Industrial relations in the Australian engineering industry, 1920-1945: the Amalgamated Engineering Union and craft unionism

Kouichi Inaba
University of Wollongong


This paper is posted at Research Online.
NOTE

This online version of the thesis may have different page formatting and pagination from the paper copy held in the University of Wollongong Library.

UNIVERSITY OF WOLLONGONG

COPYRIGHT WARNING

You may print or download ONE copy of this document for the purpose of your own research or study. The University does not authorise you to copy, communicate or otherwise make available electronically to any other person any copyright material contained on this site. You are reminded of the following:

Copyright owners are entitled to take legal action against persons who infringe their copyright. A reproduction of material that is protected by copyright may be a copyright infringement. A court may impose penalties and award damages in relation to offences and infringements relating to copyright material. Higher penalties may apply, and higher damages may be awarded, for offences and infringements involving the conversion of material into digital or electronic form.
Chapter Five

Production Methods and Work Practices

As noted in Chapter Two, the Australian metal industries had been in contraction from 1928. In the employers' view, the fundamental problem was the uncompetitiveness of domestic products from imported goods, produced at lower costs by different production methods. In the circumstances, employers insisted on a new industrial framework to help them develop Australian 'manufacturing'. Meeting their demand, Justice Beeby advocated industrial reform comprising piecework, re-classification and the greater use of junior labour. The 1930 Metal Trades Award became the embodiment of these plans.

'Manufacturing' had been sporadically adopted by enterprising employers in the late 1920s, and was to spread, backed by the 1930 Metal Trades Award, during the 1930s as the industry recovered from the Great Depression. To examine the effects of the Metal Trades Award and the changes in the production method during the 1930s, it is first necessary to clarify the meanings of 'manufacturing'. Although the legal definition of 'manufacturing' was cited in the previous chapter, the practical implications of 'manufacturing' in connection with managerial strategies should also be investigated.

First, 'manufacturing' was, according to one employer, 'the production of new articles', in contrast to 'jobbing' which was seen more as 'repair work and alteration and reconstruction'.

articles but also the production for 'stock' and for the market, instead of 'making' to special orders.²

Although 'manufacturing' did assume the implication of production in quantities, it is not so much the number of articles produced as the method of production adopted that comprised the crucial point in 'manufacturing'. As an employer explained, the kernel of 'manufacturing' resided in the elimination of skill from the production process:

[W]e will not say whether a man is making one or a million. We will say that it is a question of method, and these methods would be the adoption of automatic and semi-automatic single purpose machines, the use of jigs, gauges, and fixtures, all of which are locked together, and eliminate skill on the part of the operator.³

Furthermore, the employers expected that the 'manufacturing' method would not only eliminate skill technically, but also allow them to take control over the production process. As shown in the following comment, they hoped that the 'manufacturing' method would do away with their dependence on tradesmen through the re-organisation of production:

Any process which consists of a series of specialised steps is a manufacturing process...I mean a step that has been decided upon by a competent foreman or management, and organised so that a worker carries it out under definite instructions, without any necessary knowledge of what he is doing, and may keep on doing it for quite a time. It is a step that has been organised, as distinct from leaving a fitter or a competent man to follow...his own judgement. It is a step that has been organised for the worker by superior authority.⁴

Despite the employers' ambitious expectation, the actual 'manufacturing' method gradually spreading in Australia since the late 1920s was not a radical departure from the traditional production method. In its scale, Australian 'manufacturing' could

² Evidence of W. Myhill, ibid., 11/9/1928, p. 27.
hardly be compared with the American type of mass production like Fordism. In fact, the employers rarely used the term, 'mass production', to designate what they were attempting, preferring to call it 'semi-mass production' or 'quantity production'.

Australian 'manufacturing' was characterised not so much by the large scale introduction of automatic and semi-automatic single purpose machines as by the attachment of deskilling devices like jigs, stops and fixtures to standard machines and articles.

This kind of deskilling method was most suitable, and therefore most widely adopted, for relatively simple operations like drilling. An employer compared the new method of drilling with jigs and fixtures to the traditional one:

The ordinary way of drilling a hole is to get a rule, pick out the position, make a dot with a centre punch, and draw a circle representing the size of the hole. The part is then put under the drilling machine, and after the operator gets nearly to the size of the hole, he has to move the drill up to see whether it is true with the hole. Invariably it is not. He has then take a drawing chisel and a hammer, and cut a little channel on to the side on which he wants to coax the drill - a very lengthy process....We would not be able to exist today if we had to do that; so we take the piece, barring the two holes, and it drops into a jig. There are two screw fixtures which go into the slot. The operator tightens up the screw, and you will observe the two holes...[H]e simply puts the drill through the holes. That is an operation of only a minute or so, whereas it would be a lengthy operation in the general engineering line.

Jigs and fixtures thus serving as a guide, drillers' task now was to repeat the simple operation which required no special training.

The use of such deskilling devices did make the operations repetitive and thus suitable for quantity production. It should be noted, however, that the number of the article to be produced was not necessarily the prime reason for the adoption of this method. As

---

the employers themselves admitted, more fundamental was interchangeability:

[The object of jigs is] to eliminate all skill, and to ensure absolute interchangeability of the part, once it is finished, and also to increase the speed at which the job can be done.\(^7\)
The important thing is interchangeability and to produce interchangeable parts in quantities you must set up your machines to work to fixed sizes or you must have jigs to eliminate error on the part of the operator.\(^8\)

Since the 1920s, the production of commodities made of standardised parts, like internal combustion engines and electrical appliances, was growing. Therefore, the use of jigs and fixtures was becoming imperative in order to maintain interchangeability, regardless of the number of the article to be produced.

The main reason for the adoption of the 'manufacturing' method being the technical necessity to secure accuracy, the economic advantage of this method resided in the piecemeal curtailment of labour-costs, instead of the large reduction in the unit production cost the American type of mass production would have brought about. The following testimony of an employer in the Arbitration Court gives an idea about the scale of production at that time and what the employers were realistically expecting of the adoption of 'manufacturing':

Q: So that if you had about 300 [of the article produced with jigs] a year, and they only took half a minute each, that jig would be in use for about two and a half hours a year?
A: Yes.
Q: Do you think that it would then make very much difference who operated the machine?
A: Taking that job by itself, it certainly would not, but as our wages bill amounts to something like £15000 or £20000 a year, a saving on practically every job in the shop would mean a very tidy sum.\(^9\)

\(^7\) Evidence of A. Buzacott, *ibid.*, 21/3/1929, p. 474.
\(^8\) Evidence of W. Myhill, *ibid.*, 24/9/1929, p. 5126.
Because of the limited and fragmented nature of the market, it was not a workable strategy for the Australian employers to implement the systematic introduction of automatic and semi-automatic single purpose machines to take advantage of economies of scale. The following statement by an employer typically represented the actual situation concerning Australian 'manufacturing':

We use no automatic machines. Our policy is to buy standard machines, and equipment, so that while they are actually being used on these jobs they are practically semi automatic machines. (Q: Do you use jigs and fixtures?) Very largely.¹⁰

In order to respond efficiently to the demand for a relatively small amount of varied products, it was rather more practical for the employers to keep standard machines which served for various purposes, and attach to them deskilling devices like jigs and fixtures where it was applicable. In this way, the employers maintained flexibility in production. In terms of the deskilling and cost-reducing effects, however, the 'manufacturing' method had only limited potential.

Because of the rather limited scope for productivity improvements, the employers' thrust for the reduction of labour costs was intensified. This was why the employers pressed so hard in the Court for the creation of a new classificatory category for the lowly skilled:

We have introduced methods to reduce the cost of production, but we have not reduced it as we should, because, having eliminated the skill, we still have to pay skilled wages...In regard to the engines, the connecting rods are done with jigs. If the employee wanted to make a mistake he could not do it; he could only [go] one way with the jig. The operation is controlled by the jig, and yet we have to pay 12/- a week margin [i.e. the margin for the Third Class Machinist] for that work. We have probably spent anything from £2 to £200 in producing jigs and dies to eliminate the skill and yet we still have to pay skilled wages for the operation.¹¹

¹⁰ Ibid., p. 471.
As already discussed, Judge Beeby established in the Metal Trades Award the new category of 'process workers', who were prescribed only 6s. a week.

