A LIFETIME OF CONTRACTING AND CRUSHING
Roger Mahan

Roger Mahan, Manager of Milburn Lime Ltd operates a lime quarry 40kms south of Dunedin. Roger followed in his father's footsteps and has spent a lifetime in contracting and quarrying industry.

Since leaving school, I've been 55 years working in the industry, and it's one which I have enjoyed very much, and still enjoy. I was raised at Peel Forest, which is north of Geraldine, attend Peel Forest Primary School, the role went from about 10 to 15, then went to Timaru Boys' High in Timaru as a border. The first year went well – had a ball. Start of '32 I was second from the top, second year I was 15 and I had in my mind that I was leaving school to go and drive machines and be a contractor.

Towards the end of the year, disaster struck – a mate and myself got expelled! It didn't worry me at all – I thought it was a good idea – I wanted to get home to my beloved Model T Ford and operate machines and pull machines to bits. I couldn't tell anyone what my mother said and threatened to do to me!

About a day later, my father had me drive one of his TD9 national tractors with a hampered loaded dozer on. Loading river gravel onto trucks. Great machines in their day. You took the blade off, put the bucket on, drove forward into the face, load the bucket, reverse, and while reversing with the bucket coming over the dozer, duly dumped it into the tray of the truck. You had to load a yard a minute, average, to satisfy my father. Shortly after, I remember having my 16th birthday on an RV10 dragline loading trucks. And look out if there was stone landed on any cab or paint work.

During the time working with my father, I was introduced to a considerable amount of drilling and blasting – all bloody hard work, and gut-wrenching work. Any rock encountered on roading we'd generally use ex-WWII Worsop petrol engine drills, similar style to the Atlas Copco Cobra. The engine turned and hammered the removable starboard on the end of the steel while the exhaust blew down the centre of the drill to flush out the dust and chip. They were better than the old hammer and tap gear, but still damn hard work as most of the holes were horizontal and semi-horizontal. One job, for example, was putting the road from the Lake Ohau Lodge up to the top of the mountain to form a ski field. That is rock damn-near all the way. Ohau has become a fairly well known ski field, so most of you will know what I'm talking about. I sometimes wonder if there is anybody about today wide enough between the eyes who could take on such a task with an 8 tonne bulldozer and a Worsop drill.

We also had a Sullivan wagon drill on three iron wheels and a seapeck compressor, but we used this mainly on vertical holes – paddock drilling, or where we had room to use it.

After a few years working around Canterbury with dad, he had cretarow [something road?] construction company in those days too. On a wide variety of work and machines. I joined the Ministry of Works at Benmore which was getting ready to build the dam – some of my mates had gone there, so I thought it was a wonderful opportunity to go and experience. I worked with older chaps who had travelled and worked around the world. Learned a lot about blasting during this time.

A couple of years later, I was up in Temuka one weekend after a severe flood and met up with some of my mates from the Catchment Board who told me they would be looking for a lot of bulldozers. I thought "My word! This could be an opportunity for me". So I caught up with area engineer who I had worked for previously at times, and he said "Roger, you're always doing the odd job for us, so I can give you at least three or four months work, but could you quarry some rock for river protection?", and my reply was "Yes, I can, I'm sure".

I took leave from the Ministry of Works, saw sights for rock, brought in international TD18 bulldozer for Littleton Harbour Board for £500, and total assets from the receiver of the Smith construction company for £750, which was a TD15 bulldozer, galleon grader, 10 Yardley torno carry-all, and a V8 run-about.

I purchased two sleeve valve air compressors and some jack hammers for £100 off the State Coalmine at Kaitangera, and a climax wagon drill from the Ministry of Works. I got the TD15 to work within a week or two. Incidently, the chap who drove the TD15 came for a fortnight to help me out, and stayed 28 years until retiring

in his 60s. Nothing was planned, and I built on opportunities as they came along, and learnt by experience along the way. I didn't like to turn any job down if it involved rock. I opened numerous pits and quarries. I'd got an enthusiastic team, mainly younger chaps like myself, who enjoyed the everyday challenges and excitement. We quarried rock from the closest source, just doing a deal with the landowner concerned. Payment was generally a bit of cash or a bit of bulldozer work, sometimes a couple of dozen beer or a bottle of whiskey. No resource consents or mucking about in those days – just move in and do it. To allow me time to mine and quarry for the first few years, I worked on permits issued by the local postmaster which allowed you to carry out quarry work on your own under a designated certified quarry manager. These had to be endorsed by the postmaster and a JP known to you. The quarry manager was expected to visit the site once a week. This was great, and I was in fulltime rockwork, I was doing roadworks and rock protection for Geraldine, McKenzie, Ashburton County Counties, rock protection for cash and board, and the Ministry of Works.

