Review in Review

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On Listening

We live in a noisy time. It's so noisy, in fact, that we've learned to tune out unpleasant sounds, especially if they happen to be words we don't want to hear. Insults, epithets and obscenities fill the air around us with so much shock and tension that the only way to cope is not to hear them.

That's a pity, for the people who clamor so hideously have something to say that we never hear because of their noise and our reluctance. What they're saying is that the world is changing—that it has already changed, in fact—and that we must change our attitudes and institutions to meet it, or we'll perish.

In the oil business, change is about the only thing you can be certain of, and each change seems to be more spectacular than the last. New product standards make old methods of manufacture obsolete, and the new techniques that replace them turn out to be better than the old; changed

...
big cold tough Job

Harnessing the power of Churchill Falls is pretty straightforward but the project's size, location and climate make it a staggering task.
P.E.I., and Derek Dyck of Carrot River, Sask., were married.

It’s almost like any other town. The Catholic priest who lives there (his second trailer is the chapel—he lives in the first) says that the spiritual counseling he is called upon to do converges the same sort of matters he used to encounter in his Montreal parish.

Yet life is radically different. There are only one or two private cars in the townsite—one driven by the priest—although there is a fleet of bright yellow passenger cars owned by the company. But if nobody has a car, plenty of people have snowmobiles and the area around the townsite is cross-hatched with their trails. Ski abroad—there is a ski run down the bank of the Churchill River just outside the townsite with a run of 1,000 feet and a drop of 300 feet, with a tow back up to the top of the run. Naturally, snow-cooking machines are unnecessary.

Fresh vegetables are a problem for the housewives of Churchill Falls. At the mini-mart, as the collection of trailers that constitutes the temporary store is called, the price of food is subsidized to stay at the levels prevailing in Montreal and, while there is a fairly good variety, fresh food sometimes is scarce, even in the summer. Vegetable gardens aren’t very successful either; one woman who tried growing her own found the soil too thin, the season too short and frosts unpredictable. She now lives in one of the houses in the permanent town being built to accommodate maintenance personnel when the project is finished. ‘And what I’m going to do,’ she said last spring, ‘is put fluorescent lights in the garage and grow my own vegetables inside all year long. You have no idea how much I crave fresh radishes.’

The whole, though, food is one of the great delights at Churchill Falls. The trucks bring in it every day in enormous quantities (a ton of potatoes, more than three tons of meat) to satisfy the gargantuan appetites of the project workers. Visitors who remark on the heaping plates are told the story of the young Dutchman at one of the outcamps who will eat 12 pork chops and then go back for a second helping of meat loaf. They say he’s six-foot-six, and weighs 280 pounds, all of it bone and gristle. That kind of board, plus lodging, costs the men $2 a day.

The men in the main camp area eat at the dining hall, a vast cafeteria-style room that can seat 1,000 at a time, and feeds 2,000 people at each meal. Yet despite the throng, you have a choice of rare, medium or well-done roast beef every Tuesday, and you get what you ask for in enormous helpings.

The food keeps the men going through 10-hour shifts and enough overtime to bring their wages up to $1,500 a month sometimes, most of which goes home to Newfoundland or Quebec. Newfoundlanders have first call on jobs at Churchill Falls, and Quebeckers second call.

To keep the men occupied when they’re not at work there are movies with three changes of program a week, a barber shop, a covered rink for hockey games, a recreation hall with billiard tables, shuffleboard, table tennis, dart boards and television sets that receive taped English-language programs (the CBC has announced it will apply for
approval for a French station as well, and radio in both languages. When the permanent town center is finished this summer, there will also be bowling alleys, a gymnastics for such sports as basketball, a curling rink, a library, a beauty salon and a hotel with dining room and cocktail lounge.

Outside there is fishing reported to be so good that fishermen disdain to angle for 30-pound northern pike. Instead, they fish for speckled trout that regularly go two or three ponds and sometimes reach five, lake trout from five to 25 pounds, and eels ranging around four or five pounds. Panamonic are common and other game birds are plentiful, and caribou are seen occasionally close to Churchill Falls. But hunting of small game is discouraged, and forbidden in the case of big game.

The variety of work is great as the range of after-hours occupations. The men and women at Churchill Falls include doctors and nurses, schoolteachers, housekeepers, publicans, postmast- er, barbers, shopkeepers, bus drivers, bankers, a dentist, pilon, policemen, telephone men, CBC people and firemen, but the real work is in the field and underground where the powerhouse is being carved out of the solid rock of Labrador. Every cubic yard of it is drilled, blasted and hauled out in roat- ing tracks that can carry 20 yards in every load. When the job is complete, 2,350,000 yards of rock will have been removed enough to make a mountain bigger than the Great Pyramid of Egypt. In its place will be tunnels, shafts, gal- leries and three huge chambers in the rock, one of them 972 feet long, 81 feet wide and 154 feet high at its highest. The space above the generator floor, in the underground powerhouse, will be five times as big as the main concourse in Montreal's Central Station, and seven times larger than the main lobby in Toronto's Union Station.