Although much attention has been paid by labour historians to the creation of 'process workers', it was junior labour that the employers were keen to utilise. As a corollary of their quest for the cheapest labour, the employers sought to engage, first of all, unapprenticed juniors on deskillled operations. The following interrogation of an employer by the Court conveys the situation of junior workers before the 1930 Metal Trades Award:

Q: In your manufacturing, do you make use of jigs, gauges and fixtures to eliminate skill?
A: Yes.
Q: Do you employ any process workers?
A: Yes, juniors...
Q: How many process workers would you have?
A: Somewhere about 50. There are no adult process workers...
[W]e have to pay £5/18/- [i.e. the full tradesmen's rate] for adult process workers.
Q: When the process workers reached 21 years of age you pay them the tradesmen wage?
A: Yes.12

Under the circumstances, the category of 'process workers' was contrived by the employers to restrict the increase of junior workers' wages when they became adults:

It has only been by the employment of boys that we have been able to start some of these [manufacturing] industries; but those boys are now becoming 21 years of age, and we do not want to have to throw them out into the streets; we want to be able to continue to employ them, and we would be able to do so if the margin of 12/- a week [i.e. the margin of third class machinists] did not exist.13

Beeby eventually set the weekly margin of 6s. above the Basic Wage for adult 'process workers'. It should be noted, however, that the employers originally did not want fixed weekly rates exceeding

---

the Basic Wage for this class of workers. If any extra wages had to be paid for adult 'process workers' beyond the Basic Wage, the employers insisted, they should be paid on the result basis:

[T]he practice of this Court is to fix a margin for skill according to the amount of training or knowledge required for the job. No margin is allowed for quantity...[W]ith modern methods of production, on the production side, skill does not exist at all, and...the wage should be based upon the fact that no skill is required...[A]ny additional wage to that base should be by way of payment by results.¹⁴

Taking this request into consideration, Judge Beeby fixed remarkably low weekly rates for 'process workers', while encouraging piecework.

It should be borne in mind, however, that the employers intended to apply piecework only to those engaged on the sections of production where operations were made repetitive by the 'manufacturing' method. Its application to skilled tradesmen, whose work was wide-ranging and heterogeneous, was out of the question even for the employers. Because of the incalculability of their work, tradesmen could not be paid other than by fixed weekly rates.

Because payment by results was only applicable where the work was made calculable and the sections of production standardised by 'manufacturing' was relatively limited, the scope for the spread of piecework was limited from the outset. In fact, even some employers cast doubts about the workability of this method of payment:

The wage should be fixed on output where that is workable; but you must take into consideration that, sometimes, where there may be people manufacturing in not very large quantities, the operations may change a dozen times in a day. It therefore becomes a very complicated scheme for the worker and the office to compute the time.¹⁵

¹⁴ Ibid., p. 327.
¹⁵ Evidence of M. Chapman, ibid., 21/2/1929, p. 443.
Of course, the employers tried to apply the 'manufacturing' method to the core engineering operations like fitting and turning, and they were not unaffected by technological changes. With regard to fitting, as finished products became constituted by interchangeable parts, the setting-up of articles was becoming more 'assembling', rather than 'fitting', of standardised parts, which did not necessarily require the skill of tradesman fitters. Under the circumstances, the employers were intending to assign this assembling job to non-skilled workers:

Take the assembling of an engine. The parts are all made to jigs and fixtures, so that they are practically interchangeable... The adult [worker] would be a man who would be capable of attaching those parts together. At the present time that work is done by a fitter. He gets the full rate, and possibly a little more. We prefer to put that man on to work of labour saving devices...If everyone did his work according to instructions there would be no fitting required. That work can be so arranged that there is no need for any fitting.16

In practice, however, the employers' expectation proved too optimistic. The transformation of 'fitting' into 'assembling' was not to proceed as smoothly as they hoped. Because of the technical limitations of the 'manufacturing' method at the time to attain the exact accuracy required, the setting-up of intricate products like internal combustion engines was still impossible without the skilled hands of tradesman fitters. As a tradesman engineer explained:

You never work on those engines without a fitter as in every part of the engine a fitter is required to use his tools. Crank shafts must be fitted, big ends must be fitted, pistons must be fitted, governing gear must be adjusted, and the knocking arm must be adjusted, but there is no work that an assembler could do without using a fitter's tools...[W]ith the present machines of which he has a great number for saving time and as far as possible for increasing efficiency they are not capable of turning out a job which could be assembled without the use of tools. (Q: Are any of the parts interchangeable?) No, they are not. They are approximately right, but,...you must use the chisel, the scraper, or any other tool which is necessary...From my experience I would say that it would never be possible to put an unskilled man to assemble such a thing as an engine, because

16 Evidence of A. McDonald, *ibid.*, 16/5/1929, pp. 2139-2140.
an engine must be assembled in the right way, and there is only one way, that is with a tradesman.\textsuperscript{17}

Thus, the industrial ground of tradesman fitters was not seriously undermined.

With regard to the machining operations of tradesmen, the pressure was a little greater. By the introduction of the turret lathes and the universal milling machines, together with the attachment of stops and fixtures to the standard lathes and the milling machines, the operation of basic machines of the industry, which had required the skill and experience of tradesmen, was becoming routinised. Once the setting-up and the attachment of deskilling devices were done by tradesmen, it was now technically possible for the non-skilled to operate these machines.

As the use of the turret lathes became widespread, turners bore the brunt of the employers' attack on the tradesmen's fortress. The employers pointed out the characteristics of the turret lathe as follows, calling it a 'semi-automatic' machine which did no longer require tradesman turners:

Take an ordinary engine lathe and you are going to produce a part for which a man has to work with a micrometer and, probably, to a drawing; that is what I call making. Then, a man is going to manufacture, and he puts in a semi-automatic machine, such as a turret lathe, that is set up to work to the exact size required, and all the man has to do is to operate that machine.\textsuperscript{18}

It [i.e. the operation of the turret lathe] would be repetition work, probably 500 to 1000 pieces going through at one time; there would be no measurement required, the whole machine would be adjusted to cut off and adjust its own lengths, so that there would be no measurement required by the operator. (Q: No training required to operate the machine?) No.\textsuperscript{19}

\textsuperscript{17} Evidence of P. Gallagher, \textit{ibid.}, 27/5/1929, pp. 2436-2437.

\textsuperscript{18} Evidence of W. Myhill, \textit{ibid.}, 27/5/1929, p. 2465.

\textsuperscript{19} Evidence of J. Henry, \textit{ibid.}, 10/4/1929, pp. 1018-1019.
Taking advantage of the technical deskilling by the use of the turret lathes, the employers turned their offensive to turners in the Court, calling into question the definition of 'tradesmen' itself:

[W]e have been paying them [i.e. operators of the turret lathes] a margin for skill which never existed on the job. We have had to pay for the man because there has been no definition of tradesman. It just says, "A tradesman means a turner". The union interpret that as meaning...a turner is any man who stands and operates a lathe. Well, a turret lathe set up to work to fixed sizes is still a lathe, and we have to pay 24/- margin for skill, although we have paid skilled men to make tools and equipment, and to set up a machine to eliminate that skill. That is what we have to fight, and it is a most important point.\(^2\)

What the employers demanded was the alteration of the wage setting principle itself. They insisted that workers should be paid according to the actual work they had performed, instead of their qualifications:

If the lathe is merely going to be used for what we call second class machining, then the man is employed as a second class machinist. I am dealing with the act; it is not a question of the qualifications...[W]e must go by what they are paid for. (Q: Irrespective of the qualifications a man may have, you would pay him according to the class of work you wanted him to do?) According to the class he was called upon to do.\(^2\)

When a worker was assigned on work comprising various operations, the wage rate could not be set other than according to the worker's qualification. However, where the 'manufacturing' method simplified and standardised the work, it was technically possible for the employers to specify and set the rate for each operation, regardless of the qualification of the worker engaged.

