An assessment of cattle husbandry problems in Western Australia

W J O Wilkie

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THE science of animal husbandry deals with all those things which affect the welfare and productivity of our domestic animals. The relative emphasis placed on welfare and productivity depends on whether the animals are kept as pets or for profit.

In general, animals kept for profit must be well cared for. This has been recognised through the ages and is expressed in such old sayings as "the eye of the master fattens the beast."

The basic requirements for successful animal production can be stated simply as:

- High reproductive rates.
- Fast economic growth.
- An end product that meets market demands.

These relate only to the animal's potential. Profit made from rapid changes in market value is another matter.

Normally, when approaching animal husbandry problems on any scale, it is convenient to relate them to the above basic factors. Certain information is necessary in all cases—for example, the genetic potential (or limitation imposed by breeding) and the values that can be given to environmental factors such as day length, temperatures, rainfall and feed.

**Reproductive Rates**

The genetic potential of the species or breed concerned sets an upper limit to possible production under ideal conditions.

A simple example is that it is normal for a cow to have one calf a year. Twins are rare among bovines and mortality rates among twins and the cows producing them are high.

Twins are usually lighter than singles and as growth rates during the first few months are related to birth weights, this is a further disadvantage in an area with a short growing season.
In sheep, on the other hand, twinning is already accepted as normal and there is more than a suggestion that higher reproduction rates are possible. Individual reproductive rates are usually not given the same consideration as group breeding performance. In terms of income, it is what is available for sale that counts. Sound animal husbandry, however, will take note of every failure to reproduce, and it is by eliminating the failures that good group performance will be obtained.

In cattle a calving percentage of 97 per cent. would be exceptionally high; one above 85 per cent. is good. In sheep a lambing percentage of 90 per cent. or over is a requirement if the flock is to improve in productivity, and in fat lamb production 150 per cent. is not beyond the potential of a good flock if breeding, nutrition, disease control and management are of a satisfactory standard.

Table 1.—The importance of reproduction rate

<table>
<thead>
<tr>
<th>Lambing percentage:—</th>
<th>50</th>
<th>70</th>
<th>90</th>
</tr>
</thead>
<tbody>
<tr>
<td>Survivors to 18 months:—</td>
<td>45</td>
<td>63</td>
<td>81</td>
</tr>
<tr>
<td>Ewes available as replacements:—</td>
<td>22</td>
<td>31</td>
<td>40</td>
</tr>
<tr>
<td>Ewes needed</td>
<td>22</td>
<td>22</td>
<td>22</td>
</tr>
<tr>
<td>Available for culling:—</td>
<td>0</td>
<td>9</td>
<td>18</td>
</tr>
<tr>
<td>Flock standard:—</td>
<td>deteriorating</td>
<td>Static</td>
<td>improving</td>
</tr>
</tbody>
</table>

CASH RETURNS

<table>
<thead>
<tr>
<th>Cull (c.f.a.) ewes</th>
<th>17 @ £3</th>
<th>17 @ £3 10s.</th>
<th>17 @ £4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wool: per head pence/lb.</td>
<td>9 lb. 48d.</td>
<td>11 lb. 51d.</td>
<td>13 lb. 54d.</td>
</tr>
<tr>
<td>Return/100 ewes</td>
<td>£180</td>
<td>£234</td>
<td>£295</td>
</tr>
<tr>
<td>Sale wether weaners</td>
<td>23 @ 30/-</td>
<td>32 @ 35/-</td>
<td>41 @ 40/-</td>
</tr>
<tr>
<td>Sale cull ewe weaners</td>
<td>0</td>
<td>9 @ 40/-</td>
<td>18 @ 60/-</td>
</tr>
<tr>
<td>TOTAL</td>
<td>£266</td>
<td>£368</td>
<td>£499</td>
</tr>
</tbody>
</table>

COMPOSITION OF EWE FLOCK (allow 5% deaths): Maiden 2 year—22; 3 year—21; 4 year—20; 5 year—19; 6 year—18; Total 100

Table 1 shows the importance of lambing percentage on the continuing profitability of a Merino flock with approximate flock structure as shown. The cash returns show how a poor lambing percentage can affect every aspect of productivity. The values shown are much lower than those prevailing in W.A. today but in all circumstances the balance favours the higher lambing flock.

(The data are from a South Australian study made in 1957-59.)
Hereford cow and calf running on what should be satisfactory pasture.
Left.—The calf was growing at 2 lb. a day but both cow and calf had yellow, ragged coats. Pictured in September.
Right.—The same cow and calf in January, four months later

The factors affecting growth make a fascinating and important study. They include—

- Size at birth.
- Breed size.
- Milk supply of the dam, especially in the first three to four months.
- Adequate rations from three months on (including water).
- Freedom from disease.
- Shade.