Down in the tunnels the noise can be so loud that you can shout at the top of your voice into the ear of the person standing beside you, and not be heard. The rock drills chatter and grind, the compressors that drive them sigh and roar, the diesel engines rumble at full throttle while power shovels crash into mounds of rock rubble and dump their loads clanging into the steel hoppers of the ramming trucks. All the time a huge tube in the ceiling blows out a supply of fresh air in a hoarse roar. Whereover things get quiet in the tunnel it's a sig- nal for the worst noise of all—a dyna- nite blast that not only echoes in the cham- bers, but sets the very air pulsating like a throbbing wound. The explosion forces the air out of the tunnel; it rushes back as the force subsides, hits the tun- nel ends and washes out again in waves, back and forth like the slosh in a bath- tub.

In contrast, the activity outside seems puny, although by any other standard it is awesome. The 99 dikes that will plug the gaps in the reservoir's rim will need 26 million yards of fill—almost twice the amount needed to build the two man- made islands for Expo 67. The dikes will range in length from less than 200 feet to more than 315 miles, and in height from four feet to 90 feet. They will create a reservoir covering 2,567 square miles that will hold 1,100 billion cubic feet (almost 7½ cubic miles) of useable water. The drainage basins from which the reservoir will collect water has an area of 26,744 square miles—almost as big as the province of New Brunswick.

Power will start coming out of Chur- chill Falls in 1972, and when the project is completed in 1976 it will have a ca- pacity of 516 million kilowatts. In a year it will provide 34½ billion kilowatt-hours of electricity, or about a fifth of all the hydroelectric power generated in Canada last year.

In the meantime, power is going to Churchill Falls. Electric power comes from a smaller hydro development at Twin Falls, 23 miles away on the Un- known River, that sends most of its power to the iron mines at Wabush and Labrador City. But the power for the huge trucks, the diesel engines, the earth movers and cement mixers comes from oil. Imperial Oil supplies all of it, through a multi-million-dollar contract covering an estimated 37 million gallons of oil products mostly diesel fuel, but including motor gasoline, aviation gas- line and jet fuel—to be supplied be- tween last March 1 and the end of 1972. Every drop of it has to be railroaded 286 miles north on the Quebec North Shore & Labrador Railway to Eager, then transferred to tank trucks for the 113- mile haul along the gravel access road to Churchill Falls, and from there to dunks in out-camps where it is needed. Lubricants are also supplied by Imperial.

The development will send electricity at 735,000 volts a.c. over three trans- mission lines 126 miles to the point of delivery to Hydro-Quebec which will buy most of the Churchill Falls power during more than 65 years.

The project has preceded without difficulties; in fact, the problems facing Churchill Falls have been as gigantic as everything else about the thing. It has taken 20 years to bring the project to its present stage through legal tangles, political skirmishes and financial hurdles that, at one point in 1964, brought all work to a halt and saw the project de- mobilized. It got going again late in 1966 when Hydro-Quebec signed a let- ter of intent to buy Churchill Falls power. But most of the money for the huge development still had to be raised and, as Donald McParland, the presi- dent of Churchill Falls (Labrador) Cor- poration Ltd., told the Canadian Insti- tute of Mining and Metallurgy last January: "... the complexities of the legal terminology involved in the sale of power and the raising of finance on this scale make even the management and engineering seem quite simple."

Finally, last May the formal sales contract was signed and financing ar- rangements were completed.

The complexities of Churchill Falls' brutal climate, its isolation, its heroic size—may be largely responsible for its successful completion. It seems to evoke a determination to set it finished that amounts to something like zeal in the people there. When one man, who has been there with his family since 1967, was asked if he wouldn't rather be work- ing in Montreal or Toronto, he replied: 'Hell no! I want to be here when they press the button.'
NO, HE WON'T LEAD YOU TO A GOOD PLACE TO EAT, BUT—
YES, HE CAN SHOW YOU HOW TO SURVIVE ON THE HIGHWAY

by Albert Martin

One . . . Two . . . Three . . . The driver performs an elegant little ballet with clutch pedal and gearshift. The 238 h.p. motor begins to raise its voice, subtly gaining speed as he leads it through the 10 forward gears. Five low, five high, and he plays them as gracefully as those ever-smiling magazine-advertised people play the Hammond organ. Oliver Yallop (forever known as 'Ol', because long ago his small brother couldn't pronounce his given name), a very professional trucker, making music on a 15-ton GMC diesel tractor and trailer.

Four . . . Five . . . The shifting is as smooth as your automatic sedan, although this trailer truck is an awesome brute: 15 tons of vehicle plus 20 tons of cargo. 'People curse us in the city 'cause we're slow getting away from traffic lights,' Yallop is saying. 'But once I get up to 10, we'll move.'