This alteration of the principle of wage setting from 'the rate for the worker (qualification)' to 'the rate for the job' did threaten the industrial status of tradesman turners. A turner expressed his


concern that he might be paid the rate of second class machinists when assigned on repetition work:

At present I am operating a lathe turning a roll which weights sixteen and a half tons, and for some time I was on a turret lathe on which a variety of work is done. At times I have had large quantities of a given job to make on this machine which could be regarded as repetition work, and...I could be for the time being come under the "manufacturing" award and be probably classified as a second class turner, but if I had to leave this work to do some urgent repair job - which is invariably the case - I would again become a first class turner under the "general" award. My own case is typical of the majority of the engineers...22

Under the circumstances, tradesman turners insisted, with their strong craft pride, that work for any kinds of lathes, from the standard lathes to the turret lathes and even the automatic lathes, should be in their sole possession.23

Turners' industrial ground being at stake, the AEU was determined not to make any compromise in this struggle over the lathes. The Arbitration agent of the Union made it clear in the Court that the Union was ready to use its industrial strength, if necessary, in order to protect this tradesmen's sanctum:

A turner would be engaged on that work and would centre it up in the machine. The employer would then say to the turner "You can go off this machine and I will put Bob on this job to rough it down". The tradesman, providing he carried out those instructions, would leave the machine and leave it to be worked for the time being by an unskilled man. Of course that would not work out in practice, because it would immediately objected to, but the employer would say that under the Award he was allowed to do it. The shop steward would say under general shop practice, you cannot do it.24

While there was relatively little friction in the case of the deployment of juniors on the simplified drilling operation, the Union would never tolerate the invasion into the traditional craft

territory. On this issue of deployment, the right to manage was at stake for the employers, while, for the Union, the kernel of craft regulation was threatened. The result of the dispute ultimately hinged on the balance of power between the parties on the shopfloor.

Technical deskilling was the necessary condition for classificatory deskilling, but not the sufficient one. It can be said in general, however, that in order for classificatory deskilling to be successful, the deskilling of the operation had to be thorough. In other words, if the deskilling of the operation remained incomplete, it would not be easy for the management to degrade the workers or substitute cheaper ones.

In the case of the drilling operation, which was a relatively simple one, the use of jigs thoroughly eliminated the skill from the operation and, as a result, the employers were able to utilise junior labour in a large scale. With regard to turning, however, the skill required was not as thoroughly eliminated even by the turret lathes. As a tradesman stated:

[O]n that semi-automatic machine [i.e. the turret lathe] he must still use his precision tools and gauges...I say a turret lathe cannot be worked up to such an extent as to eliminate gauges...A gauge is a precision instrument.25

In order to obtain required accuracy in turning, the skill and experience of tradesman turners could not be dispensed with. In fact, what the employers expected of the non-skilled on the turret lathes was only to do the 'roughing down', while the finishing up of the job was still left to skilled turners:

[T]here is a number of shops where a second class machinist [i.e. a non-skilled worker] would be used, but where a 1st class machinist [i.e. a tradesman turner] is used today on such work as roughing down jobs[?]. That could done by a second class machinist. The machine could be set by a 1st class machinist, and he could go on to other work while the job was being cut

down near to size. Then he would return to that machine and complete the job.\textsuperscript{26}

[H]e [i.e. a second class machinist (a lathe operator)]...would be employed in this district [i.e., South Australia] in doing some of the roughing down, and later on that would be done by the first class machinists to finish the job...A division of work would be made. If a firm were employing 6 turners, two would be on this work [i.e. roughing down] and the other four would be first class machinists. (Q: Where a job is set up in the lathe, would it be possible then to take a turner on to some other work and a man who was not a tradesman on to that?) Yes.\textsuperscript{27}

Thus, although part of the turning operation was assigned to non-tradesmen workers on account of the introduction of the turret lathes (and the attachment of stops to the standard lathes), skilled turners were still required for such crucial operations as setting up and finishing up. Considering the necessity to produce relatively small amount of varied articles, which entailed frequent changes in setting, the demand for tradesman turners was not seriously affected by the introduction of the 'manufacturing' method. It should be noted, incidentally, that those lathe operators engaged on roughing down were classified as 'second class machinists' and the employers had no intention of degrading them to 'process workers'.

Although some employers engaged 'second class machinists' on simple turning operations, it was more common that such jobs were given to apprentices, cheap skilled labour legitimately available for the employers. While unapprenticed juniors were engaged on relatively simple drilling operations, apprentices were generally assigned to more important machines, including the lathes. The following questioning of an employer gives a typical example of work practices at the time. This piston making company employed ten workers including five juniors, two of whom were apprentices:

Q: What machines are the apprentices operating at the present time?
A: The turret [lathe] and the four-spindle [drill].
Q: Who is roughing out pistons...an apprentice?

\textsuperscript{26} Evidence of P. Elliott, \textit{ibid.}, 26/7/1929, p. 3514.
\textsuperscript{27} \textit{Ibid.}, 26/7/1929, p. 3520.
A: Yes...[tradesmen] set up and if there is no one to put on them - if the others are too busy - they might go through the whole run.

Q: So that the turret lathes are at present worked by both journeymen and apprentices?
A: Yes.
Q: And the multicut lathes?
A: Apprentices are all the time on that, except that it has to be set up by tradesmen.
Q: The four-spindle drill?
A: Mostly by apprentices.
Q: What about the special grinder you have?
A: That is an apprentice's job too. There is no precision about that.
Q: Who works the engine lathes?
A: Tradesmen...[T]here is more skill to those than to the multicut and turret lathes.
Q: What work are they [i.e. tradesmen] doing on them?
A: Finishing...
Q: [T]he roughing down is done on the turret lathes and the finishing on the engine lathes?
A: That is so...
Q: Are the machines set up to fixed sizes?
A: They are all set by the tradesmen, and then the juveniles carry on...Jigs and fixtures are used right through.
Q: Have you any adult employees on any of this work who have not served an apprenticeship to the trade.
A: No, not on the repetition work.
Q: You have five tradesmen...What work are they doing?
A: Setting up the machines. They are actually working machines, too. They change about one machine to another...
Q: That setting up having been done how long can the junior work on that machine without the assistance of a tradesman?
A: Pretty well to the end of the run. If anything happens to go wrong, such as a tool breaking, he will call the tradesman to reset or sharpen the tool.
Q: Does the junior finish those pistons?
A: No: the tradesmen does the final grinding to size and the work involving the use of the micrometer.
Q: And the rubbing down would be done by juniors.
A: Yes.
Q: The finishing by tradesmen?
A: Yes.

---

It should be borne in mind that division of labour was being established as a common practice between junior workers, be they apprenticed or unapprenticed, and tradesmen. The former were assigned to simplified repetition work, while the latter were required for the setting up of machines and the finishing. It should be noted that this was a small-sized firm with only ten employees. Regardless of its size, it adopted the 'manufacturing' method and work was divided between juniors and tradesmen.

As demonstrated, although some operations in the production process, including tradesmen's work, were more or less simplified by the 'manufacturing' method, the running of production, as a whole, still necessitated a large amount of skilled workers, especially for such essential operations like the setting of machines and the finishing up. It was a fact that tradesmen were sometimes engaged on simple repetitive work like the operation of the turret lathes. However, they were unlikely to be kept on such lower classes of work long enough to be paid at the non-skilled weekly rates, because of the frequent changes of their assignments. On account of the diversity of articles to be produced, 'manufacturing' still could not help depend on the versatility of skilled tradesmen.

