CHAPTER 5
The Biggest Iron Ore Exporter in the World

5.1 An adventure in the Amazon

"You can send us the snakebite serum." The telegram on the desk of American geologist Gene Tolbert,1 in Rio de Janeiro, was short and incredibly promising. Snakebite serum, in this case, had nothing to do with adders – it was the code used among geologists at Companhia Mendos de Mineração, the Brazilian arm of American giant US Steel, to announce the discovery of a major deposit. The telegram was sent from Belém by Breno dos Santos, also a geologist, and the cryptic message served to protect against the spying that went on between the mining companies scouring northern Brazil in search of riches. There were no snakes, but there was manganese, and above all, a spectacular amount of iron. Gold, silver, copper, bauxite and zinc, as well as nickel, chromium, tin and tungsten would also be found in due course.

Breno was 27 years old. He was a recently qualified geologist who had accepted – more through lack of options than idealism – a job at Companhia Mendos de Mineração, which was looking for manganese in the Amazon. It was an adventure in every sense. It wasn’t an easy job: the salary wasn’t great, the food was terrible, there were mosquitoes everywhere, and there were few geologists around. The indigenous peoples (Amurin and Xikrin) were not very friendly and, worst of all, Breno often had to fly over the jungle in very unreliable helicopters.

It was on one of these flights, on July 11, 1967, on board a red helicopter with room for two passengers, that the telegram arrived in Pará. It was for the history of mining in Brazil (and the world) began to change. Since then, Carajás – named for the tribe that lived on the banks of the Araguaia River – has been synonymous with iron ore.

In the mid-1960s, the Amazon region was being mapped by large American companies looking for electrolytic manganese essential for the manufacture of batteries. The recommended location was the Serono Mountains, known as the ‘Serena Xico’ (‘Rich Mountains’). In geological jargon, there is a saying that “You only look for elephants where there are elephants.” Park – where enormous manganese deposits had already been found near Marais – was the ‘elephant’ of the moment.

The strategy adopted by mining companies was to plot routes starting from Belém, and crossing to Santarém and Altamira. Initially, Breno’s team, led by Gene Tolbert, was going to be based in Altamira, but Union Carbide, US Steel’s main competitor, discovered its plans and got there first. The solution found was to create an alternative route via Marais, where camps were set up around the

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1. Gene Edward Tolbert was born in Kansas, USA in 1925, and died in October 1989 in Virginia, USA. He served in the American Air Force during the Second World War. He moved to Brazil in 1949 to work for the Island Survey, following Gunter.2

2. According to geologist Breno dos Santos in an interview given to Vale, while flying over an indigenous village as part of a prospecting flight over the Amazon, he saw the villagers waving their arms in the air, which didn’t yet have any contact with civilization. They only became acquainted with Western culture when the Trans-Amazon Highway was built, he explained.

3. The Karajá or Carajá is the name of the indigenous group of people occupying the broad strip between the Araguaia River valley and the island of Marais in what is now the state of Tocantins, near its borders with Pará, Goiás and Mato Grosso. The name Karajá comes from the Tupi word meaning “big monkey.” In their own language, they call themselves “iny” (“we”).

4. The Karajá family belongs to the Macro-Jê linguistic branch, and is divided into three languages: Karajá, Javaé and Xambioá. The Karajá or Carajá is the name of the indigenous group of people occupying the broad strip between the Araguaia River valley and the island of Marais in what is now the state of Tocantins, near its borders with Pará, Goiás and Mato Grosso. The name Karajá comes from the Tupi word meaning “big monkey.” In their own language, they call themselves “iny” (“we”).
Above: members of the Xikrin indigenous people pose for a photograph on July 22, 1967.

Below: geologist Breno dos Santos on December 17, 1967.

Previous page: men crossing the Itacaiunas River in Pará by canoe on August 11, 1967.
city in places with precarious landing strips cleared alongside nut and rubber plantations.

From his camp, Breno and his team members would leave on short explorative flights. The geologist called his team “the Incredible Army of Brancaleone,” in reference to the movie by Mário Monicelli that tells the story of a hapless group of soldiers who try to conquer a kingdom of dreams in medieval Europe. Breno’s reference made sense. The kingdom idealized by the Brancaleone of the Amazon was initially a whitish clearing, covered with stunted plants known by the local people as “canaças de ema” (“emu shins”) – but the location was an El Dorado of iron.

“The clearing was enormous, and there was low undergrowth around, which normally characterizes a ‘canga,’ meaning a region rich in ore very close to the surface, impeding the growth of trees. When I knocked in my hammer, a red substance came out, and I saw it wasn’t manganese – it was iron. I thought: ‘Wow! Everything here is iron!’” recounts Breno. The geologist had already seen similar clearings on previous flights, and was starting to think that everything was part of an immense mineral reserve, of a kind that had never before been discovered on the planet.

It had been working as a geologist for a short time, I was enthusiastic about my discovery, but at the same time I was afraid I could be making a very embarrassing mistake.” But it was no mistake: Breno had discovered 17 billion metric tons of high-grade iron – and as of 1984 (after a lot of research, legal disputes, technological adventures, heroism, political battles, and enterprise), it would lead to a new stage in Vale’s history.

5.2 Vale becomes the global iron ore leader

In the late 1960s, Companhia Vale do Rio Doce’s commercial prospects were excellent. In 1968, the company signed its first long- and medium-term contracts to supply iron ore to a French state-owned steel company (for 15 years), and Italian steelmakers (for three years). Also in 1968, CVRD signed its third contract with seven steel companies in Japan, involving the supply of 2.4 million metric tons of iron per year, for eight years starting in 1971 – a decisive step in strengthening its presence in the Japanese market. This deal shocked the Australian iron producers, who thought their position in Japan was assured, given their geographical proximity.

Benefiting from the global steelmaking boom that began in 1969, CVRD exported 21.8 million metric tons of ore in 1970 (an increase of nearly 200% in relation to 1969), bringing in around US$150 million of revenue to the country. Japan bought practically one-third of this total – which included, for the first time, 750,000 metric tons of pellets. As of 1969, Japan had overtaken West Germany to become CVRD’s biggest customer.

By the end of 1970, the company’s long-term sales commitments amounted to 24 million metric tons of ore and pellets, destined for customers in various countries. In the same year, Vale renewed its agreements, made in 1962 and 1964 with Samitri and Ferteco, respectively, involving the use of its railroad and port facilities to transport iron ore produced by these two foreign companies in the Iron Quadrangle region.

However, the seesaw of global steel production continued with its ups and downs. The boom of 1969-1970 was followed by a slowdown for two years. Even so, in 1972 the company exported 26.1 million metric tons of iron ore and pellets. The following year, as the steel industry heated up once more, the company’s sales...
Raymundo Mascarenhas

Raymundo Mascarenhas (Prado, Bahia, 1928 – Linhares, Espírito Santo, 1997) joined the company in 1957, and 12 years later became its president – the second in-house president in its history. Between 1969 and 1973, he sat on the board of directors of Vale's board of directors, remaining until 1983. In 1973, the company's long-term commitments to supply iron ore amounted to 400 million metric tons, of which 170 million metric tons were to customers in West Germany, Argentina, Austria, Spain, the USA, France, The Netherlands, Switzerland and Poland. At the end of 1974, despite the first signs of a downturn in the international market, the company was now the world's biggest exporter of iron ore. Despite adverse conditions on the international market, aggregated by a deepening crisis in the steel industry, CVRD ended 1975 with very positive results. Modest growth in its physical volume of exports (up 3.5% from the previous year) was outweighed by a 16% rise in its value, due to an increase in the ore price from US$74 to US$112 per metric ton. The company was now the world’s biggest exporter of iron ore, accounting for 16% of world trade in the product. 1

1 See the text in the next chapter. The mineral ore price was not a reflection of the global economic recession. Excess capacity cost pressures and overproduction were other factors that contributed. Demand, on the other hand, is a function of international demand, and the fact that the steel industry was experiencing a deep recession at the time, contributed to the decline in the price. CVRD was in a better position than its competitors, being able to sell ore at a price of US$15 per metric ton ($112 per metric ton in 1975), and the fact that the average iron ore price reached US$15.51 per metric ton, rising operating costs and a stronger cruzeiro contributed to a significant fall in the company’s profit. The combination of an appreciation in Brazil’s currency and a falling average iron ore price would be experienced at various moments, with adverse effects for the company’s financial status.

