brother Joe rode on an elephant also. My sister Liz rode on a pony. My sister Cathy rode on a steer, and my sister Shannon rode on a pony.

At the fish pond I got a baseball glove. Willie got a toy truck. My friend got a horse and stagecoach. I got a horse and wagon. I wanted to do some duck-shooting. I won a gun and holster. My friend did, too. Then we did some dart-shooting. We both missed once. So we didn't get a prize. Then we went and got some root beer and ice cream, popcorn and hot dogs. Then we found we had five dollars left. Then we went on the Ferris wheel. We only went around once.

We had to go home now and my father said we were going home by bus. We saw a different circus just like the other one. My father said we would go to another circus. Pretty soon everybody was asleep.



THE BUG

By Matt Kudelka, Age 12

Golfus wildmantus is a bug about a quarter of an inch long and shaped like a stick with a round head. Some are soft and flat-sided on one portion of the head (*Woodus longestus*). Some are punier and harder-headed (*Ironus shorterus*). There is a pygmy species with almost no end to its shapes (*Puttus greenus*).

This minute bug is noted for its bite. When it bites, the victim quickly receives the urge to float down to the neighborhood sporting goods store and buy a set of plastic golf clubs for three dollars and eighty-eight cents. But it doesn't stop yet!

The victim gets the urge to knock a tiny white ball across a narrow clearing, desperately (and in vain) attempting to reach a small hole.

He steps up to the first tee with delusions of reaching the green in less than five. But he flubs one into the trees about 30 yards to the right. The half-crazed golfer finds a small opening through the jungle. He takes out a three-wood, sizes up his shot and slashes one, straight and true. It sails perfectly through the trees—right toward that branch! Nearer and nearer! He can hardly see straight with suspense. Then, four, three, two feet away. Then, just as his banshee wail forms, the little speck dips, grazing the branch, and drops in the centre of the fairway, 80 feet from the green.

Now the maniac takes out his wedge and drops the ball out of the sky just short of the green. He stifles a fit of anger and strides up to the ball. His chip shot is heading straight for the hole, three feet up. It hits the pin and drops about 10 feet from the cup. But now it starts to come back! Five feet, three feet, two feet; it stops on the rim of the cup! He gives out two banshee wails and pounds the earth with his fists!

The ball rims the cup and drops in. His fevered brain immediately conceives that the ball has vanished and he flies into another rage.

Now luck turns against him and he plays badly up to seventeen, including a seven on a par three.

But the last terrible symptom is about to occur.

The eighteenth hole is a short par three. He tees off, shaking like a leaf; the ball hits a tree, another tree, another! Always on the fairway. A cloud is gathering.

The ball skims through a water hazard and hits a rock. The cloud is spitting.

It hits the green; it starts to roll! Straight at the cup! Five feet! Three feet! A foot!

A lone thunderbolt streaks across the sky. Then, suddenly, the sky clears. All is silent and the fevered man is not there.

The only sign of him is a golf ball in the eighteenth cup.



A MOTION OF PROTEST

By Jack Ouellet, Age 11

There is a little song that goes like this: "What are little girls made of? Sugar and spice, and everything nice; that's what little girls are made of!" Who wants to be full of sugar and spice . . . ugg! I'd much prefer to be full of steak and apple pie.

And, gentlemen, have you ever heard the second verse of this song? It goes like this: "What are little boys made of? Snips and snails and puppydogs' tails . . ." Of course, we all know it was a girl who made that up!

Well, in the name of boys all over the world, I would like to ask the composer of that song a few questions:

When her confection of sugar and spice sees a mouse, who has to kill it?

When "everything nice" can't open the cover on a jar, who gives it a little twist and it opens?

Did you ever see a girl make a forward tackle on a football field?

Is there a girl anywhere who could get in the ring and beat Cassius Clay?

When Jean Béliveau scores, are the girls cheering for a puppydog's tail?

When The Beatles sing, are they squealing for a bunch of snips and snails?

Where would they be without our spare rib?

We boys must stick together and stop the girls from taking over our jobs or there won't be any use for us anymore. Let us put an end to songs like this or, better still, let us make our own version. In all humility, ladies and gentlemen, I would suggest the following:

What are little boys made of?

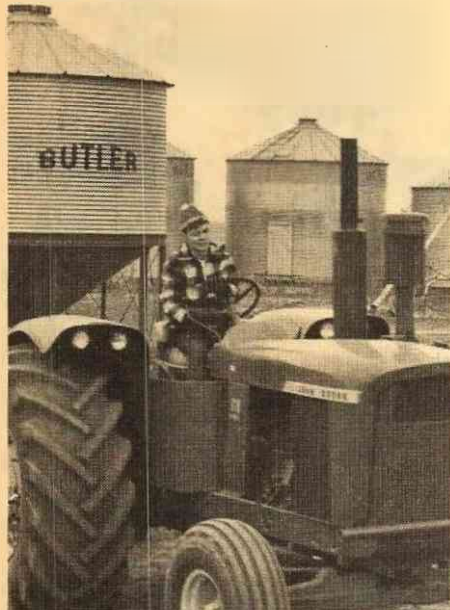
Muscles and brain,

And everything sane;

That's what little boys are made of!

If you don't believe me, just ask my best friend: my mother.

SASKATCHEWAN BOY: JIM WOODS



Jim likes to drive the big tractors on his father's wheat farm. There are unlimited opportunities here for a boy with mechanical aptitudes!

If you are a 15-year-old boy living on a Saskatchewan wheat farm, you just have to try harder to be a teenager. Look at Jim Woods, who lives near the little town of Pense, Sask. Among other things, he spends ten hours a day just going to school!

Jim's father is a dryland wheat farmer who cultivates about five square miles of rich Prairie soil. The Woods family lives among a sprawling cluster of buildings, about a mile outside Pense. The first thing a visitor notices is the lack of a barn. Instead, there are several granaries. The big, red hip-roofed barns, once so common, are disappearing from the Prairies. Most farmers today are specialists; if you grow wheat, you don't raise livestock, and vice versa.

The Woods' residence — like so many farm houses these days — is a modern ranch-type bungalow, nestled behind a windbreak of trees. In the background are the always-present grain elevators or "Prairie Sentinels" — and miles and miles

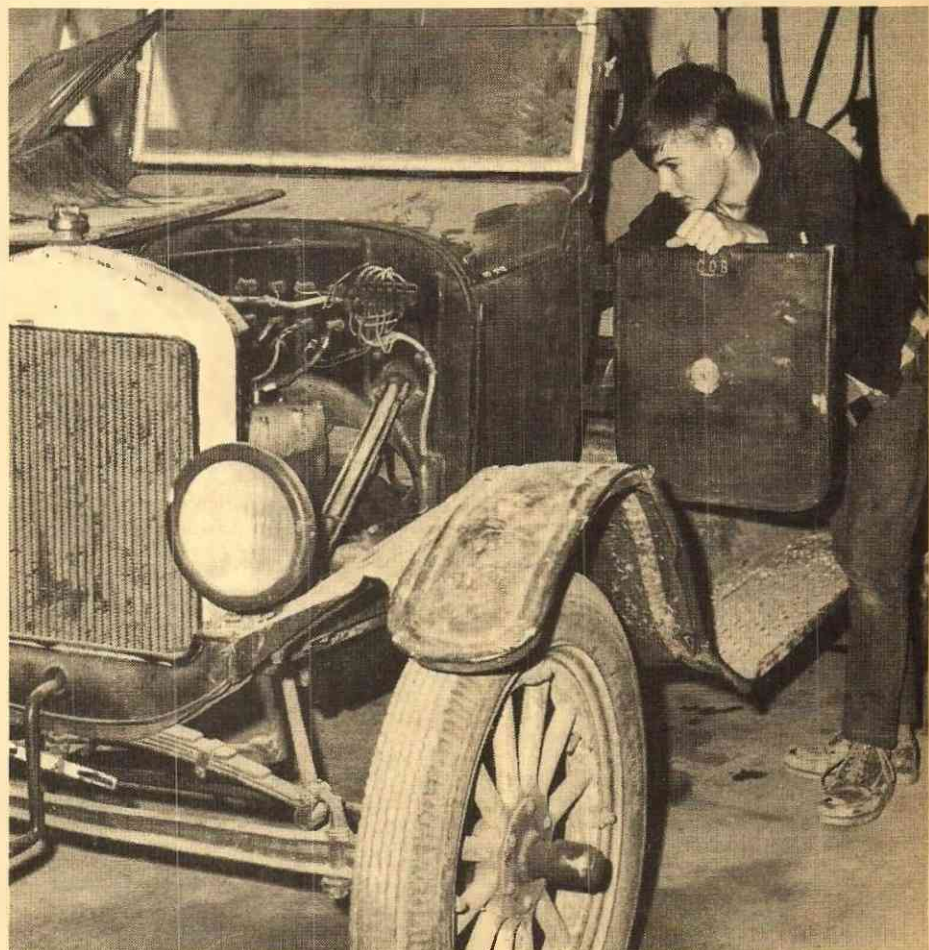
of nothing but miles and miles! Pense is situated near the centre of the incredibly flat Regina Plain, which is actually the silt bottom of a prehistoric lake. The horizon stretches twenty miles in every direction. It looks lonely to a city dweller, or an eastern Canadian, but Jim Woods has lived all his life on a wheat farm. He loves the clean lines of the Prairies.

Until this year, Jim went to school in Pense, but now he goes into the city of Regina to a large, modern collegiate — 20 miles away. The school in Pense was unable this year to get qualified teachers to come out to a rural town, so now all the high school students in the area take a school bus every day into Regina. More teenage students from the province's farms do this every year. In Jim's case, it means getting out of bed at 6:30 a.m. to catch his bus at 7:15. He gets home about 5 p.m. During the winter, he leaves and returns in darkness. This, plus the isolation, cuts down on extracurricular activities.