The employers and the Union basically agreed on the requirements of tradesmen: that is, 'experience', 'dexterity' and 'judgement'. To be recognised as a tradesman, first, no less than five years of 'experience' in the industry was required; that is, practically, to have served an apprenticeship. Second, a tradesman had to have manual 'dexterity', together with the ability to work from drawings or blueprints and to make precision measurements. Finally, a tradesman had to be capable of making his own 'judgements' in carrying out his assignment. Although the final point was not a specified requirement, it was in practice an essential element for the smooth running of production. As an employer remarked:

That man has to do his work without a foreman to tell him exactly what to do. When he goes there, he has to find out what

30 See, for instance, evidence of C. Mundy, ibid., 10/9/1929, p4345.
bolt is lose, and tighten it up. That is using judgement and experience without the supervision of a foreman.31

While juniors and 'process workers' were expected to reiterate routinised operations only as instructed, tradesmen were required to work at their discretion with minimum consultation with the foremen. In short, tradesmen were employees to whom the management could entrust the job. It was for this same reason that the ability to read drawings or blueprints and to make precision measurements was emphasised. In fact, according to the employers, the qualification which distinguished 'first class machinists' (tradesmen) from 'second class machinists' was this ability:

I am calling a turner a man who has those qualifications - general trade experience, dexterity and [who is] capable of using them in the absence of a foreman...[B]ut if he said that he was a second class machinist...I would expect...that is a man who can do some of these jobs where there are no precision measurements involved, and where it is not necessary for him to work to a drawing or print.32

Tradesmen's ability to read drawings saved the management the necessity to provide detailed instructions, and their ability to make precision measurement guaranteed quality control in workers' responsibility.

In the case of mass production of the same products, it was efficient for the management to divide the whole production line into standardised routines so that they could be assigned to cheap non-skilled workers. However, where a small amount of varied articles were produced, the heterogeneity and the flexibility of production made it more practical for the employers to entrust the core work to those skilled workers who were able to perform a certain range of work at their own discretion, while peripheral and simplified operations were left to the non-skilled.

The future of 'manufacturing' depended on to what extent the employers were able to undermine the rigidity of the traditional

apprentices-tradesmen system. For this reason, apprentices were also the target of the employers' offensive. Some cases of the abuse of apprentices were reported where they were assigned to the same repetition work as unapprenticed juniors. For the employers who were keen on reducing production costs, it was too costly to keep legally-bound apprentices. As an employer remarked, 'Apprentices are too expensive...They would entirely eliminate the possibility of carrying on production with junior labour'.

Although the employers did use apprentices as convenient cheap labour on occasions, the *raison d'être* of apprenticeship training itself did not perish. Because the running of production still required a large number of skilled engineers in spite of the introduction of the 'manufacturing' method, it was for the employers' own benefit to train competent tradesmen. Thus, apprenticeship training had to be substantial enough to teach apprentices the minimum requirements of tradesmen. As a fitter recalled:

For the first six months, I was walking about sweeping up the floor, and doing practically labourers' [i.e. unskilled workers'] work. For two and a half years I was on the machines. I suppose that I went on every machine in the machine shop. Then I was placed in the top fitting shop, and I was on the bench for the rest of my time. (Q: Are you able to work from a drawing?) Yes. (Q: Are you able to make precision measurements?) Yes.

Basically, the training remained of all-round nature, producing tradesman engineers equipped with 'experience', 'dexterity' and 'judgement'.

As shown, the 'manufacturing' method standardised some sections of production by the use of such deskilling devices as jigs, dies and fixtures, and left them to non-skilled workers. At the same time, this method of production also deepened the division of labour among skilled tradesmen. Because of job specialisation the

---

'manufacturing' method precipitated, integral part of tradesmen's tasks were separated from ordinary tradesmen's tasks and regarded as independent trades of greater skill. While ordinary tradesmen's tasks were becoming operations like the setting up of machines and the finishing up, some tradesmen were specialising in, for example, marking off. Those engaged on marking off had conventionally been paid higher than ordinary tradesmen, and then, in the 1930 Metal Trades Award, marking off was legally categorised as an independent division of the trade for which the margin was set at 3s. a week above ordinary tradesmen's.

The importance of toolmakers' roles was further increased by the adoption of 'manufacturing'. Recognised as the highest class of tradesmen, toolmakers were awarded in the Metal Trades Award the margin which was 6s. a week higher than ordinary tradesmen. With the development of the division of labour that this production method necessitated, the essential part of production was becoming concentrated in the tool room, where toolmakers assumed the crucial part in production. In the tool room, toolmakers, with the help of other (ordinary) tradesmen, made such essential devices for 'manufacturing' as jigs, dies, fixtures and gauges, which enabled non-skilled workers to carry out actual production. A toolmaker described his work as follows:

The toolmaker is the foundation of the engineering and allied trades where standardisation is required. He must have a good technical education, possess the necessary sense of touch and feel to attain the required accuracy in his work, and must have a trained hand and brain to initiate ideas of manufacture or production. His work comprises the making of jigs, fixtures, gauges, power press and machine tools. He has to provide a more expensive set of tools than the average fitter and turner...He must be capable of working any class of machine, as it often happens that only one toolmaker is employed to make all classes of tools and gauges. Therefore, he would have to do his own fitting, turning and machining. It is not uncommon for him to spend a considerable time on a tool of his own design, which, if successful, would mean a substantial increase in production, but otherwise, would be a severe loss to any employer not possessing large capital.36

Toolmakers' attributes made them more valuable than ordinary tradesmen. The most important of these attributes was their ability to design, whereas ordinary tradesmen were only required to read drawings. Moreover, toolmakers were expected to perform all the operations of the engineering trades, although ordinary fitters, turners and (first class) machinists were entrusted to only fitting, turning and machining, respectively. In the making of jigs, dies and fixtures, toolmakers took full responsibility from designing to completion. It should be noted that the making of such deskilling devices was totally dependent on toolmakers' personal abilities gained through their own experience.

Toolmakers were ranked the highest among the employees and sometimes bore similar responsibility to that of foremen. The following comment by an employer reflected this ambivalent position of toolmakers:

The toolmaker may design his own tool; usually the foreman does it...But where the toolmaker merely has to turn certain parts he is a turner.\(^{37}\)

The employers regarded toolmakers, who usually belonged to the Union, as employed tradesmen, despite their skill being comparable to that of a foreman.

In contrast, foremen represented the management on the shopfloor, holding staff status. They were responsible for organising and supervising production. Moreover, they also had the power of employment. As an employer said, 'It is left to the foremen, who engage their own staffs...It is the foremen's responsibility to see that the men he employs are competent'.\(^{38}\) In practice, it was via foremen that management controlled the shopfloor. Technically, foremen needed support from highly skilled workers. In fact, it was usually from toolmakers that foremen were chosen. Foremen and toolmakers both designed and produced deskilling devices for 'manufacturing', together with ordinary tradesmen who were able

---


to execute their assignments with minimum instructions and assistance.

Thus, the tasks required for skilled tradesmen under the 'manufacturing' method included such a wide range of operations as toolmaking, marking off, setting up of machines and finishing. Because of the variety of articles to be produced, production still largely depended on the individual skill and experience of tradesmen, the management's control over the shopfloor remaining an indirect and limited one through the foremen.

'Manufacturing' was the production method gradually adopted after the late 1920s; its development regarded as vital for the future of the Australian engineering industry. It was especially in so-called 'new industries' that this method spread widely. Thus, Justice Beeby said, 'there has been a very big development in the making of interchangeable parts in Australia since then[i.e. 1924], particularly in the electrical section of the trade and also in connection with the making of various motor car parts'.

As to the electrical industry, the employers themselves were fully aware of the development and the importance of the industry:

The Electrical industry, particularly from a manufacturing point of view, is every bit as important to the development of Australia...The tendency of today is to do wherever practicable, every operation electrically. We find electricity is used in connection with the running of plants, vehicles, lighting, telephone, wireless, and numerous other things...We are manufacturing motors, switch gear, telephones, wireless apparatus, electrical signs, transformers, and a host of other electrical appliances. In fact in the factory [i.e. the Australian General Electric] just opened up in Newcastle, they are now manufacturing electric irons...