1 Raymundo Mascarenhas

With its policy of entering new markets, CVRD began supplying iron ore to China, Taiwan and the United States in 1970. The company’s long-term commitments to supply iron ore amounted to 400 million metric tons, of which 170 million metric tons were to customers in West Germany, Argentina, Austria, Spain, the USA, France, The Netherlands, Switzerland and Poland. At the end of 1974, despite the first signs of a downturn in the international market, the company was now the world’s biggest exporter of iron ore. Despite adverse conditions on the international market, aggregated by a deepening crisis in the steel industry, CVRD ended 1975 with very positive results. Modest growth in its physical volume of exports (up 3.5% from the previous year) was outweighed by a 16% rise in its value, due to an increase in the ore price from US$74 to US$112 per metric ton. The company was now the world’s biggest exporter of iron ore, accounting for 16% of world trade in the product. 1

A summary of CVRD’s performance in the first half of the 1970s makes clear how important this period was to the company’s history. Between 1970 and 1975, the volume of ore it exported rose by 16.056 million metric tons, resulting in growth in export revenue of around 285%, from US$160 million to US$570 million. The start of the 1970s saw a worldwide general strike in the international division of labor, a process in which developed countries invested heavily in emerging countries such as Brazil in sectors that directly or indirectly made intensive use of natural resources. This included the development of projects with extensive power consumption, especially in sectors with major environmental impacts, such as mining and pulp.

2 See the text in the next chapter. The mineral ore price was not a reflection of the global economic recession. Excess capacity cost pressures and overproduction were other factors that contributed. Demand, on the other hand, is a function of international demand, and the fact that the steel industry was experiencing a deep recession at the time, contributed to the decline in the price. CVRD was in a better position than its competitors, being able to sell ore at a price of US$15 per metric ton ($112 per metric ton in 1975), and the fact that the average iron ore price reached US$15.51 per metric ton, rising operating costs and a stronger cruzeiro contributed to a significant fall in the company’s profit. The combination of an appreciation in Brazil’s currency and a falling average iron ore price would be experienced at various moments, with adverse effects for the company’s financial status.

2 If the future seemed guaranteed – thanks to the long-term contracts with Japanese steel companies – the present was not as assured. In 1977, for the first time since 1948 (at the height of the post- war crisis), Vale’s performance went into reverse. Its exports fell by 14% in relation to the previous year, from 47.3 to 39.8 million metric tons. On top of lower volumes and export revenues, and despite the fact that the average iron ore price reached US$15.51 per metric ton, rising operating costs and a stronger cruzeiro contributed to a significant fall in the company’s profit. The combination of an appreciation in Brazil’s currency and a falling average iron ore price would be experienced at various moments, with adverse effects for the company’s financial status.

3 “Go ahead, Brazil!”

In 1976, CVRD’s export volumes stayed at practically the same level as in 1975. However, thanks to a further rise in the average ore price, which reached US$15.51 per metric ton, the company received revenues of US$817.7 million, making the US$74 million that was now the biggest contributor to Brazil’s trade balance. To maintain this position, though, government intervention was increasingly necessary.

4 General Ernesto Geisel became president of Brazil in March 1974, succeeding General Emilio Garrastazu Médici, who was known for his overall control of spending and political intolerance. Geisel’s government, which lasted until 1979, was marked by the start of the ‘political opening’ process in the country’s economic field, the president invited in infrastructure, signing a controversial nuclear agreement with Germany and arranging large sums of money to build the Itaipu hydroelectric power project. During his administration – and in particular, together with the Minister of Mines and Energy, Shigeaki Ueki – mining was treated as a matter of state. President Geisel’s visit to Japan in mid-1976 reanimated CVRD’s sales in the Japanese market. In 1976, there was a slight recovery in CVRD’s sales on the international market (to 41.9 million metric tons). New contracts were signed with China (to supply 250,000 metric tons on a trial basis, followed by 14 million metric tons between 1977 and 1980), Qatar, South Korea, Indonesia and the Philippines. At the end of the year, the company signed contracts involving around 609 million metric tons – more than half represented by the Asian market (371 million metric tons), and the rest accounted for by Western Europe (200 million metric tons), Eastern Europe (95 million metric tons) and the Americas (32 million metric tons). It was now selling to 65 customers in 26 countries. In 1978, there was a slight recovery in CVRD’s sales on the international market (to 41.9 million metric tons). New contracts were signed with China (to supply 250,000 metric tons on a trial basis, followed by 14 million metric tons between 1977 and 1980), Qatar, South Korea, Indonesia and the Philippines. At the end of the year, the company signed contracts involving around 609 million metric tons – more than half represented by the Asian market (371 million metric tons), and the rest accounted for by Western Europe (200 million metric tons), Eastern Europe (95 million metric tons) and the Americas (32 million metric tons). It was now selling to 65 customers in 26 countries. In 1978, there was a slight recovery in CVRD’s sales on the international market (to 41.9 million metric tons). New contracts were signed with China (to supply 250,000 metric tons on a trial basis, followed by 14 million metric tons between 1977 and 1980), Qatar, South Korea, Indonesia and the Philippines. At the end of the year, the company signed contracts involving around 609 million metric tons – more than half represented by the Asian market (371 million metric tons), and the rest accounted for by Western Europe (200 million metric tons), Eastern Europe (95 million metric tons) and the Americas (32 million metric tons). It was now selling to 65 customers in 26 countries.
Table 1 shows the movements in CVRD's sales of iron ore and pellets on the global market between 1968 and 1974, broken down by consuming country including the quantity purchased annually by each one and its share of total sales. It was necessary to produce a separate table (Table 2) for the years 1975 to 1978 in order to reflect a change in the criteria used in the company's reports, which meant that data from different countries were grouped into major markets (Asia, Western Europe, Eastern Europe and the Americas). In addition, the figures are more approximate for this latter period.