Six . . . Seven . . . Eight . . . Yallop is playing the gears by ear, of course; no need to watch the r.p.m.'s gauge. When you have been driving truck for 40 of your 55 years, it is instinctive, like finding your mouth when you're eating. A little gold, diamond-studded pin on Yallop's chest says he has driven 29 of those years—about three million miles—without a chargeable accident.

Yallop is probably not everybody's idea of a truck driver; he fits none of the stereotypes. He is short and mild looking; immaculate in a clean sport shirt, peak cap, freshly pressed.

*I love trucking. I never wanted to do anything else*
blue uniform with the Inter-City Truck Lines emblem on his jacket; pink cheeks freckle-haven; horn rimmed spectacles. A balanced man at work.

Nine... Ten! Now 775, the grey 'tractor' part of the tractor-trailer, the one Yallop always drives, smooths out into a maternal 55 m.p.h. Yallop sits erect, hands on the steering wheel at 10 and two o'clock, eyes always moving, watching. Sunset on our left. Toronto at our backs. We're on the night run to Sudbury.

Behind us, the Inter-City terminal is undoubtedly still seething as it was when Yallop left; as it does around the clock. As does every big truck terminal in this country, Inter-City, one of the larger privately owned carriers, is a little city in itself with 1,250 employees, 1,500 pieces of equipment, tire shop, repair shop, truck wash, offices and lunch room, canyons of waiting trailers and a long loading dock where little 'jimmy' trucks disgorge their day's collection of cargo and the trailers take on loads for much of Ontario, parts of Quebec, and Detroit. Liquor, TV sets, disposable diapers, tobacco, food, light bulbs—every conceivable kind of product moves through that dock. An assortment—an 'LTL' load (each portion brings 'less than a truck load')—is riding now at Osh Yallop's back.

'I've hauled about everything, I guess. But the stuff I hate is steel pipe. If there's an accident or if it breaks loose and comes at the cab, you haven't got much chance.' We are free of the city now and he runs his eyes affectionately over the woods and fields. 'I had the Montreal run for 18 years but I wouldn't want it now. Those four-lane highways drive me crazy, especially that one. Everybody doing 70 or 80, clawing up your back. Nothing much to see along the way.'

Yallop is always looking. Throughout this evening and night he is the first to spot clumps of trillium in the woods, a rabbit or beaver at the roadside, any strange mark or movement on this route that he knows literally by heart. 'I'd be no good without the glasses, but with 'em I could see a dime on the road!'

Part of his looking is for pleasure; part is survival. He is cool but unflagging watchful, checking the roadside, the road ahead, the road behind in his two 16-inch side view mirrors. Will a deer spring into the road ahead? Will that idiot in the sports car try to pass on the hill? And if he does, and someone is coming the other way on this two-lane road, is there room to pull onto the shoulder?

All around us motorists are committing appalling errors, cutting over solid white 'no passing' lines at the brow of a hill or on curves, cutting around Yallop just yards ahead of on-coming traffic. Yallop is unruffled, but also never ceases to marvel that more motorists aren't killed. You just wouldn't believe the things some of them do! He eases back to let a sedan snake in ahead of him. 'If you could see what I see in even a week-

well, I could write a book. Too much speed, not enough control, not enough brains.'

We pull into a service center for the first of two coffee stops on the 200-mile trip. No, says Yallop, truckers do not always know the best places to eat. 'Some of their favorite hangouts are real dumps. But I like this place—clean washrooms, good food and tires or repairs close by if you need them.'

Then, as at every stop, he carefully walks down each side of the 60-foot rig, checking each of the 22 tires, inspecting every wheel nut. 'I always worry that a tire will fly off and kill somebody. But I've never lost one yet.'

The air, as we walk to the restaurant, is sharp, clean and pine-scented. 'I love this country,' Yallop says. 'I love to fish and there's lakes up here where you can fish all day and never meet a soul. I fish as many weekends as I can. On a job like this you get tense up. Fishing is real soothing.'

Over coffee he explains why even-or maybe especially—a professional driver 'gets tense up'. It's because of the unpredictable. Drunks in cars. Drunks wandering along the roadside. Wild animals. One night a buck deer jumped out of the bushes in front of him. Yallop had no time to stab the brakes. The deer hit the heavy front bumper and bent it back against a tire, and the truck spun broadside. Luckily no other vehicles were close. Yallop called a tow truck and shared the vigil with the other driver.

Another night a car pulled deliberately from a sideroad across his path. Yallop hit the airbrakes and ground to a stop, inches away. Just as deliberately, the elderly motorist drove off.

'When I told the police about it, they said it sounded like an attempted suicide. Now sometimes I wonder just how many accidents are accidental.'

Back in the warm embrace of the cab, softly lit by the instrument panel and the string of 'running lights' outside, we push on north, toward a white picket fence of northern lights in the sky. Other heathens like 775 are hurrying north and south. Night time is truck time. All are hurrying to complete 'overnight delivery', a promise that companies in this area must keep if they expect to survive in the fierce competition of the trucking business.