The production of electrical appliances was ideally suitable for the 'manufacturing' method. The standardised nature of products necessitated the adoption of devices like jigs and fixtures. In

addition, the production was for the general public rather than to specific orders, the large consumer market making possible large production runs.

It should be noted that, because the electrical industry was a new and peripheral sector within the engineering industry, legal restrictions and Union's interest and influence were relatively weak here.\textsuperscript{41} Judge Beeby remarked on his inspection into an electrical company:

\begin{quote}
[S]ometime ago I was going round the Electric Meters...and I found that the engineers and the electrical mechanics accepted that there was a rough demarcation there. Some of the work was claimed as the work of a skilled mechanic, but the great mass of the repetition work that was going on there was not claimed for at all...\textsuperscript{42}
\end{quote}

The Electric Meters (the Electricity Meter Manufacturing Company) was regarded as the ideal type of Australian 'manufacturing'. This firm was manufacturing, at the end of the 1920s, electricity meters, petrol pumps, refrigerators, wireless parts, bakelite mouldings, die castings and so on, with about 300 tradesmen and 600 process workers. These process workers were mostly juniors engaged on piecework and operated, with the help of jigs and fixtures, such machines as 'turret lathes, small hand milling machines, drilling machines, tapping machines, small lathes with lever tail stock, power presses, and hydraulic presses for moulding'.\textsuperscript{43} Because of the lack of legal regulations and Union's neglect of this class of low skilled workers, the management virtually had a free hand in the implementation of their 'manufacturing' strategies.

The growth of the electrical industry provided employers with the impetus to spread the production method and working conditions prevailing in the new and still peripheral sector to the core sector of the industry. From the employers' point of view, there was no

\textsuperscript{41} For instance, payment by results was spread among those engaged on repetitive operations at electrical companies. See \textit{ibid.}, p. 106.

\textsuperscript{42} G. Beeby, \textit{ibid.}, p. 105.

\textsuperscript{43} Evidence of J. Schard, \textit{ibid.}, 27/3/1929, p. 833.
difference between electrical and engineering operations, so far as 'process work' was concerned:

[T]hese operations [performed at the Electrical Meters], which are termed electrical operations, are in fact mechanical operations, and are identical with the operations which we seek to have classifications for in the Engineer's Award...[T]he operations of a drilling machine in a manufacturing process is no different in other sections of the industry. It is all repetition, drilling, or tapping, done by the aid of jigs.44

In the core sector of the industry, however, the employers met staunch opposition from the Union to their 'manufacturing' strategies. For example, even at the same Electrical Meters, the management could not wield the same managerial power in the engineering section of the plant which was producing, for instance, petrol pumps. As the directing manager testified:

Q: Do you use unskilled labour on the production of petrol pumps, aside from the parts like stampings?
A: No, we are not allowed to do so.45

Both technically and industrially, there was little chance for the employers to spread what they had attained in the new, and still peripheral, sectors to the core sector of the industry.

The severity of the Great Depression and the rather rapid and strong recovery process, the performance of the Australian metal industries since the late 1920s is shown in Table 5.1 in terms of the number of factories and employees and the value of output in both current and constant prices.

Table 5.1

(I) Number of Metal Factories in Australia, (II) Average Number of Employees in Metal Factories (x1000), (III) Nominal Value of Output of Metal Factories (x1000 pounds) and (IV) Real Value of Output of Metal Factories (1920-21=100)*, 1928-1939

<table>
<thead>
<tr>
<th></th>
<th>I</th>
<th>II</th>
<th>III</th>
<th>IV</th>
</tr>
</thead>
<tbody>
<tr>
<td>1928-29</td>
<td>5577</td>
<td>132.3</td>
<td>99907</td>
<td>170.5</td>
</tr>
<tr>
<td>29-30</td>
<td>5591</td>
<td>118.7</td>
<td>86924</td>
<td>144.9</td>
</tr>
<tr>
<td>30-31</td>
<td>5362</td>
<td>89.5</td>
<td>55502</td>
<td>97.6</td>
</tr>
<tr>
<td>31-32</td>
<td>5376</td>
<td>82.7</td>
<td>49513</td>
<td>97.3</td>
</tr>
<tr>
<td>32-33</td>
<td>5529</td>
<td>94.6</td>
<td>60812</td>
<td>125.6</td>
</tr>
<tr>
<td>33-34</td>
<td>5789</td>
<td>107.4</td>
<td>71888</td>
<td>154</td>
</tr>
<tr>
<td>34-35</td>
<td>6100</td>
<td>125.6</td>
<td>85650</td>
<td>179.5</td>
</tr>
<tr>
<td>35-36</td>
<td>6395</td>
<td>145.5</td>
<td>104965</td>
<td>216.7</td>
</tr>
<tr>
<td>36-37</td>
<td>6758</td>
<td>161.5</td>
<td>124769</td>
<td>252.2</td>
</tr>
<tr>
<td>37-38</td>
<td>7102</td>
<td>178</td>
<td>140050</td>
<td>275.2</td>
</tr>
<tr>
<td>38-39</td>
<td>7255</td>
<td>177.7</td>
<td>141152</td>
<td>270</td>
</tr>
</tbody>
</table>

Source: Official Year Book of the Commonwealth of Australia.

Note: As to 1928-29 and 1929-30, figures in the categories of 'Metal Works, Machinery, etc.', 'Arms and Explosives', 'Vehicles and Fittings, Saddlery and Harness, etc.' and 'Ship and Boat Building and Repairing' are combined. In 1930-31, these categories were put together into the new category, 'Industrial Metals, Machines, Conveyances'. In 1937-38, this category had a minor revision.


1931-32 can be regarded as the trough of the Depression for the Australian metal industries. In the four years between 1928-29 and 1931-32, the number of employees dropped by 37 per cent, the nominal value of output, by 50 per cent and the real value of output, by 43 per cent.

However, in terms of the real value of output, the level of the pre-Depression peak was surmounted as early as by 1934-35. By 1935-36, both employment and nominal output exceeded the level reached during the 1920s. Between 1931-32, the trough of the Depression, and 1937-38, the Australian metal industries continued to rise. During this period, the number of employees increased around 2.2 times, both the nominal and real value of output, 2.8 times. Over all, the development of the metal industries in the
1930s was much more significant than that of the previous decade. To compare the figures of 1938-39 to those of 1928-29, the number of employees increased around 1.3 times, the nominal value of output, 1.4 times and the real value of output, 1.6 times.

It was in the process of recovery from the Great Depression that the 'manufacturing' method became widely adopted. By 1934, employers in the metal industry as a whole had been permeated with the comforting view that their business fortune had already improved. Not only were they confident in the recovery and the expansion of their industry, they were also content with the ongoing transformation of the industry towards 'manufacturing', together with the success of import substitution.

Table 5.2 shows the changes in the values of imports of metal products to Australia since the late 1920s.

Table 5.2  (I)Nominal Value of Imports of Metal Products(x1000 pounds), (II)Real Value of Imports of Metal Products(1920=100)*, 1925-39

<table>
<thead>
<tr>
<th></th>
<th>I</th>
<th>II</th>
</tr>
</thead>
<tbody>
<tr>
<td>1925-26</td>
<td>45499</td>
<td>126.1</td>
</tr>
<tr>
<td>26-27</td>
<td>51282</td>
<td>139.5</td>
</tr>
<tr>
<td>27-28</td>
<td>42802</td>
<td>117.9</td>
</tr>
<tr>
<td>28-29</td>
<td>42987</td>
<td>117.7</td>
</tr>
<tr>
<td>29-30</td>
<td>36323</td>
<td>97.1</td>
</tr>
<tr>
<td>30-31</td>
<td>12339</td>
<td>34.8</td>
</tr>
<tr>
<td>31-32</td>
<td>6560</td>
<td>20.7</td>
</tr>
<tr>
<td>32-33</td>
<td>10128</td>
<td>33.5</td>
</tr>
<tr>
<td>33-34</td>
<td>13050</td>
<td>44.9</td>
</tr>
<tr>
<td>34-35</td>
<td>19301</td>
<td>64.9</td>
</tr>
<tr>
<td>35-36</td>
<td>25207</td>
<td>83.5</td>
</tr>
<tr>
<td>36-37</td>
<td>27277</td>
<td>88.4</td>
</tr>
<tr>
<td>37-38</td>
<td>37280</td>
<td>117.5</td>
</tr>
<tr>
<td>38-39</td>
<td>31274</td>
<td>95.9</td>
</tr>
</tbody>
</table>

Source: Official Year Book of the Commonwealth of Australia.
Note: Figures are taken from the category, 'Metals, Metal Manufactures and Machinery'.