Growth after weaning is affected by growth before weaning, and by sex, breed, breeding, nutrition, management and disease incidence.

It will be noticed that the importance of disease is continuously recognised. Disease does not have to be dramatic. Inapparent disease can lower calving rates and quite small parasitic infestations can slow down growth.

This point is illustrated in Table 1, using figures prepared in South Australia a few years ago. These values do not apply in Western Australia today.

In breeding units of cattle run on modern commercial lines, the same principles apply. The more calves—the more heifers.

The more heifers, the greater possibility exists for selection for commercial merit.

Gains are two-fold:—More stock for current profit and a better unit to breed for future profit.

Growth Rate

Growth rate has been studied quite extensively in cattle. In Australia calves on their mothers have gained 30 to 100 lb. per month in the first few months of life. Overseas, gains of up to 150 lb. have been obtained under somewhat artificial conditions.
OTHER FACTORS:- WIND and RA(N, TEMPERATURE HOURS of SUNLIGHT. LIGHT INTENSITY, VOLUME of AVAILABLE FEED.

DIAGRAM 1.—Changes in environment play an important part in livestock production.

Hours of daylight increase to mid-summer and decrease to mid-winter; this variation is greatest at Albany and least at Wyndham. Variations in light affect coat growth in cattle and breeding behaviour in ewes.

Temperature changes are also important and at temperatures over 80°F, grazing cattle are affected. At low temperature they use energy to maintain heat but they can withstand cold if well fed.

Seasonal changes in pasture are well recognised, although the importance of water content of winter feed is sometimes overlooked.

This diagram attempts to analyse the situation and set out the periods where various factors limit growth. The extent of these limitations will obviously vary from district to district. Understanding the limitations is the first step towards correcting them.
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PLEASE FORWARD FURTHER DETAILS OF ALCON PUMPS FOR THE FOLLOWING REQUIREMENTS

<table>
<thead>
<tr>
<th>SIZE</th>
<th>SUCTION DISCHARGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>OUTPUT</td>
<td>GALS. PER HOUR</td>
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<tr>
<td>TOTAL HEAD</td>
<td>FEET</td>
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<tr>
<td>TYPE OF MOTOR</td>
<td>PETROL DIESEL ELECTRIC</td>
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<td>IF ELECTRIC</td>
<td>SINGLE PHASE THIRD PHASE</td>
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MURESK AGRICULTURAL COLLEGE
(Department of Agriculture)

Parents are reminded that applications for 1966 admission to Muresk Agricultural College close on December 31 of this year. A preliminary selection of 1966 entrants is made after the Junior results are available early in 1965.

The successful applicants then continue with Sub-Leaving, or higher studies at secondary school in 1965.

Before the course can be commenced applicants must have studied:

Junior.—
(a) English; Maths A; Maths B.
(b) Physics and Chemistry; (or Science A and Science B).
(c) Book-keeping, if possible.
(d) Others such as Geography.

Sub-Leaving.—English; Maths A; Physics; Chemistry and others.
Some prefer to take Junior Book-keeping in Sub-Leaving.

Places still exist for 1965 commencement. They are filled in order of application during 1964, by qualified applicants.

Duration of Course.—Two years.
Fees.—Approximately £200 per annum covering full residential charges.
Scholarships.—Department of Agriculture (3), the "Countryman", and J. J. Poynton Memorial (2).

Boarding Allowance.—Most Muresk students are eligible for the Education Department Boarding Allowance (£50 per annum).

Full details of the College are obtainable from the Principal, Muresk Agricultural College, Muresk, W.A., or the Department of Agriculture, Jarrah Road, South Perth.
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Investigation of worm infestations has opened up a wide field of enquiry into the relationship of degree of infection, and persistence of infection, to nutrition.

There is evidence to show that a young calf can pick up worm larvae, and, if well fed, will offer enough resistance to the infection to delay the development of many of these larvae. If the feeding stays good, resistance will become more complete, and the calf will be immune to many worm species.

However, this takes some time, and with a change to poorer nutrition, such as in summer and autumn, the retarded larvae continue their development, and a frank worm burden will develop.

This, like many of our problems of animal production, is related to our dependence on pastures. These are seasonal in growth and vary in all their elements from month to month.

Diagram 1 shows approximately what happens in an area south of Perth.

This illustrates a general situation. In many places there is also a particular problem which is popularly, and possibly rightly, classed as a mineral imbalance.

