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Farming at Wylie : A Technical Biography 1933- 1963

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USE OF THESIS

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Farming at Wylie
- a technical biography
1933 - 1963

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Abstract

The genesis of this project was my father Graeme Rhind's collection of photographs of farming in Western Australia, dating back to 1929 when his parents first began farming in the wheatbelt near Wyalkatchem. I was interested in the way these photographs illustrated changing farming practices during the following three decades. and how they provided both documentary evidence and stimulated recall of memory.

I was also concerned by the loss of knowledge of old photographic collections. The photographs are insufficient by themselves because each image requires specialised knowledge which the viewer may not possess. and that knowledge is lost with the passing of time. Images are often regarded as self-contained, and rarely include related background text. As a result I advocate the process of collecting photographs and oral information at the same time. and integrating substantial text with each photograph so they can be used for other purposes in the future.

The cost of printing photographs in books is a significant barrier for photographic publication. but electronic media provide inexpensive methods of preserving and publishing photographs and text as a CD e-book. In this project I used common and familiar Internet programming software so the e-book can be read on almost all computers. Internet-style programming also allows the writer to link images to other images or pages. so readers can explore unfamiliar images (like the unusual 1955 photo below) in ways that cannot be done in printed text. The final product of this project is a CD e-book on farm life between 1933 and 1963, integrating both photographic and oral history.
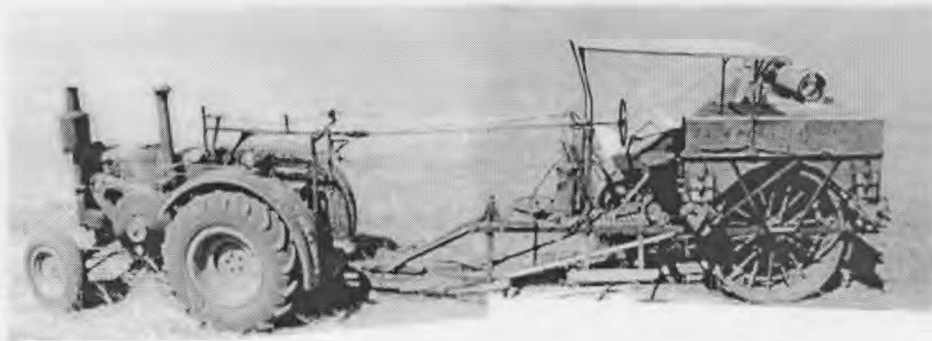
The creative work attempts to integrate images and text to preserve a historical recollection of farming life at that time. The story begins with an abbreviated family biography to provide the social context, but the technical routine of farming is the main interest of the story. Perhaps the best description of this work is a technical biography.

A selection of the e-book has been printed here, but the text is best read as an Internet document, with all the added pages, links, extra images, and colour. The disk is included as an appendix and can be opened with any web browser. The pages and images can be individually accessed, copied and printed.

The accompanying essay explores some of the issues in writing history in this manner, including collection and preservation of material, and the difficulties of maintaining a coherent form for a narrative created from the two disparate media of photographs and text.

Declaration

I certify that this thesis does not, to the best of my knowledge and belief:
  i. incorporate without acknowledgement any material previously submitted for a degree or diploma in any institute of higher education
  ii. contain any material previously published or written by another person except where due reference is made in the text; or
 iii. contain any defamatory material.

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- a technical biography

This story relates part of the seasonal routine of one farm near Wyalkatchem in Western Australia during the mid-1900s. It is based on my father Graeme Rhind's photos and recollections, with references from history books and local museums.

Graeme was born in 1933 at Koorda in the central wheatbelt and lived on his father's farm north of town. A year later the family moved south to another farm at Nalkain near Wyalkatchem. Graeme took over that farm in 1955 and ran it until 1963, when he moved to new land on the south coast. The story describes the Koorda farm but focuses on the Nalkain farm. named Melrose, from 1935 to 1963.

The main page provides background on the Rhind family. The side pages go to descriptions of different aspects of farming. Machinery was rapidly changing farming life: cars. trucks. tractors, ploughs. seeder, harvesters, shearing equipment, stationary engines. electrical equipment, and others. New biological and chemical knowledge was changing cropping and animal husbandry. Each side page explains one specific area of farming technology at the time.

Each photo links to a larger high resolution version of the same photo, or a related page. Click on the image to bring up the page or picture. Some photos also have rollover images which show exact parts of the image. Pass the mouse over the image to see the titles. If you want to print any part of this story, I suggest that you open the pages from Word and convert to page view. This will keep the pictures intact on your printer. Web browsers tend to cut pictures when you print the pages.

Sources (technical and historical) are listed at the bottom of this page. For readers in Western Australia. I also recommend visiting the Tractor Museum at Whiteman Park north of Perth, the Wyalkatchem Museum, and the Discovery Farm Museum at Beverley.

**Sources and
Acknowledgments**

Bruce Rhind, 2005

Kulja and Nalkain

Kulja: Going West

At the beginning of the last century, the Rhind family were farmers in Victoria. Hector Rhind (my grandfather) wanted to follow in the family farming tradition but could not afford land in Victoria. After Hector (Hec) and Ada Minnie Nichols (Nick) Rhind married in 1926 and had their first child Ailene in 1927, they decided to look for land in Western Australia. They arrived in Fremantle in 1928 and Hec went out to the wheatbelt looking for a land he could afford.

In 1929 their second child David was born in Perth, and Hec purchased an uncleared block of 900 acres (365 hectares) near Koorda, 250 kilometres northeast of Perth. Money was tight so the first farm house was improvised from two wooden truck crates that Hec carted to the farm on the back of his 1928 Chevrolet truck. One crate became the kitchen, the other the bedroom.

The closest crate is the kitchen, with a tin roof held down by poles wired down to logs under the crate. The chimney is connected to a wood stove. The far crate is the bedroom. Kulja, 20th April 1929.
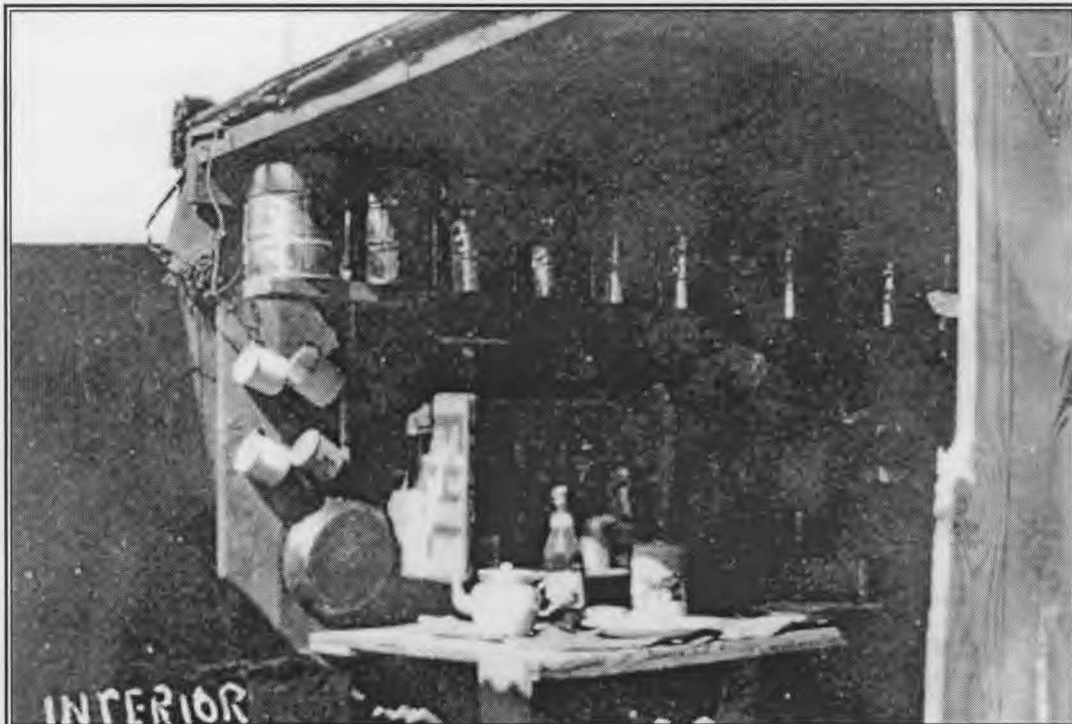
The kitchen crate interior. Large round tins on the shelf protect food. Enamel mugs and a frying pan hang from nails on the wall. Above the handmade table is a pantry box nailed to the wall. Kulja, 20th April 1929.

Hec's new farm was in an area called Kulja, about 26 km north of Koorda. Hec chose the house site for the soil, as he needed the right earth for making mud bricks. In the following months Hec and Nick built a house from handmade mud bricks, bush poles and corrugated iron. Hec planted their first crop and began harvesting.

But Hec's timing could not have been worse. On the 24th October 1929 the US stock market crashed, triggering the worldwide Great Depression. On the back of one of his photos Hec wrote that his seed grain cost him 3 shillings 4 pence per bushel in 1929, but the sale price was 1 shilling 2 pence.

Banks began to foreclose on farms that could not repay their loans. To avoid the collapse of the farming industry, the federal government introduced the Farmers' Debt Adjustment Act in 1930 to keep farms working. Farmers covered by the Act effectively worked for the bank, which took control of every aspect of the farm. In Western Australia, unemployment rose from 6% in 1928 to a peak of 29% in 1932, while Australia's export income (dependent largely on wool and wheat) dropped 30% by 1932. Hundreds of farmers gave up and walked off the land.

Hec laying the first mud brick for the new
house at Kulja in 1929.

Hec pulling a Mackay Sunshine WA harvester with a Holt 2-ton crawler. The
two men on the harvester control the comb height and bag the wheat. Nov. 1930.

Hec and Nick hung on. Nick later told me that life in the country during the Depression was not as severe as the cities: farmers had the ability to provide most of their own food. They had land for planting vegetables and grain, and were never short of wheat for bread, or oats for porridge. They could raise chickens, pigs, sheep and cattle, or trap rabbits and birds for food. Many farms moved to a subsistence economy, bartering farm products (often wheat) for necessities.

Hec and Nick acquired an English labourer, Jock Adamson, on a similar basis. Jock (a mining engineer) arrived in Koorda looking for work during the Depression, and was desperate for a job. Hector took him on though he could not pay him for the first year. Nick said that Jock was "thrilled to bits to have work, food and a bed". Food and shelter were more important than wages.

David, Hector and Ailene Rhind with labourer Jock Adamson on the comb of the Mackay Sunshine WA harvester. Kulja, about 1933.

The summer stack of bagged wheat awaiting transport at the Kulja siding in about 1930.

Fortunately Hector found work with the local Road Board (the predecessors of the rural Shire Councils) under one of the Depression employment schemes. He used his crawler tractor with the Koorda Road Board's grader to repair local roads and sink dams. He was paid five shillings per day, plus kerosene for the crawler. He was lucky to have the work and the income.

Hec Rhind on his Holt 2-ton crawler tractor, repairing a typical dirt road with an Adams grader near Koorda in the early 1930s. The bitumen began a hundred kilometres west of Wylie. *Click the image for the Crawler Tractor page.*

Graeme Rhind, my father, the youngest of the three children, was born in the tin-roofed hospital in Koorda in 1933 as the Depression reached its depths. He said the Depression had little effect on him because he was too young to know anything was missing. He still had food, clothing, shelter, and family. His parents could not buy toys, but Hec helped the children make toys from sticks, wooden boxes, string, tin cans, and any material on the farm scrap heap. Graeme regarded this childhood improvisation as an essential part of his own career as a farmer.

Nalkain: water, at last

The Kulja farm had one major problem: a lack of permanent water. Most of the soil on the farm was sandy and Hec was unable to sink a dam or a well. In 1935, as the combined effects of the Depression and a four-year drought began to bite, he abandoned the property. He took the family 55 km south to start again at Nalkain, 15 km north of Wyalkatchem. This 3,000 acre (1,215 hectare) farm was successful.

Rhind Road and Melrose farm at Nalkain, 15 km north of Wyalkatchem on the Koorda Road. *Click the image for a regional map (from 2003).*
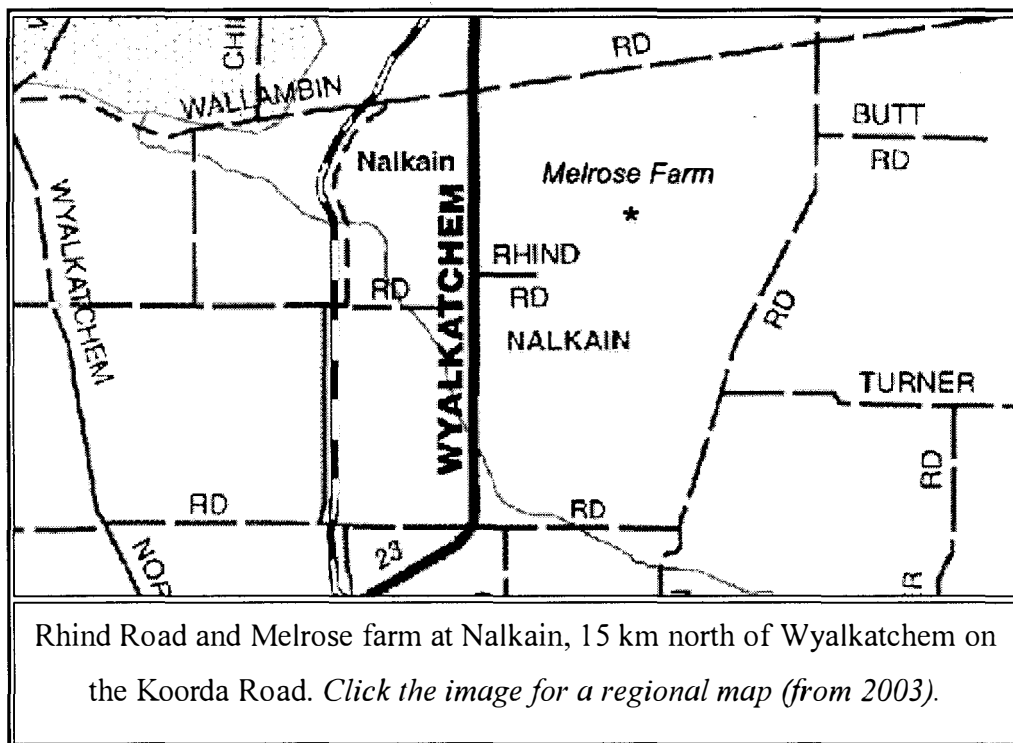
Graeme Rhind in a homemade canoe in the Melrose house
dam, about 1947. *Click the image for the Water page.*

The Nalkain farm, named Melrose, had higher rainfall and permanent water. The
previous owner had excavated a small dam in the centre and a well near the southern
boundary. The soils ranged from fertile red clay loam to the "gutless" yellow sand
covered with scrub known as wodjil. About a third of the farm was already cleared. Hec
cleared a similar area but left most of the wodjil uncleared, and other patches of bush,
including the shelter belts along the fence lines, and the salmon gum and gimlet
woodland around the house.