### TABLE 1

**CVRD'S EXPORTS OF IRON ORE AND PELLETS BY CONSUMING COUNTRY, IN MILLION METRIC TONS (1968-1974)**

<table>
<thead>
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</tr>
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<tbody>
<tr>
<td><strong>West Germany</strong></td>
<td>4,200,317</td>
<td>3,977,001</td>
<td>5,051,822</td>
<td>4,944,124</td>
<td>6,189,613</td>
<td>6,314,645</td>
<td></td>
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<tr>
<td><strong>East Germany</strong></td>
<td>27.9</td>
<td>26.7</td>
<td>20.2</td>
<td>20.0</td>
<td>18.8</td>
<td>16.5</td>
<td>19.7</td>
</tr>
<tr>
<td><strong>Argentina</strong></td>
<td>64,329</td>
<td>156,275</td>
<td>167,676</td>
<td>533,313</td>
<td>468,499</td>
<td>765,774</td>
<td>800,773</td>
</tr>
<tr>
<td><strong>Austria</strong></td>
<td>1,019,537</td>
<td>1,388,246</td>
<td>1,572,112</td>
<td>1,634,597</td>
<td>1,394,570</td>
<td>1,196,130</td>
<td>780,667</td>
</tr>
<tr>
<td><strong>Belgium</strong></td>
<td>272,215</td>
<td>385,941</td>
<td>459,189</td>
<td>354,025</td>
<td>520,480</td>
<td>479,657</td>
<td>616,091</td>
</tr>
<tr>
<td><strong>Canada</strong></td>
<td>2,032</td>
<td>2,002</td>
<td>2,500</td>
<td>1,500</td>
<td>2,000</td>
<td>3,746</td>
<td>448,112</td>
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<tr>
<td><strong>China</strong></td>
<td>82,211</td>
<td>185,049</td>
<td>1,022,147</td>
<td>1,121,550</td>
<td>1,209,244</td>
<td>1,296,746</td>
<td>1,448,202</td>
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<tr>
<td><strong>Czechoslovakia</strong></td>
<td>12.7</td>
<td>12.2</td>
<td>14.4</td>
<td>13.6</td>
<td>14.6</td>
<td>13.4</td>
<td>13.3</td>
</tr>
<tr>
<td><strong>Scandinavia</strong></td>
<td>2,042</td>
<td>3,657</td>
<td>1,000</td>
<td>1,000</td>
<td>1,000</td>
<td>1,000</td>
<td>1,000</td>
</tr>
<tr>
<td><strong>Italy</strong></td>
<td>57,071</td>
<td>105,571</td>
<td>9,082,691</td>
<td>10,000,000</td>
<td>9,000,000</td>
<td>8,399,355</td>
<td>8,838,709</td>
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<tr>
<td><strong>Japan</strong></td>
<td>4,247,386</td>
<td>4,417,190</td>
<td>7,140,081</td>
<td>9,036,758</td>
<td>9,131,163</td>
<td>13,779,881</td>
<td>16,000,156</td>
</tr>
<tr>
<td><strong>Luxembourg</strong></td>
<td>2,052</td>
<td>153,952</td>
<td>191,758</td>
<td>200,952</td>
<td>93,488</td>
<td>135,994</td>
<td>244,671</td>
</tr>
<tr>
<td><strong>Mexico</strong></td>
<td>79,484</td>
<td>154,749</td>
<td>56,142</td>
<td>0.7</td>
<td>0.7</td>
<td>0.7</td>
<td>0.7</td>
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<tr>
<td><strong>Netherlands</strong></td>
<td>37,383</td>
<td>134,605</td>
<td>318,749</td>
<td>101,958</td>
<td>201,949</td>
<td>462,672</td>
<td>507,493</td>
</tr>
<tr>
<td><strong>Poland</strong></td>
<td>77,984</td>
<td>154,749</td>
<td>56,142</td>
<td>0.7</td>
<td>0.7</td>
<td>0.7</td>
<td>0.7</td>
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<tr>
<td><strong>Portugal</strong></td>
<td>45,835</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>Romania</strong></td>
<td>0.4</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>Czechoslovakia</strong></td>
<td>97,745</td>
<td>78,777</td>
<td>145,468</td>
<td>141,481</td>
<td>173,750</td>
<td>325,133</td>
<td>535,542</td>
</tr>
<tr>
<td><strong>Turkey</strong></td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>11,529,329</td>
<td>16,664,597</td>
<td>31,866,036</td>
<td>35,357,525</td>
<td>26,574,415</td>
<td>37,332,972</td>
<td>42,625,872</td>
</tr>
</tbody>
</table>

* Approximate values. Sources: Board of Directors’ Reports 1968-1974

### TABLE 2

**CVRD’S EXPORTS OF IRON ORE AND PELLETS BY CONSUMING GEOGRAPHICAL AREA, IN MILLION METRIC TONS (1975-1978)**

<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>Asia</td>
<td>3.75</td>
<td>3.75</td>
<td>3.75</td>
<td>3.75</td>
</tr>
<tr>
<td>Western Europe</td>
<td>1.8</td>
<td>1.8</td>
<td>1.8</td>
<td>1.8</td>
</tr>
<tr>
<td>Eastern Europe</td>
<td>6.6</td>
<td>6.6</td>
<td>6.6</td>
<td>6.6</td>
</tr>
<tr>
<td>Americas</td>
<td>14.8</td>
<td>14.8</td>
<td>14.8</td>
<td>14.8</td>
</tr>
<tr>
<td>Total</td>
<td>47.9</td>
<td>47.9</td>
<td>47.9</td>
<td>47.9</td>
</tr>
</tbody>
</table>

* Source: Board of Directors’ Reports, 1975-1978*
Vale’s excellent commercial performance on foreign markets between 1968 and 1978 can be attributed to the company’s efforts to adapt its maritime transport infrastructure to its ever more ambitious export targets.

Besides exporting its own production, CVRD through the Vitória-Minas Railroad (EFVM) and its port facilities, also transported the output of Ferteco and Samitri, as described in Chapter 4. The expansion provided through contracts signed almost a decade earlier with these two companies generated good results. The figures available for the years 1974 to 1978, accompanying the exports of both companies, amounted to 33.1 million metric tons. The markets served by Samitri were Western Europe (France, Belgium, West Germany and Luxembourg) and North America (the United States and Canada). Ferteco’s ore was largely sold to West Germany. In 1977, CVRD also began exporting pellets produced by its affiliates, shipping around 500,000 metric tons of the products. The following year, this figure rose to 1.9 million metric tons.

Vale | Our History

CVRD’s average share of Brazil’s total sales of iron ore and pellets between 1968 and 1978, was slightly higher than in the 1961-1967 period, rising from 73.5% to 74.9%. It was not just Vale – by far – that recorded enormous growth in its export volumes. The three largest foreign iron miners operating in Brazil – MBR, Samitri and Ferteco – also experienced extraordinary growth in their foreign sales, due to the growing specialization of production between developed and emerging countries. MBR accounted for approximately 12% of Brazil’s iron exports during this period, while Samitri and Ferteco each represented slightly over 5%.

CVRD’s fleet of ships and international trade

CVRD’s excellent commercial performance on foreign markets between 1968 and 1978, especially in the early 1970s, may largely be attributed to the company’s efforts to adapt its maritime transport infrastructure to its ever more ambitious export targets. In order to consider investing in the building of Docenave, CVRD’s shipping subsidiary, its own fleet was fundamental. The lack of efficient, coordinated logistics systems resulted in higher operating costs, reducing the competitiveness of companies. Investment was made in global supply chains’ logistics systems to improve geostategic positioning, overcoming the peripheral effect of domestic logistics. In these systems, leadership was awarded to the countries that had structures for planning, regulating and investing to ensure a strategic network of logistics infrastructure, based on production centers that continuously added value for consumer markets.

Aware of this competitive trend, in 1970 Docenave received its first new ships, with total transportation capacity of 510,000 deadweight tonnage (DWT). This fleet, composed of ore-oil carriers, was expanded in the following years, reaching a total of 15 ships in 1976, with total transportation capacity of 1.261 million DWT. This included Docenave, an ore-oil carrier of 265,500 DWT, delivered by Japanese shipyard Nippon Kokkan in 1973.