In both nominal and real terms, the values of metal imports was reduced to a significant extent, compared to the previous decade when the employers had suffered so much from import pressure. Initially, it was due to the deflationary impact of the Great Depression that caused the rapid decrease of importation. However, the value of metal imports remained below the pre-Depression level throughout the remainder of the decade. Considering the consistent development of the Australian metal industries mentioned earlier, the aim of Australian metal employers, import substitution, was realised satisfactorily during the 1930s. In fact, the representative of the employers for the Arbitration Court expressed his complacent view on the development of the industry since the delivery of the 1930 Metal Trades Award:

[W]e have established industries under your Honor's [sic] award [i.e. the 1930 Metal Trades Award] which have proved of enormous benefit to the whole of the community. We have produced an article equal to the world's best. We have reduced prices consistently to the consumers. We have found employment not only for juniors but for skilled men and other adults - considerable employment.46

He reported in addition that 'about 75 firms in Sydney alone had expended £1,000,000 on new machines, jigs, tools, dies, fixtures, etc. for manufacturing'.47 According to him, it was the Metal Trades Award rather than the enhanced tariff protection that was 'the main reason for the advancement of manufacturing in Australia'.48

The benefit of the Award was so palpable that the manufacturers in Queensland, where Federal awards had not been applicable, sought, successfully, to have the provisions of the Award concerning the manufacturing section applied to them. A Queensland manufacturer commented that he would expect a ten to fifteen per cent reduction

47 Evidence of W. Myhill, ibid., 31/7/1934, p. 13a.
48 Ibid., 28/2/1935, p. 2048.
in wage costs on account of classificatory deskillling the application of the Award would bring about.49

Within the metal engineering industry, the production of motor parts was among the trades where 'manufacturing' developed most successfully. The production of motor parts like cylinders, crankshafts and pistons almost reached self-sufficiency by the mid 1930s, as an employer commented:

Interchangeability of parts is the foundation on which the motor industry of today has been raised...The production and availability of replacement parts has been so increased that today practically every part - definitely every wearing part of the vehicle is made locally in such quantities that huge factories are entirely devoted to their manufacture. The price of them has been reduced to a fraction of former figures...They are guaranteed replacement parts, sold as such to the consumer - the repair garage.50

Thus, social division of labour was established between parts manufacturers and motor garages. At motor garages, the work of 'motor mechanics' was becoming the mere replacement of ready-made parts. The owner of a small motor garage described the changes in their jobs as follows:

[A]s the local trade has developed, the amount of hand work has become less and less. I remember the time when we had to have good fitters in the job because you could not buy replacement parts and you had to make them. (Q: Now you get a replacement for any car?) For almost any car...I might make a small and simple part, but in 90% of the cases someone makes it for me...[T]he agents are making the parts...(Q: You say there was a time when the motor garages made their own spare parts?) Yes...I made a lot of spare parts at one time.51

In the early 1930s, the engineering industry as a whole was moving towards the direction both the employers and the Arbitration Judge had desired. The production of standardised articles with the help of deskillling devices was rapidly spreading, catering for the

growing domestic market with import replacement, while social division of labour was further deepening.

The only deviation from the blueprint the employers and the Judge had drawn was that adult 'process workers', the focus of contention in the 1930 Court case, did not become an industrial group of any numerical significance within the metal workforce. Instead, it was junior workers that were engaged on simplified process work. As a unionist remarked:

[T]he award has provided for a process worker, but there are no process workers, or very few of them as such...and in the majority of the places we find that they are either tradesmen...[or] the juveniles...being used as the process workers, and no adult process workers are being employed.\(^{52}\)

As a result of the paucity of adult 'process workers', the piecework system did not become the predominant method of payment. The weekly wages for (unindentured) junior workers had been so lowly prescribed in the Metal Trades Award that the employers did not feel the necessity to apply the method of payment by result. Thus, as the industry recovered from the Depression with the development of 'manufacturing', the workforce in the metal industries became constituted by tradesmen, apprentices and unindentured juniors.

In fact, it was junior labour that became the most contentious issues in the metal industries during the 1930s. Considering that the deployment of non-skilled juniors was more suitable in those trades where the deskilling of production proceeded more thoroughly. Thus, especially at moulding, blacksmithing and sheetmetal works, the number of junior workers increased markedly.\(^{53}\)

---

\(^{52}\) Evidence of N. Roberts, \textit{ibid.}, 9/11/1934, p. 800.

The moulding industry, especially the bakelite moulding industry, was recognised as the most developed since the establishment of the 1930 Award.\textsuperscript{54} With the market growing, a clear division of labour was established between tradesmen who made dies and juniors who operated the moulding machines (the hydraulic presses). Even female workers were employed as coremakers at some firms.\textsuperscript{55}

As to blacksmithing, the traditional work of blacksmiths (tradesmen) was being simplified by the pressing machines, which was operated by juniors:

We find that juniors are now becoming associated with blacksmithing, or the trade which was originally covered by blacksmithing. For instance, in many cases, the smith is disappearing, and the new forging processes which are in operation are employing juniors and non-tradesmen in the operations generally. Take the manufacture of shovels as a case in point...[The Savage Shovel Co.] is only a small firm, but it turns out a very large number of shovels. The process there is the heating of the blank or the metal to make the shovel. That work is being performed by junior labour. Previously, it was always done by an adult on the furnace. The old award prohibited junior labour. Then the metal goes to a press, and there is a junior labourer on the press. Previously, it would be done by a drop-hammersmith...but in this Savage Shovel Co., there is no adult employed in the process at all.\textsuperscript{56}

It should be noted that the employers tended to regard all simple operations as the 'manufacturing' process and sought to have them done by juniors. This provided the ground for the abuse of junior workers. As to the operations with sheetmetal, for instance, some cases were reported by unionists where juniors were engaged on what should not be regarded as adult 'process work', simply because it was light work:

I will take the Clyde Engineering Co., who manufactured the new tramcars for Sydney. The very heavy part of the work would be done by tradesmen, and all the smaller sheet metal

\textsuperscript{54} Evidence of W. Myhill, \textit{Transcript, op. cit.}, 13/8/34, p. 302.
\textsuperscript{55} Evidence of J. Coley, \textit{ibid.}, 26/11/1934, p. 838.
\textsuperscript{56} Evidence of H. Denford, \textit{ibid.}, 13/8/1934, pp. 316-317.
parts or the plate work of the cars would be taken away from the engineering, sheet metal and boilermaking shops and sent to another shop, where the whole of the work was done by junior labour...The parts necessary for the manufacture of the seats - all of that work was cut out by junior labour, even the fitting which were fitted on those parts were put on by junior labour, riveted on by junior labour, and where it was necessary to cut it to fit it correctly, junior labour would use hacksaws and cut it off. They would use files and file it down to get the proper fit. The whole of that was done by junior labour, and was claimed by the employers as being manufacturing. They were only paid the junior rates of wages.57

Problems with junior labour, be they indentured or unindentured, became serious in the core engineering industry as well. During the Great Depression, apprentices, who could not be dismissed during their apprenticeship of five years because of the indenture, became too much of a burden for the employers lacking orders. In 1932, the Arbitration Court allowed the employers to unilaterally terminate indentures.58

Although the 1930 Award had allowed the use of unindentured juniors only in the trades where apprenticeships were not provided, the employers were becoming more and more keen on substituting unindentured juniors for apprentices. Beeby did reject, in 1932, the employers' request for the permission to engage unapprenticed juniors for skilled occupations. In 1935, however, he drove a wedge into the rigid apprenticeship system by giving the Court's approval to the unindentured trainee apprenticeship system which had been introduced in NSW by the conservative State Government in 1933.59

Throughout the 1930s, the distinction between apprentices and unindentured juniors was becoming blurred. Taking advantage of

57 Ibid., p. 322.
58 32 CAR 258 at p262.
59 As to the institutional changes in the apprenticeship system before the Second World War, see J. Shields, 'Capital, Craft Unions and Metal Trades Apprenticeship in NSW prior to World War II', in D. Cuttle (ed), Critical Essays: Selected Papers from the General Studies Conference on Australian Capital History, (University of New South Wales Press, Sydney, 1984).
the industrial disorder caused by the Great Depression, the employers sought to make full use of unindentured juniors, the newly available cheapest labour. As mentioned, the 1930 Award only allowed them for non-skilled 'process work' which was not regarded as an apprenticeship trade. That is, they were supposed to perform no more than the operation of already set-up machines equipped with jigs and fixtures. In some cases, however, they were required to do more than that.