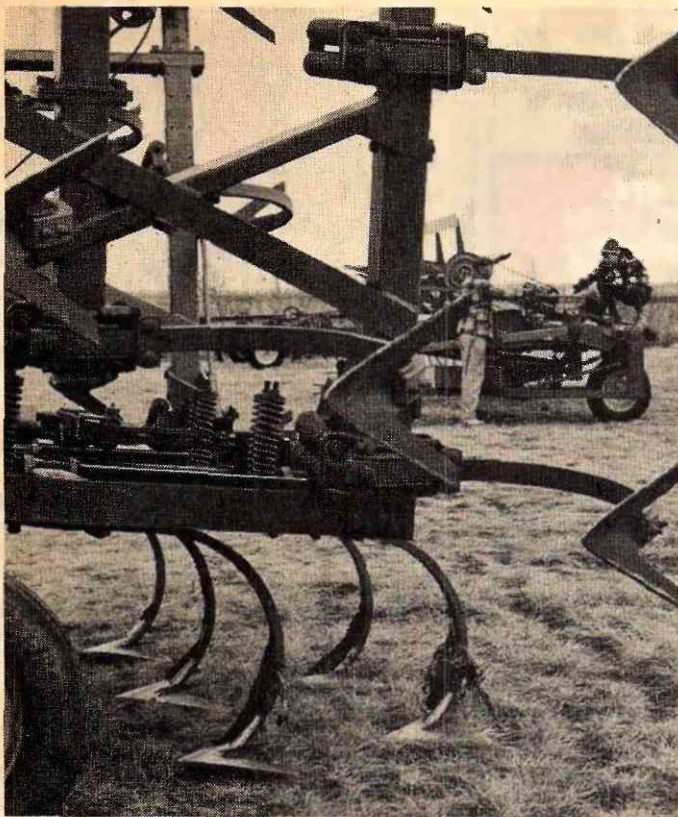
Switching to a city high school

has made big changes in Jim's life. "I felt like shooting myself the first few days," he says. "Everything was so big and confusing!" But things are working out now. He doesn't even begrudge the extra time travelling to and fro, because of the better facilities at the 750-student Thom Collegiate. He cannot play on any of the school's sports teams, because his school bus departs for home about the same time practices are held. This is a disappointment, but Jim can still take part in intramural athletics which are held during school hours. Occasionally he gets teased about being from the farm, but it no longer bothers him. After all, most boys only tinker with their dad's lawn mower — Jim can take apart a five-ton combine!

Every wheat farm on the Prairies has many thousands of dollars invested in machinery, so it is only natural that engines and machines should be of vital interest to a farm boy. Jim's father has tractors, trucks, combines, a swather, a deep-level cultivator, and other large pieces of equipment. There are un-



Jim is the proud owner of an ancient Model T Ford, which he found rusting on a nearby farm. He and a friend are restoring it.



Most boys only tinker with their dad's lawn mower. Jim can take apart a five-ton farm combine!



Jim is an avid hot rod fan, as you can see by the pictures on his wall! He plans on a university education.

limited opportunities for a boy with mechanical aptitudes! Jim himself — although too young to hold a driver's licence — is the owner of a motorbike and an ancient Model T Ford.

The Model T was discovered on a nearby farm, rusting into oblivion, and Jim decided to restore it with the help of a friend. They got the old car into running order after weeks of work, and had the pleasure of entering it in a parade last summer. It achieved a top speed of 20 miles per hour. The car is just one of the things Jim no longer has time for, while he goes to high school. But he is an avid hot rod and car fan, and subscribes to several such magazines.

Oddly enough, Jim's love for engines doesn't go as far as wanting to own a modern car. Even though the isolation of the farm would seem to make a car necessary for his social life, he says he can't afford to run one while going to school. What's more, he is apprehensive about its possible effect on his school work. He has seen it happen to too many of his acquaintances. Although he is miles away from all his friends, Jim says, "You can always catch a ride with someone if you want to go anywhere!"

Next year, when he gets a licence, he will have his motorbike for transportation. He bought it with money he earned out of his 4H Grain Club last year. The 4H organization encourages rural youths to undertake small enterprises in preparation for the business of grain and livestock growing. Almost every farm boy and girl belongs to a 4H club of some description. Jim, naturally, belonged to the Pense grain club. With other boys, he raised small plots of grain on his father's land, and tried to perfect the quality of the grain through modern methods of fertilizing, and weed and pest control. The boys sell their finished product to local grain companies. If the crop is good, as it was last fall, they stand to earn some good money!

Jim's major activity is in the lively Pense Boy Scout group. Whereas most Saskatchewan farm boys ten years ago would have been Lone Scouts, the rapidly improving transportation facilities and roads in the province now make small rural troops possible. There are 15 Scouts in or around Pense who come to the weekly meetings. Jim is the leader of the Eagle Patrol; he is half-way through his First Class Scout tests. Because of the flatness of the surrounding Prairie, the boys

have to go to Buffalo Pound Lake — about 40 miles away — to find good campsites. Occasionally they set up winter camps, in numbing temperatures of 20 below zero!

Although Scouting activities are curtailed during the winter in a small Saskatchewan town, the boys can — and do — turn to hockey. Jim plays right wing for the Pense team that plays in an informal little league setup with other towns around them. The competition is keen, and Jim looks forward to the time when it gets cold enough to put in the natural ice in the town's rink.

Another favorite sport among Saskatchewan boys is hunting. The Woods farm is in the middle of some of the best duck-hunting country in southern Saskatchewan. Hunting ducks on the Prairies is much different from duck-hunting in eastern Canada. There are sloughs and artificial dug-outs on almost every farm. All you have to do is sit beside them and wait quietly until the birds come in. There is a good slough less than a mile from Jim's back door. On Saturdays, he just walks over with his 16-gauge shotgun and brings home enough ducks for Sunday dinner!

Continued on page 27

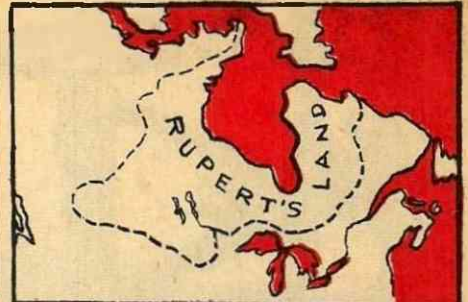
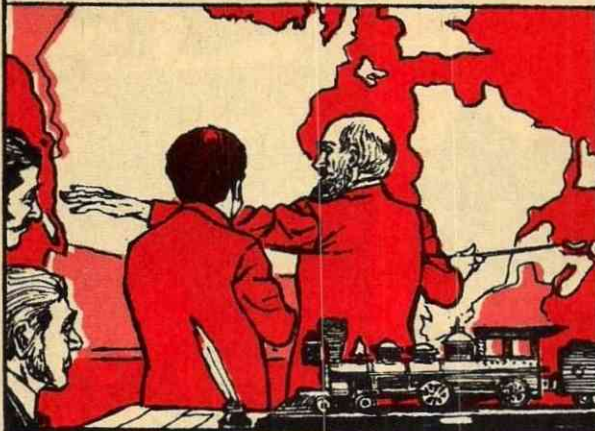
FROM SEA TO SEA



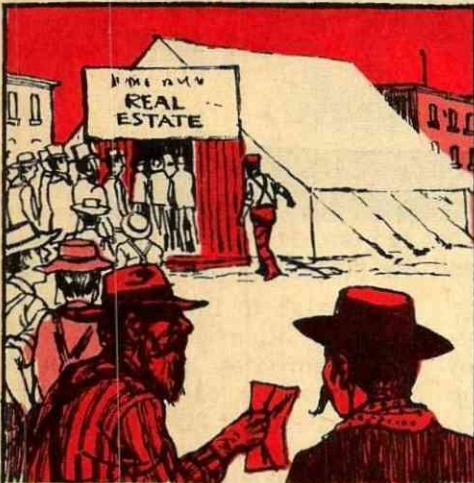
THE STORY OF CANADA

by James Simpkins

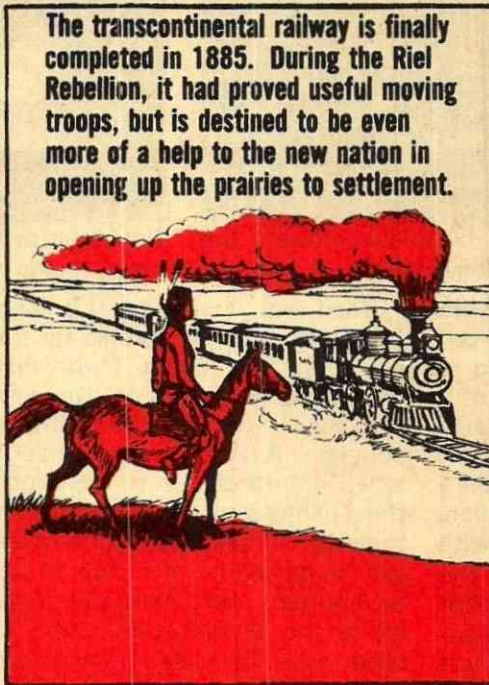
After Confederation Canada continues to grow. B.C. joins in 1871 after she is promised a railway link to the East. Prince Edward Island becomes part of the nation in 1873 after a financial settlement.



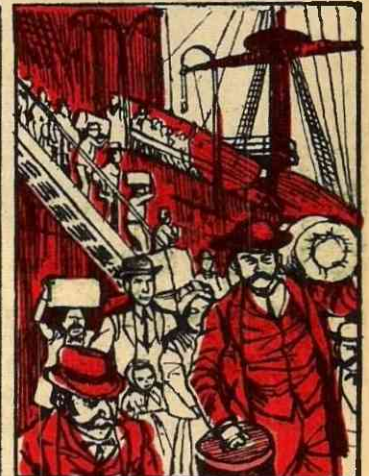
The gigantic area of Rupert's Land is absorbed into the new Dominion by act in 1868. The Hudson's Bay Company, former owner of the vast territory, is compensated in 1870 for the loss of its monopoly. Manitoba becomes a province the same year. Filling the new land is the next big problem.



The Homestead Act of 1872 allows a new settler to secure 160 acres of land on which he has to live and raise crops for three years. The price for this? A \$10 fee! Now all that's needed is a way to transport settlers to the West.



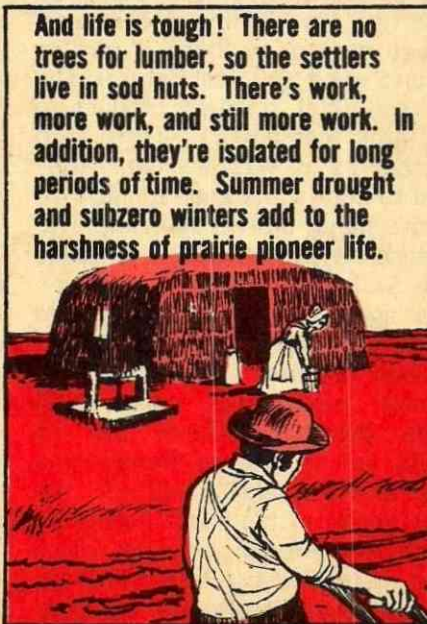
The transcontinental railway is finally completed in 1885. During the Riel Rebellion, it had proved useful moving troops, but is destined to be even more of a help to the new nation in opening up the prairies to settlement.