Hec used the local soil to build another mud brick house. The walls were rendered with
mud, except the south and west walls, which were rendered with lime to prevent erosion
by the wind and rain which came from the southwest. The house had two bedrooms, one
for Hec and Nick, and the other for Ailene. The boys had a sleepout on one of the two
verandahs, enclosed by a half-wall and awnings. Mosquito nets hung from the rafters.
More beds were kept on the other verandah for visitors.

Hec added a machinery shed with a workshop at one end, and later a hay shed and other
small shelters. The sheds were built from bush poles cut from tall gum trees, and roofed
with corrugated iron. The sheds faced east to avoid winter rain and summer sun. The
farm had no electricity for many years, using kerosene in hurricane lanterns, and later
Aladdin storm lanterns, for light. In the 1940s Hec installed batteries and a wind-
powered Windlite generator, but it was many more years before the farm had an engine.

Eventually Hec installed the standard 32 volt farm supply, powered by a single cylinder 2½ horsepower Lister engine and batteries in the main shed.

The Melrose homestead at Nalkain in about 1940. The closest room with awnings is the boys' sleepout. Visitors slept on the right verandah. The tower holds the Windlite generator; the car is a 1932 Chevrolet ute. *Click the image for a farm map in 1955, after David Rhind bought the Threlfall's property next door.*

Melrose farm looking north in about 1957. *Use mouseover for titles.*

The children spent most of the time "mucking about in the bush". They built tree forts from old corrugated iron in a couple of salmon gums and shot at each other with gings (slingshots). They made miniature farms populated with bottles and other objects to represent animals, and built model ports on the sandy beach in the house dam. They also had tasks around the house: feeding chickens or orphan lambs, collecting eggs, milking cows, and chopping firewood.

David, Graeme and Ailene feed orphan lambs, about 1935.

From the age of six, all three children cycled five miles (eight km) to the tiny primary school at Nalkain. Nalkain was too small to be called a town. It had a railway siding, weighbridge for summer grain crops, government dam, and a primary school combined with a hall. Three passenger trains and two goods trains (which also carried passengers) passed through each week, but the real purpose of the railway was transport of wheat.

The Nalkain Primary School had only 12 pupils by 1941 and closed the following year. The children continued their primary education in Wyalkatchem (Wylie), boarding in town during the week. Later all three boarded in Northam to attend high school, as Wylie had no high school at the time. There are no buildings at Nalkain now.

Graeme watches Ailene and David cycle to school in 1938.

The Nalkain Primary School and Hall in 1941.

The entire school, June 1941.
Ailene is back centre;
Graeme left end of middle row;
David right end of middle row.

The Second World War

The war began in 1939 and Graeme joined his brother and sister at Nalkain Primary School. Hec, aged 44 that year, had served in the First World War, but farmers were encouraged to stay on the farm to provide food and materials for "the war effort". Hec became Captain of the local Volunteer Defence Corps (VDC) in 1941. The Wyalkatchem VDC unit had about a hundred men, mostly farmers, who met each month to practice grenade throwing, shooting, silent manoeuvres, delaying tactics, ambushing and road blocking. Training ceased during the summer harvest.

When the Japanese attacked Pearl Harbour on 7th December 1941, overwhelmed Singapore on 15th February 1942, and bombed Darwin four days later, invasion looked certain. Graeme knew that the adults were worried, but he was too young to get caught up in the drama. Most of his time was spent playing in the bush with his siblings, at school, or helping his parents run the farm. The most direct effect was the arrival of the Italian Prisoners of War in 1944, who were intended to solve the manpower shortage on farms. Most farmers soon realised that the Italians had little enthusiasm for the war and were no danger to Australians. Hec's two workers, Delfino Primotici and Adriano Manfredi, built themselves sleeping quarters from homemade concrete bricks. They ate with the Rhind family, worked with them, and slept unguarded in their quarters. Graeme found Delfino and Adriano fascinating. They were artistic, musical, religious, and much more emotional than Australians. Both Italians returned to Italy in 1946.

Adriano (Andre) Manfredi, Italian POW, driving the Lanz HR5 tractor while Graeme looks after the Mackay Sunshine AL harvester. Summer 1944.

After High School, and the War

After the war ended in 1945, Hec and Nick finally began to make money from the farm. For the first time in thirty years, Hec was able to buy a new car, a 1948 Chevrolet Fleetwood.

Graeme, Ailene, Hec, Nick and David Rhind at Melrose in 1947.

Nick Rhind in the new Chevrolet Fleetwood, May 1948.

Each of the three children had to decide on a career. Ailene, who had been ill with bronchitis for most of her high school years and had to stay at home, began nursing training in 1947. She later travelled to Victoria, married, and brought up a family there.

Ailene Rhind (left) at Princess Margaret Hospital in 1947.

David returned to Melrose after three years of high school, and bought the Threlfalls' property next door in 1949 (see the farm map, 1955.) He married in 1950 and ran his farm, Chevy, until 1966, when he set up a Massey Ferguson agency in Wyalkatchem.

David Rhind in his shearing shed with his nephew Rob Maldon, 1956.

Graeme in uniform as a cadet at Northam High School, August 1948.

Graeme finished high school in 1948 and started an agricultural diploma at Muresk Agricultural College near Northam. However, the course at that time was designed for city kids who knew little of farming; after a year, Graeme had learnt a lot about pigs and chooks, but nothing useful for Melrose, and Hec decided to bring him home.

Farmers' sons were expected to take over the farm, but Graeme did not need persuasion. He wanted to have his own farm. He had learnt the necessary skills from his father, and was full of enthusiasm for the lifestyle. After a year of compulsory National Service in the Army in 1952 he was ready to take over the farm.

Alison Hitchins

Graeme met Alison by accident during the 1952 harvest. The accident was snakebite.

Graeme had returned from National Service and had begun harvesting on his father's farm. The old Sunshine harvester broke down frequently and Graeme, clad in the farm uniform of shorts and sandals, had to walk to the harvester to fix the problems. In the

middle of a repair he stood on a dugite "which got upset, bit me a couple of times, and shot through".

At that time the only proven treatment was anti-venene at the local hospital. Graeme reached his ute and headed for his brother David harvesting on his own farm next door. Graeme and David disagree on this part of the story: Graeme thought he drove around drove along the fence to reach David, and that David then drove through the crop to reach the gate. David says it was Graeme, in an understandable panic, who drove straight through the crop to quickly reach David. Either way, the radiator ended up full of straw. David jumped in the driver's seat and set off for Wylie.

Graeme began to feel the effects of the poison. Despite the summer heat he had bouts of icy chill that made him shiver, but he recovered in time to get out and open David's farm gate. The effects returned episodically and worsened as they drove down to Wylie. At one point Graeme momentarily went blind and nearly passed out. David told me that Graeme said, "It's no good, I'm buggered, you can stop here", but David didn't want to bury him on the roadside, so he kept going. Then the blocked radiator began to overheat. With the radiator boiling under the bonnet, and Graeme nearly unconscious, David thought the engine would seize and he'd be left with a disabled car and a dying brother.

The ute made it to the hospital and Graeme was able to walk in, "until another bout laid me low", and he passed out. Unfortunately he came to just as the doctor was pumping in the anti-venene, "thick as treacle, through an oversized needle, which hurt more than any other part of the experience." The doctor used the standard (now known to be useless) treatment of cutting the wound and letting blood wash the poison out. He left the wound to bleed. At midnight, nurse Alison Hitchins came on duty and saw that Graeme was as pale as a sheet under his summer tan. She lifted the sheet, saw the puddle of blood and realised that Graeme was slowly bleeding to death. She bandaged the wound and Graeme stayed in hospital for three days.

Hec killed the snake. On 10th September 1955, Graeme married the nurse.

Alison Hitchins and Graeme Rhind in Perth, about 1954.

Graeme and Alison Rhind's wedding in Perth, September 1955.

Hector and Nick Rhind in Perth on their retirement, about 1955.

Hec and Nick retired to Lesmurdie, in the hills behind Perth, in 1955 and Graeme took over the farm. Initially he managed the farm for Hec, followed by a sharecropping arrangement, and by 1960 he took over the lease completely.

Alison wanted to have a family quickly, and the "family breeding program" produced four children: Jim (1956), Bruce (1957), Susan (1959) and Ralph (1961).

Graeme wanted to buy Melrose Farm, but price of the developed land was too high. His ambition was to buy his own farm. In 1963 he took up new land near Esperance, but that's a later story.

Above, Graeme Rhind with children Bruce, Susan, Ralph and Jim, at the Melrose homestead. Right, Alison Rhind with Susan. Early 1962.

The rest of this biography covers some of the technical aspects of running Melrose Farm. Follow the links below for descriptions of each area.

Crawler tractors		Robust iron crawler tractors preceded wheeled tractors, but eventually rubber wheels took over
Tractors	**Lanz**	Hec Rhind had three versions of the single-cylinder Lanz tractor, while Graeme bought multi-cylinder tractors
	Others	
Forges and Acetylene		The charcoal burning forges were the basic metalworking method for hundreds of years, but was replaced by oxyacetylene welding
Seeding		Planting the new crop with the first rains
Harvesting		Mechanising crop harvesting and grain carting
Sheep		Breeding for wool and fat lambs
Cattle		Milking cows
Water		Shortages, dams, wells and rainwater
Wildlife		Attitudes towards native flora and fauna
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Crawler tractors

At the turn of the century most farmers used horses for heavy farm work. A few farmers owned traction engines, huge steam engines on four steel wheels, but they were heavy, expensive, and slow. Farmers required something smaller than a steam engine but more powerful than a horse. One of the first alternatives was the combustion-engined crawler tractor which moved on continuous tracks of hinged metal plates. Benjamin Holt built the first crawler tractor in 1904 in USA, combining with competitor Daniel Best to form the Caterpillar company in 1925. Hec Rhind's first tractor was a 1923 Holt 2-ton crawler which he used for heavy tasks on the farm: clearing, road building, ploughing, seeding, and harvesting. The all-metal construction was perfect for protection against trees, stumps and stakes in the newly cleared scrub.

Hector Rhind driving the Holt 2-ton, with hands resting on the steering horns.
The two passengers operate the Mackay Sunshine WA harvester. Harvesting at
Kulja, 13th November 1930.

Most crawlers were steered by two clutches, one for each side. Disengaging a clutch caused the track on that side to slow down and turn the tractor in that direction. The Holt had a T-bar with two horns which operated the clutches, but later crawlers had two clutch levers. The Holt was powered by a 35 hp (horsepower) kerosene engine with three gears. At the time, most farm engines ran on kerosene because it was much

cheaper than petrol. However, kero needed a hot engine to maintain vaporisation. Most kero engines had a small petrol tank for starting, and switched to kerosene when the engine was warm. The Holt was started on petrol by a crank handle.

Hec worked for the Koorda Road Board during the Depression, pulling an Adams grader with his Holt. Note the crank handle. Early 1930s.

Hector with his two sons Graeme and David on the Holt 2-ton during winter ploughing. The t-bar is clearly visible. Melrose, about 1939.

However, metal crawler tracks with all their weight, joints and bearings, were slow. Eventually <u>four wheeled tractors</u> took their place as the basic farm machine.

In the 1950s David Rhind bought a 27 hp Caterpillar Twenty Two crawler, which was still kero/petrol. Graeme later bought a Caterpillar D2, one of the first of the diesel Caterpillars.

The most significant variation was the bulldozer, which emerged during the Second World War. They were a crawler with a blade on the front. Bulldozers remained the best machine for tasks requiring brute power, such as land clearing and <u>dam excavation.</u>

David Rhind using his Caterpillar Twenty Two to pull an engine base into the Melrose shed in about 1952. The assistant is Paul Johnston.

Lanz Bulldog tractors

Wheeled tractors began to take over from horses in the 1920s.

One of the most robust tractors of this era was the Lanz Bulldog, built by the Lanz company at Mannheim in Germany. In 1921 designer Dr Fritz Huber put out the first Bulldog tractor, a mini-tractor with just six major moving engine parts. It had one cylinder, no valves, and no gearbox. It didn't need a gearbox because it only had one gear: the engine was run backwards for reverse. The single piston was a huge 10.4 litres but only generated 12 hp. Huber was an engineering purist whose motto was "an agricultural tractor cannot be one-cylinder enough." He connected everything to the engine, using the huge block and crankcase as part of the tractor chassis. The Lanz Bulldog was basic but extremely reliable.

The engine was a semi-diesel. Diesels were not yet small enough to put in farm machinery; they required very high compression and so used more iron to get the necessary strength. As a result they were much too big and heavy for trucks and tractors. The semi-diesel was a compromise which gave more power than petrol or kerosene and less weight than a diesel.

The basic problem was getting the fuel to combust. Diesel engines achieve combustion through pressure. In physics, this is Charles' law: double the pressure, double the temperature. However, if compression doesn't heat the fuel enough, the temperature of the fuel has to be raised another way. The Lanz engine achieved this by passing the fuel through a "hot bowl" at the front of the tractor. Once this was hot enough to vaporise the fuel, the engine could run on any type of unrefined oil - kerosene, distillate, oil, old sump oil, even fat.

The low compression caused a slow and relatively soft explosion. The result was less problems through pressure, but it gave increased torque. Torque is a measure of pulling power, and the pulling power of the Bulldog was impressive. The Lanz was able to pull heavy loads all day, and that was the most important factor for the farmer.

Andre Manfredi (an Italian Prisoner of War) driving the Lanz HR5 Bulldog
with Graeme Rhind operating the Sunshine AL harvester. Summer 1944.

Paul Johnston driving the Lanz HR with David Rhind operating the
Sunshine AL harvester. End of harvest, December 1948.

Hec Rhind's first wheeled tractor was a secondhand 1930 battleship grey Lanz HR5
Bulldog which he bought in about 1940. The Lanz now had one reverse and three
forward gears, with a maximum speed of about 3.5 miles per hour (5.5 kilometres per
hour) at maximum revs of 540 rpm (revolutions per minute).