There are nearly a million and a half trucks of all kinds in this country, carrying 500 million tons of goods per year. In more than half of Canada's communities, trucks are the only available means of public carriage. A third of the trucks are in Ontario, where they represent a $2 billion investment and employ about 460,000 people—the largest source of direct employment in the province, according to the Automotive Transport Association. More freight is carried by motor vehicles in Ontario than by all other forms of transportation.

Three quarters of the Niagara Peninsula's fruit and vegetables move to market by trucks. So do 90 percent of south-western Ontario's livestock, and much of its milk and other dairy products.

They come and go like gusts of wind, this night. Many, with lighter loads and less caution, pass Yallop. He helps them, blinding his lights when it's safe to pass, blinking again to say: 'Safe to cut in.' Not all are safe drivers. Often, so-called professional truckers pass him on curves or on hill approaches like the greenest motorist.

Once Yallop snarls at the receding airliner: 'That's the kind that gives the rest of us a bad name. I've never seen him, but I can tell you what he's like. He works for a cheap outfit. They don't pay him nothing. He sleeps in the cab when there's a layover, and he drives scruffy.' Yallop is proud of Inter-City, which always puts him into a good motel when there's an out-of-town wait, and pays his meals.

Another truck ploughs by, cutting in dangerously. Twenty minutes later we spot it idling at a wayside diner. The black
On the 250-mile run from Toronto to Sudbury, Ol Yallop stops twice for coffee, and strolls down both sides of the rig to check its 22 tires and make sure the wheel nuts are tight. At three a.m. he reaches Sudbury in a tight rain and hooks onto another trailer for the 6 1/2-hour return trip.

curse of the Yallops goes down on that driver. ‘He bunts past me so he can go in there and shoot the breeze with other guys for an hour.’ And furthermore, that place has lousy food and its waitresses are ugly!’

In 12 or 13 years on this route, 100,000 miles a year, Ol Yallop knows every lousy cup of coffee, every baggy-eyed waitress, every hill, bump and bump Jacqueline. All the way this night he read aloud the language of the trail. Here a skid mark where a motorist rocketed right into the back end of a truck, right now it actually, killing himself. There a broken guard rail where a driver missed the curve and lost his load. Here some scraps of rusted metal where a truck piled up a year or so ago; he’d been drinking, it was rumored, and ‘dope or booze just don’t belong in this business.’ Here’s where the deer usually come out ... There’s where seven people were killed ... Here’s where the Ontario Department of Highways is finally repainting the road markings.

‘The DHO boys are great. If it wasn’t for them, there wouldn’t be any trucking in the winter,’ Yallop says. ‘But some of their engineers sure missed the boat here. Solid lines where they shouldn’t be; dotted lines that should be solid; curves that are engineered wrong. It was so bad in some places that I wrote them a letter. They’re fixing most of it now.’

Yallop is the sort of man who would write a letter, where other people would merely curse the road and then forget it. He works at his business, right down to the last detail. It gets lonely and boring at night but he is always chewing gum or smoking cigarettes or cigars to help ward off boredom and drowsiness. Now, firing up another Old Port, he remembers: ‘When I was young we never saw a tail-end cigarette; everybody twisted their own. And we had to pick up railway coal for the fire, and old crates for wood.’

Gradually the story unfolds, of a kid who lay awake at night listening to the trucks from the terminal, near home, chugging and gurgling up hill on Toronto’s Eglinton Avenue. ‘I knew that was what I wanted to do. I never wanted anything else. I loved it.’ And it was steady work, at a time when work was scarce.

So at 15 he quit school to work as a trucker’s helper, hauling meat to London, Ont., at $3 a trip. After 10 years he was making $34 a week. Now, in a good year, his job pays $12,000. He gets a month’s holiday and the regulations prevent him from being worked more than 2,100 miles in any week. His grown-up son is going to be an accountant; his wife is a part-time nurse who also (luckily for them both) loves to fish. Life is good and Ol Yallop wants to keep driving for Inter-City until he retires.

Because trucking is good to him, he tries to re-pay it. He is concerned not just with his own safety record but the image he creates for Inter-City. Every year he helps maybe 50 people in distress. ‘Our rules say don’t pick anybody up unless he’s in trouble; then use your own judgment.’ Two years ago his judgment probably saved two lives. Driving this north road at 3 a.m., and 39 below zero, he met two ghostly figures on foot: a man and wife whose car had crashed out on a sideroad. They were trying to reach shelter, in thin city clothes, and the woman was near collapse. When they lifted her into the cab, she screamed as the heat hit her face. But both recovered, and Yallop takes them occasionally.

Another night he drove a stranded motorist to a service station. The man studied Yallop so persistently that he began to fear a hold-up. Suddenly the passenger cried: ‘Are you a Christian?’

‘Well ... sure, I try to be.’ (Good grief, was the guy going to tell him to say his last prayers?)

‘HALLELUJAH!’ bellowed the passenger, causing Yallop to nearly swallow his cigar.