Another important measure was the renewal, in 1968, of a contract with Petróbras by which Docenave committed to transporting large quantities of oil from the Middle East, using its ships returning from Japan, ensuring attractive freight costs in both directions. Likewise, Docenave entered into an agreement with Usiminas to transport the metallurgical coal imported by the steel company. The practice of freight sharing (combining the transportation of different types of cargo, in accordance with the itinerary) would be further intensified in the coming years. The company was improving its competitiveness while helping to develop Brazil’s industrial system.

The sales structure that CVRD established abroad had three main components: Habira Eisenerz, a subsidiary succeeded by Rio Doce Europa (RDE), founded in January 1974 and headquartered in Brussels, responsible for selling the company’s products in Europe, as well as importing equipment and materials from there; Habira International Corporation (Habo); and Rio Doce America (RDA), a wholly owned subsidiary of Habo, headquartered in New York, tasked with selling iron ore and pellets in the USA, Canada, Mexico, and Trinidad and Tobago. CVRD’s negotiations with Japan continued to take place directly between the company and Japanese trading companies.
As it expanded its exports, Vale also significantly increased its sales in Brazil. Its share of the domestic iron ore market rose from 18.3% in 1976 to 34.4% in 1978. Among the various deals made during this period, it is worth emphasizing contracts signed in 1973 for the long-term supply of a special type of pellet to Usina Siderúrgica da Bahia (Usiba) and Aços Finos Piratini (in Rio Grande do Sul), companies that were pioneering direct-reduction steel production in Brazil.

CVRD’s steady expansion of sales in the country – largely to Usiminas, its biggest customer, but also to Cosipa, CSN, Usiba and other smaller steel mills – justified the establishment, in 1973, of Navegação Rio Doce Ltda., a Docenave subsidiary dedicated exclusively to coastal shipping rather than long-distance shipping.

Table 3 presents information on the company’s sales volumes in Brazil between 1968 and 1978, showing the quantity purchased by each main customer and its share of total sales, sources permitting.

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As soon as General Ernesto Geisel became President of the Republic in 1974, Fernando Roquete Reis (Belo Horizonte, Minas Gerais, 1932 – Rio de Janeiro, 1983) was appointed president of Vale. Mining in Brazil was going through strategic changes, with a focus on domestication and foreign trade, and Reis, who had a solid background in economic policy (having served as director of Brazil’s Central Bank, finance minister of Minas Gerais State Government, and organizer of the postgraduate Economics course at UFMG, among other positions), seemed the right man to run the company in its new phase. It was within Brazil’s frontiers, namely in the Carajás Mountains, that Reis would prove that Geisel’s choice had been wise. Reis led the entire legal dispute involving Vale and United States Steel (partners in Amazônia Mineração S.A.) for control of the exploitation of the world’s biggest iron ore reserve.

11 - About this subject, see “Reis, Fernando Antônio Roquete,” DHBB, vol. 5, pp. 4,954-4,955.

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**TABLE 3**

<table>
<thead>
<tr>
<th>YEAR</th>
<th>SALES</th>
<th>CUSTOMER</th>
</tr>
</thead>
<tbody>
<tr>
<td>1968</td>
<td>877,366</td>
<td>-</td>
</tr>
<tr>
<td>1969</td>
<td>1,021,674</td>
<td>Usiminas – 1,011,884; others (Itabira Agro-Industrial and Fertimetal) – 9,790</td>
</tr>
<tr>
<td>1970</td>
<td>1,163,102</td>
<td>Usiminas – 1,146,672; others (Itabira Agro-Industrial, Fertimetal, Ferrovel, and Cober) – 16,430</td>
</tr>
<tr>
<td>1971</td>
<td>1,317,122</td>
<td>Usiminas – 1,305,088; others (Itabira Agro-Industrial, Fertimetal, Ferrovel, and Cober) – 12,034</td>
</tr>
<tr>
<td>1972</td>
<td>1,876,477</td>
<td>Usiminas – 1,540,364; Cosipa – 76,214; CSN – 31,520; others (Usiba, Aços Finos Piratini, etc.) – 8,690</td>
</tr>
<tr>
<td>1973</td>
<td>2,137,225</td>
<td>Usiminas – 1,628,899; Cosipa – 112,306; Usiba – 19,467; CSN – 255,427; others – 101,126</td>
</tr>
<tr>
<td>1974</td>
<td>2,244,008</td>
<td>Usiminas – 1,382,149; Cosipa – 263,463; Usiba – 239,757; CSN – 106,670; others – 251,969</td>
</tr>
<tr>
<td>1975</td>
<td>2.8 million</td>
<td>-</td>
</tr>
<tr>
<td>1976</td>
<td>3.2 million</td>
<td>-</td>
</tr>
<tr>
<td>1977</td>
<td>5.9 million</td>
<td>-</td>
</tr>
<tr>
<td>1978</td>
<td>9.5 million*</td>
<td>Usiminas, Cosipa, CSN, Usiba, Aços Finos Piratini, and Cimetal</td>
</tr>
</tbody>
</table>

* Including sales of concentrate to the company’s pellet-producing affiliates. Sources: Board of Directors’ Reports, 1968-1978.
5.3 Expansion of the mine-railroad-port complex

Rising exports and new production targets demanded constant improvements in CVRD’s mine-railroad-port complex, the structure around which the company revolved. A large share of investment was focused on expanding the transportation capacity of the EFVM, which had practically reached saturation point, especially after the incorporation in 1959 of a further 158 kilometers of track by the Desembargador Drumond branch line, extending it from Costa Lacerda to Fábrica in Minas Gerais, and establishing a link with the Central do Brasil Railroad. The extension of this branch line significantly increased train movement on the railroad. Besides serving CVRD, Semimóveis, and Fornecer, the EFVM also transported imported metallurgical coal for Usiminas, Acesita, Belgo-Mineira and other steel companies in the Iron Quadrangle region.

With its new branch line, the EFVM started to function as an export corridor for the output of small steel mills and pig iron manufacturers located in the west of Minas Gerais. Before long, steel products were in third place – behind iron ore and coke – in the list of items transported by the railroad, which also included timber, charcoal and grains, as well as passengers.14 Things were also changing at the other end of the railroad tracks, at the port. In the late 1960s, the company began implementing a centralized, integrated communications and traffic control system, in order to optimize traffic capacity along the railroad with maximum safety. Locomotive movements would be controlled from a single dispatch center. The project also involved implementing an automatic train car identification system and acquiring two automatic scales to weigh moving trains.

To definitively resolve the EFVM’s overloading problem, in 1971 work began on double-tracking 548 kilometers of the main line. This project was completed in 1977.15 Meanwhile, considerable sums were also invested in expanding the Port of Tubarão.16 Work at the port, executed between 1970 and 1974, included dredging the access channel and ship-turning basin, building a new pier with a water depth of 24 meters, capable of receiving bulk carriers of more than 250,000 DWT, where two ship loaders would be installed, and creating a goods yard around 150,000 m² in area and a new fines stockyard, built on land reclaimed from the sea using dredged material, and sheltered by a breakwater.