The Lanz company boasted that "a Bulldog can wear out five drivers, but five drivers cannot wear out a Bulldog". Graeme considered this a threat rather than a promise. The tractor was iron from top to bottom: iron steering wheel, iron seat, four iron wheels, no suspension. With steel lugs bolted on the steel rims for extra grip, the violent jolting on hard ground was an ordeal for the driver.

The four metal wheels made the Bulldog perfect for working on newly cleared land, as the wheels were immune to punctures. However in the mid-1930s tractor manufacturers found that inflatable rubber wheels provided better ride, grip and speed than iron. By 1940 most new tractors were on rubber. Hec replaced his rear wheels with rubber, but kept the metal front wheels as insurance against stakes. The disadvantage was that the front wheels had poor grip on sand and tended to slide when the tractor turned a corner.

Early Bulldogs had hoppers instead of radiators. The hopper was a water tank which cooled the engine by hot water convection. This was adequate for cool climates but not for an Australian summer. In 1928 the hopper was replaced by eight narrow radiator units, four bolted on each side, with a fan in the middle. Like modern radiators, the thin metal fins provided greater heat loss from a larger surface area. A leaking radiator was easy to service, as the two hollow bolts which held each radiator in place, allowing water to flow through the core, could be replaced with solid bolts and let the tractor keep working.

The two-stroke engine was propelled by a single huge horizontal piston. The engine could run in either direction, and a small dial indicated the direction of revolution. At idle, the engine fired about once a second, a speed so slow that the piston never finished the stroke at combustion, but just reversed direction. The direction gauge showed the opposite direction each time the engine fired. The advantage of this action was that the driver could set the engine running in the desired direction simply by accelerating at the right moment. This gave the reverse gear on the early models.

A pair of heavy flywheels under cylindrical covers, one each side of the engine, absorbed the power of each stroke and smoothed out power delivery. This was not perfect; at idle, the whole tractor convulsed gently backwards and forwards. When the tractor was stationary on soft ground, the engine had to be turned off to prevent the slow vibration sinking the wheels and bogging the tractor.

Ebba Wassard (Nick's friend from Melbourne) pulling a plough with the Lanz HR5 Bulldog in May 1946. Graeme commented that the rear tyres are on backwards; in the other direction the tread is self-cleaning. *Use mouseover for titles.*
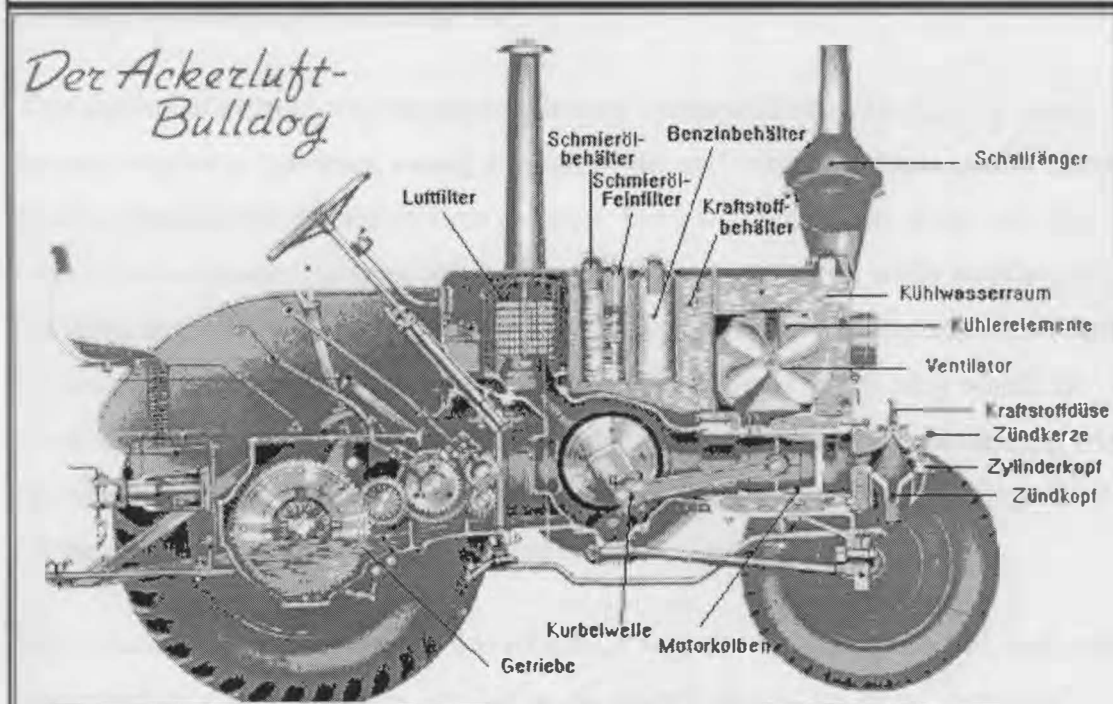
A cross-section from an original Lanz manual in German.

Operating the Lanz

Lanz engines had no starter motor, and the fuel had to be preheated before starting.

The driver began by igniting a blowlamp and hanging it on the front of the engine to heat the protruding iron hotbowl, which began to vaporise the fuel after about ten minutes. Then the heavy cast iron steering wheel was disconnected and inserted in the side of the flywheel as a crank. When the hotbowl was red-hot, the fuel injector was given a couple of pumps with a spanner, and fuel began to vaporise internally on the hot metal. The driver rotated the steering wheel back and forward, moving the piston, and threw it vigorously in the right direction to fire the cylinder. As the engine fired, the driver pulled the steering wheel out of the engine. If the direction was wrong, the farmer found he had one forward gear and three reverse. This was resolved by dropping the engine to an idle, and accelerating when the engine indicator showed the opposite direction. The steering wheel was returned to the steering column. The entire routine took about fifteen minutes. Drivers were reluctant to turn off the engine and go through the process again, but if the engine was restarted within five minutes, the hotbowl remained warm enough to vaporise fuel.

This method of starting was dangerous. Graeme explained that if the steering wheel became trapped at ignition it swung through wilder and wilder gyrations until it threw itself out and landed in some random location. The only remedy was to run and hide until the wheel landed. Graeme nearly met a flying steering wheel while working with his father in the farm workshop on a minor tractor problem. As Hector started the Lanz his foot slipped on loose stones and he fell over and let go of the steering wheel. He shouted a warning, and Graeme looked up from the workbench to see the steering wheel cartwheeling his way. He dropped to the ground behind the bench; the steering wheel hit the bench top, scattering the tools, and bounced over his head.

Maintenance of the Lanz tractors was lengthy. Every day the fuel, water, oil, and grease points had to be filled. Surplus lubricating oil dripped into a "dry sump" and was pumped back to the oil tank through a gauze filter, which was cleaned daily. Even the exhaust needed maintenance. The fuel, a mixture of heavy distillate and sump oil, did not burn completely and left carbon deposits in the exhaust. Inside the exhaust, a spark arrester prevented incandescent fragments of carbon flying out of the exhaust and starting fires. Once the carbon built up sparks began to escape. During summer

harvesting, when the fire risk was extreme, Graeme had to clean the filters every two or three hours. He had to undo a dozen bolts on the spark arrester, clean four different screens, and then reassemble the whole unit. He took about twenty minutes to complete the task, repeated three or four times a day.

The muffler in the exhaust was primitive and let most of the engine sound hit the driver's ears. Hearing loss was common. Hec had lost his hearing by the time he retired in 1955, and Graeme found his own hearing declining at the same time. (He started using earmuffs when they became available in the 1960s, but he also lost much of his hearing from noisy farm machinery.)

Modern tractors have a cabin, safe cockpit, and comfortable seats. The Lanz had none of these. The seating of the Lanz was hazardous. The driver did not reach the seat from the side, but through the back, over the top of the towed machinery. The driver perched on the metal seat on the end of a curved spring steel bar. That bar was held onto the floor by two bolts at the front end. The first of the two bolts included a spring as a token gesture to comfort. The driver could adjust the degree of pressure with the bolt, and so the flexing of the arm. However the adjustment bolt could work itself undone. In that case the seat fell backwards and dropped the driver into the towed gear, where injury was likely. (But to be fair, other tractors were much worse.)

| Lanz HR5 cockpit, with iron seat and no floor, at the Wyalkatchem Museum, 2004. | Lanz HR5 seat with sprung arm, at the Wyalkatchem Museum, 2004. |

Graeme Rhind pulling a combine seeder with the Lanz HR5 Bulldog with his schoolfriend Ian Hardwick on the seeder. The tyre tread is now correct on the tractor. School holidays, 15th May 1948.

The lack of a cabin created problems in bad weather. As a schoolboy, helping his father with the seeding during the holidays, Graeme hated the lack of protection from winter squalls. There was no place to store jumpers or raincoats on the tractor, and the Lanz was so slow that it could take half an hour to finish a round of seeding and reach the truck for a change of clothing. All he could do was turn the tractor sideways to the incoming weather, and huddle into the wheel arch until the weather passed. When Graeme first saw a cabin on a tractor he suggested they build one for the Lanz, but his father, like most farmers of that era, thought cabs were for cissies.

The basic Lanz tractor had no electrics of any sort: no indicators, stoplights, headlights, or horn. However, this didn't matter most of the time, as farmers usually worked alone in the paddocks. Graeme said most didn't work at night. A day's work on a Lanz was enough.

Farmers often modified their tractors to reduce the need for farm labour. Hec rigged his Lanz HR5 Bulldog with remote controls on the harvester. Rods control the steering, clutch and brake. The steering wheel has been removed and is lying next to the seat. Summer 1947.

Click here for details on the Harvesting page.

The KL Bulldog

The second tractor on Melrose farm was an Australian-built KL Bulldog. Kelly & Lewis were Victorian pump makers who had been the Australian agents for Lanz since the 1930s. During the Second World War no machines were imported, but the end of the war did not solve the problem. There were no tractors to import. The Lanz factories in Germany had been almost destroyed by bombing, and production had ceased by the surrender in August 1945.

German agricultural industries were soon allowed to start working again, but rebuilding the economy and infrastructure of the defeated country was almost impossible. Lanz had no raw materials, most of the buildings and manufacturing machines were badly damaged, and many staff were missing. Their first postwar tractors were cannibalised from incomplete machines. In 1939 Lanz had made 15,000 tractors, but in the second half of 1945 they produced just 55. None were available in Australia, so Kelly & Lewis decided to make a licensed copy of a 40 hp Bulldog. The first red KL Bulldogs came out of their Melbourne factory in 1949.

Hec bought one the next year. Graeme, aged 17, had been driving tractors on the farm since he was a boy and had just passed his driving license, so he was given the job of

driving the KL from Perth to Nalkain. The KL had four rubber wheels and a flat box-style cockpit, but little other concession to comfort. The 3½ ton tractor had no shock absorbers, and the seat support was a rigid n-shaped bracket with no suspension. Graeme drove standing up, and in that position he discovered that the tractor kept bouncing after hitting bumps. Bored with the tedium of driving at low speed, he began to jump in time, increasing the height with each bounce. However the KL began to bounce from side to side, and Graeme realised that he could lose control and crash the tractor. In a cold sweat he stood still and let the tractor settle down.

The KL was a better tractor than the older Bulldog, with a top speed of 17 mph compared with 3.5 mph for the HR. It was also faster than the later Lanz P (below) with its maximum speed of 12.5 mph. The KL was almost identical to the Lanz and could use the same parts. It still had the hotbowl, blowlamp and steering wheel crank start. Hec retired the old Lanz HR, except for knocking down scrub in uncleared parts of the farm. The Rhinds had no problem with the KL Bulldog, but it acquired a reputation for faulty cast-iron parts, and could not compete with Lanz tractors once imports resumed. Kelly and Lewis ceased production in 1953 after building about 800 tractors.

The KL Bulldog rigged up with remote controls (steering, clutch and brakes) to the harvester. December 1955.
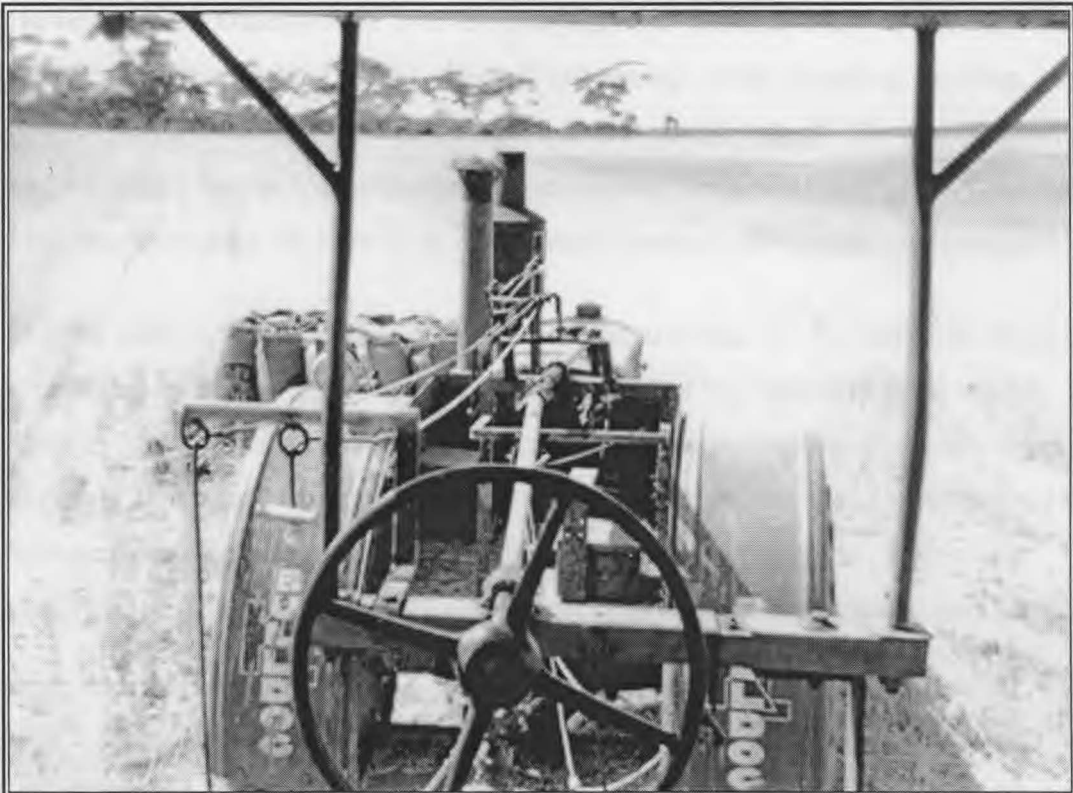
The KL Bulldog from the harvester. The rope lines controlled the brake and clutch. Summer, about 1955.

