T.I.C. Activities

The Ninth General Assembly of the T.I.C. will be held in Rothenburg ob der Tauber and will be followed by the First International Symposium on Tantalum. 120 participants have registered for the Symposium and of these about 50 will be accompanied by their wives, who will take part in the ladies' programme.

FIRST INTERNATIONAL SYMPOSIUM ON TANTALUM

PROGRAMME

WEDNESDAY 10th MAY
9.00  Ninth General Assembly of the T.I.C. at the Hotel Eisenhut (for members).
10.30 Opening of the Symposium by the President of the T.I.C. in the Reichstadthalle.
11.00-13.15 Presentation and discussion of the following papers:
   Metallurgy, production and applications of tantalum.
   Prof. Dr. R. Kieffer, Technical University, Vienna. (Please note change of title and speaker.)
   Tantalum supply and demand outlook - is the balance favourable?
   T.C. Barron, Emory Ayers Associates, USA.
   The interplay of industry and trade press with special reference to the problems of representative price and market information.
13.15-14.30 Luncheon at the Reichstadthalle.
14.45-17.30 Presentation and discussion of the following papers:
   The relationship between cost of tantalum and tantalum capacitor demand.
   Capacitor trends - an impact study, and the alternative to the use of solid electrolyte tantalum capacitors due to current trends in the price of TaQ.
   W.E. McLean, Sprague Electric Company, USA.
   Future of tantalum powder for capacitor use.
   John A. Caneronzo, Kawecki Beryllco Industries Inc., USA.
19.30  Address of welcome by the Lord Mayor of Rothenburg ob der Tauber, at the Rathaus.
20.15  Festive Dinner at the Reichstadthalle.
   The guest speaker will be the Secretary of State at the Ministry of Economics and Transport, Mr. Franz Sackmann.

THURSDAY 11th MAY
9.00-11.45 Presentation and discussion of the following papers:
   Use of tantalum carbide in cemented carbides.
   Sven Ekema, Sandvik, Sweden.
   Tantalum developments in Europe - products and processes.
   G.J. Karinek, Hermann C. Stark, Germany.
   Specific problems related to tantalum products.
   H.J. Heinrich, G.F. Gesellschaft für Elektrometallurgie mbH, Düsseldorf, Germany.
12.00-13.15 Luncheon at the Reichstadthalle.
13.30-15.00 Presentation and discussion of the following papers:
   Engineering aspects of tantalum chemical equipment.
   Gerald D. Corey, Fansteel Inc, USA.
   Tantalum in chemical plants.
   F. Spamer and C.H. Liesner, W.C. Heraeus, Germany.
15.00-18.00 General discussion and final report.
17.00  Departure by coach for Nuremberg.
18.30  Arrival at hotels.
19.45  Departure by coach for Reception at Nuremberg Castle, with buffet.

FRIDAY 12th MAY
9.00  Departure by coach for GFE works.
9.30-10.30 Film on GFE's metallurgical operations.
10.30-12.00 Visit to the works and Central Research Department.
13.00-14.00 Luncheon at the canteen of GFE. Official closing of the Symposium.
14.00-16.00 Visit to the Grundig works.
19.30  Bratwurstessen.

SATURDAY 13th MAY
10.00  Sightseeing in Nuremberg and Fränkische Schweiz, visit to the Germanisches Museum.

T.I.C. NINTH GENERAL ASSEMBLY

The Ninth General Assembly of the T.I.C. will be convened at 9.00 a.m. on Wednesday 10th May 1978 at the Hotel Eisenhut, Rothenburg ob der Tauber, West Germany, preceding the First International Symposium on Tantalum. All members will be represented. The Agenda for the meeting will be:

1. Approval of Minutes.
4. T.I.C. Programme:
   - Bulletin and Publications;
   - Statistics.
5. Statutory Elections:
   - New members;
   - Executive Committee;
   - Resignation of a member.
6. Tenth General Assembly:
   - location and date.
7. Other Matters.
   Prospective members wishing to be elected during the Ninth General Assembly should send their applications before the Assembly to Mr. P. Leen, President of the T.I.C., care of Compagnie Geominex, Chaussee de la Hulpe 150, 1170 Brussel, Belgium.
   Telephone 673 98 50.
   Telex Socinm 26.361.

ARRIVAL

Participants arriving at Nuremberg airport on 9th May should note that coaches will be available throughout the day for the transfer to Rothenburg.