By the end of the decade, the Port of Tubarão, now consisting of two piers and a dry dock for maneuvering, and protected by a breakwater, had an annual loading capacity of 75 million metric tons. The port’s loading and unloading operations were coordinated manually, basically consisted of removing ore from train cars using four car dumpers, and then taking it by conveyor belt to its scheduled destination – the holds of ships or one of the two stockyards. The stockyards, equipped with three stackers, were capable of storing 5.6 million metric tons of 20 different kinds of products. When the time came to ship out the ore, the company used bucket wheels to remove it from the piles and place it onto conveyor belts leading to the piers. While the ore was being transferred onto vessels, small samples of the product were constantly taken to be examined at sampling stations located next to the terminal, providing information on the cargo’s grain size and chemical composition, to ensure that purchasers’ specifications were met. To make any necessary corrections, alongside the quay CVRD installed a screening plant capable of processing 12,000 metric tons of ore per hour.

14 – Regarding EFVM’s investments, see Board of Directors’ Reports, 1968-1978; and Fernandes, Francisco do Rego (org.), Estatísticas do Rio Grande do Sul, op. cit., vol. 1, p. 91.

15 – In 1978, the railroad carried (for CVRD and third parties) 48.7 million metric tons of ore, charcoal and grains, as well as passengers. See Fernandes, Francisco do Rego (org.), op. cit., vol. 1, pp. 91-92.

16 – To definitively resolve the EFVM’s overloading problem, in 1971 work began on double-tracking 548 kilometers of the main line. Work at the port, executed between 1970 and 1974, included dredging the access channel and ship-turning basin, building a new pier with a water depth of 24 meters, capable of receiving bulk carriers of more than 250,000 DWT, where two ship loaders would be installed, and creating a goods yard around 150,000 m² in area and a new fines stockyard, built on land reclaimed from the sea using dredged material, and sheltered by a breakwater. This project was completed in 1977. Meanwhile, considerable sums were also invested in expanding the Port of Tubarão. Work at the port, executed between 1970 and 1974, included dredging the access channel and ship-turning basin, building a new pier with a water depth of 24 meters, capable of receiving bulk carriers of more than 250,000 DWT, where two ship loaders would be installed, and creating a goods yard around 150,000 m² in area and a new fines stockyard, built on land reclaimed from the sea using dredged material, and sheltered by a breakwater.

17 – The new pier, equipped with a fully automatic and signaling system on both tracks, and located at an agreement with the Federal Railroad Network (RFFSA) and Usiminas, CVRD began constructing a transshipment yard near Miguel Burnier Station, in order to accommodate the iron ore trains from the Feijó branch. The extension of this branch line significantly increased train movement on the railroad, and the construction and equipment of a new transshipment yard near Miguel Burnier Station eliminated the need for 180 kilometers of journeys between steel producers in the Iron Quadrangle region served by the EFVM and centers of consumption. CVRD began constructing a transshipment yard near Miguel Burnier Station, in order to accommodate the iron ore trains from the Feijó branch. The new pier, equipped with an automatic control and signaling system on both tracks, and located at an agreement with the Federal Railroad Network (RFFSA) and Usiminas, CVRD began constructing a transshipment yard near Miguel Burnier Station, in order to accommodate the iron ore trains from the Feijó branch. The extension of this branch line significantly increased train movement on the railroad, and the construction and equipment of a new transshipment yard near Miguel Burnier Station eliminated the need for 180 kilometers of journeys between steel producers in the Iron Quadrangle region served by the EFVM and centers of consumption.

18 – Regarding the expansion of CVRD’s port facilities, see Fernandes, Francisco do Rego (org.), op. cit., vol. 1, pp. 91-93, and Board of Directors’ Reports, 1968-1978.

Opposite page: The ore stockyard at Tubarão.
The ship Docecanova at Tubarão Maritime Terminal in Espírito Santo.
During the following decades, the Itabira region would face a serious limitation: if the pace of extraction were to continue, the iron-bearing horizon would be completely exhausted by the end of the century. It was vital for the company to optimize the production of the Itabira deposits, the two main bodies of ore: the Itabira iron ore deposit, extending over 400 kilometers, and the Bambuí iron ore deposit, embedded in the Bambuí schist along a 120-kilometer stretch. The mine was 12.5% owned by the company and had an estimated reserve of 700 million metric tons, 30% of it in high-grade ore. In 1969, the company decided to build a new pelletizing plant, which had a nominal production capacity of 2 million metric tons of pellets per year. It was completed in 1970, and the company was left with deposits of lower-grade itabirite, as waste products accumulated, high-grade ore began to be used up, and the company was left with deposits of lower-grade itabirite, it was decided to go deeper at Cauê.

New facilities at Cauê Mine were opened in 1973, and in the same year, the Bambuí Project was launched. It involved the construction of new facilities for processing ore at both mines and a single tertiary crushing and screening unit next to the mine. In all, around US$400 million was invested in new mechanized facilities for processing ore at the two mines, and the company was left with deposits of lower-grade itabirite, as waste products accumulated, high-grade ore began to be used up, and the company was left with deposits of lower-grade itabirite, it was decided to go deeper at Cauê. New facilities at Cauê Mine were opened in 1973, and in the same year, the Bambuí Project was launched. It involved the construction of new facilities for processing ore at both mines and a single tertiary crushing and screening unit next to the mine. In all, around US$400 million was invested in new mechanized facilities for processing ore at the two mines, and the company was left with deposits of lower-grade itabirite, as waste products accumulated, high-grade ore began to be used up, and the company was left with deposits of lower-grade itabirite, it was decided to go deeper at Cauê.

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and it could be renewed if more time were required for Itavale to complete studies of its reserves and produce a definitive plan to extract them. Mining activities at the Petiquito deposit began in 1976, and in its first year the mine produced 3.6 million metric tons of iron ore, rising to 3.8 million metric tons in 1977 and 5.9 million metric tons in 1978.

A second project aimed to develop Capixaba Mine, in the municipality of Ouro Preto, Minas Gerais, whose mining rights belonged to the Kawasaki Steel Corporation. To proceed with the project, a new company, Mineração Serra Geral (MSG), was set up in October 1976, through an association between CVRD (51%) and a group of Japanese companies led by Kawasaki Steel. 21 In order to process the ore produced at Capixaba Mine, in 1977 CVRD began another initiative, called the Timbopeba Project. As well as processing ore from Capixaba, this project also involved mining and processing ore from the neighboring deposit of Timbopeba, also in Ouro Preto. Acquired by the company in 1967, the Timbopeba reserve contained an estimated 110 million metric tons of hematite and 50 million metric tons of magnetite.

CVRD’s traditional mines of Cauê, Conceição and Dina Coreną, together with the new mining operations developed elsewhere in Minas Gerais, produced rapid growth in output in the 1970s. The company’s set of mining operations in the Iron Quadrangle produced 350 million metric tons of ore over the course of the decade, giving rise to various types of products. Output of pellet feed and sinter feed grew significantly during this period, and by 1977, these items accounted for 13.8% and 36%, respectively, of CVRD’s total production. However, there was a decline in the company’s share of Brazilian iron ore output, from 56.8% in 1970 to 48.3% in 1975 and 43.3% in 1978, as shown in Table 4.

CVRD’s investments to expand its mine-railroad-port complex were to a large extent enabled by funding and loans from various international entities, notably Eximbank, the Export-Development Corporation (EDC), Chase Manhattan Bank, Chemical Bank, Commerzbank AG, Austrian group Vereinigte Oesterreichische Eisen- und Stahlwerke AG (VOEST), Mitsubishi Bank Ltd., Matsushita Co. Ltd., Mitsu & Co. Ltd., and the Inter-American Development Bank (IDB). Brazilian funding agencies that lent to the company during this period included the National Economic Development Bank (BNDE), 22 Banco do Brasil, and the Minas Gerais Development Bank.