Marketing

The third basic factor affecting profit in animal production is having an end product that meets market demands.

This surprisingly is the factor which allows the greatest scope for individual and imaginative skill in production.

Quite well-defined upper limits are placed by nature on reproductive value and growth rates.

In the matter of the end product where the end product is a beef animal you can have a choice of—

(a) The month at which you market;
(b) The age at which market;
(c) The type of animal you sell;
(d) The uniformity of the animals you sell;
(e) The degree of finish on the animals you sell; and
(f) The market you use.

These problems are hard to define, and investigate, but a beginning has been made. The pictures in this article illustrate some of these problems.
(a) **Month of Marketing**

Where dependence on pasture is complete this can limit the number of months when marketable animals are available. Feed other than pasture is expensive. The decision to use it can only be made if possible returns are known.

Diagram 2 illustrates this. It shows the average monthly prices for three periods, 1950-1953, 1954-1958 and 1959-1962. Table 2 shows the percentage by which prices in certain months varied from the current year's average.

Diagram 2 shows how prices in general have risen while the pattern of prices continues to show a seasonal peak. It is of interest to note that the seasonal peak appears earlier in the year now than it did a decade ago. It is a challenge to find a system of management that will allow the marketing of stock at the period of highest returns, without spending more on them than will be covered by the extra return.

Table 2 shows how each month's price differed from the year's average.

(b) **The Age at Marketing**

This is often dictated by the age at which the cattle become marketable, as in the North-West, but in most cases in the South-West there is an element of choice.

Age at marketing has a real bearing on the amount of meat that can be produced per ton of pasture, or per acre or per mature beast equivalent (shown in Tables 3 to 5). Animals over two years are mature equivalents. A calf is considered as half a mature equivalent in terms of pasture needs and a yearling equals two thirds.

(c) **Type and Uniformity**

In matters of type we have placed a great deal of reliance on show rings. This has been objected to on the grounds that show animals are usually too fat for trade purposes. However, good type animals of those same breeds usually command higher prices than animals of no fixed breed, given equal finish.

Uniformity will come to be given greater recognition when it is realised that the man who buys the living animal will

### Table 2.—Beef prices at Midland Junction

Showing major differences within each year between monthly prices and the average price for the current year

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<td>128/-</td>
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*12 Monthly Average Price per 1001b.*
stretch his purse a little further if he is familiar with the "cut out" potential of the beast.

This is illustrated by the system used in America, where cattle, which remain the property of the producer, are consigned to a commission agent at the stockyard. He in turn invites inspection by meat works buyers, wholesalers or butchers and a per lb. liveweight price is negotiated solely on the quality of the beast, that is, the degree of finish, conformation and general appearance. The deal is completed by running the pen of cattle in batches over a large weigh-bridge where their aggregate weights are recorded.

The merit in this is that the producer can learn by direct experience what the market, represented by the buyers, wants, and can adjust his production programme accordingly. This method also encourages sale of evenly drafted, properly presented mobs and often results in such a build up of confidence between producer, agent and buyer that drafts of cattle from known producers are bought "sight unseen."

(d) Degree of Finish

The sweetest and most tender meat comes from an animal that is thriving. Meat from an animal that had been in store condition but was fattening at the

Table 3.—Comparison of five management systems

(CALVING % = 95)

<table>
<thead>
<tr>
<th>System</th>
<th>Sell</th>
<th>95 Survive</th>
<th>Sell 15 (300 lb.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Baby Beef</td>
<td>70</td>
<td>25 heifers, 45 steers, 300 lb.</td>
</tr>
<tr>
<td>B</td>
<td>Yearlings</td>
<td>68 survive, 68</td>
<td>450 lb.</td>
</tr>
<tr>
<td>C</td>
<td>2 year olds</td>
<td>66 survive, 33</td>
<td>500 lb.</td>
</tr>
<tr>
<td>D</td>
<td>3 year olds</td>
<td>42 survive, 42</td>
<td>600 lb.</td>
</tr>
<tr>
<td>E</td>
<td>4 year olds</td>
<td>41 survive, 41</td>
<td>650 lb.</td>
</tr>
</tbody>
</table>

Table 3 compares five systems of management. The basic difference considered here is age at marketing, the range being baby beef at eight to 10 months to four-year-olds. When cattle are left to older ages some mortalities have to be allowed for and here it is entered at 5 per cent. for breeders and calves and 2 per cent. for older stock; although this is too high for a well-managed property it is common in pastoral country. As age at marketing increases the number of cattle kept increases in proportion to the number sold. The conversion to "mature equivalents" is made because small animals eat more than larger animals. A calf is taken here as half, and a yearling as two-thirds of a mature equivalent.