For instance, at McDonald's, one of the leading manufacturing firms in Victoria, it was reported that junior workers sometimes set up machines. These juniors were selected from messenger boys, for example, and, without being indentured, assigned to such basic machines as the lathes, milling, slotting, planing and drilling machines. At times, they also made precision measurements with callipers and micrometers and worked from what the employer called 'instruction cards', blue prints with more specific instructions on the back.

Some of these juniors had attended technical college before employment and had learnt something about fitting, turning and machining, including how to make precision measurements and how to read blue prints. Moreover, these juniors regarded themselves as improvers (unindentured apprentices) rather than mere 'process workers', and anticipated becoming tradesmen after five years. Of course, the Union protested against such practices:

The work being done was work that properly should be done by apprentices...[These juniors] were operating machines,...[doing] work other than that which Your Honor [sic] has prescribed should be done by process workers.

The employers' attempt to substitute unindentured junior process workers for apprentices was, however, circumscribed fundamentally by the technological limitation of the 'manufacturing' method. Practically, it was convenient for the employers to keep

---

61 Evidence of H. Bradley, ibid., 1/11/1934, p. 520.
those with certain skills even on 'process work'. Unindentured juniors were mostly assigned to simplified routine work. However, considering the variety of articles to be produced, it made the running of production smoother and cheaper, if those process workers themselves had the ability to change the setting of machines, make precision measurements and read blue prints. In the case with those juniors at McDonald's mentioned above, not all but 70 per cent of their work was regarded as process work guided by jigs and fixtures. As to the rest, they used their skill and discretion.

It should be noted in addition that by the mid 1930s the employers were already sensing the shortage of skilled labour. This was part of the reason why they tried to have unskilled juniors perform skilled operations.

After all, the employers could not dispense with the training of workers with craft-type skill. Thus, the significance of apprenticeship training remained because of the very technical reason. Under these circumstances, moreover, the craft Union would not acquiesce, so far as the deployment of those with such skill, be they adults or juniors, were concerned. Eventually, Justice Beeby warned the employers against the abuse of junior process workers, and made clear that they should not be required to perform skilled operations like the setting up of machines and precision measurements, while the Union was maintaining enough influence on the shopfloor to observe this principle. Thus, despite the intensified challenge to the apprenticeship system, the Union was able to minimise the erosion of the system.

The replacement of tradesman engineers did not take place either, as the Union had feared at the time of the establishment of the Metal Trades Award. It was true that, with the introduction of the 'manufacturing' method, the skill required for the actual execution of production lessened. When the job was totally guided by jigs and fixtures, it required virtually no skill. Moreover, because of

---

63 Evidence of H. Perry, ibid., 1/11/1934, p. 507
64 See, for instance, evidence of N. Roberts, ibid., 12/12/1934, p. 1302.
technological developments, technical difficulties with machine settings and measurements were, in general, being eased. Under the circumstances, 'fitting' and 'turning' were losing their traditional craftsmanship status to some extent, the former becoming mere 'assembling' and the latter becoming a branch of machining. Some employers went so far as to say, '[t]oday he [i.e. a tradesman] is really a machinist'.

Although the technical advantage of tradesmen in the direct production process did not remain intact, this did not lead to the displacement of tradesmen by non-skilled labour. As mentioned, the heterogeneity of production necessitated a large number of tradesman engineers for such skilled jobs as toolmaking, setting up of machines and finishing. Even in operations assigned to non-skilled workers, the 'manufacturing' method still left room for more than simple process work. In order to keep quality control, it was still safer for the employers to leave it to tradesmen. Even at McDonald's, where the most aggressive challenge to craft regulation was made, the management had to admit their fundamental reliance on tradesmen:

[T]radesmen would be responsible for the size...(Q: [T]he fact that they have gauges or jigs to work does not lessen their responsibility?) It makes the work easier...The majority of the tradesmen do use jigs and fixtures, and they could be correctly classified as process workers. But he [i.e. the foreman] does not do that. We give the tradesmen that advantage from time to time, and therefore we feel that there should not be quite so much fuss as to the other part.

In the Court, the employers pressed hard the change of the wage setting principle from 'the rates for the person (qualification)' to 'the rates for the actual work', and indeed, it was not illegal to pay process workers' rates for tradesmen who did non-skilled work. In practice, however, they could not enforce this.

Considering the advantageous bargaining position of the employers in the chaotic economic situation and the legal favours given to

---

66 Evidence of A. McDonald, *ibid.*, 10/12/1934, p. 1174.
them by the Arbitration Court in the early 1930s, they would have demolished the apprentices-tradesmen system, had the technological advantages of tradesmen been substantially diminished by the new production method. In reality, however, the employers themselves were rather reluctant to do away completely with the traditional industrial order, because of the halfway nature of the deskilling effect of the 'manufacturing' method. Thus, the erosion of craft regulation proceeded only piecemeal, the solid industrial ground of tradesman engineers not seriously undermined.

The arguments of this chapter are supplemented with some statistics. The recovery process from the Great Depression corresponded with the transformation of the industry into 'manufacturing'. In terms of output, the Australian metal industries made a considerable development after the Depression. As shown in Table 5.1, both the nominal and the real value of the output of the metal industries increased 2.8 times between 1931-32, the trough of the Depression, and 1937-38. Compared to the level of 1928-29, the value of the output in 1938-39 was 1.4 times as high in the nominal term and 1.6 times as high in the real term.

Table 5.3 and 5.4 below show the changes in the value of output per capita, the value of materials used per capita and the value of salaries and wages per capita in both current and constant prices, respectively.
Table 5.3 (I)The Value of Output Per Capita, (II)The Value of Materials Used Per Capita and (III)The Value of Salaries and Wages Per Capita of the Australian Metal Industries, 1928-39: Current Prices (pounds)

<table>
<thead>
<tr>
<th></th>
<th>I</th>
<th>II</th>
<th>III</th>
</tr>
</thead>
<tbody>
<tr>
<td>1928-29</td>
<td>755.2</td>
<td>376.4</td>
<td>231.6</td>
</tr>
<tr>
<td>29-30</td>
<td>732.6</td>
<td>358.2</td>
<td>232.3</td>
</tr>
<tr>
<td>30-31</td>
<td>620.1</td>
<td>290</td>
<td>208.5</td>
</tr>
<tr>
<td>31-32</td>
<td>598.8</td>
<td>297.2</td>
<td>186.4</td>
</tr>
<tr>
<td>32-33</td>
<td>642.8</td>
<td>336.7</td>
<td>182.1</td>
</tr>
<tr>
<td>33-34</td>
<td>669.4</td>
<td>353.7</td>
<td>181</td>
</tr>
<tr>
<td>34-35</td>
<td>681.7</td>
<td>365.6</td>
<td>185.1</td>
</tr>
<tr>
<td>35-36</td>
<td>721.5</td>
<td>383.2</td>
<td>191.3</td>
</tr>
<tr>
<td>36-37</td>
<td>772.5</td>
<td>420.8</td>
<td>197.5</td>
</tr>
<tr>
<td>37-38</td>
<td>786.7</td>
<td>423.6</td>
<td>208.4</td>
</tr>
<tr>
<td>38-39</td>
<td>794.4</td>
<td>417.2</td>
<td>216.7</td>
</tr>
</tbody>
</table>