‘He said he was a missionary,’ Yallop recalls, as we turn into the second coffee shop. ‘I was glad to let him out.’

The night, and this coffee shop, is given over to truckers now, members of an exclusive little club, kiddling the waitresses, greeting each other with cheerful curses, exchanging news and gossip in their own verbal shorthand. Back on the road, riding ghostly now by mist rising from the lakes and shrouding the valleys, most of the truckers are driving harder, eager to finish the run. Yallop is more careful than ever. He is professional enough never to stop being scared—and never to be ashamed of it.

‘If you let down just once, make one big mistake, you’ve had it. What scares me most is when the truck running at me doesn’t drop his high beams when I blink mine. Then I figure he’s asleep at the wheel.’

But finally, at 3 a.m., 775 grumbles along the echoing empty streets of Sudbury, into Inter-City’s terminal. Yallop backs his rig into an unloading dock with one smooth movement, unhooks the tractor, rounds to the opposite side, and hitchens on to a trailer of oxide from the nickel smelter, bound for Toronto and ultimately Detroit. He checks his tires, fills out a time sheet and checks the fuel. But with a 150-gallon tank and the skill to eke out seven miles to the gallon (an average driver would get only five miles per gallon, or less) Yallop has fuel to spare. The turnabout takes maybe a half-hour. Then he swings back into the cab.

Tired? Not too tired to still be the best driver on the road. And at Toronto he’ll have at least 10 hours off before another run. ‘You get used to it,’ Yallop says, lighting another stogie. ‘It gets in your blood.’ Then he runs through the musical scale on his gearshift and the man who loves trucking better than anything in the world is gone in the misty night.
TEMPEL TO INDUSTRY

It's very black inside the chamber. Not grey-black or blue-black but coal-black. The blackness swallows the walls, the roof and the base. It eats up the feeble lights. It absorbs the shadows.

Creepy. But the people who work in Imperial Oil's new fluidized coker reactor at Sarnia don't seem to notice how disorienting it is. Why, in some ways, it is downright reassuring. Jim Cramp, a technical advisor in the Sarnia chemical plant, would rather climb 130 feet down a maze of scaffolding inside the reactor to inspect equipment than climb a 200-foot tower outside. 'It's so dark in there,' he said, 'I can't see how far away the bottom is.'

Few people in Sarnia have to worry about clambering around inside a great, black cylinder to inspect, repair or clean equipment. But even for people outside, the coker is impressive. The reactor and the neighboring pieces of equipment are an eye-catching collection of shapes and colors—towers and pipes, stairways and platforms; silvers and greys and blacks with splashes of royal blue, dark red and yellow.

The most interesting part of all, though, nobody can see. This is the ingenious round robin going on inside the coker to turn a portion of crude oil with little value into a variety of useful products. It takes place in two connecting units—a very hot reactor and a vessel where coke is burned to provide heat for the process.

Hot, powder-fine particles of coke so small they can flow like a liquid enter the reactor, and fall slowly down in a dense, churning cloud of coke. At the same time, oil so heavy it is solid at room temperature is heated and sprayed into the chamber which operates at nearly 1,000 degrees Fahrenheit. In this hot, dense caldron, the oil reacts with the coke, splitting into gases, gasoline, gas oils and more coke. The gases, gasoline and gas oils, in the form of vapors, are whirled out through cylinders at the top of the reactor spinning so fast that they go that the coke particles are flung to the sides of the cylinders so that they can fall back to the bottom of the reactor.

Coke from the reactor flows to the burner through a U-shaped pipe at the rate of 20 tons a minute in a stream of steam—a mixture that is almost as dense as water. In the burner, 200 tons of coke a day are burned to heat up coke particles that flow back through a second pipe to the reactor to maintain its heat.

The coker is designed to produce 650 tons of coke a day, including the amount that is burned to provide heat. The coke not used in the process is drawn off, cooled and either stored or burned to provide steam for other refinery processes.

What happens to the coke is, in a way, incidental. It's handy to be able to use the coke, but the real purpose of the coker

The 200-foot high coker reactor and burner rise behind three silver fractionation towers at Sarnia
is to produce other things that are far more useful. The coker increases by almost 20 per cent the amount of valuable products that can be taken out of a barrel of crude oil. It starts with 24,000 barrels a day of heavy, black pitch-like material useful only for products like asphalt or bunker oil—a heavy fuel used by industry or in ships. It helps turn them, in this typical example, into 1,000 barrels of naphtha for high octane gasoline, or ethylene; 8,000 barrels of gas oil, a component of furnace oil after further treating; 15,000 barrels of a molasses-like oil used in another process in the refinery; and gases at the rate of from 500,000 to 700,000 standard cubic feet an hour. More comes out of the coker than went in because the splitting reaction increases the volume.

