

City to foreclose on Albany Titanium

By CARTER WOOD
Democrat-Herald Writer

It was February 1987 when Albany Titanium Inc. last paid the monthly bill for a sewer line the city of Albany constructed to the company's now-empty plant.

That's long enough, the City Council decided last week before voting to start foreclosure proceedings on the plant property at 840 30th Ave. S.W.

The city says it's owed \$11,025, even though Albany Titanium and its holding company, ALTI, no longer exist.

This February Albany Titanium filed for relief under Chapter 11 of federal bankruptcy laws. Robert S. Custer, former president and chief executive officer, said the company tried for several months but was unable to obtain additional financing.

Industrial Finance Co. foreclosed on the property and plant on June 13. It was owed more than \$1 million by Albany Titanium.

The foreclosure resulted from a ruling in February by Linn County Circuit Court Judge James Goode in a suit brought against ALTI by Industrial Finance.

Court records show that Goode awarded the finance company \$1,034,268 plus court costs and interest.

Industrial Finance is a wholly owned subsidiary of Pape Bros. Inc., a construction and logging company based in Eugene. The company spokesman could not be reached this week to say what plans Pape Bros. had for the property.

Albany Titanium began in 1981 with plans to make high-grade titanium sponge. The light-weight, high-strength metal is used mainly in the aircraft and chemical industries.

Founders were Rene Fritz Jr. and Ronnie Dunagin of Albany, and Bob Smith of Salem.

The company licensed a process to

chemicals for the Pennwalt Corp. in Philadelphia. Custer was expected to move the company from research into the profitable production stage, but within three months, Albany Titanium had laid off most of its 36 workers.

"The whole thing was a killer for me," Custer said Monday. "I came out with the expectation that the company would be financed by General Electric, and that financing never came through."

General Electric had already invested more than \$6 million in the company.

Weeds and grass grow high on the grounds at the former Albany Titanium plant on 30th Avenue.

Fritz left the company in June 1987. Monday he described the financial situation as "one of those messy things you end up in."

"It's a sad situation," Fritz said. "The process will probably go on and be developed by someone else. Others have faith in it, and I think it will happen."

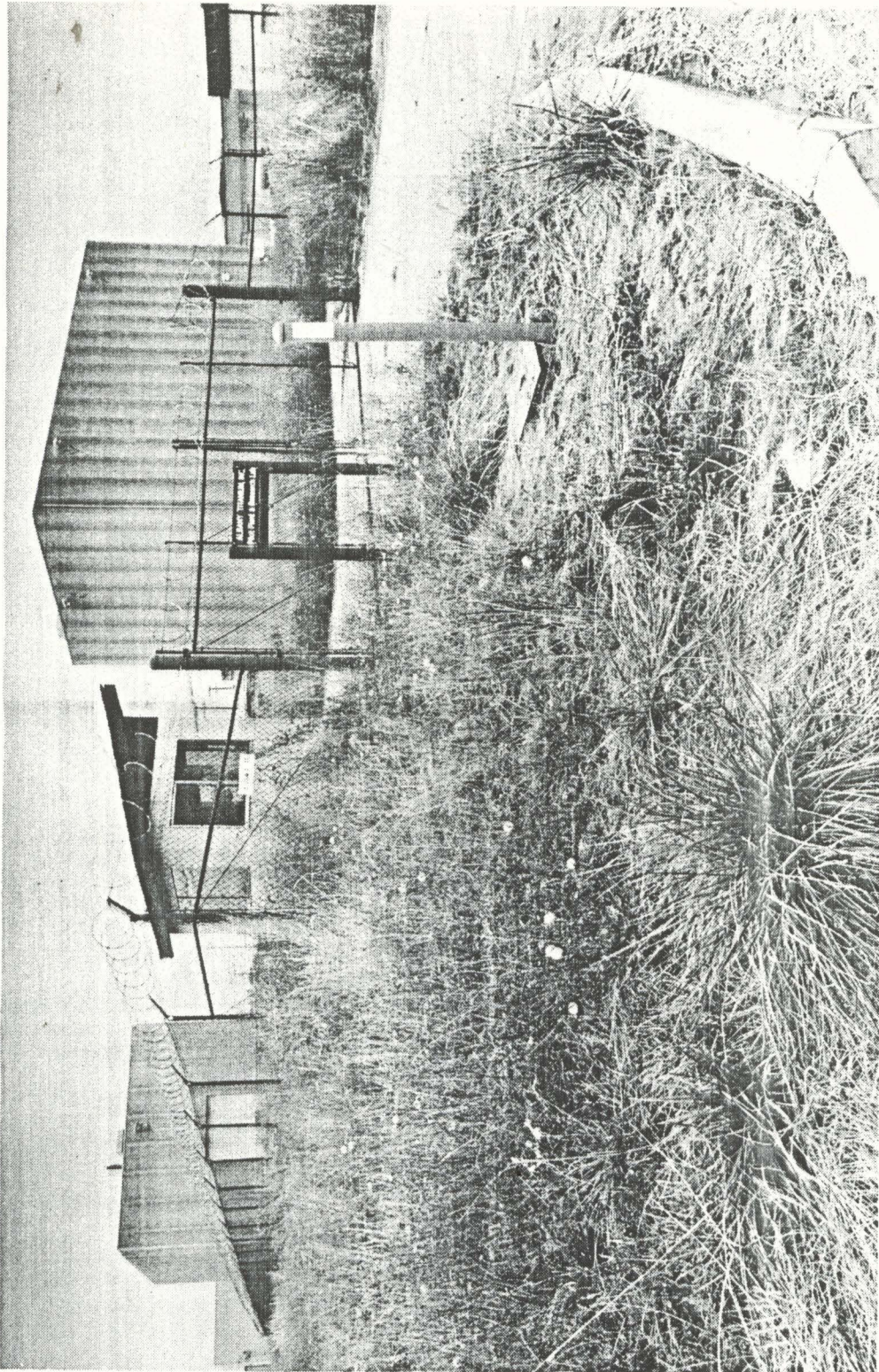
Fritz said he had been working on some real estate deals and helping with other businesses since he left Albany Titanium. Custer is involved with C.M. Tech, a new company in Albany studying ways of recovering waste titanium