Now, one afternoon, after I'd just fired quite a reasonable blast, who should turn up but the quarries inspector. He asked me "Where's the quarry manager?" and I replied "I am". "Have you got a ticket?". "Yes", and I showed him my postmaster's letter, and he practically fainted. "I haven't seen one of these for years!". "Looks like you know what you're doing – have you got a day book?". I said "Yes" and gave it to him. I was bulling out boreholes and producing good size rock which seemed to impress him and also had a 3200 guarded end rear track, a 600 cubic foot compressor, and a TD15 drop skid shovel capable of loading 12 tonne stone. "Well," he said "you'd better have a real certificate", and he wrote me a quarryman's certificate right there and then.

All these young fellas may not know what "bulling" is in quarry terms. Now, before you get all excited, I can assure you there are no young heifers involved. The flow basalt was laying on top of clay. So we drilled into the clay, put a small amount of powder into the bottom, fired it which expanded the bottom of the hole to allow us to get the bulk of the explosives into the bottom of the hole. I had the highest respect for the older inspectors. They carried a wealth of experience, and so gladly shared it, and gave you helpful information, suggestions, and various alternatives associated with the industry. Sadly today, most mining inspectors have never been at the coalface and are of a very different background, and also the different style of duties they now carry out.

About 1965 I received an application to join the British Institute of Quarrying. I joined, and have attended several h****held shows and today I enjoy the activities of the now-New Zealand Institute of Quarrying, and was presented with the FIQ a few years ago.

I had opened up a new field in rockwork with little or no competition from Central Otago to Blenheim. I developed my own recipes for obtaining larger style stones from greywacke, and learned from experience how to read the different rock. After 18 months I had three TD18 bulldozers and two TD15 bulldozers working, a couple of rock trucks, two air track drill rigs, three carry-alls, one grader, one RV10, and one RV19 excavator. I had the first bulldozer round with hydraulic rear-mounted rippers, and the first excavator-mounted rock breaker which was an MPK air operated machine. We got out in front with Australian/New Zealand patents for inventing equipment for ploughing in up to 400mm plastic pipe with 1m cover and the ability to work under the sea bed or any other hard to work place. We also patented special equipment for ploughing in fibre-optic cable with sera tension spool fitting equipment. The patents for both operations gave us work right throughout New Zealand and we spent just on 17 years working in the North Island. I had not long constructed a sea wall at the mouth of the Orere River on the Pacific Coast. This job entailed 25,000 tonne of rock, from 1 tonne to 15 tonne in size.

I received an invitation from Royd Sutherland McLay Consultants for the Chatham Islands County Council and Ministry of Works to attend a meeting in Christchurch for interest in proposals to develop rock quarries on the Chathams and Pitt Island, and supply rocks for breakwaters and extended wharf yard area at Waitangi and crush road metal. A party was arranged to visit Chathams to view the work. On the 2nd day there they asked me to tender for the roading as well, which took me by surprise, as there were some very big boys there. Both the Ministry of Works and Halroyds appeared to be spending more time in covering concepts of my thoughts and ways of achieving what they wanted, and I knew they were serious towards me. We had to have our proposal presented in six weeks. I had two older engineers who I had worked with over the years who gave me real help in putting my proposal to the tender stage. About a week later I was notified and booked on a flight