For output of meat see Tables 4 and 5.
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Above: A view of the main Coleambally Canal

waterway to a new wonderland of Rice and Cotton

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See mile after mile of brown, flat plains...silent, empty acres...a lonely monotony of sparse, winter grasses with spindly box and boree lining ancient dry creek beds. Then, see these same acres two years later, a colourful patchwork of flourishing fruit, rice, cotton and green pastures, and you see a miracle...the almost unbelievable miracle that water brings to a continent known as the driest on earth.

Such a place is the new Coleambally Irrigation Area, stretching across the land like some gigantic real estate project with roads, bridges, canals and a contoured pattern of farmlands—destined to be Australia's largest irrigation area and planned on the additional bounty of water from the 'Snowy' Scheme. Spectacular, bustling Coleambally is an area of 1 million acres adjacent to the Murrumbidgee Irrigation Area in Southern N.S.W. New farmers, including ex-clerks, builders and tradesmen, mingle with neighbouring farmers in the Murrumbidgee Irrigation Area in a common bond of progress and achievement.

In tune with the tempo of the area is the success of two relatively new crops to Australia—rice and cotton. The 1964 rice crop from the M.I.A., Coleambally, and other Riverina areas is a record 139,000 tons from 58,000 acres and worth £15 million. Coleambally contributed 25,000 tons, equivalent to the total rice harvest in Australia a few years ago. Already Australia is exporting more than two-thirds of its crop.

The introduction of cotton in 1963 as an alternative crop to rice in these areas has added a new zest to rapid expansion. Australia imports £7 million of cotton lint, and a further £30 to £40 million in cotton piece goods. To grow sufficient cotton for present requirements would occupy about 100,000 acres. Until 1963 cotton was mainly confined to Queensland. Since then irrigated cotton has also been established at Wee Waa in N.S.W., and the Ord River in W.A. In N.S.W., acreage has leapt from 59 acres in 1959 to 10,000 acres in 1963. This is expected to reach 25,000 acres in 1965 and perhaps 50,000 acres in 1966.

Mr E. R. Hoare, of the C.S.I.R.O. Irrigation Research Laboratories at Griffith, N.S.W., has stated that "it has now been firmly established that future developments in cotton will occur only where there is adequate irrigation."

Thus, a new chapter is unfolding in the brilliant saga of water development in Australia and the benefit it brings to the nation.

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time of slaughter is more tender than meat from an animal that had been fat but was losing condition at slaughter.

This is about the only way the producer can affect tenderness; a much greater influence on this is the method of handling the meat between slaughter and consumption.

Fatness is probably the most important factor in marketing meat animals today. The demand is for lean meat, in every market available to us.

Table 6 shows how carcases may vary in fatness. It shows the average cut out of the main tissues of three steers each 1,000 lb. liveweight.

Fat is related to dressing percentage. For many markets the fat not only unsaleable but represents a cost, as it has to be cut off.

Fat deposition increases with age, and for this reason younger animals have an advantage for today's trade.

Research of far-reaching importance has begun on methods of carcase appraisal, that will allow an accurate estimate of
carcase composition to be made quickly and cheaply, so that breeders will have information on this point.

Table 5.—Output of meat and estimated value under five systems

<table>
<thead>
<tr>
<th>System</th>
<th>95% Calving</th>
<th></th>
<th>65% Calving</th>
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<tbody>
<tr>
<td></td>
<td>Production per Mature Beast</td>
<td></td>
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<tr>
<td></td>
<td>Meat</td>
<td>Money</td>
<td>Meat</td>
<td>Money</td>
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<tr>
<td>System A</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Selling Baby Beef</td>
<td>172</td>
<td>16  2  0</td>
<td>134</td>
<td>12  3  0</td>
</tr>
<tr>
<td>Selling Yearlings</td>
<td>181</td>
<td>15  4  0</td>
<td>146</td>
<td>12  1  0</td>
</tr>
<tr>
<td>Selling 2 year olds</td>
<td>151</td>
<td>12  1  0</td>
<td>130</td>
<td>10  1  0</td>
</tr>
<tr>
<td>Selling 3 year olds</td>
<td>139</td>
<td>11   7  0</td>
<td>121</td>
<td>9  1  5  0</td>
</tr>
<tr>
<td>Selling 4 year olds</td>
<td>127</td>
<td>10  4  0</td>
<td>112</td>
<td>8  1  7  0</td>
</tr>
</tbody>
</table>

Table 5 shows the influence of calving percentage on returns. The calving percentage effect is greatest in system A, where young stock make up the highest proportion of the herd.