### TABLE 4

<table>
<thead>
<tr>
<th>YEAR</th>
<th>CVRD’S PRODUCTION</th>
<th>BRAZILIAN PRODUCTION</th>
<th>CVRD/BRAZIL %</th>
</tr>
</thead>
<tbody>
<tr>
<td>1968</td>
<td>11,830</td>
<td>25,123</td>
<td>47.1</td>
</tr>
<tr>
<td>1969*</td>
<td>14,875</td>
<td>27,157</td>
<td>54.8</td>
</tr>
<tr>
<td>1970*</td>
<td>20,024</td>
<td>30,381</td>
<td>52.8</td>
</tr>
<tr>
<td>1971*</td>
<td>19,740</td>
<td>37,484</td>
<td>52.7</td>
</tr>
<tr>
<td>1972*</td>
<td>25,043</td>
<td>46,713</td>
<td>53.8</td>
</tr>
<tr>
<td>1973*</td>
<td>30,304</td>
<td>51,056</td>
<td>55.1</td>
</tr>
<tr>
<td>1974*</td>
<td>42,675</td>
<td>91,488</td>
<td>46.6</td>
</tr>
<tr>
<td>1975</td>
<td>52,227</td>
<td>108,162</td>
<td>48.3</td>
</tr>
<tr>
<td>1976</td>
<td>60,883</td>
<td>107,395</td>
<td>46.4</td>
</tr>
<tr>
<td>1977</td>
<td>45,796</td>
<td>100,817</td>
<td>45.1</td>
</tr>
<tr>
<td>1978</td>
<td>45,000</td>
<td>103,896</td>
<td>43.3</td>
</tr>
</tbody>
</table>

* From 1969 to 1974, CVRD’s export volume exceeded its production level. This is explained by its increasing use of stocks of fines accumulated by the company. Sources: Fernandes, Francisco Rego (org.), op. cit., vol. 1, p. 176; AEB 1978, p. 418.

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21 Kawasaki Steel had a 24.5% stake in MSG, together with Mitsubishi Mining (8.67%), Nippon Trading Co. (7.16%), Kawasaki Corp. (6.2%), Kawasaki Research Co. Co. (5%), Nissho-Iwai Co. (4.92%), C. Itoh and Co. Ltd. (4.92%), and Toyo Metals Shokai (1.96%).

22 The BNDE was established in 1952 to promote the government’s national economic development policy. In the early 1980s, the bank incorporated the management of a new tax associated with social issues. As a result, in 1982 the bank’s name was changed to the National Economic and Social Development Bank (Banco Nacional de Desenvolvimento Econômico e Social, or BNDES). See BNDES – História, available at <http://www.bndes.gov.br/SiteBNDES/bndes/bndes_pt/Institucional/O_BNDES/A_Empresa/historia.html>.
It is said that during a visit to the Carajás Mountains in Park, Zhao Ziyang, the prime minister of China, seeing a large outcropping of iron ore sticking out of the ground, told CVRD’s geologists: “Your ancestors must have pleased God for him to have given you so much. I am envious of you!” Ziyang, who was in Brazil from October 30 to November 4, 1987, “was the second most senior official in the Chinese government and the person responsible for the country’s economic liberalization.

The Carajás Mountains are a set of ridges and plateaus rising to between 300 and 400 meters above the surrounding land, reaching altitudes of around 600 meters above sea level. Located between the Xicaracu and Parauapebas rivers, tributaries of the Tocantins, the mountains are almost entirely covered with equatorial forest. Although it had made its discovery three years previously, US Steel, which in this case are related to iron deposits. The region also has manganese, copper, gold, nickel and much more. Itacaiunas and Parauapebas rivers, tributaries of the Tocantins, altitudes of around 660 meters above sea level. Located between the Xicaracu and Parauapebas rivers, tributaries of the Tocantins, the mountains are almost entirely covered with equatorial forest.

The Carajás Mountains, revealing the region’s potential to the world. Although it had made its discovery three years previously, US Steel subsidiary Companhia Mineral de Mineração had not yet started to exploit the area’s mineral, for various reasons. The seeing the discovery of iron ore reserves of Carajás between the Brazilian state-owned enterprise and the American company that discovered them constitutes an important chapter in CVRD’s history in the 1970s.

As seen earlier, the research conducted by Companhia Mineral in the Carajás Mountains, which resulted in the discovery of the region’s iron-bearing potential, had the original objective of finding new manganese reserves. Before Meridional came to the region, Union Carbide had discovered manganese deposits in 1966 in the Serrenos Mountains. Also, in Park, its main office in Brazil, the largest iron ore discovery in the world. The Brazilian government’s interest in its iron reserves was not viewed favorably by the Brazilian government. Based on restrictions established in the Mining Code on the number of prospecting licenses that a single company could hold, the DNPM stalled the process of granting permits for the region until mid-1969. That was when the government managed to persuade the American company to include CVRD as majority partner in a unified mineral research project covering an area of 160 million hectares. The agreement was signed in April 1970, establishing the Amazônia Mineração S.A. (AMZA) joint venture, owned by CVRD (51%) and Companhia Mineral de Mineração (49%). AMZA was tasked with implementing the Carajás Iron Project.

Later in 1970, AMZA began the geological surveying of its reserves, completed in 1977, which would reveal the existence of around 37.5 billion metric tons of ore with an average iron content of 62.5%. Given these results, the joint venture immediately initiated technical and financial feasibility studies for exploiting the deposits to be conducted by Violino Serviços Técnicos Ltda., as well as negotiations with the DNPM to obtain the right to mine in the region.

The conclusions of these studies were presented in May 1974 and, the same year, the DNPM authorized mining operations. Budgeted at US$930 million, the Carajás Iron Project planned to extract 12 million metric tons of iron ore per year as of 1977, reaching output of 50 million metric tons per year by 1985. The main
destinations for the ore would be the North American, European and Japanese markets. To transport the ore from the mine to the coast, an 802-kilometer railroad – the Carajás Railroad – would be built, linking Marabá in Pará to Ponta da Madeira in São Marcos Bay in the municipality of Itaituba. In the second phase, which was not built, a port capable of receiving ore carriers of up to 280,000 DWT would be constructed.

The environment, nationalism and controversy
Carajás was no ordinary project. All stages of its development involved money politics, the environment, human rights, nationalism – and a great deal of controversy. One of the most contentious points was AMZA’s decision to build a railroad rather than using waterways. The initial option was to make use of the Pará and Maranhão rivers. Some sections of society argued that implementing a waterborne solution – involving the construction of a port in Espadarte at the mouth of the Pará River, near Belém – would not only benefit communities along the river, but would also avoid expensive and imported locomotives, tracks and metal bridges. The solution could be implemented by the Brazilian shipbuilding companies, in whose favor was the control of the sector of people even suspected that US Steel’s preference for a railroad was the result of confidential agreements with CVRD guaranteeing the American group the right to supply the equipment required to build and operate the railroad.

In fact, CVRD’s preference for the railroad solution was based not only on technical and financial considerations, but above all on strategic factors. The Port of Espadarte would only be able to receive small ships. At that moment, selecting Espadarte could make it impossible to sell ore to Europe, which the company considered its primary market, thereby making the project completely dependent on the North American market. The discussions concerning which transportation system should link the mine to the port (waterway or railroad) also involved, among other actors, the governments of Pará and Maranhão, each seeking to guarantee its own state’s position and share of the project. The issue continued to be debated until 1976, when the government of the State of Pará signed an agreement to the effect that AMZA would be dissolved and the railroad would be built.