to Wellington for a meeting at Ministry of Works Head office – I really had the shivers, I was shaking, not knowing what I had let myself in for. It was like applying to be a policeman. They went right through my history from school days. They asked a number of trick questions, as well as types of plant, work procedures, whys, and hows. I was humble and had no problems with answers. At afternoon tea time, I said to one of the MOW guys on the panel who I had known previously that I had not expected such an interrogation. Roger, he said, you're on your way. Just have to convince the Chiefs that you'll not fall over, as we can't take over ourselves. Excitement grew. About a week later I received a letter to say that I'd been chosen for the road making including three single span bridges, all work including the road metal crushing on the Chathams, and a road across Spit Island to Glory Bay with a bridge breakwater and wharf upgrade at Flower Point and seabed drilling and blasting at Pitt Island and Chathams. McConnell Dowell were my main competitors. The wharf work at Chathams was awarded to Arup (?) Construction of Auckland. International Halves (?) that gave me real support as their biggest deal of the year for the South Island. Six new tip trucks, two new TD15 bulldozers, one 75 drop loader, a 65 off loader, and all on 10% deposit. All other plant was from my existing operation. I chartered the home and company vessel, called The Squall – originally Canterbury Steamship ship – to shift all our equipment and stores. My men had flown over to set up the accommodation which had been Skeggs Fisheries from Dunedin. I decided to stay with the gear on the ship. There had been banner parades outside the Chatham Islands County Council offices against the work I was to do. Some wanted the money spent on other fields, some thought they could do the work themselves. We were about to pull away from the wharf when the gong went and the crew wouldn't sail in sympathy of the demonstrators. We (the boat and our gear) got towed around to the exposed wharf as I had a good few tonne of explosives on board. This went on for nearly three weeks. I was under police protection. The Islanders were given the option of getting the ship to sail or the money for the development would be withdrawn and the Government would be transferring the money and sending the ship (with my gear) for an airport extension at Rarotonga, which, like the Chathams, was under Island territories. There were numerous newspaper articles in the press where some islanders would blow up our machines and the wharf, and threaten by letter to kill the Manager of International Halves (?) Company and myself.

Finance and insurance company withdrew their services, so my accountant said "you're stuffed, right, you might as well go and have a few beers!". That was OK. I've never really taken a lot of notice of these professional people. So, went up seeing the Halves Company, had a meeting in their glasshouse, which was their Head Office. They pulled some bugger out of bed while I was there in Chicago, and I remember hearing him say on the phone "Let the lad go ! We'll appropriate all the finance," he said "we'll take over the insurers". I was on the way still. Finally we sailed unexpectedly and quickly. When we arrived at the Chathams, the ship's crew stayed below decks out of sight, as there were locals ready to beat them up. The Chatham Islanders on our side worked the cranes and gave us a hand to unload all our gear in quick time. Some locals were rounded up and we had 24-hour watch on our gear. The weather was good, and our first job was to make a road to Otakau Fishery Settlement and Freezer. We just picked the best route for all our roads – ignoring any paper roads or dirt tracks or whatever they might have called roads before. Once our roads were formed, they sent surveyors down from Wellington who surveyed our roads and made new road lines. The quarries, we just picked the closest source of suitable material – no such things as resource consents like today. I worked closely with the Council, and especially the County Chairman. I used to spend a lot of time with him which was great. I'd ring him up if I could see anything better to do. It was a very practical set up. I was on performance bond. I had to do so much roading, so much.... About once a month we'd have a 3-day visit by an engineer from New Zealand. He was no problem. Materials we quarried were schist, basalt, limestone, sandstone, and seashells. Sometimes there were three lots of stuff within the core of this room, one side to the other you'd have some volcanic stone, you'd have a bit of schist on the other side, and you could have some limestone in the third corner.

Most of our roads on the northern part of the island were on peat, which is up to 200 foot deep in the deepest of it. We constructed approximately 100 kms of road. We would close down for each winter because of the wet and no evaporation. I would leave a skeleton crew crushing through winter for top coarse, and the rest of us would come out for the winter. Our crushing plant was a 1944 model Booth Mac jaw with an oversize return. Extra money was made available, so we had the contract extended. Also when the roading was done, we shifted the Tikerakau School down to the Tioni school, and the Tikerakau Schoolhouse to Owanga. They had some roads so they'd get backwards and forwards to pick up the kiddies. We spent a whole season of