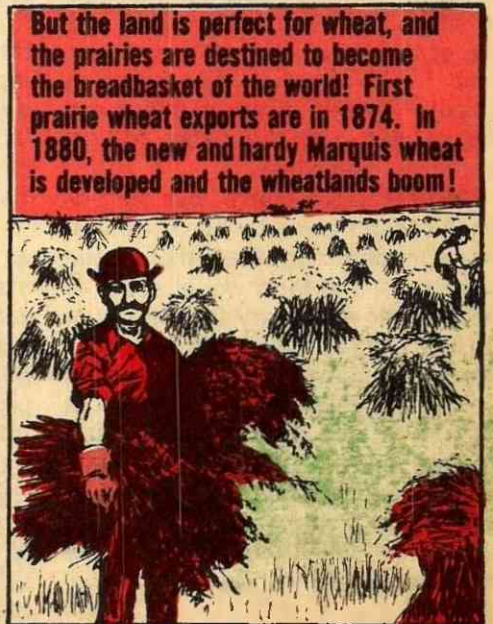
By the end of the century, a new immigration policy lets Ukrainians, Poles, Icelanders, Germans, Finns, Norwegians, and a host of others flock to Canada's Northwest.



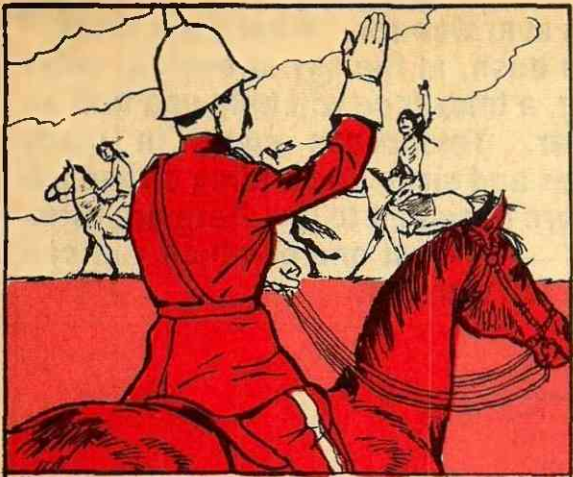
These new Canadians mix with the flood of settlers from Eastern Canada and the midwestern U.S., where the land is filled up. A new Canadianism is born on the Canadian prairies, where people of a dozen nationalities pioneer side by side in a hard land.



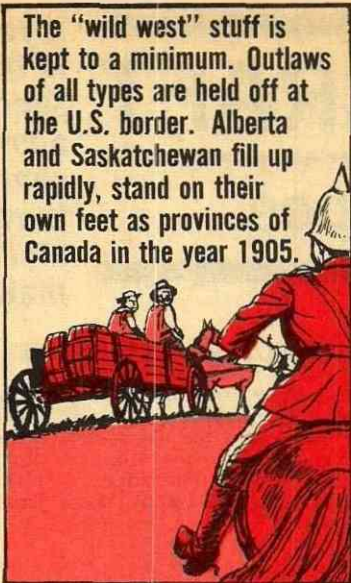
And life is tough! There are no trees for lumber, so the settlers live in sod huts. There's work, more work, and still more work. In addition, they're isolated for long periods of time. Summer drought and subzero winters add to the harshness of prairie pioneer life.



But the land is perfect for wheat, and the prairies are destined to become the breadbasket of the world! First prairie wheat exports are in 1874. In 1880, the new and hardy Marquis wheat is developed and the wheatlands boom!



The North West Mounted Police, formed in 1873, bring law and order to the west, and maintain peaceful relations with the prairie Indians.



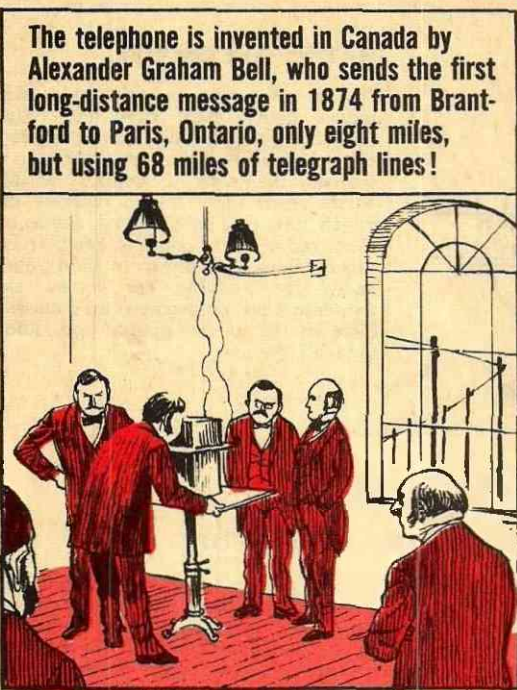
The "wild west" stuff is kept to a minimum. Outlaws of all types are held off at the U.S. border. Alberta and Saskatchewan fill up rapidly, stand on their own feet as provinces of Canada in the year 1905.



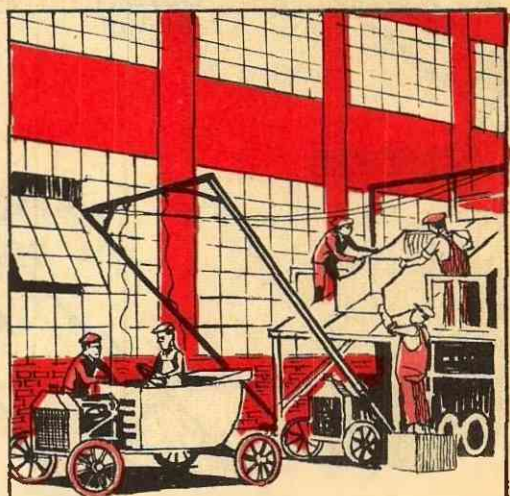
In the late 1800's life in Canada changes. While still primitive in some areas, the country is growing and maturing rapidly.



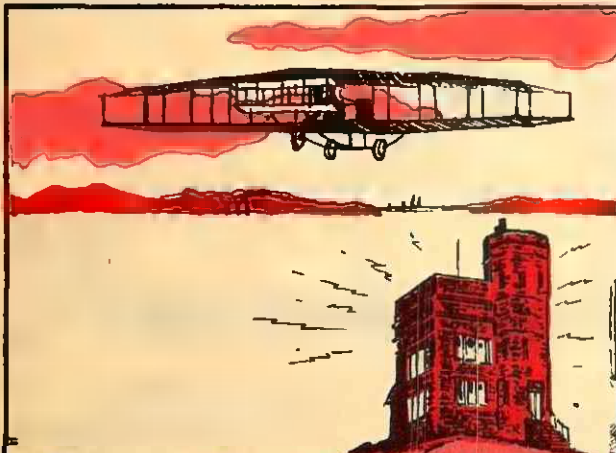
Gas is used for lighting but is replaced almost immediately by the new-fangled electricity! City life becomes almost luxurious compared to a few years earlier!



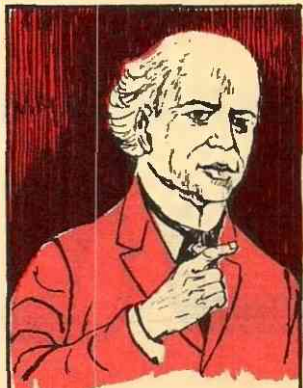
The telephone is invented in Canada by Alexander Graham Bell, who sends the first long-distance message in 1874 from Brantford to Paris, Ontario, only eight miles, but using 68 miles of telegraph lines!



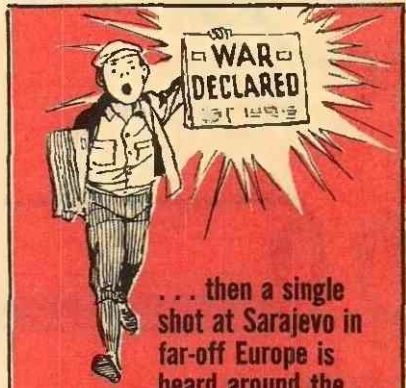
Cities grow, industries mushroom, the economy expands. By 1900, the first cars appear in Canada, and four years later, the Ford Motor Company starts mass-producing automobiles here.



More new inventions are seen. The world's first wireless message has already been sent in 1901 from Newfoundland to Britain. In 1909, J. A. D. McCurdy makes first airplane flight in British Empire over Nova Scotia in his Silver Dart.



Canada's prime minister Sir Wilfrid Laurier declares that "The 20th century belongs to Canada!" And it does appear that we will be a great power . . .



. . . then a single shot at Sarajevo in far-off Europe is heard around the world! War erupts! It will be one of the turning points in Canada's history.

Next: THE GREAT WAR

SCOUTCRAFT

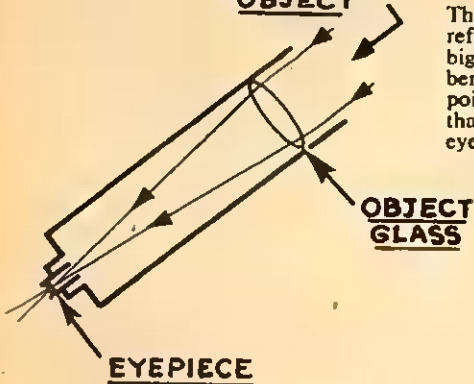
Telescopes

If you ever wonder, "What's out there?" in the bush, in the sky or even in outer space, a telescope will help you find an answer. Telescopes come in many shapes and sizes, depending on the job they are designed to do. Here are three kinds — at least one of which you can make for yourself.

LIGHT RAYS FROM OBJECT

REFRACTING TELESCOPE

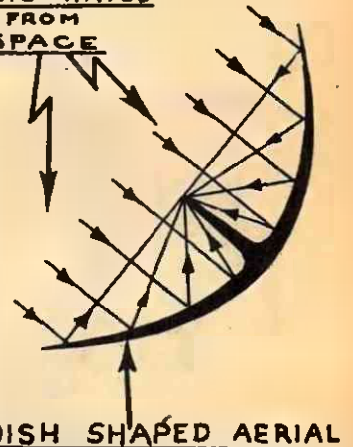
The earliest and simplest telescopes, called refracting telescopes, have two lenses. The big one, called the object lens, gathers and bends the light rays from an object to a point of focus. This forms a small image that is enlarged by the small lens in the eyepiece.



RADIO WAVES FROM SPACE

RADIO TELESCOPE

Just as refracting and reflecting telescopes gather light rays, the radio telescope gathers radio waves. Instead of focusing them to an eyepiece, it focuses them to a central aerial, which feeds them into a receiver on which they can be observed. Some of these radio waves come to earth from objects that are millions of light years away. By studying the waves, astronomers are enlarging man's knowledge of the earth's galaxy and other galaxies beyond.



