

# The geopolitics of aluminum – an introduction

By GRESEA

In recent years the bauxite, alumina and aluminium industries have undergone profound structural changes.

In a series of articles GRESEA will look at the forces behind these changes. In the first article the major actors in the market are identified and the links between them outlined. The article also examines the functioning of the production chain in the industry.

The formation of the International Bauxite Association (IBA) ten years ago coincided with the first signs of the energy crisis and a general slowdown in international economic activity. Around 1980 a certain falling-off in the demand for primary aluminium occurred. After a drop of 4 per cent in 1980, the Western world's consumption diminished by 6 per cent in 1981 and by 2.8 per cent in 1982<sup>1</sup>. At the same time, certain countries producing bauxite attempted to obtain a substantial increase in the price of their principal resource, with the aim of assuring their economic survival. They also demanded further integration in the industrial chain of bauxite, alumina and aluminium.

Faced with this situation, the multinationals decided to relocate their operations, mainly by reducing aluminium production where energy costs were considered too high. They thereby altered the pattern of the international flow of bauxite and alumina.

As Bonnie K Campbell<sup>2</sup> has emphasized, the process of redeployment of the aluminium industry on a world level is neither linear, nor devoid of contradictions. The policies of the producer countries, like the strategies of the multinationals, can only be understood by analysing the level of accumulation both in the specific branch and on a world level.

This report attempts to clarify this process by tackling three themes:

- The dominant characteristics underlying the undisputed economic power of the big aluminium companies.
- The location of the aluminium chain's products: new trends and their consequences for the IBA member countries.
- Strategy and counter-strategy in the Caribbean.

## The companies in the aluminium sector – a general presentation

### 1. The contingent situation

Table 1 gives a list of the eighteen leading companies in the aluminium sector, ex-

cluding those in countries which are centrally planned, classed according to their primary aluminium production capacity in 1979 and 1982.

Following the conjunctural crisis, which led to a considerable drop in the demand for aluminum, many production units, smelters and refineries were closed. However, others were opened, to the extent that the global production capacity of the eighteen companies in question increased by 12 per cent between 1979 and 1982. At the end of 1982, the average rate of capacity utilization on the world level was about 72 per cent (60 per cent in the United States, 84 per cent in Europe and less than 30 per cent in Japan).

Most of the units closed can resume operations with an increase in the level of demand. However, an estimated 25 per cent of the smelters closed, which represent a capacity of 4 Mt/year, will probably be unable to start up again, either because of a relative decay of the installations, or the increase in energy costs.

Until 1979, the six big companies in the sector (60 per cent of world capacity in 1982) had a stable growth in profitability<sup>3</sup>. But since then the increase in stocks (four consumer months at the end of 1982) and the drop in free market prices has led to a collapse in their gains. In the past, the producers had managed to maintain a relative stability in prices despite the fluctuations in demand, in large part due to a policy of stock adjustment, but they have been unable to do so in the present circumstances.

It is well known that the big companies early established what is called a *producer price* (price limit) for the refined aluminium ingot. One company in particular played a leading role on the international exchange level: Alcan, a Canadian-based company and a former subsidiary of Alcoa. The company's producer price, known as the "Alcan price" or the export price in fact served as a reference in international transactions until the end of October 1984.

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It is also well known that this price was not fixed as a result of market laws, but rather according to company strategies (they are all associates in the IPAI), to their production costs, investment needs, research and development requirements, as well as their profit margins. In addition, the high degree of vertical integration in the sector means that a large part of the sales take place within the companies. The Alcan price was used in the great majority of international transactions and still plays a key role in the North American market.

After the suppression of the Alcan price the major producers in Australia, Europe and Japan, eg Comalco, Pechiney and ÅSV, have published their own list prices.

The free market price, known as the *spot price*, is drawn from a small volume of dealings. It reflects the fluctuations of the market and is thus very sensitive to sudden changes in supply and demand.

Since 1979, a part of the free market of aluminium is quoted at the London Metal Exchange (LME) in London. The big companies have shown their resent-

ment concerning this quotation, considering that it leads to price instability and to speculation. This hostility can be understood when one knows that at the time of the introduction of the LME the Alcan price was 15 per cent above the free market price.