approximately nine months on Pitt Island constructing a road from the west to the east side. Besides giving access between the farms, it gave an alternative landing place for the supply ship to shelter and work the surf boats on the opposite side of the island to the prevailing wind. We made a barge, mainly out of a welded together fuel tanks and a bridge timber, we made this at Geraldine and took it all to bits again and put it on the ship and re-erected it when we got over there. The bulldozer was the first one off. All the islanders turned up on horseback to help up. A few had saddles, the rest just a rope around the neck of the horse. I heard one lad, about 10 years old, say to his dad "Dad, look at those biggest four-by-twos I've every seen!" – they were actually 20 by 14 bridge girders. We had them for the wharf and a bridge. All went well. Roading materials were volcanic or limestone. We did a lot of drilling and blasting on Pitt for breakwater and road material. Had a good team and all construction went well.

On leaving the island, the TD15 was the last piece of equipment to be loaded on the ship. Quite a swell sprung up towards the end of loading the ship, and as they were loading the TD15 into the hole of the ship, one end of the blade hit the side of the ship reasonably hard, and it broke 23 rivets on an overlap outer skin of the ship. Water burst in. all hell broke loose. The bilge pumps were all set going, but the water was gaining. The crew wanted to dump my loader, my dozer, and my trucks overboard into the tide. Captain Terry Hunt was running around carrying a hailer calling "Calm it boys, calm it boys, we'll get home – calm it boys!". The boys were yelling "We'll never see our wives again!" etc. the ship's crew, the ones not doing all the bellowing, worked with precision. We timber boxed between the bulldozer blade and the affected area and put in 6" pipes and valves into the source of the rupture. Woodchips and fast-setting cement were poured into the boxing, and about 45 minutes later we were able to start winding the valves down. Problem fixed, and the ship sailed back to New Zealand.

After coming back from the Chathams and Pitt Island, I built up further on drilling and blasting. We were doing the drilling and blasting for seven limeworks, a number of middle quarries, Littleton and Timaru Harbour Boards, Clyde Dam (before the MOW got their own gear), miscellaneous roadworks, access tracks, foundation work, some tunnel work – I had four drillers and four airtracks. Only ever had the four of them working at once and that was up in the Maniatoto on the irrigation race where McConnell Dowell put the tunnel through. The job had to be done in a hurry to allow McConnell to get in, and we formed the Parthey canal from it and set the portal up for them. I underlined works at Geraldine and operated portable plant as well and saw an opportunity to set up at Milburn. I spent three months test drilling around Milburn, and finally set up plant in the closed down Milburn & Cement Company quarry – that's where we put our crushing gear and our workshop and smoker hut - and reopened the abandoned Dominion Lime & Phosphate quarry for our stone supply approximately 1km to the west. Limestone is formed on horizontal plains, and we worked the depth of the seam as one face and drilled from top to bottom which is about 36m. we drilled all vertical holes and fire it in one shot. We get excellent fragmentation with a powder factor of about 0.5. Each blast we do is between 60 and 80,000 tonne. Work your high faces is only as safe as the people around it. If anything goes wrong, it can go wrong in a bigger way. We've never had any problem, and it's a very economical and practical way for us to do it. The design of our shots I look after very carefully - I spend quite a bit of time on our timing of our explosives.... on our non-els especially. In the old days we couldn't do the same as what we are doing today....we'd have sympathy shooting which would stuff the whole thing up!

Generally the holes are water-free, so ANFO was the the norm. For a good number of years we've imported our own ammoniumnitrate and used Westfarmers high explosives and non-els. We've been dealing for over 30 years with Clarrie Bairdsmore from the days when he was with Dupont Explosives. Dupont company were a great company for technical services, and I learned much from their USA representatives who used to visit New Zealand from time to time. One gave me a good hand to a drop of 200 foot high face which I couldn't get on top of protection rock, which looking at it now was even quite a feat for today with a drawing everything from the bottom and putting all explosives in the bottom.