LIGHT RAYS FROM OBJECT

REFLECTING TELESCOPE

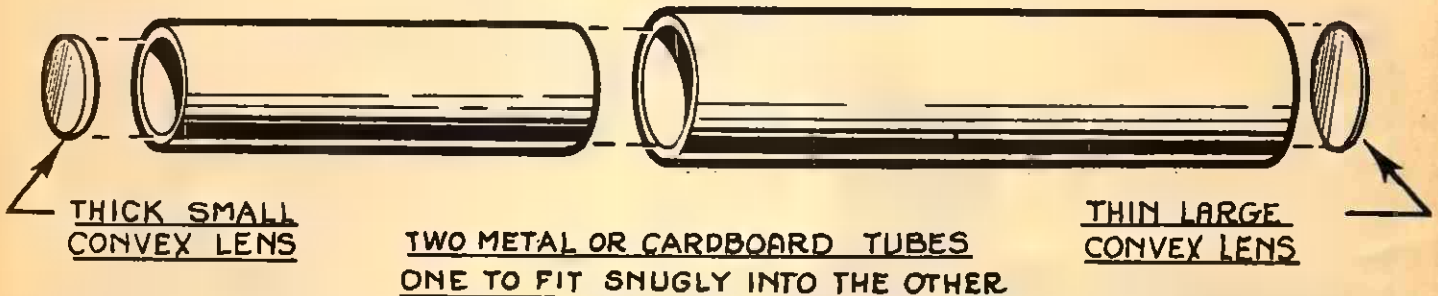
A reflecting telescope gives a larger and sharper image. Light rays are reflected by a large curved mirror toward a small flat mirror. The small mirror is tilted so that the image is seen through an eyepiece at the side. Many observatories and amateur astronomers have this kind of telescope.

SMALL TILTED MIRROR

EYEPIECE

CURVED MIRROR

How to Make a Simple Telescope



SIMPLE TELESCOPE

Hold lenses in place with tape or glue used in model building. Slide smaller tube in and out until object you are viewing comes into clearest focus. Lenses should be available from hobby shops or optical supply houses. The lenses must be mounted straight,

should be kept clean, and should just fit into the tube so that none of the lens surface is obstructed. Even a simple telescope such as this should be able to pick out the craters of the moon on a clear night!

LETTERS TO LESTER



HE'S GOT 300 PENPALS!

Dear Lester:

Thank you very much for putting my request in your *Penpals* column (CB, May '67). I have already received 300 letters in six weeks. I would also like to thank the persons who sent me their letters. It will take me quite a long time to answer all of these letters.

Chris Brereton, Vancouver, B.C.

All you guys who wrote to Chris will have to be patient and give him time to reply to you. He's slaving away right now at his summer cottage, ploughing through the fan mail!—LS

SURVIVAL TIPS COMING UP

Dear Lester:

Those stories about *Jerry Potts* and *Camping '67* were good! I hope you continue putting in *Hustle Buck!* and *Award for Valour*. I am surprised, however, that you have not left some space in an edition of CB for the emergency foods in Canada's forests. By this I mean the edible roots, berries, barks, and so on, throughout Canada. Articles like this may help Scouts who plan to go on a survival hike.

Michael LaBerge, Bourlanaque, Que.

Space is reserved in our November issue for a survival article by British Columbia writer *Jan Gould*. It will give you some answers to the problems of finding food in the forest!—LS

FLICKS FLICKERED — NOT OUT

Dear Lester:

You've got a mint magazine! June's issue was the best. You should make more like it. *Rib Ticklers* was good. By the way, what happened to *Movies*? I just started to like it!

Bruce Reynolds, Kelowna, B.C.

Our movie reviewer missed that one issue of CB because he had been travelling in Britain and the U.S. on assignments for other publications. Pressure of the resulting work forced him to bow out of the June number.—LS

RULE OF THE ROAD

Dear Lester:

I like your magazine very much. I saw the story about *Quebec Boy: Bruce Tremblay* in the May issue. One thing wrong with Bruce Tremblay is that he walks on the right side of the road when he should walk on the left side of the road facing traffic.

Claude Thibodeau, Bagotville, Que.

Hey, Bruce! What's your excuse?—LS

MOVED TO MONTSERRAT

Dear Lester:

It gives me great pleasure to once again write to you. I have recently moved to the island of Montserrat, in the West Indies. I have, until my move here, enjoyed reading *CANADIAN BOY*, which I received at Clarkson, Ont. I am still interested in being a subscriber, and would much appreciate your forwarding all future copies to my new address.

Tony Corfe, Spanish Point, Montserrat, W.I.

Taken care of, Old Chap!—LS



How would you like a shot at the 1972 Olympics?



The thing to do is to get started shooting right away.

And that's where C-1-L can help you through its Dominion Marksmen Programme.

All you need to form a shooting club is four or more other fellows. We supply free targets and complete instructions for setting up a rifle range.

You'll be surprised how quickly your marksmanship improves. First, because you'll be shooting more often. Second, because shooting in competition with yourself and others will give you greater incentive to improve.

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Many of our Dominion Marksmen members compete in local and national shooting competitions.

Some have gone on to represent Canada in the Olympics.

You can create the same opportunity for yourself. And it's a lot of fun trying.

For complete details, write: Dominion Marksmen, P.O. Box 10, Montreal, Quebec.

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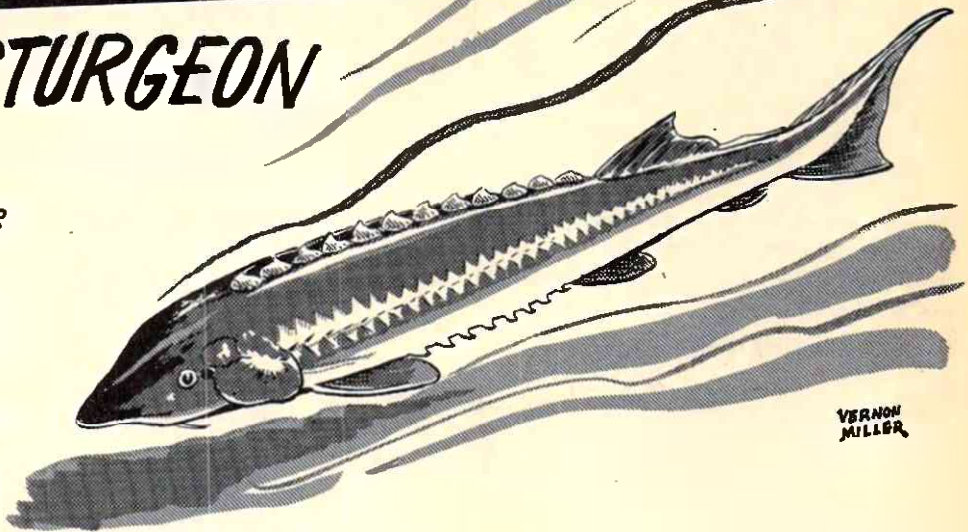
The WHITE STURGEON

IS THE LARGEST FRESH-WATER FISH IN NORTH AMERICA AND IS FOUND PRIMARILY IN THE STREAMS & RIVERS OF BRITISH COLUMBIA.

ONE SPECIMEN, WHICH WAS CAUGHT IN THE COLUMBIA RIVER, WEIGHED 1,285 POUNDS AND WAS 12½ FEET LONG.

THE STURGEON IS A REMINDER OF THE FISHES OF ANCIENT TIMES AS IT HAS AN ARMOUR OF BONY PLATES AND SCALES COVERING ITS GREAT TUBULAR BODY....

IT IS TERRIFYING IN APPEARANCE, YET IS HARMLESS AND TOOTHLESS, A MERE GRUBBER IN THE SAND AND RIVER BED AFTER FISH EGGS, SMALL AQUATIC CREATURES AND WORMS....

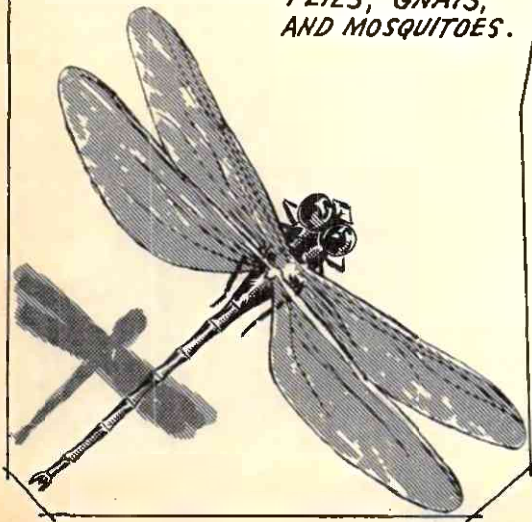


VERNON MILLER

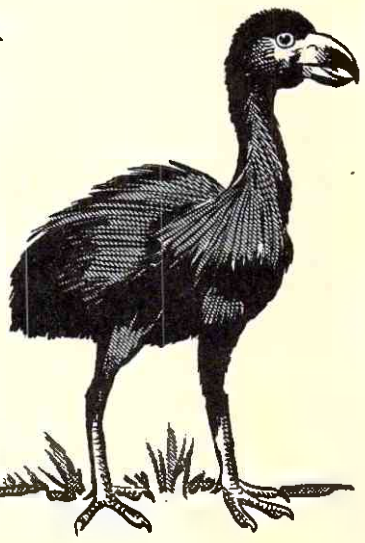
The DRAGONFLY

A FULL-GROWN DRAGONFLY IS REMARKABLE NOT ONLY FOR THE BEAUTY OF ITS WINGS BUT ALSO FOR ITS HUGE EYES.... MOST INSECTS HAVE COMPOUND EYES, BUT THE DRAGONFLY HAS ESPECIALLY LARGE ONES... EACH EYE IS MADE UP OF ABOUT 30,000 TINY EYES... DRAGONFLIES ARE AMONG THE STRONGEST FLIERS IN THE INSECT WORLD... IT CATCHES AND EATS

FLIES, GNATS, AND MOSQUITOES.



The DIATRYMA BIRD



THIS BIRD WAS A FLIGHTLESS GIANT OF OUR NORTH AMERICAN PLAINS 60 MILLION YEARS AGO.

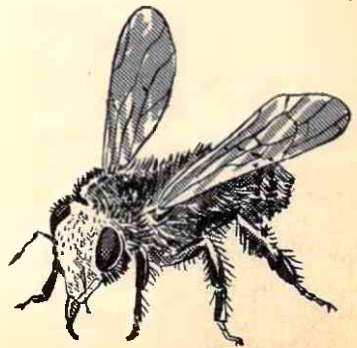
IT STOOD SEVEN FEET TALL AND HAD A HEAD AS LARGE AS THAT OF A HORSE...