The quotation of aluminium at the LME does not innovate anything, but simply draws attention to spot prices, thus attracting potential buyers. In 1980, this free market covered only 2 to 5 per cent of the world market of aluminium. The spot prices have always been subject

**Table 1**  
The companies of the aluminium sector at the end of 1982  
(excluding those from centrally planned economies)

Company	Country of origin	Primary aluminium capacity (kt)		% of the total capacity of the western world 1982	Cumulative % 1982
		1979	1982		
Alcan	Canada	1 558	2 035	14.6	14.6
Alcoa	USA	1 770	1 964	14.1	28.7
Pechiney <sup>1</sup>	France	1 100	1 300	9.4	38.1
Reynolds	USA	1 156	1 200	8.6	46.7
Kaiser	USA	1 004	1 033	7.4	54.1
Alusuisse	Switzerland	788	872	6.3	60.4
Å S V <sup>2</sup>	Norway	300	370	2.7	63.1
Arco Metals <sup>3</sup>	USA	325	360	2.6	65.7
V A W <sup>4</sup>	FRG	350	345	2.5	68.2
Mitsui	Japan	262	337*	2.4	70.6
Revere Copper & Brass	USA	180	299*	2.2	72.8
Sumitomo	Japan	413	296	2.1	74.9
Martin Marietta	USA	200	275	2.0	76.9
Mitsubishi	Japan	358	237	1.7	78.6
Comalco <sup>5</sup>	Australia	187	220	1.6	80.2
Amax	USA	110	215	1.5	81.7
Showa Light Metals <sup>6</sup>	Japan	235	162*	1.2	82.9
Norsk Hydro	Norway	110	160	1.2	84.1

**Notes:**

\* In 1981

<sup>1</sup> Formerly PUK

<sup>2</sup> Årdal og Sunndal Verk

<sup>3</sup> Acquired by Alcan in October 1984

<sup>4</sup> Vereinigte Aluminium Werke AG

<sup>5</sup> Subsidiary of Rio Tinto-Zinc

<sup>6</sup> 50 % subsidiary of Comalco

**Sources:**

The data in this table are based on the figures given in the companies' annual reports.

The production capacity figures all include the production of the company itself plus those from joint ventures.



to a great deal of fluctuation, and their introduction at the LME increased the breadth of these variations. In effect, the LME quotations have been widely accepted, the volume treated is increasing and foreign speculators are attracted to the aluminium commerce (data processing gives the order to buy or sell automatically, according to predetermined price thresholds).

### The present situation

The current weakness of the market explains why the Alcan price at export and the producer prices remained unchanged for so long. On the other hand, the LME quotation went from 1 170 USD at the end of 1981 to 960 USD in June 1982, and rose to 1 572 USD in January 1983 to drop today to prices below 1 200 USD (1 040 USD 1984-09-07). These very low spot prices have had a depressive effect on the producer prices applied to contractual deliveries, the aluminium producers being obliged to sell at prices below their production costs (in 1982, the spot price level was nearly 30 per cent below the production costs of the majority of producers).

In addition, the divergence between price trends and cost trends has been particularly large these last three years. To take one example, the cost of electricity furnished by the Bonneville Power Authority (BPA) to the American producers in the North-West Pacific region is at present 26/Mills/kWh, compared to 6 mills two years ago, which corresponds to an increase of 350 USD/ton of aluminium ingot.

In the first half-year of 1983 the industry's situation seemed to be improving, indicated by a reduction in producers' stocks and a rise in the LME price. This trend is at present reversed: prices are falling, the market is unstable and the situation is once again one of "overcapacity" (primary aluminium production in the Western world progressed by 21 per cent during the first seven months of

1984 as compared with the same period in 1983).

Most of the big companies announced cuts in their production capacity: Reynolds metal (86 per cent of capacity), Kaiser Aluminium (46 per cent of capacity) and Pechiney reduced production by 10 per cent.

Certain producers, however, are convinced that they will come out of the crisis strengthened. This has eg been suggested by Mr Douglas Ritchie, analyst for Alcan.<sup>4</sup> The Canadian producer was sure that the crisis would wipe out the lame ducks and allow Alcan to benefit from its advantages on the energy level by conquering new markets, in particular in Asia and in Europe.