The Lanz P Bulldog

In 1949 the loose steering wheel start was made illegal, and Lanz added a semicircular safety frame to hold the wheel to suit the law. By 1950 it was irrelevant, as Lanz geared up for full production of a complete new range of tractors from 16 hp to 55 hp, which all had battery, generator, starter motor, headlights, tail lights, and horn.

In 1952 Graeme drove a secondhand pale blue Lanz P tractor to Melrose. By Lanz standards, it was luxurious: the P had a box cockpit, and a comfortable seat with a spring and gas shock absorbers. Most engine parts had become lighter and faster. The KL had a side-mounted flywheels that weighed about 100 kg each and needed two men to carry, but the new engine flywheel was half the weight and ran at higher speed. The KL had a maximum engine speed of 590 rpm, while the P model ran up to 850 rpm.

Best of all was the starter motor. The engine still ran on the same wide range of fuel but used petrol for easier starting, so the blow lamp wasn't needed. Like the KL, the Lanz P had an excellent cockpit, with a clear flat floor and sides.

However, when Graeme took over the farm from his father in 1955 he decided to sell the two Lanz tractors and the KL. He had had enough of the chugging, shaking, and general peculiarities of his father's single cylinder "one-bungers". He wanted a new multi-cylinder tractor with smoother power delivery. In hindsight, he said, it would have been worth keeping the Lanz P, as it was more economical than his later tractors.

In 1950 about 4,000 Australian farmers had Lanz tractors, but the Lanz was about to be superseded by more sophisticated tractors. The last of the legendary Lanz single cylinder hotbowl tractors came off the production line in October 1953. The American company John Deere bought the factory in 1957 and the Lanz brand vanished in 1960. Some collectors say that the Bulldogs, both Lanz and KL, with their robust and idiosyncratic design, are now one of the most collectible classic tractors in Australia.

The Lanz HR5 Bulldog on the left, and the pale blue Lanz P Bulldog on the right. Both were sold this year, 1956.

Seeding

Seeding at Nalkain had to wait for the opening rains. Farmers expected the season to break in about the third week of May but the rains were often erratic. The average for Wyalkatchem was 332 mm, but the worst recorded drought was 113 mm in 1914, up to a flood maximum of 603 mm in 1917.

The opening rains germinated the dormant weed seeds in the ground, and two weeks of ploughing buried them. Early ploughs used mouldboards, a curved wedge of metal that turned the soil over. By the 1930s most Australian ploughs used cheaper disks, concave round metal blades pivoted at the centre. Turned slightly sideways, pressure and rotation cut the disks into the soil, and the curve rolled the top 15 cm of soil upside down, burying the newly germinated weeds. It also broke up the soil ready for seeding.

Ebba Wassard pulling a disk plough with the Lanz HR5 Bulldog, which had a top speed of 3.5 mph (5.6 kph, less than 100 metres a minute). May 1946.

Full seeding in the softened soil began in May or June and continued for at least a month. The seeder had a set of small metal shoes called tines which opened the ground in front of the tubes that delivered seed into the soil. The depth of the tines was adjusted to suit the soil and the seed. On top of the seeder were two rows of bins. The front one held seed and the rear held superphosphate fertilizer (super).

Graeme Rhind pulling the seeder with the Lanz HR5 Bulldog, while his friend
Ian Hardwick pours bagged grain and super into the seeder, from the back of
the old Chevrolet truck. 15th May 1948.

Graeme enjoyed driving for his father during the school holidays, but the absence of a
cabin on the Lanz tractors meant he had no shelter from wind and rain. Graeme hated
the sudden arrival of windy squalls which chilled him to the bone. There was no place
to store jumpers or raincoats on the early tractors, which meant that the driver had to get
to the truck or ute for a change of clothing, and the Lanz was so slow that it could take
half an hour to complete a round of seeding. The best Graeme could do was turn the
tractor sideways to the incoming weather, huddle into the wheel arch, and wait until the
bad weather passed.

At times the rain was so heavy that seeding was impossible. Graeme recalled a series of
winters in the early 50s when the wheatbelt suffered flood winters and the paddocks
became quagmires. Often the yearly totals were near average but heavy rain arrived in
one month. During the worst of these years, Hec was unable to plant the crop because
the tractor could not pull itself through a soft patch with the extra weight of a seeder.
Hector and Graeme decided to work together with two Lanz tractors and one seeder.
The first tractor used a chain to tow the second, which pulled the seeder. When they
reached a soft patch, the first tractor slowed down and laboured through the mud
without a load. By the time the second tractor reached the bog, the first was on firm

ground and could pull the other through. Even with this method, they could only plant a small part of the property that year, leaving large gaps where they had to weave to avoid the worst bogs. By summer the wheel ruts had dried into deep hollows and hard ridges. The harvesters had a terrible time, bouncing in and out of the ruts.

The hardest seeding task was refilling the seeder hoppers with grain and fertilizer. Bags of seed and superphosphate (super) were extremely heavy. Oats weighed 120 pounds. per bag (55kg), barley 150 (68kg), and wheat 180 (81kg), but super was the heaviest at 194 pounds (88kg). Much later, super bags were reduced to 100 pounds (40 kg), but as a teenager, Graeme weighed less than the super bags he had to carry from the truck to the seeder. His loading method, like most farmers, was to pull the super bag from the tray of the truck onto his back, stagger across to the seeder, and turn around to dump the bag on the narrow wooden running board along the back of the seeder. Filling the bins from the running board was relatively easy.

Unfortunately Hec towed harrows (short metal teeth) behind the seeder to bury the seed. Towed behind the seeder on chains, harrows interfered with walking between the truck and the seeder. Graeme badly hurt himself several times by tripping on the harrows or the chains, landing on the metal frame with the super bag on top of him. He commented that he ended up with many cuts and bruises, as well as back damage which became chronic in later years. When Graeme took over the farm he gave up using harrows so he could drive the truck along the loading platform, and slide the bags from the truck across to the running board. Later he bought a disk harrow which used the same disks as a plough, but had a central towing arm, and allowed access to the loading ledge.

Another discomfort was the acidity of the superphosphate. Super was safe when dry but became reactive in water. As Graeme tipped super into the seeder bin, the rain dissolved the powder on his hands, which attacked his skin. As the skin cracked the solution cut deeper, causing a lot of pain and damage. By the end of the seeding seasons, Graeme said his hands were a real mess.

However most of the time, seeding was a pleasant task. It wasn't boring either. When the weather was pleasant, driving a tractor was a calm and meditative activity. As the tractor ambled around the paddock, Graeme reflected on farming problems, planned activities, and invented gadgets to make his job easier.

Scarifiers used triangular tines to break up clods of soil after ploughing. The three vertical handles set the depth of the cut; underneath, rods and bars let the tines to flick back when they hit an obstacle. Later ploughs and scarifiers had individual spring-loaded arms. Tines were used on seeders. 1959.

Seeding oats for sheep feed over harvest stubble. The sandy soil has not been ploughed so the tines have been removed from the seeder. The seed oats falls through the tubes to the ground and the disk harrows cover up the grain. The tractor is a Massey Ferguson MF65; the blue device is a grease gun for lubricating the harrows. June 1961.

Crops and pastures

Graeme planted for two purposes: grains for harvesting, and pasture for feeding stock.

The common grain crops were wheat, barley, and oats. Graeme planted an average of 1,000 acres each year: about 500 acres of wheat, 200 acres of barley, 150 acres of oats, and a small area of other crops (100 acres is 40 hectares). By 1955 the farm had reached a size of 3,214 acres with 2,600 cleared. The uncropped area was rested or used for sheep pasture. Much of the sandier soil on the farm could not support a yearly crop.

Wheat was the dominant source of bread flour. Many varieties were available, such as Wangundy and Gamenya, and the Department of Agriculture continuously developed new strains which grew better in Western Australian conditions. One variety was developed as ninety-day crop, suited to the short wheatbelt season; areas further south and west received earlier opening rains and had longer seasons. Another useful species was dwarf bearded wheat which grew well because the short stalks needed less nutrient.

Barley came in two common forms, named for the pattern of seeds in the head. Two-row had grains in pairs running up the head (two rows), while six-row had three layers, one behind the other, a total of six rows. Two-row was for malting, usually in beer, and six-row was general purpose, often as animal feed. Growing conditions and yield were about the same as wheat, but barley did not taste as good in bread as wheat.

Oats was a general purpose crop for rolled oats, porridge, and animal feed. It was the least demanding crop for the poorer sandy soils of the farm, and the quickest to mature. When new land was cleared oats was the first crop planted. Oats was also planted as animal feed in the years after a harvest; the sheep were let in either when the crop was green or mature. The main drawback of oats was itchiness. The long hairs on the grain, full of silica, fragmented into tiny pieces which were carried on the air. The evil breath that came off varieties like Wongan had to be felt to be believed.

Another commercial crop grown on the farm was cereal rye, used in rye bread for the migrant population in Perth, and for whiskey and animal feed.

Several crops were grown for pasture, stock feed. The easiest pasture to grow on the farm was cape weed, a flat plant with a flower that looked like a dandelion, which self-seeded everywhere and was edible. In the drier months it was good food but sheep that

ate large volumes of it in winter, when it was growing rapidly, suffered from scouring (diarrhoea). Better pastures included clover, medics (an annual herb similar to clover), and Wimmera rye. Graeme ran trials of various seeds and fertilisers to evaluate their suitability on Melrose. Burr medic was troublesome because its hooked seeds became entangled in wool and caused cleaning problems in the wool factories, but barrel medics were later developed which had closed hooks. Wimmera rye turned out to be a mistake in Western Australia as it became a weed in grain crops. The seeds sometimes became poisonous and caused "ryegrass toxicity" in sheep.

Graeme's trials showed Niab cereal rye (r) grew much better than ordinary rye (l). 1960.

Stock pasture of Goldfields medic amongst stalks of Wimmera ryegrass. The white object (for scale) is a matchbox. September 1960.

Clover was one of the true miracle crops of Australian agriculture. A South Australia farmer, Amos Howard, first observed the beneficial effects of clover in 1889. Scientists later worked out that clover collected nitrogen. Nitrogen is essential for plant growth, being a major component of amino acids, proteins, chlorophyll, and hormones. Nitrogen is the most common element in air but plants can't take it out of the air by themselves. Legumes, such as clover and medic, form a symbiotic relationship with bacteria called rhizobia. The bacteria take the gaseous nitrogen and "fix" it in nodules on the clover. Later decomposition of the plants releases nitrogen ions for use by plants.

Graeme used clover for three reasons. In the beginning it stabilised the soil with its root system. Later, it provided stock feed. Finally, the clover began to decompose and

release nitrogen. As a result clover was the perfect plant for improving the sandy wodjil soils on Melrose farm. Graeme cleared and planted 100 acres of this country, and planted it with clover and cereal rye, the only crops that would grow there. After several years of use as pasture Graeme found that the soil structure and fertility had improved. He planted oats, then barley, and finally was able to harvest dwarf wheat every three years.

Graeme recalled that Dwalganup was the first clover variety available. Later the Mt Barker variety gave unexpected fertility problems in ewes, including uterine inversion. The cause was the high level of oestrogen in the foliage. Some of the later clover varieties were rose, harbinger, and barrel clover.
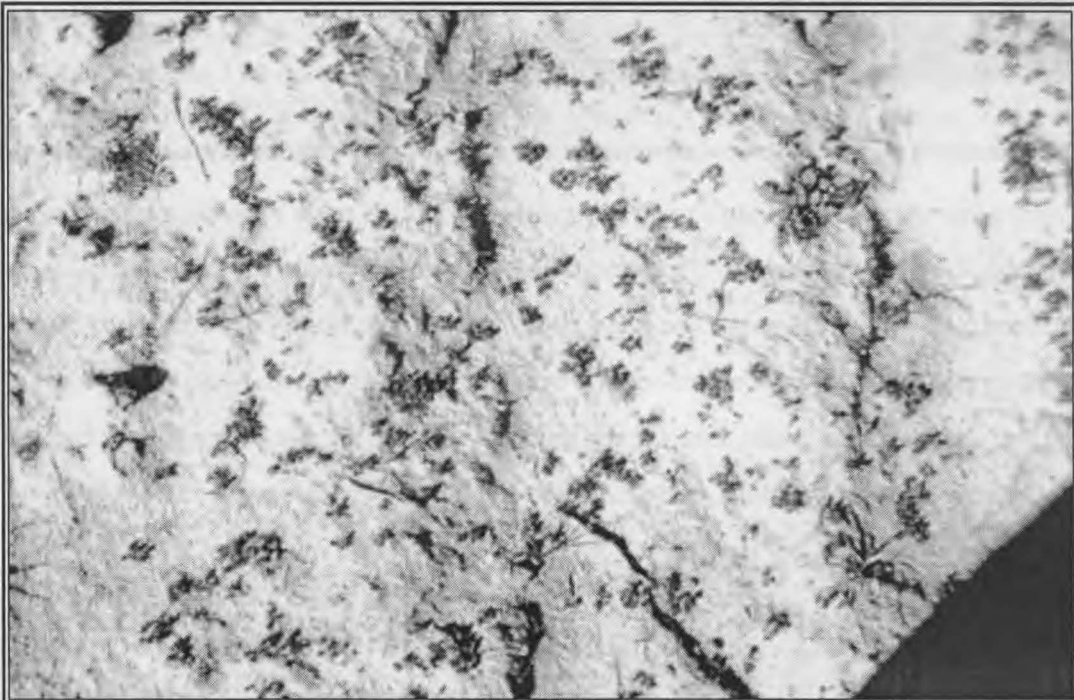
Rose clover germinating in sandy soil in September 1960.

Rose clover seedlings in late 1960. The coin (for scale) is a penny.

Many wheatbelt soils were deficient in essential plant nutrients. Graeme used three types of fertiliser on Melrose: superphosphate (super) which mainly added phosphorus to the soil; trace elements critical for growth, such as copper, zinc and molybdenum, which were usually added to the super; and urea, which added nitrogen. The super was spread with the seed (described above), but urea became sticky when mixed with super, so Graeme had a simple tray system for scattering it at a later time of the year.

Pests and diseases

Many problems faced the crop during the growing season. Grasshopper plagues. Army worms that climbed up the stalk and ate the head. Cut-worms that cut off the stalk at ground level, and then ate the fallen head. The caterpillars that hid in the ground and came out to feed at night. Graeme mentioned a local remedy, invented by a friend in the pub: fill beer caps with pepper and pebbles and leave them in the crop. At night, the pepper will make the caterpillar sneeze and it will knock its brains out on the pebbles.