ITS POWERFUL LEGS AND SHARP BILL SUGGEST THAT IT WAS A PREDATOR OF SMALL MAMMALS AND REPTILES...

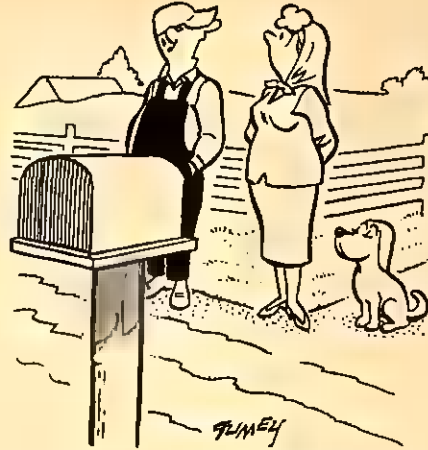
The HONEY BEE

CAN CARRY ITS OWN WEIGHT IN CARGO... IN ORDER TO FILL ITS HONEY SAC, A BEE HAS TO VISIT BETWEEN 1,000 AND 1,500 INDIVIDUAL FLORETS OF CLOVER.

ABOUT 60 FULL LOADS OF NECTAR PRODUCE ONLY A THIMBLEFUL OF HONEY...



WINNERS OF THE CB GAGLINE CONTEST



Here they are! The three winners of the CB Gagline Contest, which appeared in the May issue!

First prize — Steven Klein, 10, R.R. No. 2, Tavistock, Ont. **Gagline** — "You and the dog go home. It's my turn to bite the mailman."

Second prize — Scott Bonner, 11, 3937 Lauder Rd., Victoria, B.C. **Gagline** — "I still don't think there's a 'Bone of the Month Club'."

Third prize — Gregory McGillis, 8, Box 52, Smiley, Sask. **Gagline** — "Maggie, you've been standing here for two hours already, and Zeke just went to camp last night."

This was a really tough contest for the judges

to decide. There were hundreds of truly imaginative gaglines submitted from readers in every province of Canada and overseas. In many cases, the same gagline was dreamed up by several readers in different parts of the country. But the three winners were selected from all the rest because of the originality and aptness they displayed.

Steven Klein, winner of the first prize, will receive the artist's original drawing of the contest cartoon, suitably framed, plus \$5. Scott Bonner wins the creased and crumpled \$2 bill, and Gregory McGillis is the new owner of the mouldy \$1 bill.

The Next Hundred

Continued from page 9

ble form is the prime need in agriculture, and agriculture is still the basic industry upon which our society depends.

I have already referred to the question of air pollution and to the use of electrical energy rather than energy derived from coal, natural gas or petroleum, as a means of minimizing it. But there is also the tremendously important problem of water pollution to be dealt with in the future.

Water remains man's most important mineral. Without water, life is impossible. It is essential that large-scale research be undertaken to free our rivers and lakes, and indeed the oceans, from the menace of widespread pollution. This research will also have an important influence on food production because the fish population of the earth will perhaps begin to increase again.

And this leads me to the question of conservation of all our wonderful natural resources. The pulp and paper industry requires an ever-increasing amount of timber while con-

struction industry requires gravel, and the mining industries are continually denuding the earth of its riches. And all these activities of man call for a searching review of how our earth is being changed. We must ensure, at all costs that, wherever possible, denuded resources are replaced through, for example, reforestation. Waste is prevalent in modern society and our research in such fields as the social sciences and sociology must be aimed to some extent at minimizing it. Pollution, in all its forms, is perhaps the worst offender.

I have touched merely on a few areas in which I anticipate important implications for man and his society. Now, instead of trying to paint a broad picture of the future, I have chosen two fields for special attention. The first is the exploration of space, and the second is the future evolution and application of the electronic computer.

THE EXPLORATION OF SPACE

Within three or four years it is virtually certain that an American astronaut and a Soviet cosmonaut will have landed on the moon's surface and returned to Earth. This will cre-

ate a tremendous surge of interest in space exploration and will, justifiably, be considered as man's greatest achievement in the world of science, applied science and engineering. Perhaps you will not understand fully how much scientific and engineering research will have gone into this mammoth project. It would have been quite impossible, for instance, without fantastically high-speed and high-storage-capacity computers, or if new discoveries in the field called "space medicine" had not been achieved. Here are some of the important scientific and technological developments which were essential for the moon landings.

In the area of spaceship guidance, for example, highly precise radar equipment is necessary, and precise navigational systems which ensure that the path of the spaceship is always on course for the moon, or, on the return journey, for Earth—any errors in navigation would lead to failure of the mission and perhaps tragedy. The spaceship must be kept in continual communication with Earth and this necessitates high-power radio and television transmission and

Continued on page 25

AWARD FOR VALOUR.....

DOUGLAS BIEBRICK, II, WAS FLOATING IN BRERETON LAKE, MANITOBA, ON AN INNER TUBE, WHEN HE WAS UPSET, ABOUT 80 FEET FROM SHORE... HE WAS FLAILING AROUND IN SIX FEET OF WATER, UNABLE TO HELP HIMSELF... BLAIR ISAAC, II, SWIMMING NEARBY, CHURNED THROUGH THE WATER TO DOUGLAS' SIDE AND TRIED TO HELP HIM.

DOUGLAS RESISTED IN PANIC, AND FORCED BLAIR UNDERWATER SEVERAL TIMES... FINALLY, BLAIR MANAGED TO PULL DOUGLAS TO A SPOT WHERE THEY COULD BOTH TOUCH BOTTOM.

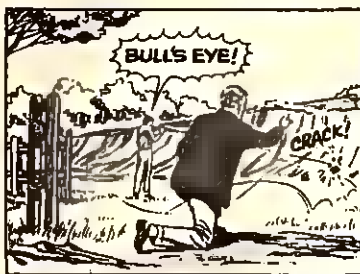


SCOUT BLAIR ISAAC, WHO WAS A CUB SIXER AT THE TIME OF THE RESCUE, NOW SERVING IN THE 72nd WINNIPEG TROOP, WAS AWARDED THE SILVER CROSS BY THE LATE GOVERNOR-GENERAL VANIER FOR HIS GALLANT AND SUCCESSFUL RESCUE...



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The Next Hundred

Continued from page 23

receiving equipment.

The environment of the spaceship must be controlled so that the astronauts can live as comfortably as possible in restricted space and under gravity-free conditions, and the spaceship must be correctly oriented at all times with respect to both the sun and Earth, so that its solar cells always face the sun and its radio antennae are always ready to transmit or receive information from Earth.

At all times, the position, direction, and speed of the spaceship will be measured and fed into computers to ensure that it is on course; if not, special small "guidance rockets" will correct it.

Having reached the vicinity of the moon and probably being in orbit around the moon, there remains the task of the lunar landing operation itself. It will involve separating the spaceship into two separate capsules with appropriate power supplies, in the form of rocket fuel. The one is to remain in orbit around the moon in readiness for the return journey to Earth, and the other is to be used for the actual landing operation.

After the landing and moon surface exploration phase, the moon capsule must be "lifted off" the moon's surface and must rendezvous with the mother spacecraft. After that comes the return-to-Earth manoeuvre.

This may sound simple, but I can assure you that technically it will involve by far the most sophisticated engineering ever conceived and developed by man. The whole moon-landing operation will mean thousands of hours of computation on the world's most powerful computers.

In fact, the whole operation will

be simulated on a computer many, many times to ensure that nothing is left to chance and that the probability of the safe return to Earth of the first man to land on the moon's surface is extremely high.

We must now ask: What next?

Throughout history we have set our sights on certain objects. Once we've arrived, we've looked around for new challenges. It happened with the evolution of railways, automobiles and aircraft; it happened with printing and the computer. In each of these examples man started with faltering steps but, with his eyes set on distant horizons, he usually achieved what he set out to do. In some cases, it took centuries!

But when the goal appeared to be reached, other more distant and difficult goals were envisioned and the process started again, climbing to ever greater heights. So it will be in the space program.

After the moon, what next?

One of the leading space authorities in North America, Professor Abraham Hyatt, has predicted that it will be a manned landing on the surface of Mars!

The planet Mars has always held a special fascination for man because in many respects it is Earth's nearest relative. A manned Mars expedition would create tremendous excitement and fascination for people all over the world because this would be the first real space adventure involving a journey of more than 70 million miles and taking about 18 months to accomplish!

Space scientists have already studied the problem of a manned landing on Mars in some detail. As a result of these studies, it appears that the most favorable period for carrying out the Mars expedition will be dur-

Continued on page 28

Movies

BY CLYDE GILMOUR

Shrewdly aimed at the so-called Family Audience are two new movies about teachers and students—one from Hollywood, one from Britain.

TO SIR, WITH LOVE is the British entry although its only "name" belongs to a familiar Hollywood personality, the Oscar-winning Negro actor, Sidney Poitier. His role is that of a teacher from British Guiana, with considerable U.S. experience, who really wants to be an engineer but accepts a temporary job on the teaching staff of a tough slum-area school in East End London.

Race prejudice is by no means absent in today's England, and this is clearly shown in *To Sir, With Love*. The colored teacher has this obstacle to fight as well as the let's-all-be-slobs attitude of the class. By almost superhuman self-control and strength of character he wins them over—a bit too easily and too suddenly, I thought—and nobody in the audience will be amazed when "Teach" decides to abandon engineering at the finish. The film deserves praise for emphasizing the idea that every boy and every girl is a separate and unique individual, not a "type."

UP THE DOWN STAIRCASE is the Hollywood entry, based on the best-selling novel by a former New York teacher, Bel Kaufman. The instructor on the spot is not a man but a young woman (Sandy Dennis), and at times she is terribly discouraged.

The tough school where she works seems to be situated in Spanish Harlem, with many Negroes and Puerto Ricans among the students, and much poverty among their parents. A problem boy with a brilliant mind tries to get fresh with her, and even on the staff she has people who make things tough for the sensitive newcomer.

Up the Down Staircase wanders a lot in its story and seems a bit too long at two hours. As in the case of the Poitier film from Britain, the teacher's decision to stick with the job is a foregone conclusion. But there are some fresh and honest scenes in this Hollywood production, and it ought to stimulate some lively discussions in real-life school yards.

JUNIOR SALES CLUB OF CANADA, Dept. 106, Ajax, Ont.