In effect, the concentration of production made an impressive leap forward between 1979 and 1982, from 54.3 per cent to 60.4 per cent for the six leading multinationals, principally to the profit of Alcan and Reynolds.

### The production chain: how does it function?

#### The concept of the products' cycle as applied to aluminium

First of all it is important to try to situate aluminium's present phase of economic development. This will help us to understand the strategies used by the companies in the sector, as much in relation to the "consumers" as to their competitors and to the governments of states producing bauxite or energy.

The notion of the products' cycle is based on the different stages through which a particular product passes:

- laboratory research
- first developments
- mass diffusion
- saturation.

#### Aluminium's present stage of development

We should make clear from the outset that we are speaking here of aluminium in a general sense and not of any specific

use of the metal. Thus we can directly eliminate the early stages of research and development. This does not mean that no research goes on in the aluminium sector. However, r&d deals not with the product itself, but with production methods: reduction in the energy necessary, use of other raw materials than bauxite, etc . . .

On the other hand, the multiplication of outlets for aluminium and the large growth, even in traditional markets (leaving aside the specific effects on the recession), clearly shows that the sector is still far from the saturation stage.

Having proceeded by elimination, we may therefore say that aluminium is presently in the mass diffusion stage. This conclusion seems to be corroborated by several factors, such as the continued big rise in turnover figures for the companies in the sector, their high investment rates (eliminating the cyclic elements), their high debt level etc . . . The net profit/turnover ratio of the aluminium sector, is also higher than that of the economy taken as a whole.

Indeed, in a general way, the newer the product, the less relevant is its cost in face of its qualities (in the case of aluminium, lightness and toughness), and this allows a higher profit margin.

However, in a period of recession such as that which has occurred since 1980, tendencies appear which are characteristic of the saturation stage. Indeed, even if this is not a long-term trend, the demand for aluminium in the traditional markets is now shrinking (in aluminium's case, those of construction and transport). The new markets (canning and other packaging) cannot assure a global rise in demand on their own.

We therefore find ourselves in a situation of short-term saturation and this has influenced the strategy of the aluminium companies. They gradually withdraw from the primary segments of the chain: the extraction of bauxite is handled more and more frequently by other companies and notably by those partially controlled



by governments of third world countries: Jamaica, Brazil, Surinam, Guinea etc. One increasingly sees joint ventures being created in the upstream, non-dominant segments of the chain. Investment, on the other hand, is concentrated in the downstream segments: semifinished and final products, but also technology supply and metal trade.

These trends existed already before 1980, but they have become more pronounced over the last years. Moreover, it is clear that a renewed increase in demand will not mean their reversal.

On the other hand, the characteristics of the mass diffusion phase will then regain their importance:

- expansion of traditional markets and economy measures favouring the use of a lightweight material such as aluminium for transport
- reduced competition – especially if certain of the small producers are eliminated
- a certain control of the upstream end of the chain, so as to guarantee raw material supplies in a period of growth.

There is thus an inexorable evolution of the products' cycle towards the saturation stage. But the rate of this evolution is not constant. It can accelerate during a period of recession or be slowed down by the creation of new markets. This evolution at long-term pushes the companies to integrate themselves more and more into the downstream end of the chain, for the closer the market goes towards saturation, the more the accumulation of capital itself moves downstream.<sup>5</sup>

We will now look at the problem of companies' vertical integration.

### Integration by sector

The concept of integration by sector, which is based on the notion of the chain, aims at estimating to what extent a particular company has effective control of the separate segments of this chain.

Concerning *upstream integration*, the six leading companies (with which we

deal here) are to all intents and purposes self-sufficient in their supply of alumina.

The situation of bauxite is somewhat different. Apart from Alcoa, the five other companies have to go elsewhere than to their subsidiaries for their bauxite; this proportion can be as high as 60 per cent as in the case of Pechiney.