Another effect not shown here but mentioned earlier is that there will be fewer heifers available for culling so that herd quality also suffers from lower calving percentages.

Table 4.—Production of cattle and estimated weights and values of meat from systems shown in Table 3.

<table>
<thead>
<tr>
<th>Meat Sold</th>
<th>Cows (500 lb.)</th>
<th>Baby Beef (300 lb.)</th>
<th>Yearling (450 lb.)</th>
<th>2 Years Heifers (500 lb.) Steers (590 lb.)</th>
<th>3 Years (600 lb.)</th>
<th>4 Years (650 lb.)</th>
<th>Total lb.</th>
<th>Per Mature Beast Equivalent lb.</th>
</tr>
</thead>
<tbody>
<tr>
<td>System A</td>
<td>7,500</td>
<td>21,000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>28,500</td>
<td>172</td>
</tr>
<tr>
<td>B</td>
<td>7,500</td>
<td>30,600</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>38,100</td>
<td>181</td>
</tr>
<tr>
<td>C</td>
<td>7,500</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>34,290</td>
<td>151</td>
</tr>
<tr>
<td>D</td>
<td>7,500</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>11,500</td>
<td>139</td>
</tr>
<tr>
<td>E</td>
<td>7,500</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>11,500</td>
<td>127</td>
</tr>
</tbody>
</table>

Price Realised at per 100 lb.

| System A | £563 | £2,100 | £2,754 | £2,915 | £978 | £2,079 | £2,132 | £563 | £2,100 | £2,754 | £2,915 | £978 | £2,079 | £2,132 |
| B         | £563 | £2,100 | £2,754 | £2,915 | £978 | £2,079 | £2,132 | £563 | £2,100 | £2,754 | £2,915 | £978 | £2,079 | £2,132 |
| C         | £563 | £2,100 | £2,754 | £2,915 | £978 | £2,079 | £2,132 | £563 | £2,100 | £2,754 | £2,915 | £978 | £2,079 | £2,132 |
| D         | £563 | £2,100 | £2,754 | £2,915 | £978 | £2,079 | £2,132 | £563 | £2,100 | £2,754 | £2,915 | £978 | £2,079 | £2,132 |
| E         | £563 | £2,100 | £2,754 | £2,915 | £978 | £2,079 | £2,132 | £563 | £2,100 | £2,754 | £2,915 | £978 | £2,079 | £2,132 |

Table 4 shows the influence of age of marketing on meat produced and cash returns, using prices typical of the past five years and estimated weights.

Both prices and weights are subject to fluctuation—but any beef producer who tabulated his actual returns on this basis would find the exercise extremely valuable.
Young cow north of Perth, suffering from protein and mineral deficiency on new ground

Table 6.—Variation in “cut out” of principal tissues from beef carcases having different levels of finish

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Live weight</td>
<td>1,000 lb.</td>
<td>1,000 lb.</td>
<td>1,000 lb.</td>
</tr>
<tr>
<td>Finish</td>
<td>Store</td>
<td>Medium</td>
<td>Fat</td>
</tr>
<tr>
<td>Dressing</td>
<td>49%</td>
<td>53%</td>
<td>58%</td>
</tr>
<tr>
<td>Bone</td>
<td>85 lb.</td>
<td>85 lb.</td>
<td>85 lb.</td>
</tr>
<tr>
<td>Fat, plus sinews and connective tissue</td>
<td>75 lb.</td>
<td>115 lb.</td>
<td>165 lb.</td>
</tr>
</tbody>
</table>

Fatness in a beef beast literally means increased fat. A 1,000 lb. overfat beast contains more than twice as much fat as a 1,000 lb. store beast, but no more lean meat.

(f) The Market Used

This is included as a final item because markets warrant continuing study and a constant flow-back of information on market demands.

Systems of appraising meat should not pretend to be quality grades. Appraisal schemes should provide specifications rather than grades. There is a market for all sorts of meat, which can be sent overseas or sold locally true to a label of specifications.

A greater appreciation of the concept of specifications and frequent visits to slaughter houses and abattoirs to see how his live product appears as a carcase will help the producer of pig, lamb or beef in his production programme.
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* Stronger rib-design roof panels, complete with centre-filling hole and lid.
* Full-width steel floor, permitting the silo to be mounted on an earth ring or timber platform.
* Two separate outlets provided.
* Holds a full 200 bushels with only 6' to the eaves and 7' 2" nominal diameter.
* Rodent-proof and weatherproof.

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- Wall Height: 6' 0"
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- Overall Height (including earth ring): 10' 4"
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- Packed Weight (including earth ring): 490 lbs.

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