The gases go to another unit in the complex—called the light ends recovery unit—to be separated. From this Imperial ends up with eight useful gases: ethylene, one of the most important petrochemical building blocks, for such products as polyethylene sheeting; ethane which can be made into ethylene in another furnace; hydrogen which is used for removing unwanted sulfur impurities from various refinery stocks; methane which can be burned in the refinery’s fuel gas system; propylene which can end up in ropes or rugs, to name just two examples; propane for stove fuel or, after chemical changes, synthetic detergents; butanes for gasoline and other uses; and hydrogen sulfide from which sulfur is extracted and sold.

The gases recovery unit is just one of the pieces of equipment associated with the coker complex. One of the integral parts of this complex is the crude tower where 60,000 barrels

Controller punches a button on panel that controls movement of all refinery liquids, including coker products

Lighted panels show how equipment functions during pre-operation check
A refinery means pipes. There are more than 1,000 miles of them in the coker complex, from 1/4 inch to five feet wide a day of crude oil are separated into fractions by distillation. One of the fractions is the heavy pitch used in the coker. There's a cylindrical chamber sitting on top of the reactor that blends this pitch with oil being recycled back to the reactor. Vapors from the reactor also pass through the chamber on their way to a fractionation unit that separates them into naptha, gas oil, and oil for the catalytic cracker which, like the coker, upgrades heavy oil.

These units all work together in a delicately balanced operation. No one can see what's going on in the thousand miles and more of pipes in the complex. But there's a computer to tell the controllers whether or not the right amounts of materials are flowing through the right pipes at the right temperatures and pressures.

Still, in such a complex operation, many things can and do go wrong. The biggest problem is probably the coke itself. For example, the fine hard particles can quickly clog the opening—only 7/16 inch in diameter—of any of the 42 nozzles that spray oil into the reactor. And these particles have a sand-blasting effect on equipment. Coke erodes pipes and quickly wears out pumps; equipment must be protected with expensive alloys. This is one reason for the high cost of coker units—Imperial paid $920 million for the coker, crude unit and coke boiler at Sarnia.

Still, the fluidized coker is more economical than its predecessor. The Delayed Coker, built in 1941, produced solid coke which had to be chopped into smaller lumps before it could be sold—often to employees as a cheap furnace fuel. They can still get fuel from the coker, but now they would not recognize it. Furnace fuel from the coker gas oils is blended in with other refinery streams before it is sold.

From the coker's 150-foot level, a panorama of the Sarnia refinery.

The circle is an endlessly repeated form.
The amazing adventures of the real Dr. Doolittle

HE WAS THE FIRST TO DRIVE A CAR ACROSS CANADA, AND HE CAMPAIGNED FOR GOOD ROADS ALL HIS LIFE

by Robert Collins

'I have been using Marvelube Motor Oil in my car ever since it came on the market last spring,' began the letter to Imperial Oil, 'and I thought you would be interested in knowing just what my experience with this oil has been.'

He had 'done considerable traveling' in the past 12 months, the writer added modestly, 'having covered Canada from coast to coast.' In fact, he had driven 20,000 miles with Marvelube, including two trips through the Rockies, and his engine ran just fine.

Was Imperial Oil interested? Imperial Oil was ecstatic, for Heaven's sake! The letter was signed 'P. E. Doolittle, President, Canadian Automobile Association.' Perry Ernest Doolittle, M.D. — the incredible Dr. Doolittle, king of the roads in Canada — had volunteered a testimonial! In June, 1927, that was like having the Queen say she approved of your tea, or Charles Lindbergh declaring he never flew anywhere without your Ryan monoplane.

Imperial reproduced the letter in full-page newspaper advertisements, with a minimum of text and a picture of the doctor. No more was necessary. Every Canadian reader knew that lean, alert face, the eyes alert behind the steel-rim spectacles, the crisply hair with neat middle part, the high white collar and immaculate cravat that Dr. Doolittle wore through flood, mud and rockslide.

He was always in the news. He was a Canadian folk-hero, a kind of cross between Don Quixote, Uncle Wiggily and the fictional Dr. Doolittle, forever bouncing off to do great deeds and find adventures. The automobile, said one newspaper, seemed to be 'his permanent place of abode.' His motor exploits were like a long-running adventure serial.

Everyone knew he was the 'inimitable physician-orator-prophet:' 'Canada's Colossus of Roads,' 'Father of the Trans-Canada Highway.' Everyone knew that by 1927 he'd already driven 150,000 nightmarish miles in his lifetime: across Canada, again and again; over a Quebec railway trestle with his wheels straddling the rails, inches from the ends of the ties and the 175-foot drop below; along a Rocky Mountain trail with no hint of a guard rail along...
an edge that seemed to drop clear to the bottom of things and rocks tumbling down on his car top from the mountainside.

Thousands of lucky people had even seen him, for Dr. Doolittle was always popping into some city or town, addressing every conceivable kind of club on safety, tourism and better roads. Yet few realized that by 1927 this gay adventurer—20,000 miles that year—was nearly 70 (the newspapers always reported: 'The doctor did not state his age'). To the world he was 'the genial doctor', as the press always called him.