More significant is the fact than until a few years ago, all of these companies were clearly more self-sufficient in bauxite than there are today. In 1976, this proportion was 65 per cent for the case of Pechiney and 15 per cent for the other companies. This change is due on the one hand to nationalizations, and increased state involvement in certain bauxite production units (Jamaica, Surinam etc . . . ), on the other, to the fact that the big six have opened new mines in countries where national capital, whether state or private, has wished to be associated with the new workings: this is the case of Brazil and Australia.

However, the big six do not seem greatly disturbed by this new situation. As we have already noted, the more the products cycle moves towards "saturation", the further the dominant segment moves upstream. Thus control of the raw material stage becomes less and less important.

Given the large debts of the big six, the "cost of money" and their desire to intensify their downstream integration, the takeover of bauxite extraction by others suits them fairly well. On the other hand, this has given the "others", such as Rio Tinto-Zinc, a chance to penetrate the sector.

Energy, one of the most important factors in the production of primary aluminium, is produced directly by several of these companies, and in proportions which vary essentially according to the country of implantation. It is clear that energy costs are the determining factor in the placing of production units.

In Canada, Alcan uses its own hydro-electric energy and produces more than it

needs; elsewhere, rather more than half its energy is bought from outside producers on the basis of long-term contracts with state companies (India, Australia).

In the United States Alcoa produces hydro-electric and thermal energy, the latter being coal-based – furnished to its own refineries in Arkansas, Alabama, Texas and Florida. Outside the United States, the group's supplies come from long-term contracts made with private as well as public companies.

Alusuisse uses hydro-electric energy and is also participating in the construction of three nuclear power plants in Switzerland.

Kaiser and Pechiney produce no energy at all and take out long-term contracts with outside producers.

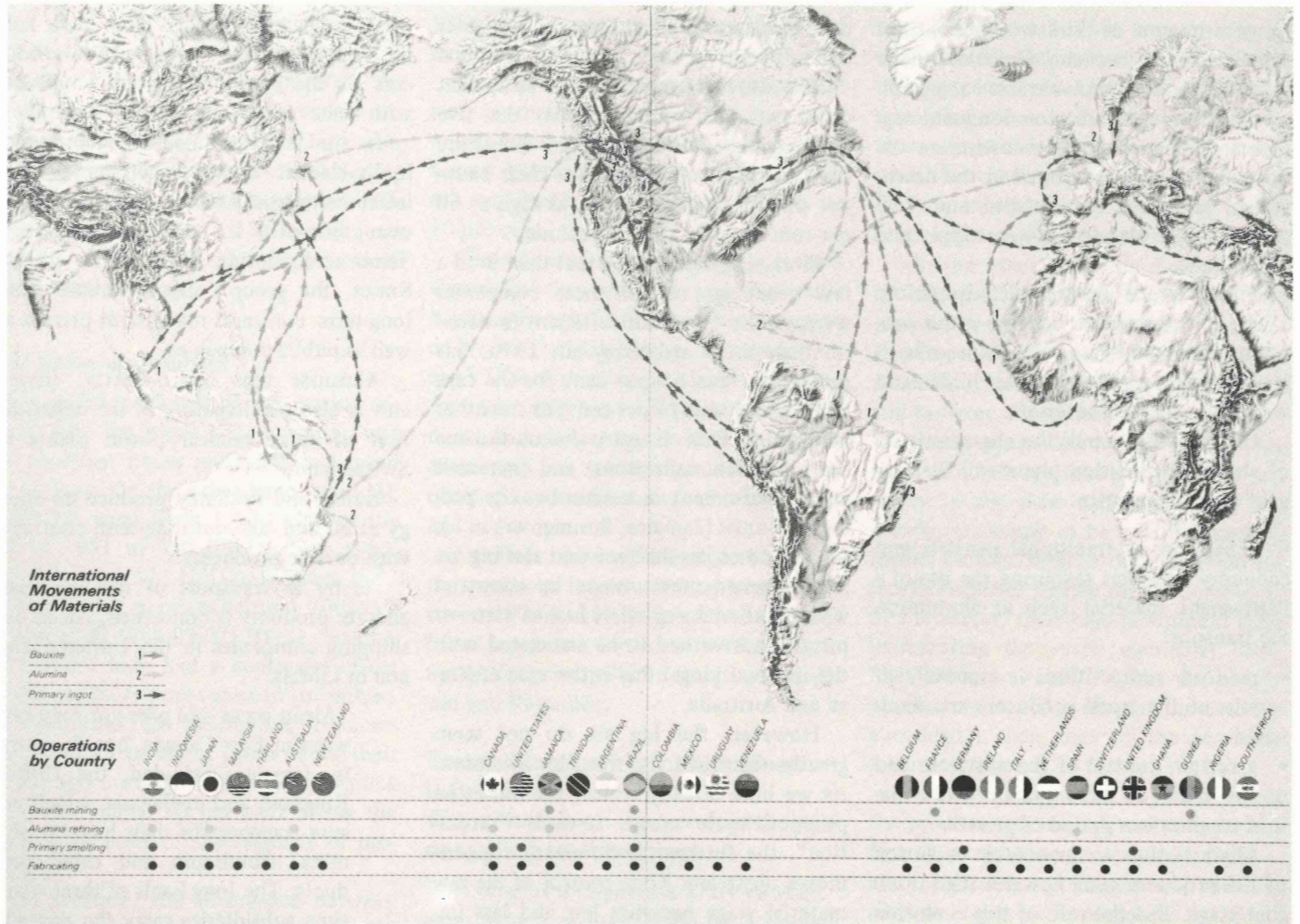
As far as transport of raw materials and its products is concerned, Alcan has shipping companies in the United States and in Liberia.