Source: Official Year Book of the Commonwealth of Australia.
Note: As to 1928-29 and 1929-30, figures in the categories of 'Metal Works, Machinery, etc.', 'Arms and Explosives', 'Vehicles and Fittings, Saddlery and Harness, etc.' and 'Ship and Boat Building and Repairing' are combined. In 1930-31, these categories were put together into the new category, 'Industrial Metals, Machines, Conveyances'. In 1937-38, this category had a minor revision.
Table 5.4  (I)The Value of Output Per Capita, (II)The Value of Materials Used Per Capita and (III)The Value of Salaries and Wages Per Capita of the Australian Metal Industries, 1928-39: Constant Prices(1920-21=100)*

<table>
<thead>
<tr>
<th></th>
<th>I</th>
<th>II</th>
<th>III</th>
</tr>
</thead>
<tbody>
<tr>
<td>1928-29</td>
<td>135.4</td>
<td>123.8</td>
<td>138.1</td>
</tr>
<tr>
<td>29-30</td>
<td>128.3</td>
<td>115</td>
<td>135.3</td>
</tr>
<tr>
<td>30-31</td>
<td>114.6</td>
<td>98.3</td>
<td>128.2</td>
</tr>
<tr>
<td>31-32</td>
<td>123.7</td>
<td>112.6</td>
<td>128</td>
</tr>
<tr>
<td>32-33</td>
<td>139.5</td>
<td>134</td>
<td>131.4</td>
</tr>
<tr>
<td>33-34</td>
<td>150.7</td>
<td>146</td>
<td>135.5</td>
</tr>
<tr>
<td>34-35</td>
<td>150.1</td>
<td>147.6</td>
<td>135.5</td>
</tr>
<tr>
<td>35-36</td>
<td>156.6</td>
<td>152.5</td>
<td>138.1</td>
</tr>
<tr>
<td>36-37</td>
<td>164.1</td>
<td>163.9</td>
<td>139.5</td>
</tr>
<tr>
<td>37-38</td>
<td>162.5</td>
<td>160.4</td>
<td>143.1</td>
</tr>
<tr>
<td>38-39</td>
<td>159.7</td>
<td>153.8</td>
<td>144.8</td>
</tr>
</tbody>
</table>

Source: Official Year Book of the Commonwealth of Australia.

Note: As to 1928-29 and 1929-30, figures in the categories of 'Metal Works, Machinery, etc.', 'Arms and Explosives', 'Vehicles and Fittings, Saddlery and Harness, etc.' and 'Ship and Boat Building and Repairing' are combined. In 1930-31, these categories were put together into the new category, 'Industrial Metals, Machines, Conveyances'. In 1937-38, this category had a minor revision.


In the real term, the value of the output per capita, which roughly indicates productivity, kept increasing after the trough of 1930-31 until 1936-37, rising about 1.4 times for the duration. Between 1928-29 and 1936-37, the overall increase was about 1.2 times. It should be noted that the increase in productivity during the 1930s was achieved, with the increase in real wages being largely restricted. Between 1930-31 and 1936-37, real wages increased less than 1.1 times, although they did not drop so drastically during the Depression years. On the one hand, the employers were able to contain the rise of real wages during the recovery process thanks to the Court's decisions like the 10 per cent cut in the Basic Wage and the prolongation of the increase in margins and the retarded restoration of the Basic Wage. On the other hand, limited increases
in real wages resulted from classificatory deskilling and the introduction of cheap labour including juniors.

The increase in productivity during the 1930s as a whole can be regarded as steady and substantial, but not drastic. This indicates both the progress and the limitation of the transformation of the metal industries in this period. Productivity stopped increasing in 1936-37 and declined thereafter, while the real output itself continued to rise until 1937-38. This means that the development of the industries after 1936 was achieved by increasing employment, while productivity itself was deteriorating. Meanwhile, real wages kept rising regardless of declining productivity, bearing heavily on the industries. It can be concluded that, as a whole, production remained labour-intensive throughout the 1930s, the employers being placed in a rather defensive bargaining position later in the decade.

Table 5.5 below shows the changes in the constitution of the metal workforce at the shopfloor level. Making use of wages books available, it traces the number of metal workers in each classificatory category employed at Mitchell & Co., a Victorian engineering establishment which manufactured, for instance, tools and machines for agriculture.

<table>
<thead>
<tr>
<th>Table 5.5</th>
<th>The Changes in the Constitution of the Metal Workforce at Mitchell &amp; Co., 1928-1936</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1928</td>
</tr>
<tr>
<td>Draftsman</td>
<td>1</td>
</tr>
<tr>
<td>Tool Fitter</td>
<td>4</td>
</tr>
<tr>
<td>Fitter</td>
<td>18</td>
</tr>
<tr>
<td>Fitter Assembler</td>
<td>3</td>
</tr>
<tr>
<td>Assembler</td>
<td>1</td>
</tr>
<tr>
<td>Junior Fitter</td>
<td></td>
</tr>
<tr>
<td>Fitter's Apprentice</td>
<td>2</td>
</tr>
<tr>
<td>Fitter's Improver</td>
<td>3</td>
</tr>
<tr>
<td>Fitter's Labourer</td>
<td>2</td>
</tr>
<tr>
<td>Plow Fitter</td>
<td>8</td>
</tr>
<tr>
<td>Plow Fitter Assembler</td>
<td>1</td>
</tr>
<tr>
<td>Plow Fitter's Improver</td>
<td>1</td>
</tr>
</tbody>
</table>

Table 5.5 The Changes in the Constitution of the Metal Workforce at Mitchell & Co., 1928-1936
<table>
<thead>
<tr>
<th>Position</th>
<th>Total</th>
<th>208</th>
</tr>
</thead>
<tbody>
<tr>
<td>Junior Plow Fitter</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td>P. Fitter's Assistant</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>Turner</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td>Turner's Improver</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Junior Turner</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Grinder</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Driller</td>
<td>7</td>
<td>3</td>
</tr>
<tr>
<td>Screwer</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Junior Screwer</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Blacksmith</td>
<td>18</td>
<td>8</td>
</tr>
<tr>
<td>B'smith's Improver</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Junior Blacksmith</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Striker</td>
<td>12</td>
<td>3</td>
</tr>
<tr>
<td>Blacksmith's Labourer</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Furnaceman</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Assistant Furnaceman</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Foundry Apprentice</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Foundry Improver</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Foundry Labourer</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>Welder</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Electric Welder</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Junior Welder</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Tinsmith</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Cutter</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>Dresser</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Patternmaker</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>P'maker's Apprentice</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Coremaker</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Moulder</td>
<td>13</td>
<td>8</td>
</tr>
<tr>
<td>Moulder's Apprentice</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Moulder's Improver</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Apprentice(so described)</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Improver(so described)</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Labourer(so described)</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Yard Labourer</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>Junior Labourer</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>124</strong></td>
<td><strong>62</strong></td>
</tr>
</tbody>
</table>

It is recognised as a general trend that the number of junior and non-skilled adult workers increased as the 1930s proceeded. With regard to the fitting operation, there was a general increase in the number of assemblers, junior fitters and fitter's improvers. It also should be noted that the employer engaged more improvers than apprentices. As to the turning and other machining operations too, such non-skilled machinists as drillers and screwers, together with junior turners and junior screwers, added to their numbers.

However, the table also shows that, in spite of the larger scale introduction of cheap labour during the 1930s, this did not lead to the replacement of core tradesman engineers like fitters and turners. They remained the predominant figure in the production process in terms of their numerical presence, let alone the significance of the roles they performed.