from "pickle acid" used during metals processing.

As for the money owed the city, Albany can begin foreclosure proceedings a month after the council's action last Wednesday. The city is due \$8,986 in principal and \$2,039 in interest.

In the event the city completes the foreclosure and sells the property, current holders of the mortgage would have a year to redeem the site, Finance Director Gary Holliday said.

"This just tells them we're really serious about them bringing things up to date on that," he said.



Democrat-Herald/Stanford Smith

Police, fire

(To 7 a.m. today)

Injury accidents

LINN COUNTY SHERIFF

ed substance. Lodged in Linn County Jail.

Kelly Brian Malloy, 20, 1680 Columbus Place S.E., Albany, Monday. Charge: violation of conditions of parole/probation on original charge of possession of a controlled substance. Released on his own recognizance; cited to appear in Linn County Circuit Court Oct. 20.

Terry Lee Gibbs, 30, 3006 Harding St., Sweet Home, Monday. Charges: violation of conditions of parole/probation on original charge of possession of a controlled substance (metham-

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Albany company patents lower-cost titanium method

By SUE McCracken
Correspondent, The Oregonian

ALBANY — Albany Titanium Inc. started out to set up a traditional titanium reduction plant but wound up with a new process company officers said will produce a chemically pure version of the rare metal at a cost low enough to compete with other metals such as stainless steel.

President Rene Fritz said ALTi, as it's known, has exclusive rights to two issued and five pending patents on the new process, which was developed over five years by Occidental Petroleum Corp. at its Irvine, Calif., laboratory.

When Occidental sold the lab, ALTi bought equipment for its own lab and negotiated rights to the new process.

Ground has been broken for the ALTi lab and office complex, and the company expects to move into its steel prefabricated building by the end of September. A pilot plant capable of producing 1 million pounds of titanium annually is scheduled for completion by late 1984. The total plant investment to that point should be about \$8 million.

Fritz said the plant will be expanded to produce 10 million pounds by early 1986 and is expected to ultimately employ about 100 workers with an annual payroll of \$3 million.

The company was capitalized at \$1.3 million. Serving on the board of directors along with Fritz are Ron Keil, owner and president of Keil Foods in Portland and Vancouver, Wash.; Bob Smith, president of the Salem-based VIP's and La Casa Real restaurant chains; and Tom Hodgson, president of Amerimet, a Connecticut company that trades in titanium internationally.