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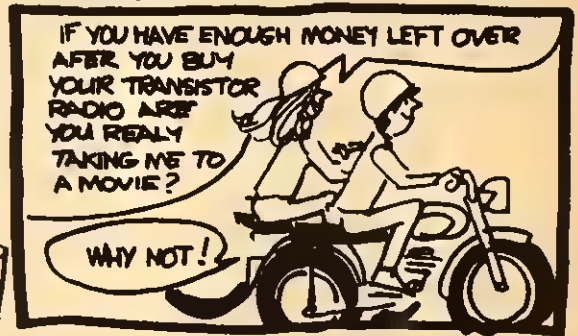
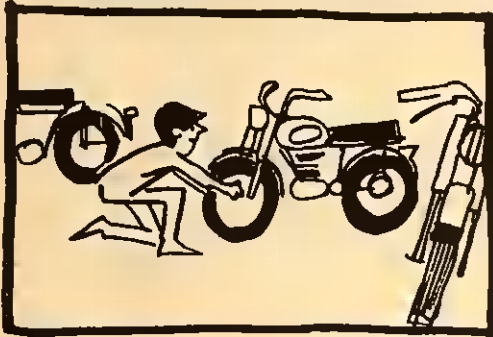
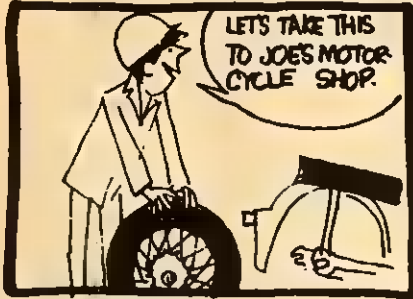
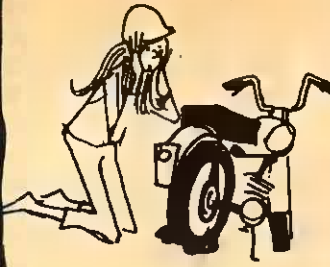
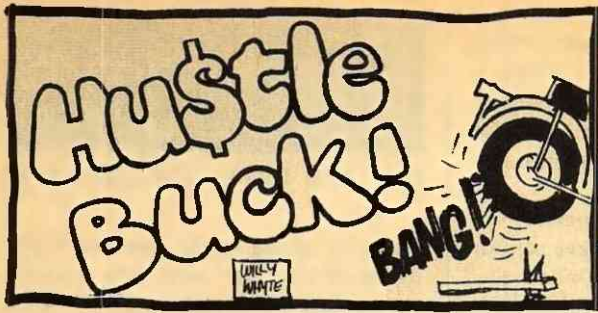
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Rules

1. Photos must be taken by entrant. Any number of photos may

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2. The contest is limited to amateurs, 8 to 18, who subscribe to Canadian Boy.

3. Photos may be black and white or colored, must be unmounted. Do not send negatives. No retouching is permitted.

4. Send prints to Photo Contest, Canadian Boy, Box 5151, Station F, Ottawa 5, Ontario. Print your name and address clearly on the back of each picture. No prints will be returned.

5. Entries must be postmarked not later than midnight, September 30, 1967.

Use This Official Entry Form

Name

Address

Age Where photo taken

When photo taken

Names and addresses of people appearing in pictures

Saskatchewan Boy

Continued from page 17

He helps with the seeding in the spring, and the summer following. Jim is thinking of becoming a commercial airline pilot, but has made no final decision. Consequently, he is planning on a university education so he can play the field of employment opportunities. He doesn't know what he will study, though.

He says, "My best grades are in French and geometry. What can you do with a combination like that?"

Social life for a farm boy is nowhere near as limited as it once was. Because of their car and the improved roads, the Woods family can make use of all the facilities in Regina. Jim can go to the dances at his school; his mother can shop in the large stores; the family can go to shows, to plays, to good restaurants. There is also a lively community spirit in Pense. Jim belongs to a youth group sponsored by the three churches in the little town, and they have dances almost every weekend.

Either the "mod" ideology is taking a long time to get to Pense, or Jim Woods is a particularly independent youth! He likes the music and he likes the clothes — but not the label. He feels it is a mistake to label any generation, when achievement — or non-achievement — depends on the individual. By the same token, he says he prefers to do his own thinking, rather than adopt a group to do it for him! His parents encourage Jim, along with his brother and two sisters, to be independent and think before they act.

Jim Woods and his family are in many ways typical of Saskatchewan's farming community. They are isolated in only one way — physically — and that isolation is slowly disappearing. Their lives are filled with the activities of other Canadians. They have to go farther and try harder, but they get there, even through raging Prairie blizzards and temperatures of 30 or 40 below zero!

They lead busy modern lives. Today, farm boys like Jim Woods no longer face a life of little education and poor opportunities. Their horizons are as wide as the world!

By Ken Mitchell

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PARENT'S SIGNATURE

The Next Hundred

Continued from page 25

ing the period 1986-1988, that is, in 20 years' time. This period has been chosen because at that time Earth and Mars will be in what is called "opposition". This means that they will be the closest together that they will have been in many years.

The number of crew involved will probably be eight and the total time for the mission is about 500 days. Of this time the actual journey to and from Mars will require about 460 days and there will remain 40 days for exploration of a small area of the Martian surface.

In order to accomplish such a mission it will be necessary at the start to have a space base station orbiting Earth and weighing about 1,000 tons. To put such a massive station into orbit will of course take many individual launchings from Earth's surface and an equivalent number of rendezvous in orbit.

The propulsion energy required to take the Mars spaceship out of its Earth orbit and, on the return trip, out of its Mars orbit, will come from a nuclear propulsion system.

It has been estimated that the total cost of launching a manned Mars expedition, starting in 1970 and spread over 15 years, will be 75 billion dollars! This sum is comparable to Canada's total gross national product for a whole year!

But many scientists and engineers believe that this will be a worthwhile project and that its ultimate payoff for society's future in all fields of the humanities, arts, sciences and technology will be considerable. And it may even be a great stepping-stone to universal world peace because it is inconceivable that a single nation, even with the power and wealth of the United States, could launch such an expedition single-handedly.

In other words, the Mars expedition is likely to be a multi-nation expedition with the United States and the Soviet Union the two major partners. And I cannot conceive of a more effective way of avoiding wars than to bring the greatest brains on Earth together for a single massive purpose.

Apart from the Mars landing, high priority will almost certainly be given to the establishment of a lunar observatory on the surface of the moon.

It will be equipped with optical, infrared, ultraviolet, X-ray, and radio telescopes. For the first time it will give man the opportunity of studying, from a far better vantage point than Earth's surface, the whole universe, how it was created, and how it is evolving.

Although such telescopes as the 200-inch optical telescope at the summit of Mount Palomar, California, have penetrated deeply into the universe (indeed, to the extent of billions of light years, which means that galaxies can be observed as they were several billion years ago) but the disadvantage of Earth-based optical telescopes is that the atmosphere around us is in a constant state of change, largely because of the effects of convection currents and this causes the "sharpness" or "resolution" of photographs of distant galaxies to be reduced.

But, since our moon has no atmosphere, observations of the universe will be possible from there under ideal conditions and there is little doubt that the results will be spectacular. They will tell us, for example, whether or not some of the galaxies and individual stars are made of "anti-matter" in which the nucleus of the atom has a negative charge rather than a positive charge. They will tell us whether in certain parts of the universe time is running "backwards". They may even give us a clue as to how many other planets (and there may be billions) can support life and if, in fact, life existed on them perhaps many millions of years ago.

These are exciting speculations which will whet the appetites of scientists and scholars in the future.

Man will also be in a position to explore the surfaces of Venus, Jupiter, Saturn and the other planets, using unmanned spacecraft. Some of these projects will take up to 20 or 30 years to accomplish, depending upon how effectively man develops his nuclear rockets. In principle there is no reason why a nuclear rocket should not propel a spacecraft, in inter-stellar space, for example, at speeds in the order of four or five million miles per hour! It is impossible to anticipate what effects such studies will have on man and on his society.

THE COMPUTER AGE

My second major area in which to crystal gaze is the computer world of

tomorrow. I have chosen it for two reasons. First, because, in 1933, I was co-builder with the late Professor Douglas Hartree of the first general analogue computer to be built in Europe. It was built essentially of Meccano parts and solved higher mathematical problems which arise in the study of the structure of atoms. I have been associated with computers in one form or another for 34 years. My second reason is that I believe the computer, in the future, is going to play a more important part in the lives of men and of our society than any other scientific and engineering device ever invented.

I have already mentioned the role of computers in space exploration programs and I pointed out that without the modern computer space exploration would be impossible. Several other human activities come to mind in which the computer plays an indispensable role, even today. For example, more and more research programs in physics, chemistry and biology depend upon the solution of extremely lengthy mathematical equations which, in some cases, would take hundreds of men a lifetime to complete without the aid of the modern computer!

The results obtained from the large atom-smashing machines, from radio telescopes, from x-ray studies of complex protein molecules, from "bubble chambers" which trace the path of fundamental particles, like electrons, protons and neutrons after interaction with atomic nuclei, are of such magnitude that only a computer can sort them out and classify the data in meaningful ways. And in the field of aeronautical engineering, and indeed all branches of engineering, the computer is rapidly becoming the most important single tool at man's disposal.

You don't sit down and design jet aircraft by rule of thumb methods, but by rigorous mathematical processes. However, the mathematics is so complex and laborious to solve by man alone that it is absolutely essential for computers to be called in.

I hope I am not giving you the idea that the computer is a superior mathematician to man himself. Far from it! The computer will perform long sequences of calculations at phenomenal speeds, but every step in the solution has been anticipated by a mathematician and the machine is instructed exactly how to proceed.

During the past 10 years there has been a tremendous upsurge of interest in computers and this has been because of their increasing use in business and industry. Today there are almost 50,000 computers in daily use in North America and, to feed them with information, almost 1,000,000 computer programmers are needed. As far as I can see, more and more of our lives will be affected by these machines. Computers now operate 10 times faster than any in use 10 years ago! And the cost of carrying out an individual simple arithmetic calculation has been reduced by more than 10 times! As man becomes more familiar with the computer it will be regarded more and more as a powerful tool which can help man in many, many ways to handle increasingly complex problems. Here are some of the more exciting ways in which the computer may be used in the future:

In medicine, for example, computers can store vast amounts of medical data for instant reference and the doctor will find the computer an in-

creasingly powerful aid in diagnosis. The computer will also be able to prepare prescriptions, print out all available data concerning any patient in a hospital, analyze data from medical examinations and be a key tool in medical research, especially where scientists seek behavioral patterns in large quantities of data. Similarly, in the legal profession, the computer will help lawyers to locate precedents in the preparation of their court cases by perhaps sifting through thousands of cases in a few seconds.

