MINERAL PRODUCTION IN IOWA

IN 1906

BY

S. W. BEYER
<table>
<thead>
<tr>
<th>Mineral</th>
<th>1904 Value</th>
<th>1905 Value</th>
<th>1906 Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coal</td>
<td>$10,439,496</td>
<td>$10,195,593</td>
<td>$11,619,455</td>
</tr>
<tr>
<td>Clay</td>
<td>$3,487,376</td>
<td>$3,408,547</td>
<td>$3,477,237</td>
</tr>
<tr>
<td>Stone</td>
<td>$542,170</td>
<td>$533,569</td>
<td>$577,782</td>
</tr>
<tr>
<td>Gypsum</td>
<td>$469,432</td>
<td>$580,055</td>
<td>$573,498</td>
</tr>
<tr>
<td>Lead</td>
<td>$2,619</td>
<td>$1,500</td>
<td>$26,300</td>
</tr>
<tr>
<td>Sand-lime brick</td>
<td>$13,907</td>
<td>$38,612</td>
<td>$38,255</td>
</tr>
<tr>
<td>Mineral water*</td>
<td>$36,200</td>
<td>$36,300</td>
<td>$27,540</td>
</tr>
<tr>
<td>Total</td>
<td>$14,955,000</td>
<td>$15,103,046</td>
<td>$16,414,447</td>
</tr>
</tbody>
</table>

*Mineral paint is combined with mineral water.

**MINERAL PRODUCTION IN IOWA FOR 1906.**

BY S. W. BEYER.

The mineral production for 1906 totals considerably over a million dollars more than for 1905. The principal gain is in the value of the coal output which shows not only an increased tonnage but also an increase in price for the year. The production

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*The policy of co-operation practised during the past ten years between the Federal and State Surveys was materially modified for 1906. All, or practically all, of the correspondence was carried on from the central office at Washington. A list of the producers who could not be called up by letter was furnished the local office and these, as far as practicable, were visited by a representative of the State Survey. Tabulation sheets were supplied by the U.S. Geological Survey for Coal, Clay, Stone, Gypsum, Mineral paints, Sand-lime brick, and Sand and gravel. The Statistics for lead and zinc, cement products, and iron ore were collected and compiled by the local office. It is a matter of regret that the data supplied will not permit tabulation by counties for all of the mineral products.*
of sand and gravel is included in mineral production for the first time in a report of the Iowa Geological Survey. As in the case of quarry products it is almost impossible to secure accurate figures on account of the large number of small operators who produce only for their own use. The aggregate output is undoubtedly much greater than the figures show.

Coal.

The production of coal for 1906 shows a healthy growth in the industry for the year. This growth represents more than simply increased tonnage. Many of the larger companies installed during the year betterments in the surface equipment and mechanical haulage underground. The Consolidation Coal Company has in addition installed coal cutting machinery, greatly increasing the efficiency of the plants.

The subjoined table shows the growth in tonnage, value, average price per ton, average number of days worked and average number of men employed during the past eight years, according to the authority of the U. S. Geological Survey:

<table>
<thead>
<tr>
<th>YEAR</th>
<th>TOTAL TONS</th>
<th>VALUE</th>
<th>AVERAGE PRICE</th>
<th>AVERAGE NUMBER OF DAYS WORKED</th>
<th>AVERAGE NUMBER OF MEN EMPLOYED</th>
</tr>
</thead>
<tbody>
<tr>
<td>1899</td>
<td>5,177,479</td>
<td>$6,397,338</td>
<td>$1.24</td>
<td>229</td>
<td>10,971</td>
</tr>
<tr>
<td>1900</td>
<td>5,202,939</td>
<td>7,155,341</td>
<td>1.38</td>
<td>228</td>
<td>11,608</td>
</tr>
<tr>
<td>1901</td>
<td>5,617,499</td>
<td>7,822,805</td>
<td>1.39</td>
<td>218</td>
<td>12,653</td>
</tr>
<tr>
<td>1902</td>
<td>5,904,766</td>
<td>8,660,287</td>
<td>1.47</td>
<td>227</td>
<td>12,434</td>
</tr>
<tr>
<td>1903</td>
<td>6,365,233</td>
<td>10,439,139</td>
<td>1.64</td>
<td>232</td>
<td>12,513</td>
</tr>
<tr>
<td>1904</td>
<td>6,507,655</td>
<td>10,439,496</td>
<td>1.60</td>
<td>213</td>
<td>13,373</td>
</tr>
<tr>
<td>1905</td>
<td>6,798,609</td>
<td>10,586,381</td>
<td>1.56</td>
<td>209</td>
<td>15,113</td>
</tr>
<tr>
<td>1906</td>
<td>7,266,224</td>
<td>11,619,435</td>
<td>1.60</td>
<td>224</td>
<td>15,260</td>
</tr>
</tbody>
</table>