Fritz, who is also president of Albany International Industries Inc., which produces computerized sawmill equipment, said, "I wanted people who have taken a small company and built it into a large one. Each of us has done that."

When ALTi was formed in 1981, Fritz said, titanium prices had slipped from a high of \$19 a pound on the market to between \$7.50 and \$8. The company

intended to build a plant using the Kroll process for reducing titanium sponge from sand containing the mineral rutile, or titanium dioxide. That process was developed by the federal government three years ago, and it and a variation called the Hunter process have been the only ones used, producing titanium at a cost of between \$4 and \$4.50 a pound.

As the price for titanium edged down near the cost of production, ALTi went into a holding pattern until Fritz heard of plans by Occidental to divest itself of the Irvine lab and the new process for producing titanium.

Joe Megy, who worked for Occidental on development of the process, and Dave Wright, who has worked on development of rare metal facilities in Albany, will be in charge of lab and plant operations.

THE (PORTLAND) SUNDAY OREGONIAN
SEPTEMBER 4, 1983

COMMODITY SECTION;
(NONFERROUS)

STATE ARTICLE FROM: (OREGON)

(MORE) 9/9

000 LOWER-COST TITANIUM METHOD.

The advantage of the Alti-Oxy process lies in its lower production cost — both in the actual metal reduction and in the cost of raw materials. Fritz said the cost of materials for producing titanium can be reduced from \$3 a pound to 75 cents a pound. A continuous, flow-through operation will be used instead of the batch process used in the traditional Kroll method, and energy costs will be only 25 percent of those required by current producers, he said.

The Kroll and Hunter processes depend on rutile, priced at \$400 to \$450 a ton. Fritz said the Alti-Oxy process uses ilmenite, which costs about \$40 a ton. The best quality of sand from which rutile ore is obtained comes from Australia, while sand containing ilmenite is abundant domestically.

Fritz said his cost estimates are based on transporting sand from northern Florida, where the biggest producer is, but there are known deposits in Southern Oregon and Idaho.

The new process produces a salt and chloride-free sponge and powder with no further purification required, according to the company.

Titanium is a relative newcomer to the family of metals, although it has been recognized as an element since 1790. It wasn't until U.S. Bureau of Mines offices in Albany and Nevada had developed and perfected the reduction process discovered by William Kroll that commercial production became feasible.

Titanium's virtues lie in its strength-to-weight and stiffness-to-weight ratios. Light and extremely strong, it is used commonly in the defense industry, the aerospace program and commercial airplanes. It is also an extremely corrosion-resistant material, performing better than many other materials in acid environments. Titanium is well-suited to applications involving briny or saline solutions, such as sea water.

Fritz said industrial uses of the metal are increasing, but the variability in its price has made manufacturers leery of using it to replace such metals as stainless steel.

Fritz said the Alti-Oxy process should be able to keep the price down and purity very high so that

titanium can compete with other metals in fields where corrosion resistance is important, such as oil and gas drilling, in pumps, valves and piping, sports equipment, desalination plants and body implants such as casing for pacemakers.

There are only four companies in the United States engaged exclusively in primary titanium metal production, one of which is Oregon Metallurgical Co. in Albany. Fritz said ALTi has no desire to harm the current producers of titanium.

"We have not talked to anybody in the industry yet," Fritz said. "We wanted a broad base of investors. We are interested in royalties, licenses for production and joint ventures."

Initial investors in ALTi have been told the company may go public to finance expansion of the plant to a capacity of 10 million pounds a year.

THE (PORTLAND) SUNDAY OREGONIAN
SEPTEMBER 4, 1983

(END)

Albany Democrat - Herald
5/18/87

Albany Titanium gains new president to lead new growth

By HUNTER JAMESON
Democrat-Herald Writer

Albany Titanium Inc., 840 30th Ave. S.W., which has been developing new technology to produce titanium powders and sponge during the past six years, has named a new president and chief operating officer.

He is Robert S. Custer, 53, who was vice president/chemicals for Pennwalt Corp. in Philadelphia before starting work in Albany on May 1.

He is a Princeton graduate and has a master's degree in business administration from the Harvard Business School.