LADIES' PROGRAMME

WEDNESDAY 10th MAY

Visit to the romantic Tauber valley, Creglingen, Weikersheim and Dinkelshult.

THURSDAY 11th MAY

Tour of Rothenburg ob der Tauber.

FRIDAY 12th MAY

Sightseeing in Nuremberg - Germanisches Museum and Spielzeugmuseum; shopping.
The role of primary materials in the relations between E.E.C. and the developing countries

This article is a condensation of a presentation made at the T.I.C. Eighteenth General Assembly on 11 October 1977 by Mr. José Nicolai, Adviser to the General Manager of Industrial Affairs of the E.E.C. Commission.

I shall start by reviewing the various problems that, in the Community, we face in the field of raw materials. First, for the very long term, we have come to the conclusion that the risk of absolute shortage is relatively small. We see problems, amply enough for a certain number of renewable resources, such as timber, paper, hides and skins, but possibly for silver. Recently, the N.T.R. has concluded that by the year 2,000 we might have some difficulties which are repetitive and since we are not concerned because if we adopt intelligent policies for the renewable resources we should be able to stabilise the balance between supply and demand. For most others, in particular silver, there exist substitutes.

But our real problem is a long-term problem. As you may know, we depend on third countries for something like 70 to 100 percent of our raw materials and of course this degree of dependency is somewhat of a worry to us. And, simultaneously, we see the development of local processing in countries like Australia and also in a large number of developing countries. And we have some worries about how industry can survive in the long run in view of this great dependency on outside sources and the development of industrialization in the Third World.

In the medium term, we have a problem which has been caused mainly by a very rapid expansion of our investments in a number of countries. We are, faced, at present, with a lack of risk capital for mining investment particularly in developing countries. To keep an adequate balance of supply and demand for raw materials, an important amount of money will have to be invested. In the medium-long term, the policy of mining houses to invest mainly in Canada and Australia, in disregard of most of the developing world, is not a very safe policy since Canada and Australia are also starting to import raw materials for themselves. For a number of years, we have had extremely tough discussions as to possible guarantees on safety of supply from the Canadian side. With uranium, we have had some serious problems both with Australia and Canada and, therefore, we would like a better spread of our dependency throughout the world. We also believe it would be contrary to our development policy not to foster investment in the developing world.

I have already, more or less, mentioned our trading partners in this field. On the one hand we have Canada and Australia. The second group is Rhodesia and South Africa where it cannot be excluded that, at some stage, political difficulties might disrupt supplies. Then there are the state trading countries and Russia, China. Developing countries, not the ideal partners as far as safety of supply is concerned.

This is why we are more or less led to concentrate on the developing countries, largely because the rest goes more or less by itself. We do not have to do much to encourage our people to import from Canada and Australia. They do so anyhow. But our worries are much more as to how we can develop our relations with the developing world.

The key problem which we are facing there is much wider than the raw materials themselves. It is what is now called the setting up of a new world economic order. The developing countries have come to the conclusion that our economic system leaves them very little chance to arrive at an adequate economic development. Therefore, they want to change the rules of the game. In fact, it is clear that the degree of indebtedness of the developing countries is enormous and growing very rapidly and our official development aid, about $13.5 billion a year for the whole of the industrialized world, represents less than the interest that the developing countries have to pay each year on their debts to us. One has pledged to get up to a level of development aid to the order of 0.7% of our GNP. We are very far from that. We are, let's say, around 0.3 for Germany, and at 0.28 for the United States. With the present recession it is extremely difficult to obtain from our finance ministers commitments that they will do better rapidly.

The developing countries also consider that they do not have an adequate access to processing of their raw materials, to technology, to maritime transport, and to marketing and distribution. They are, therefore, determined that they must have the national control over our commodity exchanges which puts them sometimes in an extremely awkward position. If you take the case of Kemono, what can Kemono do for cacao versus the commodity market on which one buys and sells each year twenty times the annual cocoa consumption of the world. And, of course, they want to get a better access to markets so that they can sell here processed raw materials and not simply raw materials as such. They also claim a right to exploitation of deep sea nodules. For five years we have been engaged by the U.N. Law of the sea in the continuous deteriation of their terms of trade", is to adopt a generalization of the indexation of the price of manufactures which they buy. Of course, this sort of idea is highly unpopular in industrialized countries. In many cases, we feel that it would be impossible to implement it. In many cases, it might even be detrimental to the developing countries because, for a certain number of commodities for which substitutes exist or which compete with synthetics, it would simply mean that consumption of these commodities would collapse if the price was not competitive.