Several diseases could attack the crop. Each prevented full development of the grain. Rust was a fungal disease that looked like rust spots. Smut, another fungus, looked like thick oily rust and left a black/brown ball of smut instead of grains. Take-all was a bacteria that left the head as a white shell, empty of grain. Root-rot, a bacteria, killed off the roots and starved the plant of water and nutrient.

The farmer had no real treatment for caterpillars, bacteria and fungi, but he could treat weeds. Three introduced weeds were common in the Wyalkatchem region: turnip, radish and mustard. They were not the same as the common vegetables. Turnip behaved like tumbleweed, breaking off close to the ground and rolling across the landscape scattering seeds. Radish had thick stalks which jammed the comb of the harvester. Mustard was part of the family of that name, but its edible seed contaminated the harvest. Fortunately the seed was small and edible, and ended up in the reject seconds (damaged grain) at harvest, and was eventually fed to the stock.

The herbicides for these three weeds were methoxone and 2-4-D. The sprays were applied one month after seeding and killed off the broadleaf weeds while leaving the crop undamaged. At one month the crop was small and flexible, and the plants recovered after the passage of the tractor carrying the spray equipment. These herbicides were not extremely toxic, but the 2-4-D killed David Rhind's dog when he drank some of the mix.

The nastiest weedicide of that time was 2-4-5-T, later used as the toxic component of the defoliant Agent Orange in Vietnam in the 60s. Some farmers used it for killing regrowth on cleared land, but Graeme kept very little of it, using it for painting stumps to prevent regrowth.

The McCormick AWD6 tractor filling up from tanks on the old blue Morris Commercial truck in August 1960. The crop is about two months old.

The Massey Ferguson MF65 refilling from tanks on the back of the Bedford truck. Month-old crop, August 1961.

Two 44-gallon drums fed the spray arms on the back of the Massey Ferguson MF65 in August 1961.

Graeme's friend Ron Jennings trying out the new Massey Ferguson MF65 and cropsprayer in August 1961.

Weather

Disasters were possible during the growing season, most related to the weather. The most serious was lack of water. Drought was the worst, but hot dry winds at the end of the season could desiccate the crops, causing the seed heads to wither. Excessive rain and humidity caused problems, often sudden growth of bacteria and fungus. Strong winds, rain and hail could also cause the wheat to fall over, called "lodging". Summer hail was a feature of weather in that area of the Wheatbelt, when moist air from the north met cold air from the south, turned to ice, and flattened the crop. Still, Graeme said it was rare to lose a whole crop. Graeme and David lost their entire crops in 1955 from heavy hail just before harvest. It was, of course, the best crop they had seen for decades. Fortunately their crops were insured. Graeme commented that farmers could insure against fire and hail, but not flooding. Flooding, unlike hail, was an "Act of God", and therefore uninsurable.

Harvesting

With luck, and good weather, the grain crops finished growing in August and September, and after a month of drying, the paddocks were ready for harvesting in November and December.

Harvesting

Few farming machines are more complex than a harvester. Traditionally, harvesting had three stages: stripping (removing heads), threshing (removing grains from heads), and winnowing (separating grain from straw). Farmers originally did all this work by hand, making harvesting the most labour intensive time of the year. The stalks were cut with a scythe, stacked together in stooks, gathered up for threshing in a clean area, and thrown up into the air to blow the chaff away. Each separate task was eventually taken over by a machine, and by 1900 all were integrated inside the harvester.

The first harvesters were horse-drawn. The power for cutting, threshing and winnowing came from the left harvester wheel. As the horses pulled the harvester and the wheel turned on the ground, planetary cogs transferred power from the wheel to the various parts of the machine. The same drive system remained in use for tractors. Tractors were more powerful so startup had to be cautious: the load was heavy and could destroy the teeth on the cog or wheel. If spare parts were not available, damaged teeth had to be built up by welding and shaping scrap iron: a task to be avoided.

The operator of the WA Sunshine harvester, under the hessian shade, controls the comb height and choke cutter. At his feet are sacks ready for bagging. The wheel under the box is the drive wheel. Summer 1930.

David, Hector and Ailene Rhind with labourer Jock Adamson on the comb of the Mackay Sunshine WA harvester. On the right is the tow bar, operator's seat and grain box. Summer at Kulja, about 1933.

Hec Rhind bought his first harvester, a Sunshine WA with a ten foot (3 metre) wide cut, in 1929. Sunshine harvesters were built by the Australian inventor Hugh Mackay, whose major contribution had been to add the final stage (winnowing) to the harvester. His early harvesters did not cut the straw, but beat the heads from the straw with rotating arms as they collected in the long metal teeth of the comb. The heads were carried up into the harvester, where the grains were beaten loose, sorted through a set of riddles (perforated iron trays), winnowed with a fan, and collected in a box on the side of the harvester. The straw and chaff fell out the back. Hec's second harvester, bought in the 1940s, was a Sunshine AL of similar design.

Each harvester needed an operator to look after the cutting and bagging. The operator tried to keep the comb level with the heads, but also had to avoid sticks or stumps in the paddock. Graeme said that both the WA and AL had their own disadvantages: the WA had a power-assisted lift system which was sometimes too slow for large obstacles, while the later AL required brute strength to change height. On each, the operator had a "choke cutter", a flat bar which ran the length of the comb, to sever the straw if it became jammed in the comb teeth. Most later harvesters replaced the choke cutter with a pair of long serrated knives to cut off the heads; these harvesters were called headers.

When the small box of the harvester was full, the workers emptied the grain into about six bags. A U-shaped handle hinged on each side of the grain door allowed the farmer to hang a jute bag from four spikes, open the sliding door and fill the bag with grain. "Seconds", grain shrivelled by dry weather or cracked by threshing in the harvester, was separated from the good grain. The Sunshine harvesters had a cylindrical seconds screen and a division in the bin which gathered the seconds for bagging. One of the two bin doors was for seconds. Farmers hoped for a low percentage of seconds, but in a bad year it could reach 50% of the crop. Seconds was used as animal feed.

The bags of good wheat were sewn shut and leant together in the paddock. Later they were loaded onto a truck and carted to the local railway station, where they were stored in huge square stacks often containing tens of thousands of bags. Seconds, and bags of seed wheat for the next crop, were stored in the farm sheds.

Bags were labour-intensive, so in 1931 the wheatbelt farmers began to experiment with bulk handling, where the grain was stored in large wheat bins and later transported in open railway wagons. It was an instant success, and led to the formation of the Cooperative Bulk Handling (CBH) organisation in 1932. Weatherproof grain bins and open "pig pens" were built in local towns and sidings, including Wyalkatchem (Wylie) and Nalkain in 1933.

Each bin had a weighbridge where the trucks were weighed before and after unloading. The difference was the weight of grain. The weighbridge clerk also took a sample of grain and checked it for quality. At the smaller sidings the clerk had a tiny tin box as an office, with a double tin roof to help resist the summer sun. After the installation of bulk handling the farmers still delivered their wheat in bags, but the bags were now carried open on the trucks, tipped into the hopper of the grain elevators, and used again. Nalkain only had a pig pen, with bitumen floors and tin walls. The grain in the pig pens was mounded as high as possible, partly to save space, but also to improve rainwater run-off when the huge tarpaulin covers were pulled over the grain to protect it in bad weather.

Graeme, Hec, and neighbour Jack Metcalfe looking at the weight of a load at the Nalkain weighbridge. The clerk is just visible in the shed. About 1948.

Some of the Nalkain farmers parked on the Nalkain weighbridge, maximum weight: 11 tons. December 1948.

Graeme remembered the Nalkain bin for the skylarking between the farmers. Everybody had known each other since childhood and the harvesting was a good time for playing up. Occasionally two trucks would arrive at the gravel road to the bin at the same time

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and race to get first place in the queue. The right hand truck was at a disadvantage on the left-hand bend before the weighbridge because the camber of the road caused the open bags of wheat to fall off the tray. Talking to the clerk after weighing was also risky. When the farmer returned to drive off he might find that his truck wouldn't move, because his mates had jacked the truck up and left the axle on chocks, the wheels spinning in air. On another occasion, Graeme and his brother David noticed that the weighbridge clerk had started cooking food on the open fire at the back of the office. The old blackened tin chimney was too tempting. A short distance down the road, they stopped, pulled out the .22 rifle behind the seat, and put a bullet through the chimney. The result was that the chimney shed its coating of dust, ash and carbon all over the food below. Graeme cannot remember who was responsible for this act.

One incident gave Graeme a scare. Don Fenwick, "a close friend and cheeky bugger", was leaning on the back of his truck and giving Graeme cheek. Graeme drove up close and pretended to squash him between the two trucks. Don didn't bat an eyelid. On the way home after unloading, Graeme saw his brother David coming in and decided to stop and talk to him. His boot went to the floor; the brake line had worn through and broken. Graeme never played chicken with anyone in front of a truck again.

Trucks unloading wheat at the Wylie wheatbin, December 1948. This wheatbin became the Wylie museum.

Wylie farmers Clarry Fenwick, Lindsay Bauer, Don Butt, and Arthur Threlfall unloading bagged wheat into the Wylie elevator. December 1948.

Nalkain only took wheat so other grains had to go to Wylie, which had a covered bin and several pig pens. The Wylie wheat bin had a floor of flat galvanised panels nailed to the ground which was easily damaged by the wheat scoops which were used inside the bin. Later bins were floored with concrete.

In the 1940s farmers began to look for other ways to reduce the two-man harvesting crew. The hard work was on the harvester, so they invented systems of rods and joints to control the tractor from the harvester. There were hazards, of course. A universal joint can turn and rotate at the same time, but it locks at 90 degrees. A farmer who turned too boldly into a corner found himself with frozen controls and the tractor pulling the harvester round in circles in the paddock. The driver could not turn the steering wheel, press on the clutch, or engage the brake. Instead he had to leap out of the harvester and run around the outside of the circle until he could board the tractor from the back, through all the extension rods, and gain control of the tractor.

Remote controls on the Lanz HR
tractor. December 1947.

Lanz HR5 tractor with remote steering, clutch and brake, controlled with rods
and universal joints from the Sunshine AL harvester. December 1947.

Later, Graeme built improved remote controls for the KL Bulldog which used cords on the clutch and brake so it could be stopped if the steering locked up on a corner. A bar across the back of the tractor provided an anchor for pulleys and a rest for the steering shaft. The steering was improved by placing the universal joint vertically above the hitching point, so everything rotated in line.
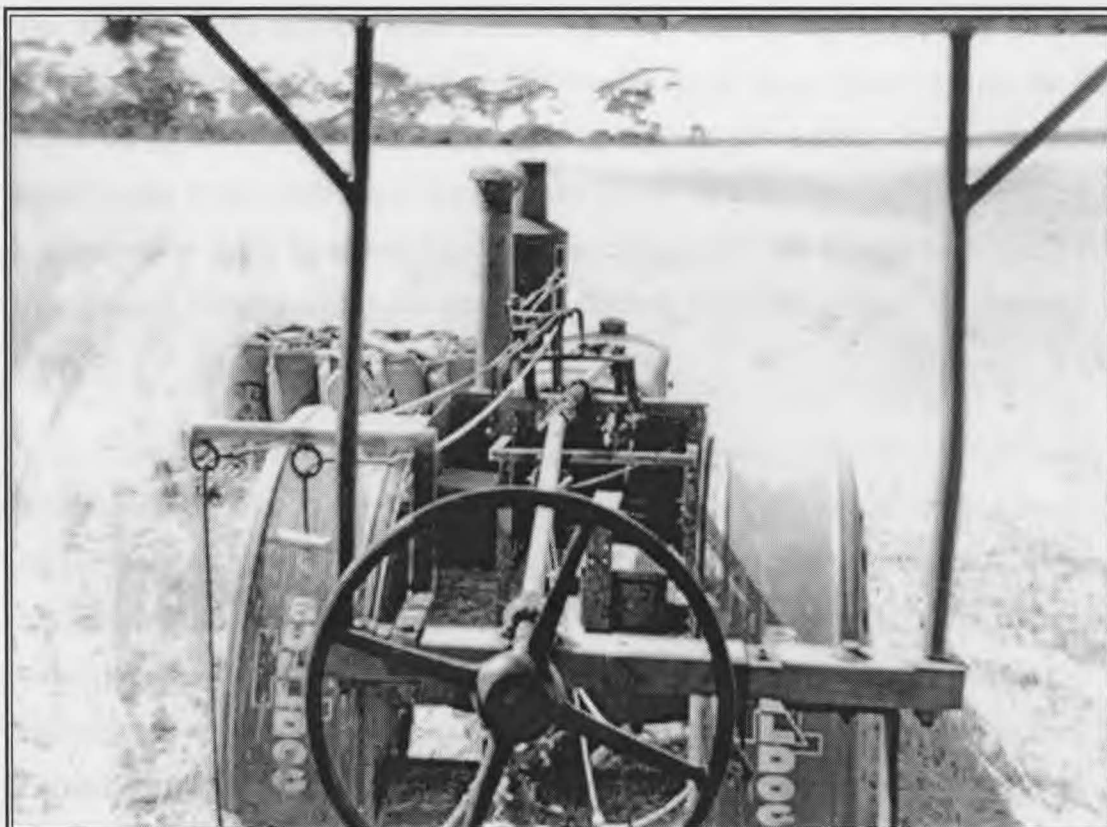
The KL Bulldog with extended steering, and clutch and brake controlled by ropes. In front, bags in the paddock. December 1955.
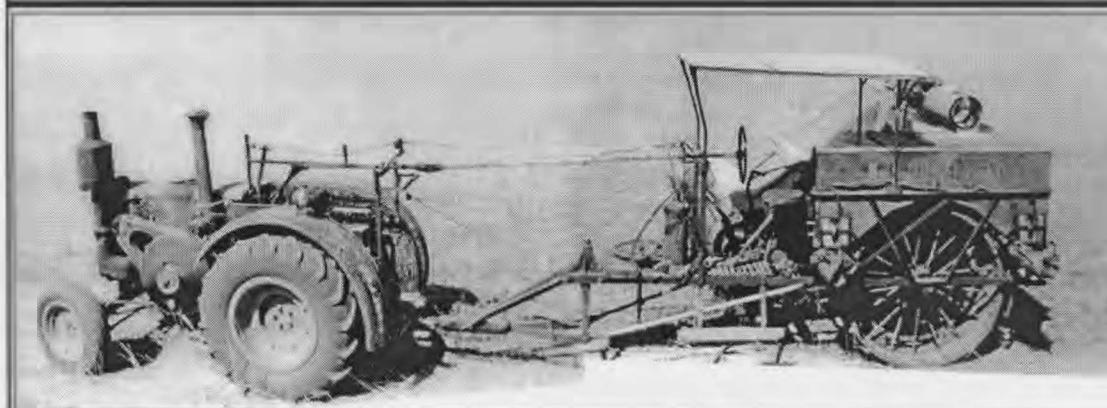
The KL Bulldog controlled from the Sunshine AL harvester. The operator started the tractor and moved to the harvester. This harvester was originally horse-drawn, but Graeme attached it directly to the tractor hitch. December 1955.