Joel Mendes Rennó
When he was appointed CVRD’s president in 1978, Joel Mendes Rennó (JMJM, 1921-1999) was already intimately familiar with the company’s mining policy. Since 1975, he had been an advisor on strategic affairs to the Minister of Mines and Energy, Shigeki Uno, and was responsible for relations between the ministry and state-owned companies. Rennó’s main goal as president was to implement the Greater Carajás Project. This occurred in 1975.

A qualified engineer who graduated from the Federal University of Itajubá, Rennó spent a relatively short time at the company. During his administration, he prioritized the construction of the Carajás Railroad, which would transport iron ore from the mine to the port (waterway or railroad) also involved, among other actors, the governments of Pará and Maranhão, each seeking to guarantee its own state’s position and share of the project. The issue continued to be debated until 1976, when the government of the State of Pará signed an agreement to the effect that AMZA would be dissolved and the railroad would be built.

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reserves, in turn, would require new and growing investment in processing. Therefore, high-grade iron from Carajás would be welcome on the international market.

Secondly, CVRD made an optimistic diagnosis of the market’s prospects, forecasting an upturn in sales as of 1985. By that time, it was thought that Carajás’ output, given its excellent quality, would enable the company to meet new demands and also serve markets already supplied by the mines of the Doce River System, retaining the reserves of Minas Gerais to be allocated preferentially to support the Brazilian steel industry.

Carajás Mineral Province

In order to implement the Carajás Iron Project, Eliezer Batista, then president of Vale, needed the support of the World Bank (among other institutions), at the time led by Robert McNamara, former Secretary of State in John F. Kennedy’s government. Eliezer described McNamara as one of the most intelligent and fascinating people he had ever met. “No one could convince him with the sales pitch of a carpet salesman,” he said. “As a banker, he wanted a return on investment.” Eliezer personally checked every detail of the project, and four years of work was necessary before he presented it. Yet in just three meetings with the American, he got the green light. However, this was not enough to get the project off the ground.

Information reported by both the Brazilian and foreign press, obtained by researchers and non-governmental organizations engaged in defending the rights of indigenous peoples, showed the need for the Brazilian government to work together with indigenous communities. This contributed to the World Bank – one of the main financiers of the Greater Carajás Project[30] – imposing certain conditions on the granting of further resources to continue the venture. Accordingly, the World Bank indirectly took on the role of supervising it, representing the interests of the other creditors, and the Bank’s support would guarantee the success of the initiative’s implementation.[31] From this point on, funding for the Brazilian government would depend on the project’s success. The eastern portion of the Amazon was considered a region that was hard to integrate, almost impenetrable. By this time, major reserves of bauxite, manganese, cassiterite, copper, nickel and gold had already been discovered in the region, and it would be possible to harness them together by using the Carajás Iron Project’s infrastructure.

In February 1978, convinced of the importance of the venture, the Economic Development Council authorized the construction of the Carajás Railroad, which began in July, with the building of the first 82-kilometer stretch. The project was only implemented more intensively, however, as of 1979, during the government of João Figueiredo. From that point onward, Carajás would become CVRD’s top-priority project.

[30] Besides the World Bank, with US$305 million, participants in funding the Carajás Iron Project also included the BNDE, the European Economic Community, Japan and, later, American commercial banks and the USSR.


Finally, there was the establishment of Docegeo, which would unify CVRD’s geological research (by introducing planning and, above all, technology) and employ some of the country’s best geologists. Interested in expanding and diversifying its investments in the mining sector, in July 1971 CVRD established Rio Doce Geologia e Mineração S.A. (Docegeo). A wholly owned subsidiary, Docegeo was tasked with exploring and harnessing mineral deposits, both in Brazil and abroad. The subsidiary’s articles of incorporation also predicted “searching for, researching and mining solid mineral and fossil fuel substances, and the distribution and sale of its products, whether raw, processed or industrialized.” The pioneering age of geological research – with men driven by instinct, rustic maps, hammers and courage – was coming to an end. The company had realized that its productivity would multiply through prior research and the use of technical apparatus capable of anticipating discoveries of mineral deposits and their economic value. Docegeo – as will be seen below – soon set the benchmark for more feasible exploration of the country’s underground resources. It would also complement the diversification plan developed by CVRD at the end of the decade.

According to its articles of incorporation, the new company would not be restricted to CVRD projects, and could also “participate in other companies directly or indirectly related to its corporate objectives, as partner or shareholder,” as well as “provide third parties with any services related to the aforementioned corporate objective.”

In practice, the company was the pioneer in mineral prospecting in the country. Its dedication to geological investigation and the development of underground sampling and exploration technologies had a significant effect: three years after establishing this subsidiary, CVRD would become the world’s leading iron exporter, accounting for 16% of the seaborne trade in the product. 36

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35 - See “CPRM lança as bases para a modificação de assistência financeira à pesquisa.” Mineração Metalurgia, August 1979, p. 6, and “A companhia de pesquisa e recursos minerais (CPRM) está considerando ser uma ‘armadora’.” Mineração Metalurgia, February 2007, p. 18.
Headquartered in Rio de Janeiro, Docegeo began operating in 1972 with a workforce of 70 geologists. To determine its subsidiary’s operational details, CVRD hired the services of consulting firm Terraservice, owned by American geologist Gene Tolbert, one of the people responsible for discovering Carajás. The consultancy’s first measure was to hire foreign geologists, geochimists and geophysicists.

Docegeo’s initial objectives were defined in its First Three Year Plan for Geological Prospecting (1972-1974), which established the priority of working with 14 minerals, namely bauxite, beryllium, cassiterite, lead, nickel, gold, titanium, tungsten and zinc. Vale wanted more than just global leadership in iron ore production.

Significant investment was made in the new company in the early 1970s. Docegeo had a total of 2,000 employees. By the late 1970s, the subsidiary had 1,200 employees in Belém alone, while a project was being conducted in the Palmas Mountains of Pará. Besides geologists and scientists, the company employed professionals with expertise in aerial and waterway transportation, as well as land vehicles (jeeps, pickup trucks, and large trucks).

The geological equipment produced in Brazil – probes and drills, for example – was now obsolete. Domestic industry had not kept up with the innovations in machinery developed in countries such as Canada and Australia. Consequently, Docegeo conducted a program to bring together Brazilian companies and the ENIDE, which, in turn, based on this demand, created a funding program for the technological updating of Brazilian geological machinery.

The prospecting strategy adopted was very wide-ranging, covering research into already known deposits, based on negotiations with concession-holders, surveying of new deposits near known ones, and the search for new reserves in virgin areas. The priority, however, was on projects targeting associations of different minerals to facilitate its activities on a national scale. Between 1971 and 1972, Docegeo formed four regional prospecting districts, determined in line with plans the government’s, covering the North region and Maranhão; headquartered in Belém, the Center-West, encompassing the states of Goiás, Mato Grosso and Mato; headquartered in Goiânia, the Center-East, covering Minas Gerais and Espírito Santo; and the South, headquartered in Salvador, to operate on the Northeast region. Besides these districts, offices were also opened in Arara (Mato Grosso) and Cachoeiro do Itapemirim (Espírito Santo). In 1976, a new Southeast district was formed, headquartered in São Paulo, extending the company’s activities towards the south of the country. The latter district was closed down two years later, however.