Of course, this brings the developing countries to demand that we establish control of production and investment in synthetic fibers and synthetic rubber so that they have a chance to develop their production and exports of natural products. There, again, we are faced with the most modern industrialized systems which would not permit them to engage in firm control, either of production or investment.

These problems have been the core of the discussions we had in the North-South Dialogue. We made some progress on a number of them in the last two years. Others remain unresolved. But we are optimistic about going forward with this dialogue in some other forum in the future. One has not been picked yet. It is generally agreed to negotiate within the U.N. framework. But, in parallel with this, most of what the group of 77 want to implement in the field of commodities through the Common Fund is embodied in what is called the UNCTAD Integrated Program which was adopted at the end of the Nairobi Conference in May of last year. Basically, this integrated program, which includes a number of 18 commodities, foresees two things for these 18 commodities: rounds of discussions, going on continuously now in Geneva, aiming at the signing of commodity agreements for as many of these commodities as is feasible, and, secondly, setting up the Fund. The Common Fund would be an institution within the UNCTAD framework which originally should be granted, by the member states, capital of the order of $1 billion with the possibility of borrowing an extra $2 billion on the capital market, and, if this did not do the trick, have a second slide a few years later to double these amounts. The basic purpose of this Common Fund, originally, was to be able to manipulate commodity markets so as to improve price levels of these commodities. Commodity agreements already exist in some cases have served as an incentive for the conclusion of commodity agreements because in the past signing of commodity agreements has failed for lack of finance. If the finance was ready then on the other hand they have been possible from the moment commodity agreements would be easier. Of course, underlying this is the problem of who would finance commodity agreements and, again, there is no totally common ground. A certain number of industrialized countries still believe that they can be a part of a commodity agreement without financing it. The recent tendency, however, has been improvement as now most industrialized countries, Japan and the U.S. the latest ones, have joined in financing the hypothetical tin buffer stock. Since there is no stock at present as there is a shortage of tin, the Republic of Germany has indicated its willingness to envisage it by the time that this stock will have to be built up. There is a certain readiness also on the part of the United States. With the present recession it is extremely difficult to obtain from the finance ministers commitments that they will do better rapidly. But, of course, not all commodities lend themselves to buffer stocking. From the start the industrial countries were extremely reluctant about this program and the Common Fund. They did agree with the developing countries as to the objectives of the operation. To the industrialized countries, the objective was essentially to stabilize commodity markets around the long term price level, and they feared that the Common Fund would be guilty of manipulating prices to modify the relationship between commodity prices and the prices of manufactures. This led some of them to make declarations in Nairobi that they had some reservations as to the propriety of the program. They are not reluctant about the Common Fund, saying that this was putting the cart before the horse. Finally, under the political pressure of the 77 in the North-South Dialogue, they accepted that there should be a Common Fund and that in November we would go...
Hermann C. Starck Berlin - A major tantalum processor

Hermann C. Starck Berlin — HCST — was established about fifty years ago and has grown to be one of the world’s leading special metal producers. Extensive production facilities in West Germany are located in Goslar, southeast of Hannover in the foreground of the Harz Mountains; in Laufenburg/Baden, near the German-Swiss border. The HCST plants comprise a very versatile combination of mineral dressing, chemical processing, and pyrometallurgical operations. This variety of available installations, complemented by an extensive experience developed over the years, gives HCST an unusual degree of flexibility in treating almost all types of raw materials in the special metals area. Both the Goslar and Laufenberg plants have modern laboratories equipped with every type of testing and evaluating instruments to ensure that HCST products satisfy the most exacting specifications.

Starck has been particularly known for its continuing extensive research and development effort. This activity, housed in a modern laboratory, is supported by a number of specialized plant facilities used exclusively for R and D. The great variety of products produced by HCST have been developed over the years “in-house” and many proprietary processes are used.

Although HCST is Europe’s leading producer of tungsten and molybdenum products, its product line covers almost all forms of metals and chemicals derived from cobalt, nickel, tantalum, and niobium. Perhaps HCST is best known for the broad line of carbides produced for the cemented-carbide industry. But in addition it manufactures carbides, nitrides, silicides and borides of the special metals for a great variety of applications as well as a full line of master alloys produced both by pyrometallurgy and powder metallurgy.