The fire extinguisher on the harvester above also points to the problem of fire. A spark from an overheated bearing in a machine could start a fire and destroy the crop, harvester and tractor. In windy conditions the fire would run wild across the farm into neighbouring properties, and could destroy whole districts. Shires had (and still have) harvesting bans where no vehicles were allowed to move in paddocks.

The Rhinds always carried a water fire extinguisher with a pump on the front of the harvester. They had harvester fires on Melrose but quick action always put out the fires before they got out of control. Graeme told me that one of the farm labourers panicked when he saw straw catch fire in the harvester comb. Instead of pumping a stream of water onto the blaze, he pulled the top off the extinguisher and poured the whole lot over the fire. Fortunately his aim was good, because he wasn't going to get a second chance.

In later years, the harvester controls were extended forward so the driver could reach them from the tractor. When Graeme took over Melrose Farm he sold the old Sunshine AL harvester and bought a Horwood Bagshaw harvester with a twelve foot (3.6 metre) cut. This was driven by a power takeoff (PTO) from the tractor. PTO drives were much better than the old wheel-powered "ground drives". Now the harvester could be powered up while stationary, or moved from paddock to paddock without operating the internal machinery. Hydraulics, and adjustment wheels on long arms, controlled adjustments on the harvester. The Horwood Bagshaw harvester still had steel wheels, but Graeme replaced the left hand wheel with a secondhand aeroplane wheel, one of the many useful things available from military surplus stores after the war. Bomber tyres were extremely tough and almost puncture-proof.

The Chamberlain 40KA tractor pulling the Horwood Bagshaw harvester, with empty bags on the back of the Morris Commercial 5-ton truck. The harvester bin held about 12 bags. January 1959.

Initially Graeme bagged his wheat for delivery to the bin. As bulk handling became common, farmers began to use truck bins to save time. Graeme could not afford to buy a bin, but when he realised he was the only farmer without one, unloading at half the speed of the truck bins, he decided to build one from ¼ inch (6 mm) angle iron, lined with 16 gauge (2.5 mm) metal sheets. He remembered getting his wife Alison to hold up the sheets of iron as he welded them to the frame. He also recalled the sound of his two and a half year old baby son Jim, irritated at being abandoned in the house, getting into the china cabinet, removing every item he could reach, and smashing them on the verandah. Jim got lots of attention but not the sort he wanted.

The truck bin sloped into a V in the middle to make unloading easier. The auger on top lifted the grain into the truck bin, and delivery meant simply opening the sliding door over the hopper of an elevator at Nalkain or Wylie. A short auger in the base of the V unloaded the last of the grain. Later, Graeme bought a secondhand side-tipping unit which was quicker to unload.

The McCormick AWD6 tractor pulling the Horwood Bagshaw harvester, with Graeme's homebuilt bin on the Bedford truck. December 1960.

The auger, a screw thread inside a tube, became the standard method of transporting grain on the farm. Some harvesters had built-in augers, but not the Horwood Bagshaw. Graeme fed the grain from the harvester into a hopper and used the truck auger to lift the grain into the truck bin. He also had a portable auger on wheels (below).

Dirty oats: grain runs from the truck bin down a corrugated iron chute and through the Horwood Bagshaw again. The cleaned grain pours from the yellow bin into a hopper and is augered into the round bin. November 1960.

Not all the grain grown on Melrose farm was sold to the CBH. Some was kept for use on the farm, either as food or seed. Oats was a staple food for animals, and the seconds (damaged grain) was also kept for animal food.

Part of the crop was also pickled with protective chemicals to protect the grain from boring insects and kept as seed wheat for seeding the next year. Hector had a small Hannafords pickler at Kulja and Nalkain. This old machine began to leak, and the chemical dust gave Graeme sinusitis, so he sold the machine and hired a Hannafords contractor with a large truck-mounted unit to treat his seed grain from then on.
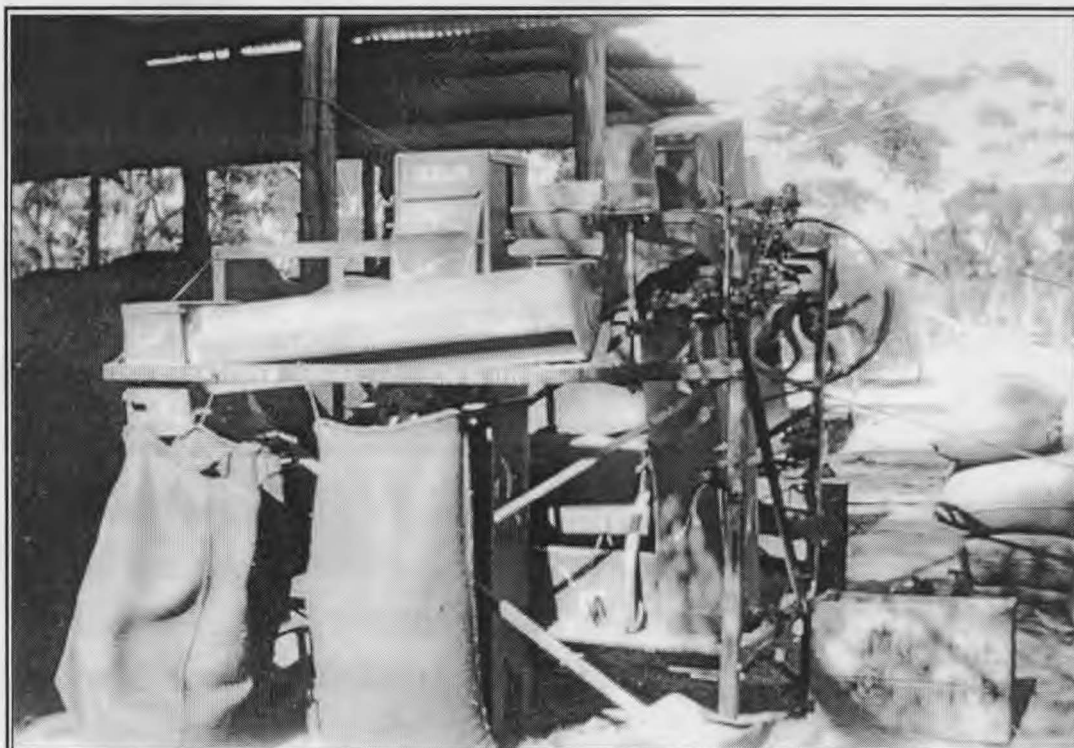
The Hannafords "Ideal Grader and Drier" at Kulja. It could dry (aerate), pickle (add chemicals) and grade (sort grain by size) into different bags. It was powered by a long leather belt from an engine on the right. About 1930.

Wheat from the tray of the old Chevrolet truck is poured into the hopper of the Hannafords grader, pickled, graded, bagged, sewn up and stored in the new shearing shed at right. 12th December 1948.

Harvesting was one of the most satisfying times of the year. After all the risks of drought, hail, disease, and fire, the clatter of the harvester and the flow of grain through the augers meant money in the bank. But it was also stressful, and Graeme didn't really relax until the last truckload of grain reached the weighbridge.

Water

Inadequate water had been the biggest problem at Kulja, and remained an important issue at Nalkain. Melrose farm had a permanent well to the south, which reached the water table at 75 feet (23 metres); it was adequate for stock but too salty for regular human consumption. East of the house was a permanent soak (a slow underground spring) which Hec used for a large vegetable garden. Three corrugated iron tanks at the house had capacity for 7,000 gallons of rainwater. Another 1,000 gallon tank on a tankstand provided overhead dam water for the kitchen, bathroom, and an outdoor shower under the tankstand. Near the house, the previous owner had excavated a 500 cubic metre dam but it was too small to last through the year; at best it was a metre deep, and dried out in summer. The Rhind family had to conserve water through the dry months. They had enough rain water for drinking and cooking, but they had to transport the rest of their water by truck from the big Nalkain government dam. They also had to make sure there was enough water for all the animals on the farm.

The windmill, overhead tank and garden at the soak east of the house, in 1947.

Graeme in a home-made tin canoe in the flooded house dam in 1947. The two-metre posts in the background originally supported a brush roof over the dam, which was less than a metre deep.

Water conservation was assisted by the absence of a hot water supply in the house. The household had a nightly basin wash, but that meant one pot of hot water heated on the wood-fired Metters stove. The bather stood in a basin, used half the water to get wet and soap up, and then rinsed off with the rest poured over their head. The cold water shower under the overhead tank was much better in the warm summer months.

Once a week everyone had a bath in Hec's home-made galvanised iron bath. The youngest washed first, and Hec was last, but the water was unchanged. A little extra hot water was added each time to keep the water warm. Once a week, Nick also washed the clothes in the "copper", a copper drum built into a circular wall with a fireplace underneath. Water was heated in the copper, and farm soap, made from sheep fat and caustic soda, was used as the detergent. Clothes were stirred with a wooden stick, drained in a concrete trough, and put through a mangle to squeeze out water before hanging. The mangle was a pair of horizontal rollers which squeezed water from the clothes. Often the garments wrapped around the bottom roller and became jammed, so the operator had to release the top roller and peel the clothes off the bottom roller. In

each case, the washing water went on the small garden near the house. Even the water from hot water bottles was recycled onto the garden.

Dam building was one of the hardest tasks a farmer could attempt, but David and Graeme became tired of water shortages at Melrose and decided that they had to sink another dam in 1952. The farm had areas of waterproof clay subsoil which were good for building dams, and the Rhinds chose a site uphill from the homestead for a dam about 30 metres square and 3 metres deep, holding 2,500 cubic yards (about the same in cubic metres).

The task was simple but arduous. David and Graeme had to break up the hard clay base with a single furrow plough behind the tractor. The slowest part of the task was to rip down 8 or 9 inches (20 cm) into the hard clay, taking 4 to 5 hours to work over the area of the dam. The plough operator walked behind, leaning his weight on the handles to keep the plough in the soil. The plough tended to catch on hard patches and flip over, with the danger of throwing the operator over the top. To reduce the risk, David and Graeme extended the point of the plough and added a metre to the handles. After ripping, the rest of the day was spent removing the soil in a towed scraper, a Linke-Noacke "Tumbling Tommy", a hand-controlled scraper towed on chains or cables from the tractor. The scraper was prone to overturning too, and needed metal extensions for flip prevention. At the edge of the dam site, a lever was tripped to empty the scraper, and the excavated soil became part of the dam wall. Once the scraper had removed all the loose soil, the plough was used to rip deeper. As the dam sank deeper the tractor driver had to be careful of rolling the tractor over on the steepening dam wall.

It was a long, slow job. The scraper held 3/4 cubic yard of soil, which meant about 3,500 passes. In a good day, the level might sink by 10 centimetres. They had to build the dam in summer because no other time was available. Farm machinery was so slow that the seeding, shearing, and harvesting took all of autumn, winter and spring. Autumn and winter were out anyway, because of the danger of ending up with a shallow trough full of mud and water which was impossible to excavate. Late spring would have been perfect, after the last rains, but David and Graeme had to build the dam in January when they had no other farm work. Some days were brutally hot, and the dam, sinking down out of the breeze, became an oven. On one occasion the metal of the plough and the scraper were too hot to touch before the sun rose. Graeme and David had to wrap every

handle in cloth, and at midday Nick came out to persuade them to give it away for the day.

The last tasks on the dam included catchment ditches out to the left and right to increase water flow into the dam in winter. David and Graeme also removed a windmill from a failed well in one of the high northern paddocks and set it on the new dam to pump water to the house. Windmills were the only way to ensure a regular water supply to the tanks and troughs around the farm. The dam was finally finished after five or six weeks of continuous work.
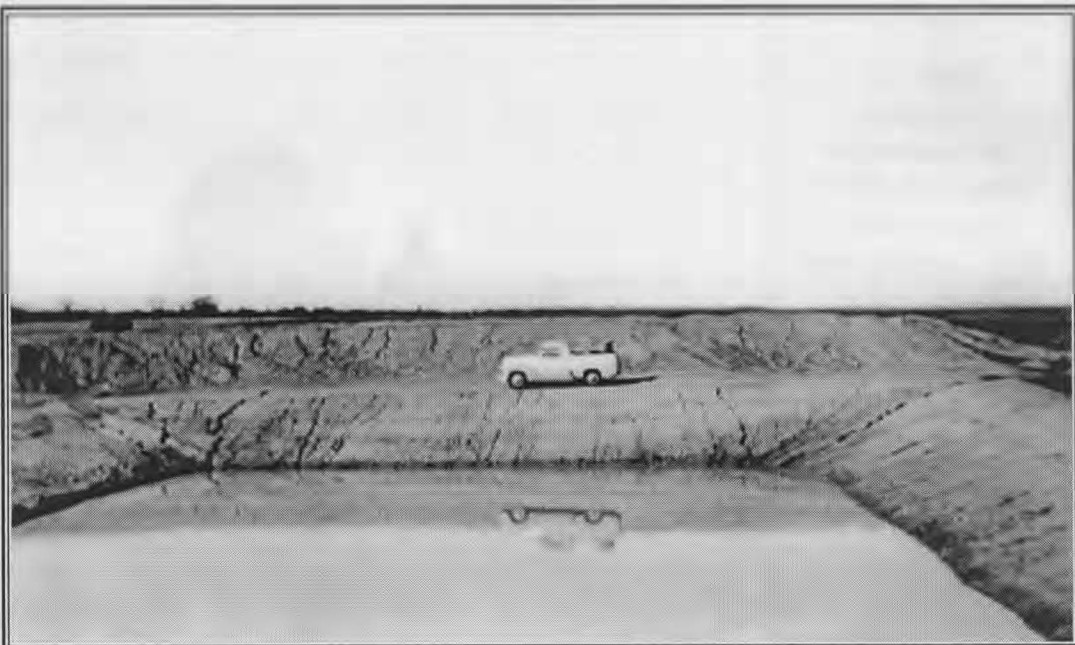
Graeme's 1952 Holden ute on the bank of the dam built by David and himself. About 1952.