The output, disposition, value, average price per ton, average number of days worked and average number of men employed by counties is given in tabulated form below.
### Coal Production of Iowa in 1906, by Counties

<table>
<thead>
<tr>
<th>COUNTY</th>
<th>Loaded at mines for shipment</th>
<th>Sold to local trade and used by employees</th>
<th>Used at mines for steam and heat</th>
<th>Total Quantity</th>
<th>Total Value</th>
<th>Average price per ton</th>
<th>Average number of days active</th>
<th>Average number of employees</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adams</td>
<td>200</td>
<td>11,488</td>
<td>36</td>
<td>11,724</td>
<td>27,154</td>
<td>2.32</td>
<td>150</td>
<td>67</td>
</tr>
<tr>
<td>Appanoose</td>
<td>1,030,610</td>
<td>47,842</td>
<td>14,143</td>
<td>1,101,595</td>
<td>2,112,109</td>
<td>1.92</td>
<td>189</td>
<td>3,254</td>
</tr>
<tr>
<td>Boone</td>
<td>213,677</td>
<td>14,780</td>
<td>4,066</td>
<td>253,110</td>
<td>436,497</td>
<td>1.73</td>
<td>179</td>
<td>844</td>
</tr>
<tr>
<td>Greene</td>
<td>2,400</td>
<td>16,306</td>
<td>1,110</td>
<td>19,816</td>
<td>40,377</td>
<td>2.03</td>
<td>178</td>
<td>62</td>
</tr>
<tr>
<td>Guthrie</td>
<td>2,128</td>
<td>9,895</td>
<td>40</td>
<td>12,063</td>
<td>31,307</td>
<td>2.60</td>
<td>140</td>
<td>68</td>
</tr>
<tr>
<td>Jasper</td>
<td>365,914</td>
<td>16,194</td>
<td>18,475</td>
<td>388,582</td>
<td>627,653</td>
<td>1.62</td>
<td>224</td>
<td>835</td>
</tr>
<tr>
<td>Keokuk</td>
<td>1,000</td>
<td>15,504</td>
<td>640</td>
<td>17,144</td>
<td>32,067</td>
<td>1.87</td>
<td>174</td>
<td>46</td>
</tr>
<tr>
<td>Mahaska</td>
<td>551,392</td>
<td>31,167</td>
<td>19,928</td>
<td>602,487</td>
<td>876,041</td>
<td>1.45</td>
<td>229</td>
<td>1,126</td>
</tr>
<tr>
<td>Marion</td>
<td>339,445</td>
<td>22,894</td>
<td>10,411</td>
<td>372,750</td>
<td>530,847</td>
<td>1.42</td>
<td>208</td>
<td>640</td>
</tr>
<tr>
<td>Monmouth</td>
<td>2,399,445</td>
<td>37,458</td>
<td>51,570</td>
<td>2,458,473</td>
<td>3,345,264</td>
<td>1.36</td>
<td>248</td>
<td>3,712</td>
</tr>
<tr>
<td>Polk</td>
<td>1,065,573</td>
<td>238,410</td>
<td>33,523</td>
<td>1,309,506</td>
<td>2,383,393</td>
<td>1.73</td>
<td>252</td>
<td>2,733</td>
</tr>
<tr>
<td>Taylor</td>
<td>12,725</td>
<td>6,177</td>
<td>20</td>
<td>19,052</td>
<td>40,099</td>
<td>2.15</td>
<td>177</td>
<td>82</td>
</tr>
<tr>
<td>Van Buren</td>
<td>9,825</td>
<td>2,200</td>
<td>103</td>
<td>12,127</td>
<td>24,418</td>
<td>2.01</td>
<td>174</td>
<td>39</td>
</tr>
<tr>
<td>Wapello</td>
<td>166,757</td>
<td>72,443</td>
<td>4,056</td>
<td>245,256</td>
<td>378,072</td>
<td>1.55</td>
<td>198</td>
<td>578</td>
</tr>
<tr>
<td>Wayne</td>
<td>117,850</td>
<td>18,744</td>
<td>100</td>
<td>136,694</td>
<td>200,178</td>
<td>1.90</td>
<td>214</td>
<td>433</td>
</tr>
<tr>
<td>Webster</td>
<td>98,118</td>
<td>8,868</td>
<td>2,536</td>
<td>109,522</td>
<td>218,180</td>
<td>1.99</td>
<td>224</td>
<td>323</td>
</tr>
<tr>
<td>Other counties (a) and small mines</td>
<td>87,619</td>
<td>62,087</td>
<td>8,007</td>
<td>100,313</td>
<td>274,029</td>
<td>1.74</td>
<td>209</td>
<td>538</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>6,461,208</strong></td>
<td><strong>633,652</strong></td>
<td><strong>171,364</strong></td>
<td><strong>7,266,224</strong></td>
<td><strong>11,619,455</strong></td>
<td><strong>1.60</strong></td>
<td><strong>224</strong></td>
<td><strong>15,260</strong></td>
</tr>
</tbody>
</table>