"Alcan owns and uses not only railways in East Canada, but also ports in Jamaica, Trinidad, the United Kingdom and in Canada, which ensure transport of their bauxite, alumina, aluminium and other products. The long hauls of three maritime subsidiaries carry the raw materials over all the world's seas."<sup>6</sup>

Reynolds transports its products by its subsidiary Caribbean Company, based in Panama. Kaiser Aluminium International, a subsidiary of Kaiser, organizes the group's shipping. Alusuisse has a maritime company – Sana – in Italy.

As far as *downstream integration* is concerned, the six companies in question process two-thirds of their primary aluminium production themselves. In addition, this proportion is increasing: Alcan processed 51 per cent of its production in 1970, 56 per cent in 1975, 68 per cent in 1979, and 74 per cent in 1981. In 1982 Alcoa processed 72 per cent of its primary aluminium production, Reynolds 92 per cent, Kaiser 71 per cent and Alusuisse 62 per cent. This last figure is





below the ordinary level; in other years Alusuisse has produced around 75 per cent.

The integration does not stop at half-finished products; more and more the companies produce the final product themselves. They all have recycling units and manufacture aluminium alloys.

One could also mention another form of integration; in the financial sector: sale of equipment, feasibility studies, patent sales and the granting of licences, construction of production units such as that planned by a contract between The People's Republic of China and the Nippon Light Metal Co Ltd, which is a 50 per cent subsidiary of Alcan.

### The advantages of integrated companies

Vertical integration increases the economic weight and thus the comparative strength of the aluminium companies in their home states as well as in the states in which they have established themselves. Vertical integration also has a series of other advantages for the companies.

- In the first place it allows them to take full advantage of the international division of labour: the extraction of bauxite takes place in one country, the processing into alumina in the same country or one close by, mainly because of transport

costs; the aluminium production is located around cheap and abundant energy sources and the final transformation takes place close to the consumer markets.

From this follows a geographical division of activities which enables the multinational companies to play one country off against another; leads to a real increase in their mobility, otherwise relative in the industry as investment costs are very high, and allows them to limit the power and coordination of the workers and their unions, dispersed as they are throughout the world.

In effect, the nationalization of one



segment, the bauxite mines for example, does not break the existing dependence as far as commercialization is concerned. The cases of Jamaica and Guyana illustrate this continued dependence perfectly.

The practice of "transfer pricing" is likewise linked to the companies' integration. It consists, in so far as the integrated multinationals are concerned, in over- or under-billing either supplies (raw materials or equipment), or services (technical studies or management, for example) between the mother company and the subsidiaries, or between subsidiaries themselves. In brief, this practice enables the groups to accumulate capital where they wish.