The Dominion Lime & Phosphate Company Lime has possibly the best agricultural lime in the country. It contains a little bit of phosphate, but it's a very pure lime, it's a young stone of between 20 and 30,000 million years old – go to the States or some of these harder limes they're two or three hundred years or more older. It's not as hard as the Cumberland stone standard which some of you may be familiar which all limestone is judged by throughout the western world. It contains many modern fossils such as exactly the same as what's in

the sea today – the same little seahorses, the same fish, and the same cockles and whatnot. It's the oldest place in the world where they've found toothed whales. Toothed whales are a young species compared to the baylene whales. We've also found a dolphin with a three metre skull, which is unheard of in today's size and was quite prized by the university. The last whale we dug out was 17 metres in length. The deposit is of international interest and brings visitors from all around the world. We notify the University of Otago when we have a new find. They come with their trailer of gear and students to collect bits and pieces and put things together. We enjoy them as they send us a letter of the specimens they find and what they are etc, so it keeps my men keen too – they've got to look out the whole time. Milburn Lime built a fossil house for the local Waihola Look Forward Group up on top of a hill above the limeworks which houses some fossils and many photos of the old Dominion Lime, the Milburn Lime, and the Ewan Phosphate Company. This building is signposted from the main road, SH1, just north of Milton.

When the quarry was first worked, a large seam of phosphate ran alongside the lime and some thousands of tonnes was processed and sold. Dominion Lime & Phosphate Company was the forerunner to Ravensdown. Milburn Lime & Cement Company operated a quarry and cement plant one kilometre to the east. After 1931 Napier earthquake, concrete standards were raised and Milburn Lime failed tests and discovered the phosphate and lime affected the cement. At that point Milburn set up a quarry at Dunback, this was inland from Palmerston, and shifted their works to Burnside in Dunedin. They carried on making agricultural lime at Milburn to supply farmers from Oamaru to Tuatapere. The long distances were no problem because lime was subsidised and rail was free. It was one of the oldest rail subsidies in the country came in about 1880 or 1890. When the free rail ceased, Milburn Lime & Cement closed down in the early 1960s and the drier and most other plant were sent up to start the McDonald works at Otorohonga in central North Island.

Stripping the overburden consists of some volcanic on top, seabed sand (which is called Clarendon Sand), and a low-grade phosphate rock above the lime. We have over 30 metres of overburden on the high end and about 7 metres at the other end. We have enough stripped for about 10 years at present day production. The main plant items we operate are three 785 100-tonne Comanche dump trucks, one X11 100 Hitachi 110 tonne excavator, a 670H 70 tonne Hitachi excavator, two Cat D8 bulldozers, two Axis 200 Hitachi excavators with rock breakers, four 980 caterpillar loaders, and we've got one Cat 966 and a 950. These are only used at our lime stores down in Southland.

We generally get very little oversized rock and generally little bit of cap rock, but damn all. We stockpile it onto the quarry floor. This rock we have for a wet day job for the 20 tonne excavators with their rock breakers. We do not have to dry our line with rotary kilns which is a great cost saving and allows us to full utilise our polarises to capacity. Savings are cost of running the coal-fired driers. Each drier can generally only do 30 tonne of lime an hour, which restricts the processing of the lime. We operate two 36x48 Jeffrey diamond pulverisers, each with a 250 horsepower motor at either end, and a No.44 Jeffrey diamond impactor. We process up to 180 tonnes of fine lime an hour, but generally stick around 140 150. We hold an organic certification for our lime these days. Our success is made from the quality of the lime, having good reliably skilled employees, machine with capacity to do the work, listen to the old hands as you don't learn it from reading it out of a book as all quarries are different and develop your own skills to suit. And No.5 would be don't over commit yourself. I've been very cautious – I've got a bit of Scots in me. Old Mother used to say to me don't you spend too much money, make sure…. And I generally never bought anything unless I had the money to pay for it – except the Chathams which I knew I was going to do well out of and it was built in for 3-year term, well we got so far advanced in our work, all the gear was paid for in less than half the time. The tax department gave me a hell of a shock though – couldn't get over that one !

Well, I've enjoyed my life with some of its ups and downs, and good times and bad times. It's been a hard life at times, but I've got no regrets. I've been with a lot of great people and have never set London Bridge on fire, but have enjoyed succeeding as a sole trader and always kept my head above water and no real financial problems. I still keep my hand in and working with the boys – and that's my life.

I thank you very much for giving me the opportunity to present this paper.