*a* Dallas, Jefferson, Lucas, Page, Scott and Warren.
It is apparent when the above table is compared with the corresponding table for 1905 that of the leading coal producing counties, Appanoose, Jasper, Marion, Monroe, Polk and Wapello show good increases while Boone, Mahaska, Wayne and Webster show a decline. Keokuk and Lucas have dropped out of the list of large producers. Considerable exploratory work has been done in the latter county during the past few years with encouraging results and it may be confidently predicted that Lucas will regain its place with the large producers in the near future.

According to the authority of the U. S. Geological Survey, Iowa ranked ninth in production and eighth in value of the bituminous coal output for 1905. The ten leading producers for the year were as follows:

<table>
<thead>
<tr>
<th>STATE</th>
<th>TONNAGE</th>
<th>VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Pennsylvania</td>
<td>118,413,637</td>
<td>$113,390,607</td>
</tr>
<tr>
<td>2 Illinois</td>
<td>38,434,363</td>
<td>40,577,592</td>
</tr>
<tr>
<td>3 West Virginia</td>
<td>37,791,580</td>
<td>32,311,790</td>
</tr>
<tr>
<td>4 Ohio</td>
<td>25,552,950</td>
<td>26,486,740</td>
</tr>
<tr>
<td>5 Indiana</td>
<td>11,895,252</td>
<td>12,492,255</td>
</tr>
<tr>
<td>6 Alabama</td>
<td>11,866,069</td>
<td>14,387,721</td>
</tr>
<tr>
<td>7 Colorado</td>
<td>8,826,429</td>
<td>10,816,978</td>
</tr>
<tr>
<td>8 Kentucky</td>
<td>8,432,323</td>
<td>8,385,232</td>
</tr>
<tr>
<td>9 Iowa</td>
<td>6,798,609</td>
<td>10,586,381</td>
</tr>
<tr>
<td>10 Kansas</td>
<td>6,423,979</td>
<td>9,390,542</td>
</tr>
</tbody>
</table>

The outlook for 1907 is for a continuance of the high price per ton with possibly a slight decrease in output.

Clay.

Iowa Clay products sold during the year 1906 were distributed as follows:

<table>
<thead>
<tr>
<th>STATE</th>
<th>THOUSANDS</th>
<th>VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Common brick</td>
<td>108,771</td>
<td>$1,125,009</td>
</tr>
<tr>
<td>Vitrified paving brick</td>
<td>19,939</td>
<td>185,990</td>
</tr>
<tr>
<td>Front brick</td>
<td>8,871</td>
<td>101,786</td>
</tr>
<tr>
<td>Fire brick</td>
<td>67</td>
<td>930</td>
</tr>
<tr>
<td>Drain tile</td>
<td></td>
<td>1,721,614</td>
</tr>
<tr>
<td>Sewer pipe</td>
<td></td>
<td>114,241</td>
</tr>
<tr>
<td>Hollow building tile or block</td>
<td>102,664</td>
<td>5,084</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td></td>
<td>$3,417,327</td>
</tr>
</tbody>
</table>

Total
PLATE II.—Production of stone in Iowa from 1896 to 1906.
Clay mined

<table>
<thead>
<tr>
<th>Clay mined</th>
<th>Tons</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fire clay</td>
<td>355</td>
<td>$ 560</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>1,650</td>
<td>$ 1,350</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>$ 1,910</td>
</tr>
</tbody>
</table>

The state still maintains her lead in the manufacture of drain tile, Indiana and Ohio being her closest competitors.