Another advantage of the integrated company relates to the consumer and is based on their downstream integration, as close as possible to the final consumer. It is obviously in the multinationals' interest to encourage a standardized and homogeneous "demand", thus allowing them to inundate different markets with the same product, rendering the consumers dependant on their policy, for the satisfaction of "their needs". The multinationals are financially able to put an enormous emphasis on advertising, which helps them to impose their products on the consumers.

### Diversification by sector

In general, the aluminium companies are relatively little diversified. This is another confirmation that the sector is still in the mass diffusion stage: the prospects of long-term market growth and the linked investments are such that the companies concentrate their efforts on the expansion of aluminium. Many of the companies' parallel activities are, in fact, an extension of activities linked to the aluminium chain: coal production (Reynolds); electric energy (Alusuisse); or again, as a prolongation of the chain: construction (Alcan, Reynolds, Kaiser).

Certain companies have opted against a total exclusion from the production of

substitute materials for aluminium: Alcoa, Pechiney and Alusuisse manufacture plastics; Alcoa and Pechiney are active in the copper sector (wire and cable) as are Kaiser and Alcan, who commercialize this metal. It is, however, copper that has to fear the competition of aluminium rather than vice-versa.

In any case, it is more than probable that the trend towards diversification by the aluminium companies goes hand-in-hand with the progressive saturation of the market. It must thus be seen as a case of spreading the risks over different productions and of increasing control over substitute materials.

### Concentration and new producers

From 1968 to 1979, the share of the big six in the Western world's production has not ceased to diminish. This drop is basically due to the recent expansion in the sector of other enterprises which fall into four categories:

- the copper producing companies
- the Japanese companies
- the Australian companies and
- the state-owned companies of the third world.

In 1979 the copper companies controlled

more than 10 per cent of the Western world's aluminium production<sup>7</sup>. This allows them not only to strengthen their position relative to copper-producing companies, but also to improve their profitability by being active in a sector which is in a much better position than copper, in spite of the 1981-82 crisis.

The rise in energy costs, which has particularly affected Japan, provoked a sudden change in the government's policy in favour of direct overseas investment. Since 1978, eight overseas projects with Japanese companies associated have been launched or accomplished: Gladstone Aluminium and Hunter Valley in Australia, Bluff in New Zealand, Asahan in Indonesia, Venalum in Venezuela, Kitimat in Canada, Albras in Brazil and Mount Holly (Alumax) in the United States.

The Australian companies have penetrated the sector by means of joint ventures. The most important are Broken Hill Prop, Western Mining, CSR, the Fletcher group and Peko Wallsend.

These new producers all develop a similar type of strategy: they associate themselves in joint ventures with large companies with solid financial bases; their investments are linked to cheap energy possibilities and to the absence of too-

Table 2

### Joint ventures in the aluminium sector — some examples

Company	Country	Partners in joint ventures
Alugasa	Spain	Alcan-Pechiney
Alumina Partners of Jamaica	Jamaica	Ananconda-Kaiser-Reynolds
Alwest	Australia	Reynolds-Shell
Aughinish Alumina	Ireland	Alcan-Anaconda-Shell
Friguia	Guinea	Alusuisse-Pechiney-Noranda
Mineracao Rio do Norte	Brazil	Alcan-Rio Tinto-Reynolds-Shell
Ormet Corp	USA	Alusuisse-Revere
Queensland Alumina	Australia	Alcan-Kaiser-Pechiney-Rio Tinto
Tomago	Australia	Pechiney and some German companies
Vlissingen Pechiney	Netherlands	Alcan-Pechiney
Volta	Ghana	Alcan-Pechiney-Kaiser-Reynolds



restrictive legislation concerning the environment; they push downstream integration as far as possible; they make efforts to acquire the most up-to-date technology available, especially that concerning energy-saving; they want to control their raw material supplies and invest in countries such as Australia and Brazil.

### Ties established by the aluminium companies

The companies generally present themselves publicly in a context of competition. It is true that this is a fundamental element of the market economies. However, many factors indicate that the companies are in fact acting in a double system, which includes some aspects of competition, of rivalry, but also aspects of an "entente" which goes as far as integration. A very large number of projects and recent investments are joint ventures, principally, but not exclusively, taking place outside the home countries of the companies. Table 2 shows some of the most important joint ventures established between the large companies.