The best machinery for dam excavation was a bulldozer. In 1954, when the farm finally had money to spare, Hec hired a local contractor with 120 hp International TD18 bulldozer to build a 3,000 cubic yard dam. He used a three prong ripper and an excavator in about 1954. The 3.5 cubic yard scraper was no longer hauled on chains, but hydraulically controlled from the bulldozer. This dam was built by one person in less then ten days.

The dam
contractor
excavating the
3,000 cubic metre
dam with an
International TD18
bulldozer and
hydraulic scoop in
1954.
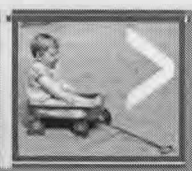
Writing electronic oral/visual history

Writing electronic oral/visual history

This honours project, a narrative about farming in Western Australia in the three decades after 1930, combines photography with oral history, and publishes the text as a CD ROM eBook.

My specific interest was the use of farm technology, emphasising the daily routine of farming, and the technical changes that took place over thirty years. Photographs would provide access to detail that was easy to see but difficult to describe.

I collected and scanned the photographs, and began interviews by using prints of those photos to determine the significance of those images. Later stages involved further interviews to provide a broad background, followed by the selection and integration of the material into a narrative.

Visual and oral history

One of the major criticisms of oral history is the unreliability of long-term memory (Dunaway & Baum, p.80 & 113). Photography provides a method of improving this reliability. The image provides a collection of objects, people and places in single images; alternative views of the same object, person or place; and a sequence of events in chronological order. In each case the narrative and the images have to remain consistent with each other. Sometimes the images provide corroborating evidence for stories gathered through interviews, or stimulated my father's recollection of past events. Some images gave documentary support to an existing story, and at other times the photograph was the source of the story. I also found that viewing a set of images of one subject in chronological order tested the narrative.

However, the use of photographic images for historical writing revealed several important problems. I do not have space here to discuss the complexities of photographic interpretation, but concentrate instead on problems of access, preservation, and context.

The Battye Library Pictorial Collection is the official historical collection for Western Australia, and uses two image systems. One is a hand-written card index connected to a catalogue of photocopies of the original photos. The second and recent addition is an Internet image database (http://henrietta.liswa.wa.gov.au/) of some of the images. The library posts small versions on its website, as below.

Unloading bagged wheat at Trayning in 1932.

The library charges users a fee to reproduce full-sized printed or electronic images. Non-commercial copies cost $14.30 per image, and commercial use is higher. As a result the use of images is much more restricted than text.

While the Battye Library provides an excellent resource, its collection is limited by space, finance, staff, and policy (Julie Martin, librarian, personal communication, 2004). By statute, the library acquires images which "collectively give a visual history of Western Australia", but "images of primarily local interest will be acquired only if they provide an important insight into a particular period of Western Australian life or a specific period of historical interest" (Library and Information Service of Western Australia (LISWA), p.12). The image above, for example, is included as an illustration of changeover from bags to bulk handling, and not the regional history of Trayning or specific farmers.

As a result, many images are never collected and preserved. The result is that the pictorial collection does not have the same depth as textual local history in the Battye Library, which can include material of local interest.

Access and preservation limitations reduce the use of historical photographs, but the lack of contextual information is a more pervasive problem. Most photos lack sufficient text for a comprehensive background. The viewer has to know, for example, that Western Australia adopted bulk handling in the 1930s to understand the significance of the prior image. However the entire data for that photograph is:

> Title: Bulk handling delivery of wheat into elevator at Trayning
> Summary: Two men unloading wheat bags into elevator at Trayning
> Author: Western Australian Government Photographer
> Date: 1932.

Photographs are often regarded as self-contained, self-explanatory, and independent of text. Family photography, for instance, usually omits text as information is available verbally or from memory. In most cases we rely on memory of the incident, person or place to fill in the story behind the image. However, knowledge of the image fades with time. Both the photographer's personal knowledge and the audience's contextual knowledge eventually vanish, and that unrecorded information is lost. From this point of view, the information recorded with the photograph above is inadequate.

Professional photographers may keep accurate written records, but most photographers do not write on their photos. If the picture has a title, it is usually brief, with perhaps a date, a location, a name or two, and a short description. At worst there is nothing; old photograph albums are often full of undescribed images. From a historical perspective, the absence of written information can leave the image unusable.

As a result, there is a distinct need for more information to be collected and attached to historical photos. No specific national standard, such as the archival system for books, applies to photographs. The Battye Library has spaces to list author, title, date, subject and summary, but the information is minimal and sometimes blank. Picture Australia (National

Australian Library at www.pictureaustralia.org) and Museum Victoria add extra detail to either the title or the subject, but the information is erratic.

Of course, one can argue over which information should be attached to the image. Images contain a wealth of detail, some banal and some significant. Some photos illustrate great historical, political, or social moments. Others refer to small local or personal events. It is difficult to determine which story should be recorded, as both can have future interest. Whichever range of information is collected, the attempt to attach written detail to the image will be useful to later writers. For instance, local oral historian Bill Bunbury used as many images as pages of text in *Reading labels on jam tins* (1993). The more precise the written information, the more accurate the use of the image.

Part of this project is an attempt to find an easy method of adding substantial information to photographs to maintain their historical utility.

Electronic texts

Computer digitisation of text and images provides new forms of publishing. The CD e-book was advocated as a successor to the printed book, but it has not become a major publishing medium. Enquiries at university libraries and local bookshops suggest that e-books have almost no role in the marketplace. The current alternative is the Internet itself (Graeme Rymill, librarian at Reid Library UWA, personal communication, October 2004). Rosenzweig states that "the Web has almost entirely displaced other media - especially CD-ROMS - for presenting digital content" (2001). Why buy an e-book in a bookshop to read on your computer at home when you can download it from the Internet?

At the same time, the reading public has not become comfortable with reading on computers. Hoorebeck comments that that "the reading public has not yet shown any deep interest in obtaining books in digital form from the web" (p.165), and that "no one seems to want to read anything much longer than a few paragraphs on a computer screen for pleasure" (p.167).

Yet there are niche markets for the CD. Education and gaming CDs are well known, but three forms of data storage are conspicuous.

The largest use of data CDs is in organisational archives, in businesses and government departments. American organisations such as the FBI, NASA and the military have begun to replace their paper archives with CD archives. In some cases they use "CD jukeboxes" to provide quick access to the disks. The applicability of CDs for large volume records was described by Mark Fritz as a "nobrainer" (1998).

The second use is historical archives. Books, photos and illustrations can be scanned and stored as text or images on CDs. For example, the 500-year-old Archive of the Indies in Seville, Spain, covering the exploration of the Americas from the time of Columbus, has been scanned to make the complete archive available to any scholar or reader (Omni, November 1993). *The complete cartoons of the New Yorker* magazine contains two CDs with every cartoon printed since 1925 (McGinness, p.R6). Web companies such as Archive CD Books sell CDs of reproductions of old documents in many countries (http:www.archivecdbooks.org/).

The initial cost is large but the publishing cost is minimal at about 50c per disk. Several other advantages are apparent: spare copies are created; the original documents need no further handling; damaged images can be digitally repaired; and public access to significant history is improved. As a result, production of CD versions of important historical records has become more common.

The third use is personal digital photo albums. Many companies offer the service of transferring personal photographic material to CDs in electronic images. This has not been as widely taken up, as many photographers do not organise permanent personal photographic storage systems.

Why doesn't the Internet take over all of these markets? Firstly, the Internet cannot handle large files; a collection of high resolution images takes hours to download, even with broadband. Secondly, the Internet is not permanent. The removal of a file, an address, or a computer from the Internet means the material vanishes. Some collections also have a

limited audience, and may have no organisation or person to host and maintain them on the Internet. There are free photographic collections on the web (such as PicturesFree.org), but these sites are, in reality, ephemeral. As soon as the owner ceases paying for the site, the material vanishes. Commercial sites (such as stockphoto.us) are more durable, but their material is limited by commercial viability.

As a result, niche markets for CDs are likely to continue. In this project the CD is perfect for the storage of photographic collections which require ease of access as well as protection. Access to printed photographs has to be restricted because the image is small, unique, and easily damaged or stolen. Physical filing systems for photos are usually complex, difficult to search, and easily disrupted. A single digital scan provides easy storage and distribution for an image which is at present inaccessible.

There are problems in using CDs, however. The three key concerns are copyright, reliability and compatibility.

Copyright concerns ownership and income from use of images. Digital images are easily copied, and Mark Hoorebeck described e-books as an opportunity for piracy (2003, p.163). However, the focus on copyright and private ownership can prevent images being either preserved or accessed (Rosenzweig, 2001): the material remains unscanned through fear of piracy, or inaccessible because of cost. There are many images whose real value is in public ownership, and making them available seems more important, in the long term, than protecting private ownership. Copyright has to be protected, especially in texts produced for profit, but it should not render such material unobtainable.

Reliability refers to how long the plastic and optical materials of the CD will last. Tests suggest that CDs can last more than a hundred years, if handled carefully (CD-ROM Professional, November 1995), but writeable and rewriteable CDs are not designed to be permanent and are not as reliable for archival purposes. Some librarians distrust CDs because they are easy to damage, lose or steal (Gina Sjepcevich, Edith Cowan University librarian, personal communication, November 2004). However electronic data of all types can be protected by multiple (mirrored) computers in separate locations which replicate the information and allow reproduction of damaged data.

Compatibility refers mainly to the software that reads disks, and the need for common software which remains compatible with earlier versions. The most common Internet programs are Adobe Acrobat and HTML (Graeme Rymill, Reid Library librarian, personal communication, October 2004). Compatibility also refers to the danger of a medium such as the CD being superceded by new media such as the DVD. Neither are serious problems, as data can be translated and transferred.

Despite their limitations, CDs are perfect for publishing huge volumes of data that are too large for the Internet and too expensive for conventional publishing. One CD of 700 megabytes, for example, can hold 300,000 typed pages (Rosenzweig, 1995), or hundreds of high resolution images. Electronic scanning and image correction (removal of dust, scratches, and colour casts with photographic software such as Adobe Photoshop) are both simple and affordable in comparison with conventional photographic laboratories. Programs (such as Dreamweaver) allow access to interactive features, including rollovers (image swapping) and links to related material. Audio and video are also possible, though they are not part of this project. Unlike books, corrections and additions are easily made, and instant correction and republishing is possible.

CDs are unlikely to replace the book or the Internet. Books still provide better longevity, visual quality, and readability. Often they are easier to use and give more tactile satisfaction. At the same time, the Internet will continue to provide the largest and most accessible databases. However CD publishing provides a perfect medium for this project. It allows me to preserve a large volume of photographs in a format that most Australians already use. It combines images and text in ways impossible in printed media, and publishes the result for a fraction of the cost of printed texts.

Historical theory

For the purposes of this project, I sought a theoretical perspective that illuminated the nature and process of writing historical narratives. The theoretician I found most useful was Hayden White in *Metahistory* (1973), who suggests that historical and literary writing share many of the same features.

White argues that ancient modes of story-telling have been repeated in history writing:

> The historian arranges the events in the chronicle into a hierarchy of significance by assigning events different functions as story elements in such a way as to disclose the formal coherence of a whole series of events considered as a comprehensible process with a discernible beginning, middle and end. (p.7)

White suggests that history writing retains many of the familiar features of narrative writing, such as plot and genre. Hanna Lewi says that some critics find the idea of imposing a narrative form on history alarming, believing it must distort history and produce dishonest interpretations. However, Lewi suggests that we have been creating narrative history for as long as we have told stories. "Narratives", Lewi comments, "are deeply inherent in the way we experience and interpret the present… and the past" (Lewi, 2001). White divides his analysis into six categories, but it is three of these, Locus of Perfection, Trope Function, and Emplotment, that I find most relevant.

Locus of Perfection (p.24) identifies the chronological focus of the writer, the time at which society has the best solutions for its problems. White's four loci are:

- past
- present
- close future
- distant future.

This view of history suggests that historians are not merely writing about the past but promoting attitudes and actions. At one end of the spectrum we can represent the past as perfect, and return there for inspiration. At the other, we can find fault with the past and use this as evidence that people need to change their attitudes and behaviour.

Radical re-interpretation, often part of post-modern or revisionist approaches, tends to oppose conventional views of a particular set of events and then create new alternatives (Rivkin & Ryan, pp.343-355). This can easily be done for the Australian landscape, by concentrating on degradation of the environment, or displacement of the Aborigines.

Alternatively it may focus on under-represented minorities such as Aborigines, migrants or rural women. This radical reappraisal, and the conservative reaction against it, have been major issues in the current Australian "History Wars", raising concerns about empirical method, ethics, ideological and political alignment, and the whole purpose of history (see Australian Historical Studies, v.123 & 124, 2004), but there is no space for that debate here.

However, the ethical emphasis of the locus of perfection is not always appropriate. In this project I attempt to collect information with a minimum of judgement. My intention is not to defend or criticise the past. Rather, it is to describe the practices of an era. It seems unfair to "confront the past with questions which could never have occurred to the people who lived in it" (Hancock, p. 215, Pascoe, p.30). I leave the reader to form their own opinion.

Trope Function illustrates the author's interpretive logic. White's decision to use four divisions for each category limits him here, because he is forced to combine two (negate and transcend) which have opposing consequences. Authors, he suggests:

- Represent: describe plainly
- Reduce: distill a wide range of events to one
- Integrate: bring everything together into one connected unit
- Negate: oppose and reject / Transcend: accept and move on.

In each case, the categories suggest a particular relationship between the present and the past, and raise the question: what do we learn about life through history, or telling stories about history?

Oral historian Marianne Lo Gerfo lists three forms of oral reminiscence: informative (focus on facts), evaluative (focus on life review, through conflicts, successes and failures), and obsessive (repeated retelling of key events, often unresolved) (Dunaway & Baum, p.315).

The least constructive strategy is the obsessive re-living of events; often reflecting the unachievable desire of returning to the past to relive or repair that experience. The informative approach tends to produce a chaotic jumble of anecdotes. It is the various

forms of evaluation, as suggested by White, that provide methods for viewing the past as a whole. My preferred method is integration, bringing many small events together into one experience, in this case, the single theme of technology and its effect on rural work.

Hayden White's most imaginative concept is Emplotment. His four main plots are Romance, Comedy, Tragedy, and Satire, though he also discusses the Chronicle, the Epic and the Apocalypse as useful variations (p.8).