Compared to tungsten, which has been produced at Goslar since 1899, tantalum is a relatively new product for HCST. It has been produced for just over twenty-five years. There are few tantalum processors who offer an extensive range of tantalum and niobium products as HCST. The most important of these products are synthetic concentrates, refined oxides, carbides, and metal powders. The synthetic concentrates are available for various applications, including the production of high-purity tantalum and niobium.

Synthetic Concentrates

More than half of the world’s tantalum demand is provided by the tantalum oxide contained in tin slags. A large portion of these slags contains so little tantalum that they cannot be processed by direct acid digestion. The cost is prohibitive. A proprietary process developed by HCST for the electric furnace conversion of lean slags to synthetic concentrates provides the only method of utilizing the low-grade tantalum industrial byproduct. This process allows HCST to process these concentrates at its Laufenburg plant.

Siegling is really an art. Years of experience have been necessary to perfect the process. The three most important requirements of a tantalum source material can be used for extraction:

1st: Applicability to slags of varying origin and varying tantalum content,
Higher quality special potassium-tantalum fluoride, used to produce capacitor powder, uses special tantalum niobium concentrates processed in a new potassium-tantalum fluoride facility. After conventional acid digestion, separation is effected by contacting the leach liquor with a TBP-containing organic. This extractant is not inflammable and is considerably less water soluble than MIKB. In a proprietary process, so-called hot extraction and direct crystallization, the special grade of potassium-tantalum fluoride is produced.

Capacitor Grade Powder

A new process, proprietary to HCST, has been developed to produce capacitor grade tantalum powder with extremely high capacitance values. The special grade K-salt and an alkali halide are mixed with an alkali metal or alloy. The reactive mass is cooled down under carefully controlled conditions before the reduction reaction is initiated. Since the reaction is run at a controlled temperature, the process yields only capacitor grade tantalum powder. The reduction process is continuous.

Typically, this tantalum powder yields a specific capacitance of more than 10,000 µF/cm². The product is marketed under the trade names of PL-8000, PL-10000, and PL-12000. The numbers refer to the specific capacitance which will be exhibited in anodes pressed from the powders if they are formed with a press-density of 5 grams per cubic centimeter and are sintered for thirty minutes at 1,500 °C. PL-12000 has the highest specific capacitance of any tantalum capacitor powder currently available in the market.

HCST also produces tantalum powders by electrolytic and carbon reduction. The ever-rising demand for high-performance high-voltage capacitors is met by powder produced from electron-beam melted tantalum.

As a part of the capacitor grade product line, HCST also produces capacitor anodes. A facility with a capacity of 300 kilograms of anodes per month is operated to provide anodes to customers when their needs exceed their own capacity. Since an essential element of capacitor production is the ability to test completely, the HCST facility provides the means of testing capacitor powders in all stages of production. By this means, the pace required continually to develop new powder types can be met.

Research and Development

As is commonly known, all activities in the tantalum field require the backing of strong research and development and well equipped analytical laboratories. HCST has excellent facilities at both Goslar and Laufenberg to provide such. Some long-term projects include the investigation of means of upgrading very low grade tin slags (with even less tantalum content than those now being processed), recovery of tantalum from minerals not now considered commercial sources, and continuing programs to improve further the quality of all products. One very important project is the study of the influences of variations in the source material upon the quality of the final product.

Since tantalum production is a very competitive industry, a successful producer must exercise continual full-scale effort even to maintain his position. The HCST stated philosophy is to research actively all aspects of the tantalum and niobium businesses and to concentrate on the production of the most important products without neglecting the sidelines. This philosophy has gained and will keep HCST’s leading position in tantalum.

HCST and NRC

Early in 1978 HCST and Saincorp jointly bought most of the business of the Metals Division of the Norton Company. This acquisition has been organized as NRC, recalling the name of National Research Corporation, the original tantalum pioneering company acquired by Norton. NRC is best known for its high quality capacitor grade powder, but also produces flat-rolled sheet, strip and plate; a variety of wire and rod; welded tubing; and line of bayonet heaters and repair kits for the chemical, petro-chemical and pharmaceutical industries. NRC is headquartered in Newton, Massachusetts, U.S.A.