Custer will lead Albany Titanium from its research and development stage into commercial production, said Rene Fritz Jr., who announced the appointment.

Fritz, 44, helped found Albany Titanium in June 1981 and will continue as chairman and chief executive officer. He was president before Custer's appointment.

Custer will be responsible for operations, finance, personnel, production, research and marketing for Albany Titanium and its holding company, AlTi Corp., Fritz said.

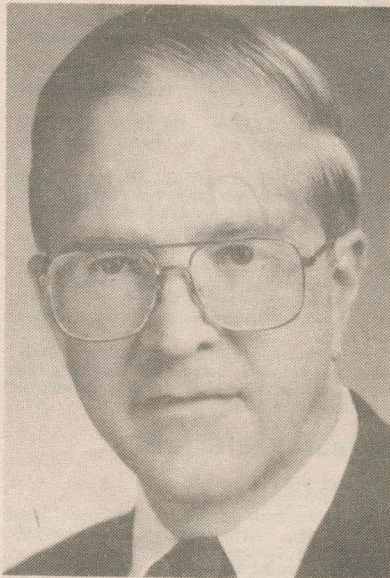
The company long has planned to appoint a top-flight operating officer like Custer as the commercial production stage neared, Fritz said, and that time has come.

"We are scaling up — right now — our pilot plant into a titanium powder production facility," Fritz said.

The plant will produce pure titanium powder and titanium alloy powder, Fritz said. It should be ready to make commercial volumes of powder by the end of June.

Albany Titanium also is working on plans for later commercial-scale production of titanium sponge for international joint ventures and for production of mill products like titanium ingots and plate.

Such production would begin at a



Robert S. Custer
Comes from Philadelphia

domestic operating divisions: fluorochemicals; inorganic chemicals; organic chemicals; and Ozark Mahoning, a natural resource subsidiary. He also was responsible for subsidiary operations in Japan, the Netherlands and Italy. The operations had annual sales of \$455 million and employed 2,200 people.

Fritz said Custer's experience in finance and in marketing as well as in operations would benefit Albany Titanium.

The firm employs somewhat under 50 workers and has raised in excess of \$14 million. A private stock placement has brought it about 200 shareholders.

Custer received a bachelor's degree in chemical engineering from Princeton University in 1955. He then worked at Mallinckrodt Chemical Works in St. Louis in design, engineering and construction of a uranium processing facility.

He received a master's in business

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Such production would begin at a chemical plant that turns ilmenite ore into sodium titanium fluoride. Because ilmenite is abundant in the South, the chemical plant will be there, Fritz said.

A second stage would change the chemical plant's output into sponge or powder. A plant to do that could be either in the South or in Albany, Fritz said.

Ground breaking for a plant for the sponge process could take place in a year or so, Fritz said.

Low production costs should make Albany Titanium's products attractive to buyers in spite of a weak international market for titanium, according to Fritz.

The Albany company has received development contracts from the Air Force, Army, Navy and the Defense Advanced Research Projects Agency. The General Electric Co. has awarded Albany Titanium a research contract and has invested in the company.

As vice president for chemicals at Pennwalt, Custer oversaw four



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Comes from Philadelphia

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He received a master's in business administration in 1960 from the Harvard Graduate School of Business Administration and then joined Pennwalt.

His wife, Gerry, will be joining him at their new home north of Corvallis in mid-June. She is working on her doctoral thesis in English at Bryn Mawr College in Pennsylvania and has been employed as a literary consultant to the Annenberg Center for the Performing Arts at the University of Pennsylvania.

The Custers have two grown sons, David, 27, and Jonathan, 24.

New hospital head

CORVALLIS — Dianne Stimson, 43, is becoming administrator of Good Samaritan Hospital today, succeeding James Mol, who has retired. She had been chief operating officer of the 475-bed St. Joseph Hospital in Fort Worth, Texas, since 1983. She became a registered nurse in 1965, and has held other administrative positions in Buffalo, N.Y., and Tallahassee, Fla.

Albany Titanium

After years of delay caused by the slump in the titanium industry, the newest player in the business has a plant, its first order, and plenty of ambition.

Albany Titanium was formed in 1981 when it announced plans for a venture which was delayed when the titanium market soured.