**Stone.**

The value of stone produced for 1906 shows a slight increase over the preceding year. The output was distributed as follows:

Limestone:

<table>
<thead>
<tr>
<th>Type</th>
<th>Tons</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rough building</td>
<td>$ 105,203</td>
<td></td>
</tr>
<tr>
<td>Dressed building</td>
<td>31,350</td>
<td></td>
</tr>
<tr>
<td>Paving</td>
<td>6,527</td>
<td></td>
</tr>
<tr>
<td>Curbing</td>
<td>8,030</td>
<td></td>
</tr>
<tr>
<td>Flagging</td>
<td>7,632</td>
<td></td>
</tr>
<tr>
<td>Rubble</td>
<td>84,553</td>
<td></td>
</tr>
<tr>
<td>Riprap</td>
<td>35,810</td>
<td></td>
</tr>
<tr>
<td>Crushed stone</td>
<td></td>
<td>$ 572,181</td>
</tr>
<tr>
<td>Road making</td>
<td>38,189</td>
<td></td>
</tr>
<tr>
<td>Railroad ballast</td>
<td>26,268</td>
<td></td>
</tr>
<tr>
<td>Concrete</td>
<td>142,124</td>
<td></td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>8,129</td>
<td></td>
</tr>
<tr>
<td>Lime burned</td>
<td>78,366</td>
<td></td>
</tr>
</tbody>
</table>

Sandstone........................................................................... $ 577,782

<table>
<thead>
<tr>
<th>Miscellaneou..</th>
<th>Tons</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lim e burned</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sandstone</td>
<td></td>
<td>$ 5,601</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>$ 577,782</td>
</tr>
</tbody>
</table>
PLATE III. — Production of Gypsum and Lime in Iowa from 1896 to 1906.
PLATE IV.—Production of Lime and Gypsum in the United States from 1896 to 1905.
LEAD AND ZINC.

Gypsum.

The total production shows a slight decline when compared with the preceding year. Two new plants were built but were not put in operation until early in 1907. The statistics of the industry for the year 1906 are as follows:

<table>
<thead>
<tr>
<th>TONS</th>
<th>VALUED AT</th>
</tr>
</thead>
<tbody>
<tr>
<td>286,857</td>
<td>$199,222</td>
</tr>
</tbody>
</table>

Distributed as follows:

<table>
<thead>
<tr>
<th>Sold crude</th>
<th>TONS</th>
<th>VALUED AT</th>
</tr>
</thead>
<tbody>
<tr>
<td>To Portland cement mills</td>
<td>8,390</td>
<td>$11,973</td>
</tr>
<tr>
<td>As land plaster</td>
<td>3,751</td>
<td>$6,922</td>
</tr>
<tr>
<td>Miscellaneous uses</td>
<td>1,472</td>
<td>$3,441</td>
</tr>
<tr>
<td>Sold as Plaster-of-Paris, Wall Plaster, etc</td>
<td>146,526</td>
<td>$551,162</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>160,139</strong></td>
<td><strong>$573,498</strong></td>
</tr>
</tbody>
</table>

Sand and Gravel.

The Survey publishes for the first time since its organization statistics of production for sand and gravel. Of necessity, reports could be secured only for the commercial pits. The pit products may be classified as follows, calculated in short tons:

<table>
<thead>
<tr>
<th>QUANTITY</th>
<th>VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>4,952</td>
<td>$5,152</td>
</tr>
<tr>
<td>127,271</td>
<td>$45,158</td>
</tr>
<tr>
<td>1,800</td>
<td>$1,400</td>
</tr>
<tr>
<td>8,550</td>
<td>$2,100</td>
</tr>
<tr>
<td>14,975</td>
<td>$4,863</td>
</tr>
<tr>
<td>27,125</td>
<td>$15,707</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>184,673</strong></td>
</tr>
</tbody>
</table>

Lead and Zinc.