Also in 1971, in accordance with the recommendation of the first National Development Plan, the government approved a Basic Scientific and Technological Development Plan. Within the scope of the Ministry of Mines and Energy, this plan prioritized three projects related to mining: the implementation of CVRD’s Basic Scientific and Technological Research Department, to support Docegeo’s geological prospecting program; stimulation for CVRD’s CPM research program, and the establishment of the CPRM Research Center. Funded in Rio de Janeiro in 1973, and 1974. All of these projects sought to contribute to removing one of the biggest obstacles to raising the country’s mineral production: a lack of expertise in one processing technology.

In June 1976, due to CVRD’s need to centralize its mineral research activities, and then conducted independently by CPM and Docegeo, it established its Mineral Research Subdepartment’s Office (Superintendência de Pesquisas Minerais, or Supem), linked to the company’s administrative structure. Supem was made responsible for geological and mineral research in all sectors except iron ore.

Between 1971 and 1978, CVRD transferred around US$23 million to Docegeo, most of which was invested in the Amazon district. Major achievements in this district during this period included the following: the discovery in 1973 and 1974 of significant bauxite deposits in Ponteiras, Almenem and the Jutaí Mountains in Pará; leading CVRD to implement an aluminum production complex in the Amazon; the discovery of significant bauxite deposits in Araxá, Minas Gerais; and the evaluation of phosphate deposits in Tapira and Salitre in Espírito Santo. In 1979, a new Southeast district was formed, headquartered in São Paulo, extending the company’s activities towards the south of the country. The latter district was closed down two years later, however.

As will be seen in the following chapters, until 2003, Docegeo’s activities in the Center-East district centered on evaluating the Tapira and Salitre phosphates and titanium reserves in Minas Gerais, and identifying the limestone deposits of Cachoeiro do Itapemirim in Espírito Santo. The Southeast district, during its two years of existence, contributed through the discovery of some promising occurrences of lead and zinc, which were transferred to the Ionitour and Banespas groups, and an evaluation of copper and molybdenum deposits detected in Carpaíba do Sul in the state of Rio Grande do Sul.

Overall, the work conducted by Docegeo during the 1970s allowed CVRD to add more than 35 new mineral deposits to its portfolio, containing 31 types of minerals and located in 15 different parts of Brazil. Finally, it is worth noting the valuable work performed by CVRD’s Technological Research Department (Departamento de Pesquisas Tecnológicas, or Deteg), based at the “km 14” point on the BR-262 highway 25 kilometers from Belo Horizonte. Deteg’s work enabled the economic exploitation of mineral deposits discovered and studied by Docegeo. Deteg’s main achievements in the 1970s included technological, capacity-building projects to make use of the company’s iron reserves in the Iron Quadrangle, and the development of processes to concentrate phosphate rock and extract ore from the Tapira and Salitre deposits and for the mechanical, metallurgical and chemical processing of bauxite, nickel, manganese, copper and gold deposits discovered in the Carajás region.

Between 1969 and 1973, CVRD established around 30 small subsidiaries. At the end of the decade, the CVRD group, including AMGA, Docegeo and this set of subsidiaries, had managed to significantly expand its mineral rights, holding 1,151 research and 21 mining concessions in 13 Brazilian states, covering a total of 3,914 hectares.

As will be seen in the following chapters, until 2003, Docegeo would be the company’s main research unit. From that point onwards, new technology projects and institutes would be constructed, continuing and extending the work begun by geologists in the late 1960s.

5.7 Going beyond iron

At the end of the 1960s, Vale was interested in expanding and, above all, diversifying its activities beyond iron ore production. At that time, the company’s leaders believed that Vale’s path...
to growth could not be based exclusively on the sale of iron ore. The implementation of this policy, however, was delayed until the end of the next decade, given that the company’s resources were committed to the expansion of its mine-railroad-port complex, especially the construction of the Port of Tubarão. Docegeo was an important driver in this area.

CVRD’s first diversification project was the establishment in 1967 of Florestas Rio Doce S.A., a subsidiary focusing on reforestation activities in Minas Gerais. In 1969, the company set up another subsidiary with the same purpose, this time in Espírito Santo: Rio Doce Madeiras S.A. (Docemade). Over the next 10 years, driven by the vigorous expansion of its iron ore sales, CVRD multiplied its areas of activity, especially in the mining and metallurgical sectors, becoming involved simultaneously in various projects to produce bauxite, alumina, aluminum, manganese, titanium, phosphates/fertilizers, and timber/pulp.

Alongside these ventures, which diversified CVRD horizontally, new vertical investment projects were also developed to process and industrialize the company’s iron ore output, involving the manufacture of pellets, magnetic ferrites and steel products. From the start, this vertical diversification policy was also an evident priority for the new sectors that CVRD entered.

To support the company in executing its diversification program, Rio Doce Engenharia e Planejamento (RDEP) was established in 1971 to provide technical assistance in the field of engineering. This subsidiary was tasked with conducting feasibility studies and managing new industrial projects. (This company was closed down in 1979.) In December 1976, CVRD set up another subsidiary, Rio Doce International Finance Ltd. (RDIF), headquartered in Georgetown, Guyana, to provide financial and marketing consultancy services. RDIF was directly controlled and 90% owned by CVRD. The remaining shares in RDIF were owned by group subsidiaries Rio Doce Europa (5%) and Seamar Shipping Corporation (5%).

CVRD’s strategy seems to have been determined much more by market considerations than by the need for capital or technology, although these factors were also important. The entry of external capital enabled the simultaneous development of various projects, which generally involved heavy investment and long maturity periods. For foreign investors, in turn, the establishment of joint ventures with the Brazilian state-owned enterprise was of interest, above all, as a means of guaranteeing the regular supply of raw materials and basic inputs for their plants and reducing their costs of production.

This explains CVRD’s partnerships with business groups from Japan, its main iron ore customer, to jointly develop projects directly related to the Japanese economy’s needs (aluminum, pellets and pulp).
Finally, CVRD’s diversification policy aimed to serve government interests. In the Brazilian government’s opinion, the experience acquired by the company in mining, transportation and foreign trade, as well as its elevated status outside the country, needed to be applied to attract foreign investment and expand exports. Accordingly, besides operating as a profit-making enterprise, CVRD also played a strategic role in implementing national development plans and executing Brazil’s mining policy.

Beginning in 1974, CVRD’s diversification projects acquired a growing weight in its investment program. In the company’s budget for the 1976-1980 five-year period, such projects were allocated 32.7% of all its planned investment for 1976. As of 1978, more money was invested in diversification initiatives than in the expansion of iron ore production. The most favored sector was aluminum, which received 30% of the diversification program’s investments in 1976 and 1978, slightly more than the Carajás Iron Project.

This trend would be reversed at the end of the decade due to a number of internal and external factors. On the one hand, the decline in CVRD’s profits from iron ore sales, caused by a downturn in the global steel industry, reduced its investment capacity. On the other hand, a worsening of the international economic crisis limited the possibility of raising new funds abroad, aggravating the company’s financial situation and compromising the development of its diversification projects. Given this situation, as of 1979, CVRD would be pressured by the government led by General João Figueiredo to review its investment program, concentrating resources on mineral extraction ventures (especially the Carajás Iron Project) and transferring control of some of its projects to the private sector.

43 - See Mário de Souza, Marcio Thyresson, “Conferência na ESG,” September 1970, cited by Abranches, Sérgio and Dain, Sulamis, op. cit., p. 84.

For foreign investors, the establishment of joint ventures with the Brazilian company was of interest, mainly as a means of guaranteeing the regular supply of raw materials and basic inputs for their industry.