In the continuous fight against crime, the computer will be used to store data, including the records and fingerprints of suspected criminals, and to help in the solution of crimes by assimilating all the facts and comparing them with those associated with a particular crime.

In the schoolroom the computer will rapidly become a teacher's assistant and students will use it to speed up their learning processes. It will not replace the teacher, of course, but it will give the teacher more time to help students understand difficult parts of their courses. Computers are already helping engineers to design complex structures by converting mathematical formulae into geometrical drawings displayed on television screens, so that they can be viewed in perspective. This will save a great deal of drafting time!

Traffic control in the air, in cities, and on the high seas, can already be carried out to a certain extent using computers. But in the future almost all traffic control situations will be handled automatically. The control of traffic signals in our cities will be regimented by central computers, perhaps controlling the traffic of several cities simultaneously! Actual traffic signals will be switched in accordance with traffic patterns as they exist at any particular time.

Similarly, air traffic in the vicinity of an airport will be controlled by computers and this will mean more

efficient use of existing airports and of aircraft, because man cannot deal with the vast amounts of data involved in complex traffic situations—especially when aircraft densities become much greater than they are now!

I could give you more examples of how the computer will be used in the society of the future—in banks, in libraries, in telephone systems, in surgery, in all forms of manufacturing—but I am sure that this would soon become boring; instead I want to spend a little time on the changing relation between man and the machine he creates.

The computer and automatic machines in general make possible the design and production of a wide variety of wonderful devices such as motor cars, aircraft, color television sets, telephone systems and wonder chemicals. But, to date, the computer has not contributed much to the solution of problems which arise on account of man's complex social environment.

Although I cannot predict how the computer will be used to help man solve so many social problems, I can predict with a reasonable degree of certainty that the computer will eventually revolutionize our whole educational system. Education hasn't really changed much in the past sev-

Continued on next page

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The Next Hundred

Continued from page 29

eral centuries. Now that we have such exciting tools available, like the computer, color television, and special educational films, the time is ripe for us to take a close look at teaching and the learning processes!

Education is man's greatest social invention and its importance, far from diminishing with time, is exploding!!


Today, most nations are judged by the excellence, or otherwise, of their educational systems. In the future, the classroom style of education is likely to fade away. In its place we will find special teaching laboratories, of which the library may well be the most important. We will find information laboratories where students can find instant access through computer terminals to all kinds of knowledge.

There will be much greater emphasis on the concept that learning can be fun!

Subjects like biology will best be learned through a study of nature, that is, out in the open air. Astronomy will be studied first by making simple telescopes in a school workshop, then using the 'scopes to explore the night sky.

Arithmetic will be handled by building, also in the school workshop; simple computers using standard building blocks just like a Meccano set of electronic parts!

There will be increasing emphasis on painting and on sculpture because those are the creative pursuits of man which help him best understand what is going on around him.

The main point I want to stress is that because of its tremendous importance to the future of society. *Education must change with the times.* And all students must contribute to the progress of education, chiefly by keeping alert and being ever on the lookout for new knowledge, and new ways of helping other people. 

BACK ISSUES
Some back issues of Canadian Boy from 1965 and 1966 are still available. Cost is 10 cents per magazine. Write to Back Issues, CANADIAN BOY, P.O. Box 5151, Station F, Ottawa 5, Ont.

READ THIS CAREFULLY BEFORE PLACING ORDERS

APPROVALS—Most of the stamp advertising in Canadian Boy make offers to "Approval Applicants" or words similar. This means: in addition to the special offer, you will receive stamps on approval which are yours only if you pay additional for them. You may select the stamps you wish, and return the balance along with payment for the ones not returned. Some stamp companies may continue to send approvals to you unless you write and tell them not to do so.

If the advertisement says "to approval buyers" you will receive the special offer stamps only after you have purchased from the approvals. If you do not understand this, ask your parents to explain. Be sure that you include FULL NAME and ADDRESS (Printed).

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STAMP CORNER



BY H. L. WOODMAN

Many of our readers will be visiting Expo 67 and, if they take the trouble to seek it out, will find much of philatelic interest. We expect to devote all of the short time we will be there in this pursuit.

The United Nations Pavilion has a stamp display, and we express our thanks to Mel Williams for sending us a souvenir presentation folder. Jamaica and France also have stamp features. Other pavilions have on display rare paintings which have been the subjects of stamps. Some countries, including Jamaica, have issued special stamps honoring the great exposition. Canada itself has a rather attractive Expo 67 stamp that will be on sale until the universal exhibition closes in October.

The United States has a 1967 commemorative for Canada's Centennial. On other occasions as well, our southern neighbor has honored us with special stamp issues. One such stamp was issued to mark the close cooperation between the two countries, and another came out on the occasion of the opening of the St. Lawrence Seaway.

Richard Viruisis, 246 Robert St., Toronto 4, has 40 packs of stamps waiting for stamp collectors to claim. Just drop Richard a line and ask for one. Don't forget to include return postage.

Alfred H. Giles, of the Canadian Sunshine Club (an association for the handicapped and invalids) advises that the club's annual bazaar will be held November 4 and anyone with duplicate stamps could put them to

good use by donating them to the group, for sale at that time.

If you want further information, write to Mr. Giles, whose address is 866 Manning Ave., Toronto 4, Ont.

This month's column has to be devoted to some of the new issues of recent weeks. From the Caribbean area, so popular with most stamp collectors, comes a set of three in observance of the attainment of autonomy by the Methodist Church; and from the Bahamas, a decimal value definitive set. After the Bahamas went off sterling currency, all stocks of stamps were overprinted in the new decimal values.

The designs will be the same as those overprinted, with the exceptions of the 5c and \$2 values. Guyana (formerly British Guiana) has issued a set of four to mark the first anniversary of that country's independence, and St. Helena commemorates its change in constitution with a set of two.

Also announced by the Crown agents is the 1967 Europa stamp for Cyprus. The design is a common one with several other European countries, viz., Austria, Belgium, Denmark, Finland, France, West Germany, Great Britain, Greece, Iceland, Ireland, Italy, Liechtenstein, Luxembourg, Monaco, The Netherlands, Norway, Portugal, San Marino, Spain, Sweden, Switzerland, Turkey, and The Vatican.

This year's design, by a Belgian artist, shows two gear wheels enmeshed with a third emblazoned with a C.E.P.T. (*Conférence Européenne des Postes et Télécommunications*) design. The *Conférence* aims to remind philatelists and members of the public of the essential links which coordinated communications play in modern life. It is the 11th annual series for most of the participating countries, although Cyprus has been included in only seven.



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Off the Record

BY SANDY GARDINER

Since last September, this writer has logged something like 40,000 miles covering the music scene.

While in London, England, I caught a crazy act called *Dave Dee, Beaky, Micky and Tich*. These boys have already scored here with "Bend It," and are likely to do it again, several times over in fact. They all dress in weird clown costumes and put on a terrific stage show. Although not basically a harmony group, they blend well both vocally and instrumentally.

The Who is about the biggest group in Britain, excluding The Beatles. Now co-managed by Brian Epstein they have started scoring in the U.S. and Canada with numbers like "Happy Jack" and "Pictures Of Lily". This quartet is undoubtedly the wildest you'll ever witness.

About the fastest rising group on the UK scene is *The Jimi Hendrix Experience*, only recently launched in the U.S. Jimi is an American, discovered and now managed by a former Animal, Charles Chandler.

During a brief stay in Miami, I witnessed one of the wildest singers in the U.S. who is yet to have a million-selling record. His name is *Wayne Cochran*, his group *The C.C. Raiders*. Their music is rhythm and blues, wild and wailing. Unfortunately, it's impossible to capture the feel of this great unit on wax and the only means of enjoying their contribution is to either catch them live or see one of their rare television appearances.

The Los Angeles scene is by far the liveliest in the U.S. Groups are a dime a dozen but new ones are constantly cropping up who go on to great record things.

The Nitty Gritty Dirt Band is a name that will be in the charts quite often in the next year. Their brand of music is jug-band with the accent on comedy. However, when it comes to recording they are extremely commercial, and "Buy Me For The Rain" hought them a large amount of chart action for a first record.

In the folk field, there are many names on the fringe of international acclaim. Remember the name *The Stone Ponies*. This is a trio made up

of two boys and one girl who wax for Capitol under the direction of one of the company's hottest producers, Nick Venet. With two albums under their belts and a third on the way, it's only a matter of time before they strike gold. Their first set sold 20,000 copies—a tremendous figure for a group who had never had a single released.

Although Bob Dylan is still around, a new name on the folk horizon that Dylan will soon have to reckon with is *Tim Buckley*. Tim looks like the originator of the folk-rock kick. He is thin, has a mop or back-combed hair and writes in the same idiom as Dylan.

The Buckley boy is signed with Elektra Records in the U.S. and is now making a lot of noise in the industry. Given a little more time, he could easily topple Dylan from his long-uncontested throne.

☆ ☆ ☆

Rock 'n' roll groups score and fade in the U.S. as often as television shows come and go. There are few outstanding groups left—*The Mamas and Papas*, *Beach Boys* and *Lovin' Spoonful* are the most consistent although only the latter are heading in a clear direction.

The Turtles are still very strong everywhere and the West Coast is successfully spreading the flower power movement into Canada. A former Montreal disc jockey, *Tim Hudson*, who came to the Expo city from England, is credited with having started the craze through groups like *The Seeds*. However, the first really big chart indication of the music was *Scott McKenzie's* "San Francisco", written and produced by Papa John Phillips.

There's a lot happening in the music field. And it takes a lot of travelling to stay informed!

The changes are as good as a rest!

Here are the winners of those 10 top albums from Capitol Records: Doreen Schaus, Clifford, Ont.; James Bertolo, Rosetown, Sask.; Greg Robertson, Hamilton, Ont.; John Anwyll, Halifax, N.S.; Lorraine Van Slack, Pickering, Ont.; Earle Taylor, Beaconsfield, Que.; Denise Howe, Rexdale, Ont.; Peggy Thompson, Vancouver, B.C.; Lynn Broughton, New Toronto, Ont., and Geoff Corfield, London, Ont.

What's the matter with the boys? Half the prizes were snapped up by girls!! Anyway, congratulations to all of you!

Cars

BY ROGER APPLETON

A couple of months ago, I asked you guys to tell me what you want to read about in this column. Thanks for the letters you sent in. You gave me some good ideas.

One thing surprised me—the number of guys who wanted basic information on automobiles, like, "what's a carburetor for?" of "what does a differential do?" and so on. Let's take care of some of those basics right now and clean up a few more next month.