In September 1983, ALTi announced it was going ahead with plans for a pilot plant at 840 30th Ave. S.W., and had acquired exclusive rights to a new process for making titanium powder.

Company president Rene Fritz says the new process will dramatically lower

the cost of titanium powder, making it competitive with stainless steel.

The U.S. Air Force gave the company its first commercial contract — a \$4 million grant for titanium sponge and powder.

Fritz announced last month that the company will build a major titanium sponge and powder plant in the Southeast, probably along the Gulf Coast. While the company's headquarters will remain in Albany, and eventually will employ about 100 to 150 people, the Southeast has a lot of the raw material the company needs.

Albany Building 2 Pilot Plants to Develop New Titanium Output Method

By TRICIA CRISAFULLI

NEW YORK—Albany Titanium Inc., Albany, Ore., is building two pilot plants in Albany to develop a newly patented process for the production of titanium powder and sponge from domestic ilmenite using a \$4 million grant from the Defense Department.

Fred Mullins of the Manufacturing Technology division of the Air Force Wright Aeronautical Laboratories/Materials Laboratory at Wright Patterson Air Force Base, Dayton, said the new titanium process could "revitalize the industry."

The program administered by Wright Air Force Base is similar to a program the base has considered for several years to spur domestic cobalt production. The Air Force guarantees purchase of the production from the pilot plant, thereby reducing the venture's risk, encouraging development.

The Air Force will be Albany Titanium's first customer for sponge and powder under the terms of a 30-month contract awarded June 1 and retroactive to May 1. The \$4 million grant was made jointly by the Army, Navy, Air Force and the Defense Advanced Research Projects Agency, and announced Wednesday.

Under the contract, the Air Force will receive 10,000 pounds of titanium sponge and 2,000 pounds of powder produced by Albany Titanium which will be analyzed and evaluated at the Air Force research lab.

Albany Titanium will also be free to sell excess titanium sponge and powder to any other customer.

"We already have two customers lined up who came to us," Albany Titanium president Rene Fritz said. "They want to buy titanium powder and sponge with a very special alloy, and we found we can make it for them very inexpensively." The customers were not identified.

Fritz said production at the pilot plants should begin between October and February, and a new production facility, with an annual capacity of 10 million pounds of sponge or powder, is planned for early next year, Fritz said.

The key to the economics of the Albany Titanium process is domestic ilmenite ore which is plentiful in Oregon, Idaho and California, Fritz said.

"It's the ninth most plentiful element around," he said. "It's selling for about \$40 to \$45 per ton, and that's about the same price as a ton of hay in Oregon."

(Continued on page 8)

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& MINERAL INDUSTRY

(Continued from first page)

But the Albany Titanium process for producing titanium is not expected to impact ilmenite ore availability or price, he continued. "It's so plentiful, it will be like picking up a grain of sand on a beach."

The government contract was a boost, for Albany Titanium, which was formed at the end of 1981, with plans to construct a production facility to begin commercial production by late 1984.

Soon after, the company faced extinction in late 1982, but switched its original plans away from producing high-purity sponge to the new ilmenite-based process after it licensed technology from

Occidental Petroleum Co. It is the Occidental process that will be tested at the pilot plant.

The government money provided the final piece in Albany Titanium's capital structure.

"We had raised \$3.5 million from the private sector with an average investment of \$100,000 and we needed \$3 to \$4 million more," Fritz said. "The offshore money was out there and they were very eager. But I wanted the process to stay in this country."

The process was certified by Dr. Tom Henry, chief scientist for the Bureau of the Mines and funding was approved by the Pentagon.

SOURCE

AMERICAN METAL MARKET

DATE:

AUGUST 31, 1984

COMMODITY SECTION:

NON FERROUS

STATE ARTICLE CONCERNS:

OREGON

7:



Staff photo by Bill Hunter

Darrell Fisher, Morse Bros. project manager, checks the plumb on prefabricated wall.

Albany Titanium builds plant for new production process

A \$180,000 titanium plant under construction in southwest Albany should be ready for production by March 1985, a spokesman for Albany Titanium Inc. said Friday.

Manager Dave Wright said the plant will use a patented process that uses only a quarter of the energy needed in existing production titanium processes. The process will lower the cost of titanium, he said, and make it more competitive with stainless steel and other metals.