The companies also collaborate on the technological level; thus Alcan and Pechiney have perfected the H+ process and installed a pilot factory near Marseille. They sell each other equipment: Pechiney to Alcan and Reynolds, and Alcoa to Alcan and Anaconda . . .

Moreover, the large companies have set up an aluminium cartel in London: the IPAI<sup>8</sup>. Officially this organism is concerned with the collection and distribution, among its members, of statistical data concerning the sector and with the forecasting of future tendencies. But it is obvious that it is also a meeting place for discussion, and for informal strategy-making on a world level.

But this is only the tip of the iceberg. Multiple ties exist between the aluminium companies via banking and financial institutions. These links are obvious not only by the holdings in the companies, but also by the presence of the same board

members on the boards of different companies and by the choice of agents of transfer and registration.

Here is just one example: the Morgan Guaranty Trust of New York (MGT): MGT has an interest of 6.6 per cent in Kaiser, of 7.9 per cent in Revere and of 8.7 per cent in Amax. William R Cross Jr, director of Amax, is vice-president of MGT; D M Kendall, director of Atlantic Richfield (Anaconda and Arco Metals), is president of Pepsico Inc (aluminium cans); MGT is the largest shareholder of Pepsico; Eugene Black, president of the Hownet board (subsidiary of Alumax), is the former president of the World Bank and one of the main directors of ITT (wire and cables) – whereas MGT is the largest shareholder of ITT. MGT is the agent for transfer and registration for Alcoa, Kaiser, Reynolds and Martin Marietta.

In addition to the links that exist between the aluminium companies themselves, there are also ties created between them and companies in other sectors, via board members. For example, in so far as energy is concerned, connections exist between Alcoa and Gulf; Noranda, Gulf and Union Gas Ltd, Reynolds and Gas Research Institute; Alcan and Atomic Energy of Canada; Imperial Oil, Amax, Kennecot and Standard Oil of California; Anaconda and Atlantic Richfield; Martin Marietta and Philadelphia Electric Co; Pechiney and Cie Francaise des Petroles.

Downstream in the chain, links exist between the sector and the automobile construction industry: Alcoa, General Motors and Ford; Alcan and Ford; Reynolds and General Motors; Pechiney, Peugeot and Citroen. There are also ties with the telecommunications sector: Alcan and Bell Canada; Martin Marietta and ATT; Pechiney, CGE (and therefore CIT – Alcatel) and Thompson Brandt, etc . . .

In brief, the interconnections between the companies, the inter-sectorialisation and internationalisation of banking and financial capital is not an illusion. Now this internationalisation of the ownership

of capital induces by itself a growing interdependence between the different industrialized nations, or, as the companies' investments prove, between them and the developing nations. This internationalization presupposes an homogenisation of the production markets, of social relations, and of consumption on a world level. Such changes will inevitably further increase the mobility and flexibility of the companies involved.

### Notes:

<sup>1</sup> A certain revival appeared in 1983 and the consumption of aluminium increased by 9 per cent during this year; producers hoped for a production of 8 per cent in 1984 (Financial Times, 1984-07-05.)

<sup>2</sup> Bonnie K Campbell, *Les Enjeux de la Bauxite, la Guinée face aux multinationales de l'aluminium*, Les Presses de l'Université de Montréal et l'Institut Universitaire de Hautes Etudes Internationales de Genève 1984.

<sup>3</sup> The net profit/turnover figure for 1979 for the six biggest aluminium companies was 6 per cent whereas for the 250 leading enterprises in the Western world, this same figure was 4.7 per cent. This gives an indication of the favourable position of the aluminium sector relative to the average of the world economy.

<sup>4</sup> *Le Monde* 83-06-26/27.

<sup>5</sup> See studies by GRESEA: *Analyse du système productif mondial du tabac*, 1978, and *Quand j'entends le mot cuivre*, 1979.

<sup>6</sup> See Alcan, Annual report supplement 1979, p 21.

<sup>7</sup> The principal companies: Arco Metals, Mitsui, Revere, Mitsubishi, Amax, Noranda, Phelps Dodge.

<sup>8</sup> International Primary Aluminium Institute. ■

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