The engine: You already know it makes the power to drive the car. It does this by "burning" a mixture of gasoline and air in a cylinder.

The carburetor: It sits on top of the engine. The carburetor mixes the gasoline and air and sends the mixture to the cylinders.

The air cleaner: Sits on top of the carburetor. The cleaner filters dirt, dust and pebbles out of the air so they can't get into the carburetor or down inside the engine.

The alternator, or generator: It's found at the front of the engine and is driven by the fan belt. It makes the electricity needed to fire the spark plugs and explode the mixture of gas and air. It makes electricity only while the car engine is running.

The distributor: It can be at the side of the engine, or on top. It's round, with a lot of thick black wires running into it. The distributor takes in electricity, then sends it out to the spark plugs, firing each plug in its proper turn.

The battery: Large and box-like. The battery stores electricity like a water tank stores water. The car can get electricity from the battery when the motor isn't running.

The radiator: Right in front of the engine. Thick black hoses run back from it. The radiator looks like a giant honeycomb. It holds water that is pumped through certain parts of the engine to help keep the motor cool.

The fan: Right behind the radiator. But it doesn't work by blowing cool air back over the engine. The fan pulls cool air through the radiator to lower the temperature of the water that cools the motor.

Futuramic Venturing

Continued from page 4

"Rice check, I.O.U." (integrated, over and out)

I immediately dialed the rest of the space cats, then hopped on my new Voltacycle (electric two - wheeler driven energizer, silent, economical and fast).

The Venturers' suite in the Planetarium was bustling with activity. Our contribution to the district space platform was advancing well, thanks to the latest laser unit donated by the chairman of our group committee. I was 45 E.S.U.'s (earth seconds, uncorrected) late, so all my buddies were there forming a circle and examining the strange object.

"I believe it is a joint for an early A.M.M.," (automated, mechanical module) said Alpha.

"Could be a toy to pull on the floor, for the Pre-Cub Age Babies, I saw on old globeopticon shows," said Fordor.

"I know what," exclaimed Veto. "Let's buzz up our advisor! He'll know for sure."

"Yeah. Good idea," said Ratsy.

So I dialed and found out that he was at work orbiting on platform C-U2.

That was no problem for the Planetarium switchboard operator and after establishing contact with him via Alouette G.A. we explained and showed him our object.

"Most interesting," said C.C. "I remember when I was an Atom Cub, I saw Pops one evening fooling around with one of those . . . First you wound the string around the central axle, then holding the loop at the end of string you let the disc go. With a slight jerk, you can return the disc into your hand at the end of the trajectory, rewinding the string. If I remember it correctly, it was called a "yo-yo" and was used to evaluate manual dexterity (skill of hands) of B.C. (Before Computer) Scouts. Nowadays we use special skill testing Exa-Computers."

"Gee, thanks, C.C. See you and I.O.U."

"Well, that's one problem solved without the data processor," said Alpha.

"Could I try it please, could I?" asked Fordor.

"Sure, go ahead," said Ratsy.

In no time Fordor was manipulat-

ing the yo-yo in a most skillful way, making the others envious and eager to try it out.

"Gee! this is fun," shouted Ratsy. "I betcha I can put the yo-yo in orbit and recover it without losing the sequence."

"Check," said I. "You're on!" Before we realized the lateness of the day, we were having a ball, playing orbital yo-yo games by using the Planetarium's small computer, figuring out the initial energy, velocity and interaction of centrifugal force to orbit the yo-yo, while keeping up the rhythm and sequence.

And that's how we invented the latest craze, the 3-D space game called S.O.Y.A. (Satellitic Orbital Yo-Yo Alignment).

"So there you are, my friend, Jelly, Old Boy," said Batgirl with a smile. "I hope you've liked the glimpse of Futuramic Venturing."

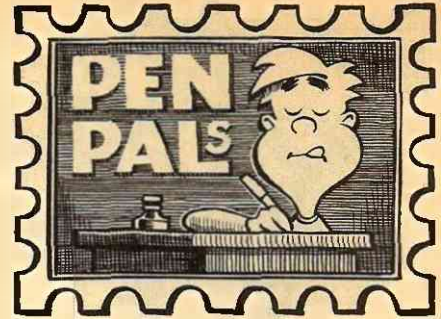
"Gee, thanks, Batgirl, but I keep wondering if basically the difference is that striking, or . . ."

"Ooops, sorry, old chum, I've got a date with Robin, so I must disintegrate. See you around!"

And Batgirl vanished, just as suddenly as she had appeared shortly before. How about that?

Electronically yours,

Your Favorite Cosmonut,
Jelly Belly



Lawrence F. Jardine of 235 Duke St., Chatham, N.B., wants a p.p. around the age of 10 who loves animals, collects models and lives in Canada. **Graham McKnight** of 57 Rookwood Ave., Fredericton, N.B., wants a penpal from anyplace in Canada. He likes pop groups, car models, basketball and hockey. He's 12. **Gordon Denning**, 31 Beacon Rd., Scarborough, Ont., is 11 and likes fishing, model building, science fiction and baseball. **Rob Humeston**, 3615-12th St. S.W., Calgary, Alta., is 15 and wants a p.p. from eastern Canada. **Bill Cameron** of 34 Crownhill St., Ottawa, Ont., is 11, likes photography and reading. Wants a p.p. from anywhere. **David Patterson**, 69 Baldwin Cres., Saskatoon, Sask., is 13 and would like to hear from any Pattersons and Lees who are Scouts in the Petitcodiac area. His interests lie with astronomy, chemistry, physics, electronics, and getting in touch with his cousins.

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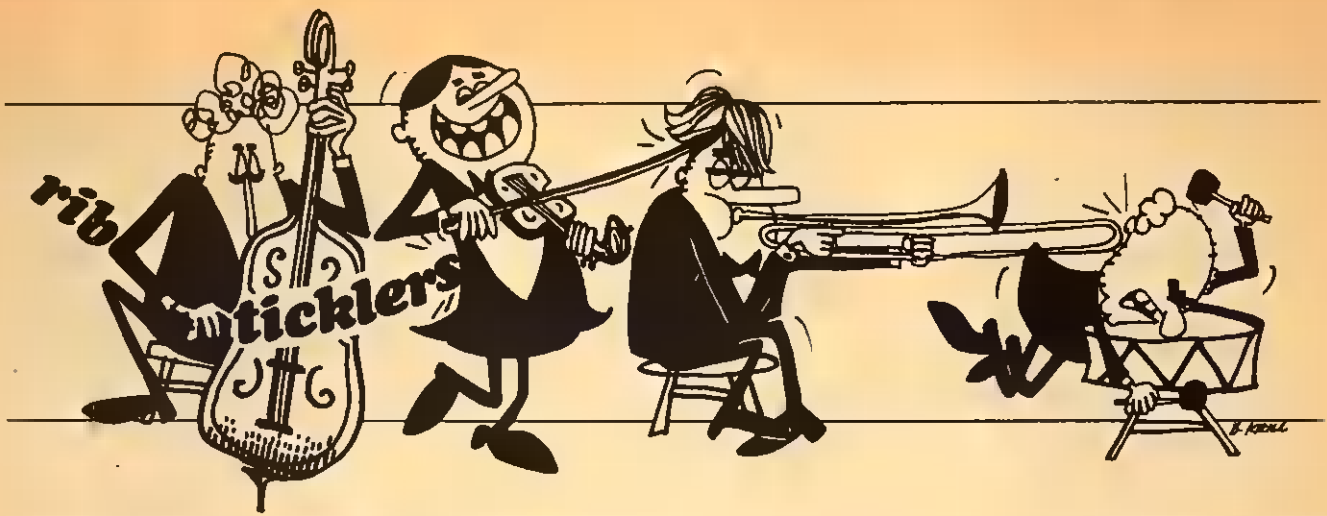
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A tourist stopped off at an Indian reserve. Deciding to make friends with the Red Man, he hailed a passing brave, and said: "White man glad to see red man White man hope big chief feel fine this morning!" The Indian gaped for a moment then turned and yelled, "Hey, Joe! Come here! This guy is terrific!"

Mike Seniuk, London, Ont.

Man: Doctor. I had a horrible dream! I dreamed I ate a huge marshmallow!
 Doctor: What's so bad about that?
 Man: When I woke up, my pillow was gone!

John Zacher, Beiseker, Alta.

She: After we are married, I will share all your troubles.
 He: But I don't have any troubles . . .
 She: You will after we're married!

Jeffrey Graham, Inglewood, Ont.

A boy was getting ready to go out and play ball, when his friend advised him: Remember these three words — "Don't Argue!"

Ballplayer: That's only two words!
 Friend: See? You're starting already!

Allen Blackbird, Elphinstone, Man.

Boy to man in smashed-up car: Have an accident?

Man: No thanks, I just had one!

Mark Fitz, South River, Ont.

As he paid his bill, the departing guest turned and yelled to the bellboy. "Quick! Boy, run up to Room 999 and see if I left my briefcase and overcoat there! Hurry up, because I've got just six minutes to catch my train!" Four minutes later, the bellboy was back, all out of breath. "Yes, sir," he gasped, "they're up there alright!"

Stephen Dernier, Moncton, N.B.

Elsie: Sometimes my father takes things apart to see why they don't go.
 Boyfriend: So what?

Elsie: So you'd better go!

Mike Hunter, Dartmouth, N.S.

The chaplain aboard a troopship said that the next Sunday he would preach a special sermon. Before then, he wanted all the sailors to read the 17th chapter of Mark. The next Sunday he asked how many sailors had done this. Nearly all of them raised their hands. "Splendid!" said the chaplain. "My sermon today will be on honesty. There are only 16 chapters in the Book of Mark!"

Robert Langlois, Rodney, Ont.

Fortune Teller: You'll be poor and unhappy until you're 40.

Client (hopefully): Then what?

Fortune Teller: Then you'll get used to it!

Brenda Ramsay, Brougham, Ont.

The butcher and his wife presented their twin babies at the church for christening. "What are their names?" asked the minister. "Steak and Kidney," blurted the nervous father. "You big lug!" whispered his wife, fiercely. "They're Kate and Sidney!"

Greg Hurst, Goderich, Ont.

Q: What does an envelope say when it's licked?

A: It just shuts up and says nothing!

John Argall, Trois-Rivières, Que.

Joan: Is your toaster a pop-up?

Fran: No, it's an Indian model.

Joan: How come?

Fran: It sends up smoke signals!

Scott Pearson, Colborne, Ont.

Jimmy: What do you call a topless mini-skirt?

Danny: I dunno!

Jimmy: A belt!

Jimmy Vaughan, Almonte, Ont.

CHOPPER

By Simpkins



"And don't come back until Expo's over!"