Mining and exploratory operations were carried on with more than the usual vigor during the year in the Dubuque region. This was due largely to the greater demand for both lead and zinc. The price of lead ore reached $42.50 per thousand during the year, the highest in more than a third of a century.
LEAD.

About 600,000 pounds of lead ore were produced in Iowa during the year and were sold at an average price of $33.00 per thousand pounds. The price at the end of the year was on the advance and a consequent increase in output for 1907 is expected.

ZINC.

For a number of years no zinc ore has been marketed from the Dubuque region. The year 1906 marks the rejuvenation of the industry. About 500 tons of "dry bone" were sold at an average of $13.00 per ton. While no "jack" was shipped a considerable quantity of the disseminated zinc sulphide ore was mined and is now held in stock ready to be milled. A fifty-ton mill is now in process of construction by the Avenue Top Mining Company and will be ready for operation September 1, 1907. The mill is so arranged that its capacity can be doubled easily. It is reported that the Superior Mining Company contemplates building a mill in the near future.

Several companies have discovered and are now opening up extensive ore bodies and are only awaiting better facilities for cleaning and handling the output before mining on a large scale is undertaken. The outlook for the immediate future of the district is brighter than for many years and a greatly increased output for 1907 may be predicted with confidence.

SUMMARY OF PRODUCTION FOR 1906.

<table>
<thead>
<tr>
<th>Product</th>
<th>Quantity</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lead (Galena)</td>
<td>600,000 lbs</td>
<td>$19,800</td>
</tr>
<tr>
<td>Zinc (Dry Bone)</td>
<td>500 tons</td>
<td>6,500</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>$26,300</strong></td>
</tr>
</tbody>
</table>

Iron.

Iowa marketed no iron ore during the year 1906. The year was not, however, without results as to the future of the iron industry in the state. The Missouri Iron Company with headquarters in Saint Louis has for more than eighteen months been exploring Iron Hill near Waukon, and neighboring well known iron ore bodies with the result that they are at the present time installing a modern washer to handle six hundred tons of finished
ore per day. The plant will be supplied with power by a 400-
horse power gas producer engine direct connected to D. C. gen-
erators and all crushers and other machinery will be direct con­
ected to motors. It is believed that by washing, jigging and
roasting the metallic iron content of the ore can be brought up
to between 55 and 60 per cent. The ore will probably be shipped
by rail to the river and then by boat to Saint Louis for reduc­
tion.

**Mineral Water.**

The bottling and shipping of mineral water has become an
established industry in Iowa. The most important producers
are the springs at Colfax in Jasper county. The amount sold
for 1906 was 227,500 gallons valued at $23,700 or at an average
price of eleven cents per gallon. It was distributed as follows:

<table>
<thead>
<tr>
<th>Product</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medicinal water</td>
<td>$23,150</td>
</tr>
<tr>
<td>Table water</td>
<td>550</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$23,700</strong></td>
</tr>
</tbody>
</table>

**PORTLAND CEMENT.**

The year 1906 was important in the history of the development
of the mineral resources of the state in the fact that two Port­
lard cement companies were organized and commenced the build­
ing of plants at Mason City and Des Moines, respectively. The
former plant will reach completion on or about November 1,
1907. The Des Moines plant will not be in operation before the
middle of 1908. A third company has been organized recently
and is planning to erect a plant at Harvey, in Marion county.

**Cement Products.**

The increase in the use of Portland cement is little less than
phenomenal. The manufacture of cement products has become
a recognized industry in a large proportion of the towns of the
state, especially throughout the north central portion, where
structural materials are scarce. The principal products are
building block, cement brick and drain tile. The industry is yet
Plate V.—Production, imports and prices of cements in the United States from 1894 to 1906.
CEMENT PRODUCTION.

in its infancy. The leading products marketed during the year were as follows:

<table>
<thead>
<tr>
<th>Product</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Building block</td>
<td>$207,195</td>
</tr>
<tr>
<td>Cement brick</td>
<td>24,379</td>
</tr>
<tr>
<td>Drain tile</td>
<td>102,535</td>
</tr>
<tr>
<td>Fence posts</td>
<td>11,497</td>
</tr>
<tr>
<td>Roof tile</td>
<td>5,215</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$350,821</strong></td>
</tr>
</tbody>
</table>

A much larger amount of cement was used in the building of sidewalks, floors, foundations, chimneys, water tanks and fire-proofing.