- Chronicle: a meandering tale ordered by time
- Epic: a chronicle of endurance and heroism
- Romance: a permanent triumph over adversity
- Comedy: a temporary triumph over adversity
- Tragedy: adversity triumphs, but provides enlightenment
- Satire: ironically, humans create their problems by repeating the same mistakes
- Apocalypse: a tragedy which exterminates almost everything.

What genre fits this project? Personally, I have avoided the chronicle because its lack of focus can irritate the reader. Nor is the text a romance, because no farmer triumphs over nature in the long term. My father appreciated the ironies of farming, but he rarely felt that his experiences were bad enough to require a tragic or apocalyptic interpretation.

I am left with the epic and the comedic plot. The heroic bush pioneer fell out of literary favour long ago, but much about farming was epic: pioneering was difficult, and a fragile physique or psyche did not last under the pressure. Stoic and pragmatic endurance was necessary, rather than heroism.

My father suggested an alternative plot type: the farming metaphor of the seasonal cycle, where everything is temporary and recurrent. The farmer expected to follow the cycle, year after year, with all the successes and failures of previous years. History is based on repetition, but it is both inevitable and acceptable. I find this the best description of plot for this work, with the cyclical pattern of applying technology to the same problems, season after season.

Hayden White's examination of narrative genres demonstrates, in part, a desire for stories that are not "just one damned thing after another" (Macintyre, p.79)[1], or "trivia of appalling proportions" (Barbara Tuchman in Dunaway & Baum, p.76). The implication of White's work is that a narrative, historical and otherwise, needs a structure with a clear goal. The absence of direction and structure can be the most confusing part of an oral history. The task of the writer is to shape the narrative structure.

Text and image

I found the undefined relationship between text and image an additional complication. While the writer has a choice of narrative forms, what methodology would enable strong integration with photographic images?

Text and image can follow two separate paths with completely different results. If the pictures dictate the structure, then the text becomes a photo album, where the text follows the image. If the text dominates the story then the images follow the words.

In my project I decided that the text and image required equal consideration. I had to keep two processes in mind at the same time: the narrative flow of plot and style, and the episodic start-and-stop of photographs.

At times the photographs were strong enough to shape their own story; at other times, the photographs did not cover a set of events or processes, and the text took charge. However the random change from text-driven to photo-driven narrative felt clumsy.

The main difficulty I experienced was finding shared concepts to unify the project. I wondered if Hayden White's ideas of genre and plot might apply to photographs, and found support in photographic books such as the landscapes in *The world of Olegas Truchanas* (Angus, 1975) and the war photographs of *Hurley at War* (O'Keefe, 1986). Hurley's photos are often tragic but have an undertone of epic heroism, while Truchanas' landscapes are

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[1] "Life is just one damned thing after another." Elbert Hubbard, in *Philistine,* December 1909.

fundamentally romantic. Each had a uniform style, subject and theme, but also focussed on a specific genre.

Clearly the consistency of the narrative could be maintained through text and photographs. Both had to illustrate the working life of the farm, and the rest had to be minimised. Now, certain photographs fitted the story, and many other photographs, such as those of the family, had to be omitted.

As a review process I read the text by itself to ensure it remained coherent and consistent. I then applied the same method to the photographs. The third step was to read the project as a whole and examine the integration of the text and image. At times this resulted in the removal of sections, at others, the addition of connecting images and text.

The ideas of consistency in genre, plot, theme, and style are useful in integrating images and text, but they also leave many difficulties. Photos and text can argue for the reader's attention. What is the best balance between text and images? How can the two be blended for most narrative impact? What happens when the images and the text confront each other? There are many other avenues of this relationship left to explore, and the effective integration of images and text for narrative history remains a complex task.

References

Angus, Max (1975). *The world of Olegas Truchanas.* Hobart: The Olegas Truchanas Publication Committee.

Australian Historical Studies, 2004, v.123. Melbourne: University of Melbourne Press.

Australian Historical Studies, 2004, v.124. Melbourne: University of Melbourne Press.

Bunbury, Bill (1993). *Reading labels on jam tins.* Fremantle: Fremantle Arts Centre Press.

Dunaway, David & Baum, Willa (1984). *Oral history: an interdisciplinary anthology.* Nashville: American Association for State and Local History.

Fritz, Mark (1998, June). *CD-R chiving to the rescue: document management.* E Media Professional journal. Available WWW: http://www.findarticles.com/p/articles/mi_m0FXG/is_n6_v11 [Oct.2004]

Hancock, Keith (1954). *Country and Calling.* London: Faber & Faber.

Hoorebeck, Mark (2003, May). *eBooks, libraries and peer-to-peer file-sharing.* Australian Library Journal. Kingston: Australian Library and Information Association.

Lewi, Hannah (2001). *Virtual spaces and visual stories.* Unpublished paper presented at the European Australian Studies Association Conference, Lecce, 2001.

LISWA (2001). *Collection Development Policy and Infolink Database Policy.* Perth: LISWA.

Macintyre, Stuart (1982). *"In my mind the next vivid scene was..."* Studies in Western Australian History, p.79. Perth: University of Western Australia Press.

McGinness, Mark (2004). *Manhattan Ink.* Weekend Australian Review, 18-19 December 2004.

Omni magazine, November 1993.

O'Keefe, Daniel (1986). *Hurley at War.* Annadale: Daniel O'Keefe Publishing.

Pascoe, Rob (1979). *The manufacture of Australian history.* Melbourne: Oxford University Press.

Petrik, Paula (n.d.) *We shall be all: designing history for the web.* Available WWW: http://chnm.gmu/assets/historyessays/weshallbeall.html [Sept. 2004]

Rivkin, Julie, & Ryan, Michael (1998). *Literary theory: an anthology.* Oxford: Blackwell Publishing.

Rosenzweig, Roy (1995). *So, what's next for Clio? CD-ROM and historians.* Journal of American History, v.81, pp. 1621-1640.
Available WWW: http://chnm.gmu.edu/assets/historyessays/nextclio.html.

Rosenzweig, Roy (2001). *The road to Xanadu: public and private paths on the history web.* Journal of American History, v.88, pp. 548-579.
Available WWW: http://chnm.gmu.edu/assets/historyessays/roadtoxanadu.html.

White, Hayden (1973). *Metahistory.* Baltimore: Johns Hopkins University.

Bibliography

Angus, Max (1975). *The world of Olegas Truchanas.* Hobart: The Olegas Truchanas Publication Committee.

Australian Historical Studies, 2004, v.123. Melbourne: University of Melbourne Press.

Australian Historical Studies, 2004, v.124. Melbourne: University of Melbourne Press.

Bolton, Geoffrey (1972). *A fine country to starve in.* Perth: University of Western Australia Press.

Batzun, Jacques, & Graff, Henry (1977). *The Modern Researcher.* New York: Harcourt Brace Jovanich.

Bunbury, Bill (1993). *Reading labels on jam tins.* Fremantle: Fremantle Arts Centre Press.

Burvill, George (ed.) (1979). *Agriculture in Western Australia, 1829 – 1979.* Perth: University of Western Australia Press.

Dunaway, David & Baum, Willa (1984). *Oral history: an interdisciplinary anthology.* Nashville: American Association for State and Local History.

Fritz, Mark (1998, June). *CD-R chiving to the rescue: document management.* E Media Professional journal. Available WWW: http://www.findarticles.com/p/articles/mi_m0FXG/is_n6_v11 [Oct.2004]

Gray, R.B. (1954). *The agricultural tractor.* St Joseph: American Society of Agricultural Engineers.

Hafner, Kurt (trans. H.E. Voigt, 1992). *Lanz Radiator Bulldogs, 1928 – 1942.* Kenthurst: Kangaroo Press.

Hafner, Kurt (trans. H.E. Voigt, 1993). *Lanz Bulldog Tractors, 1942 – 1955.* Kenthurst: Kangaroo Press.

Hancock, Keith (1954). *Country and Calling.* London: Faber & Faber.

Hoopes, James (1979). *Oral history: an introduction.* Chapel Hill: University of North Carolina Press.

Hoorebeck, Mark (2003, May). *eBooks, libraries and peer-to-peer file-sharing.* Australian Library Journal. Kingston: Australian Library and Information Association.

Johnston, Ian (1997). *Agricultural tractors: their evolution in Australia.* Roseville, Kangaroo Press.

Johnston, Ian (1997). *The World of Classic Tractors.* Roseville, Kangaroo Press.

Johnston, Ian (1997). *A century of classic tractors.* Toowoomba, Greenmount Press.

Kelly & Lewis (n.d.) *Instruction manual for KL Bulldog.* Springvale: Kelly & Lewis.

Lewi, Hannah (2001). *Virtual spaces and visual stories.* Unpublished paper presented at the European Australian Studies Association Conference, Lecce, 2001.

LISWA (2001). *Collection Development Policy and Infolink Database Policy.* Perth: LISWA.

Macintyre, Stuart (1982). *"In my mind the next vivid scene was..."* Studies in Western Australian History, p.79. Perth: University of Western Australia Press.

McGinness, Mark (2004). *Manhattan Ink.* Weekend Australian Review, 18-19 December 2004.

McLaren, Glen (1996). *Beyond Leichhardt: bushcraft and the exploration of Australia.* Fremantle: Fremantle Arts Centre Press.

O'Keefe, Daniel (1986). *Hurley at War.* Annadale: Daniel O'Keefe Publishing.

Pascoe, Rob (1979). *The manufacture of Australian history.* Melbourne: Oxford University Press.

Petrik, Paula (n.d.) *We shall be all: designing history for the web*. Available WWW: http://chnm.gmu/assets/historyessays/weshallbeall.html

Quick, Graeme (1990). *Australian tractors*. Richmond: Land Book Company.

Prunster, R.W. (ed) (1958). *Changing land use in Western Australian agriculture*. Perth: University of Western Australia Press.

Reid, R.L. (1981). *A manual of Australian agriculture*. Melbourne: Heinemann.

Reynolds, Henry (1982). *The other side of the frontier*. Melbourne: Penguin.

Rice, John (1993). *Wyalkatchem: a history of the district*. Wyalkatchem Shire Council.

Rivkin, Julie, & Ryan, Michael (1998). *Literary theory: an anthology*. Oxford: Blackwell Publishing.

Rolls, Eric (1977). *They all ran wild*. Sydney: Angus & Robertson.

Rosenzweig, Roy (1995). *So, what's next for Clio? CD-ROM and historians*. Journal of American History, v.81, pp. 1621-1640.
Available WWW: http://chnm.gmu.edu/assets/historyessays/nextclio.html

Rosenzweig, Roy (2001). *The road to Xanadu: public and private paths on the history web*. Journal of American History, v.88, pp. 548-579.
Available WWW: http://chnm.gmu.edu/assets/historyessays/roadtoxanadu.html

Stannage, C.T. (1981). *A new history of Western Australia*. Perth: University of Western Australia Press.

White, Hayden (1973). *Metahistory*. Baltimore: Johns Hopkins University.

Wiener, Philip (ed.) (1973). *The dictionary of the history of ideas: studies of selected pivotal ideas*. New York: Scribner. Available WWW: http://etext.lib.virginia.edu/DicHist/dict.html

Appendix 1: Computing details

Opening the ebook

To start, access the CD, open the folder "e-book" and click the file "00_open_here". Most computers recognise the file format automatically and open the program in a web browser such as Internet Explorer.

HTML

In order to make the project as accessible as possible, this e-book was written in HTML, the basic language of the Internet. The authoring program was Macromedia Dreamweaver 4, a user-friendly program which generates HTML code for the programmer. The e-book can be read in any common web browser, such as Internet Explorer, Netscape, or Opera. While it is written in the same form as a web program, it is meant to be read straight from the CD rather than downloaded from the Internet.

Images

I scanned the original slides or prints, and cleaned them with Adobe Photoshop 6 to remove dust and scratches, and correct faults in contrast, level and colour (changes caused by the aging of silver halides and colour dyes). Degraded images were repaired but nothing was removed or added to the photos.

All the images are all stored in the photos folder inside the e-book and can be opened in any image software, including Photoshop and Internet Explorer. The photos are numbered in chronological order with a three digit number. The underline _ replaces the space because spaces can cause faults in web browsers. The title gives some of the content, for example, 100_Perth_c1955.

There are several versions of each image. The smallest image is a "thumbnail", set at no more than 500 by 400 pixels, and identified by a "t" after the number (i.e., 167t...).

Thumbnails are usually much smaller so perhaps these are more accurately described as "postcards", and give better improved balance between text and image. These images occupy about a quarter of the monitor screen and leave adequate room for text. It is also appropriate for printing on A4 pages because the size matches the width of an A4.

In the e-book, each thumbnail provides a link to the full sized image by clicking on the first image. The full-sized image (i.e. 100_Perth) has a size limited to 1000 by 800 pixels (dots), the size of an average computer screen. The large image allows viewer to study the image of greater resolution (sharpness) if they wish to. This image will be cropped on an A4 page.

Some images are magnified segments of the image, and are identified by "z" after the number (i.e. 167z…). Some images also have "rollovers" which show titles identifying parts of the image. The rollover images have "r" after the number (i.e. 105r…).

All images can be accessed through Internet Explorer and copied (usually a right click on the image). Alternatively, you can go to the photo folder and click on the file name.

Most of the photos are JPEG images, the most common electronic photographic format. This format compresses images to a smaller size. The JPEG format has a range of quality settings from 1 to 12; a low number results in a smaller image but degrades the image. All the images in the photos folder are stored at 12 (maximum) to preserve image quality, and are large. The large high resolution monochrome images have sizes ranging from 200 to 500 Kilobytes (Kb), with colour images at 400 to 900 Kb. These are too big and slow for downloading via the web. A slow internet download takes about a second to download 20 Kb, though broadband connections can be over ten times faster. By comparison, the Battye Library website (http://henrietta.liswa.wa.gov.au/) has pictures of about 250 Kb which are saved at JPEG quality 10 (high) and are reduced to 100 Kb. Large files are not a problem on a CD and you should find the large images sufficient for most purposes.

Some images are stored in the GIF format, mainly maps, which can be found at the end of the photos folder. Most have thumbnail images too.

Photoshop has a facility called File Information which allows captions and descriptions of each photo to be saved in the same file. Most photos have a caption which can be read and printed from any version of Photoshop.

Saving the e-book

I recommend saving a copy of the e-book folder on your hard drive. Dragging and dropping the whole e-book folder onto your desktop the easiest method.

Printing the e-book

Most browsers ignore natural page breaks and so cut images and tables at page breaks. To prevent dissection of the book, I recommend opening the files with Word, and switch to "print layout". This should keep the photos intact for printing. You can also alter the size of the images under Format > Picture.

Appendix 2: CD ROM: Farming at Wylie