Perry Doolittle was a natural for the age of pioneer motoring. He was a tinkering, an inventor, a compulsive explorer. He came by it naturally. His father, Ira, a well-to-do Aylmer, Ont., farmer had a way with machines. His brother Ephraim, (one of seven older brothers and sisters) could make miraculous repairs to watches with his thick fingers. From age seven Perry was obsessed with wheels, an obsession that lasted through his school years (he won 50 cycling prizes before he graduated in medicine from Toronto's Trinity College in 1885), his marriage and his medical career.

He was also tinkering. To his wife's distress he built a fine cluttered workshop in the basement and began inventing things. The first was a bicycle coaster brake that he took to England for a patent in 1896. Someone beat him with a better brake but the trip wasn't wasted. In England he met and fell in love with the motor car.

Back home a few loners were experimenting with horseless carriages. One of the first, John Moodle, of Hamilton, was now ready to sell his imported one-cylinder Winton gas buggy. In 1899 Doolittle snapped up what was maybe the first 'used' car in Canada and drove it home. The 40-mile trip took three hours.

'I chased him down the street toward our house,' remembers his son, Gordon, now retired in Toronto. 'I couldn't gain on him and he couldn't gain on me!'

They stabled the car in a shed where Gordon's pet rabbits promptly gnawed the rubber off the tires. Never in his life did Dr. Doolittle lose his temper, the son remembers, but he was close to it this time. 'We will have to get rid of the rabbits,' said Dr. Doolittle coolly.

The Winton, like every early car, was treacherous and erratic. The carburetor was a steel barrel like a small beer keg fastened behind the engine. When its intake valve opened, gasoline squirted in to be vaporized on perforated plates.

Excess gas dribbled on the ground. It took two quick turns of the crank, hitched to the 175-pound flywheel, to bring the Winton alive. The first time, Doolittle gave only one turn; the engine backfired, knocked him flat and sprained his wrist.

The doctor began to tinker. He added an advance retard spark to avoid backfiring and broken arms. He put in a suction jet carburetor to stop the waste of gas. He invented the Doolittle De-mountable Tire Rim; instead of wrenching off a flat, it could be slipped off easily in two minutes, and described his improvements in a 1930 issue of this magazine.

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Then, 59, he began to roam the length and breadth of Canada. Everywhere he preached safe driving: be courteous, obey stop signs, get rid of glaring head-lights, don't follow along main highways—revolutionary ideas at the time. Everywhere he demanded decent hotels, honest rates and restaurants with digestible meals.

For each region he had a special message. Get those 50 million U.S. tourists up here, he begged Maritimers, but first change the rule of the road. Maritimers still legally drove to the left of the center line, scaring the wits out of drivers from elsewhere on the continent. Get gravel on those muddy trails, he pleaded with prairie governments. Get roads through the wilderness, he urged Ontario and British Columbia. Get together for a great national highway uniting the provinces.

By the early 20s Canadians could drive, with difficulty, from Halifax to Vancouver. If they detoured into the United States around Lake Superior, the Ontario-Manitoba border and certain stretches of the Rockies. But a good and all-Canadian road was not a crazy dream. Doolittle insisted. Every year he drove across the country—or portions of it, subject to the usual detours—proving it could be done, but at some hardship. One year he gave away Trans-Canada Highway maps during his travels. Another year a map of the projected route—with its gaps—went on his Christmas card, which he pointedly sent to Prime Minister Mackenzie King. However Doolittle never publicly sided with any political party.

'There'll be a lot of changes in government before we get the highway,' he once told his son. 'I'm going to stay friends with all of then.'

His persistence began to pay off. An Alberta good roads booster said Doolittle got more government action in three months 'than we've done in three years'. As he plodded through the clay roads of New Brunswick and the awful gumbos of the prairies, making free speeches to any group that would listen, the whole country began to talk Trans-Canada Highway.

Somehow, he maintained his medical
practice. He now specialized in electrotherapeutics, a treatment for arthritis. After examining a patient and prescribing treatment he could turn the case over to his trained nurse—and take off on another junket across country. He drove McLaughlin-Buicks, Pontiacs, Fords; often manufacturers donated cars just for the publicity of having Doolittle at their steering wheel. He invariably started before dawn, which devastated those occasional companions who had partied the night before. The doctor, who never drank and allowed himself only one evening cigar, was bright as a jaybird every morning.

He found amusement in every ordeal. Once, bogged down in a rain storm between Regina and Saskatoon and soaked to the tip of his starched collar, he sought shelter in a farmhouse. A glimpse into the kitchen of that farm house brought a baking of bread that suggested a mild asperity of experience. A further finding that the schoolmarm of the district was a boarder told me that I had struck luck! In 1926 on a trip through the Rockies, small stones tumbled down on his roof; big rocks lay in his path; heavy rains washed out part of the road; snow was a foot deep in places and once the car was stranded on a boulder. But, said Doolittle, 'I could not miss the accidents as being spectacular in any sense of the word.'

He was addicted to motoring, the way some people are hooked on salted peanuts. In May, 1927, he took his wife for a drive to Montreal. But, reported the Toronto Globe, 'the weather was so fine and the going so good that the genial doctor found himself in Three Rivers where he decided to call a halt… Small construction gangs were encountered here and there but this detracted little from the pleasure of the drive.'

The Globe erroneously reported it as a 550-mile trip (instead of 450) which promptly caused someone to write that Doolittle should have been prosecuted for speeding. The Toronto press rose wrathfully in his defence, pointing out that Dr. Doolittle had averaged 28 m.p.h., well within the then-legal 35 m.p.h. limit, and implying that the critic better watch his mouth.

Newspapers all rallied behind him, partly because he was excellent copy but mostly because he was a gentle, courtly man who found good in everything except clip-joint restaurants and hotels with bedbugs. Where others cursed at road construction workers, Dr. Doolittle always waved. In Nova Scotia when he saw oxen pulling a road scraper, he didn't jeer at the 19th century practice; he said: 'Their slow, steady pace gives the best possible result to the road drag and entirely eliminates the tendency to chatter, which results when higher speeds of operation are attempted.' He praised the prairie landscape which others found monotonous. He managed to turn New Brunswick's horrible roads into a compliment: 'The heavy washboard condition shows that New Brunswick roads have not been idle this season.'

So, when the Canadian automotive industry gave him a 45,000 cash gift in 1928, everyone was genuinely pleased. Doolittle might then logically have retired. But one more great season of driving was ahead. In 1930, his 70th year, he drove to the Maritimes and back, to California, twice to the west coast and once up to Alaska. One day he drove from Winnipeg to Swift Current, more than 500 miles. All year he gave lectures, as in Field, B.C. where 'the genial doctor was prevailed upon to address the audience at the conclusion of the Talkie picture program.'

He did all this with increasing pain and the realization that he had incurable cancer. A doctor friend was developing a cancer serum. Dr. Doolittle, who never backed off from a new idea in his life, said, 'Why don't you try it on me?' His wife protested: it might merely compound his agony. But for nearly three bedridden years, Dr. Doolittle served as guinea pig for the serum, which couldn't save him.

'The years were lightened a little by the knowledge that his life's dream would inevitably become reality.' I have lived to see a world of skepticism dissipated,' he said in 1932. 'Everybody is getting behind the Trans-Canada Highway.'

He died New Year's Eve, 1933. The Doolittle home was inundated with flowers and telegrams from all over Europe and North America. At the funeral his brother Ephraim spoke for the family and friends. The Saskatoon Star Phoenix three years before had spoken for other Canadians, and now: 'Everybody who drives an automobile can pay a silent debt of thanks to Dr. Doolittle.'

Underground stores

The Japanese are going underground. Plagued by traffic jams, too much noise and polluted air in their crowded cities, they are excavating 'chikagai'—literally 'underground towns'. There are already 40 chikagai, and several more are planned. The towns are really underground shopping centers—self-contained communities of shops, restaurants and service industries. One three-tiered center in Tokyo has 260 stores. In contrast, Montreal's biggest underground shopping center at Place Ville Marie has 70. In any 20-hour period, as many as 800,000 people use Osaka's huge Umeda Chikagai, which, like the other centers, is close to transporation facilities. The 'towns' even have police stations whose work includes returning lost children to their parents.

Horse sneakers

If your horse seems to be racing with a springier step these days it may be because he's wearing rubber shoes. U.S. manufacturers of the urethane synthetic rubber horseshoes claim all kinds of advantages for their various models. For example, they outwear steel or aluminum shoes by three to one; they are self-cleaning; they reduce the heating effect of the heavier steel shoes and they provide a cushioning effect. At least one type is glued on with an epoxy resin. They even come in colors.

Underground storage

Huge tanks for storing oil may one day be as common offshore as they are on land, but they may not look like oil tanks. A 21-million-gallon tank that resembles an inverted funnel has been installed in the Persian Gulf, 65 miles off the coast of Dubai. The bottomless tank, weighing 28 million pounds, is 205 feet high and 86 feet in diameter. Oil from nearby offshore wells goes into the tank, forcing out water; as oil is pumped into tanks, water flows back into the ocean. Why build it underwater? So that supertankers too big to reach shore can pick up Dubai oil.

Fake rubies

The rubies look so real they have fooled experts. They even have defects similar to those that enhance the beauty of natural stones. But these rubies are produced synthetically at a fraction of the cost. Natural rubies may cost 12 times as much for a three-carat stone and they take hundreds—or perhaps thousands—of years to grow. The new synthetic rubies, called Kazan rubies by their Texas manufacturer, grow in a few weeks. In a solution approximating the mixture of molten rocks in which natural rubies are formed. The manufacturer is taking the precaution of recording the characteristics of the stones and the names of the buyers to prevent them being passed off as the real thing.