When all the bugs are out of the process at the plant, being built at 735 34 St. S.W., the company plans to expand further Wright said

"We have no doubt we'll be building another plant," he said, but he added there were no plans for a specific location.

The pilot plant in Albany is part of a two-step construction project for the company. Another factory on the site, begun in mid-May, will produce powder titanium. That plant should be in operation late this year.

The "sponge plant" should go up rapidly, Wright said, since construction involves prefabricated panels assembled at the building site and lifted into place by a crane. The walls and roof should be in place by Tuesday he said and the

building should be completed by the end of July.

The company has about 20 employees now and may need 10 to 20 more when the new plant is complete, Wright said.

Titanium, a strong, lightweight, corrosion-resistant metal, is most commonly used for airplane and aerospace applications, Wright said.

Foresight, growing demand for

By DONALD J. SORENSEN
of The Oregonian staff

ALBANY — The foresight of some community leaders here 23 years ago is finally reaping big rewards as Oregon Metallurgical Corp. (Oremet) basks in the spotlight of a growing worldwide demand for titanium, a metal crucial to the production of the new wide-bodied jet airplanes.

Most of the time since it was organized in 1956, Oremet languished in the cyclical ups and downs of the titanium industry. Three of the last four years, it has had losses.

But all that has changed. The burgeoning demand for new commercial aircraft and the retrofitting of existing planes are major reasons that a shortage is developing in the supply of titanium.

Oremet is in an enviable spot, much to the delight of the company's stockholders. By the end of 1977, the stock, which trades over-the-counter, was quoted at 1½ bid, 1½ asked. A year later, it was 4⅝ and 5. Now it is selling around 15 and 15½, down a bit from its recent high of 16¼ bid.

The surge in stock prices reflects the boom in sales and earnings. For the nine fiscal months ending June 30, sales leaped to \$31.9 million, more than double the \$15.3 million in the previous year. Net income soared to \$5.2 million, or \$1.07 per share, from \$1.4 million and 27 cents. Employment has increased to 355 from about 275 the first of the year.

"The increase in sales reflects the increased demand for titanium in the aircraft industry," said company President Henry F. Peters.

There seems to be no slackening of demand in the foreseeable future, according to industry observers. They cite two key reasons, including the growing need for the metal by the commercial aircraft industry.

Titanium is considered the best metal for jet engines and airframes because of its resistance to high temperatures and corrosive elements and because of its high strength-to-weight ratio.

Adding to the commercial aircraft demand is the retrofitting of existing planes to meet federal noise standards.

Figures from government agencies show that commercial aircraft used only 6 million pounds of titanium in 1977. This figure leaped to 10 million the following year and is expected to reach 15 million pounds this year.

The same sources predict usage will increase to 17 million pounds in 1980



Staff photo by BOB ELLIS

HERE'S HOW — Use of retort, the vessel in which titanium is separated while in furnace, is described by Oremet Vice President Frank Caputo. Magnesium chloride is captured in bottom; titanium settles above partition.

and 1981, 16 million in 1982, 19 million in 1983 and 21 million in 1984. In addition, retrofitting is expected to take 5 million pounds a year by 1984.

A second key reason for the expected increased demand is a major stockpiling expansion planned by the government. The metal is considered of strategic importance to the defense program, and Congress is in the process of providing funding to build up the nation's stockpile of the metal.

Adding industrial consumption, military needs and other uses brings a total consumption this year to an estimated 50 million pounds. This is forecast by government agencies and corporate users to increase to 96 million pounds by 1984.

Present industry capacity is 46 million pounds a year. This is forecast to increase to 58 million pounds in 1981, just matching the forecast demand.

This prosperous outlook finds Oremet, one of six sources in the world for titanium metal, in an ideal situation. The others are two domestic companies, several plants in Russia, one in Japan

and one in Great Britain.

Titanium is Oremet's only business. It has one of the newest and most efficient sponge plants in the business and is poised to spend \$6 million in expanding sponge capacity by 50 percent to some 7.5 million pounds a year.

In addition to producing its own sponge, (the material from which titanium is made) it is buying sponge from Japan for use in its melt shop (where sponge is turned into ingots). Melt capacity is now 12 million pounds a year, and due to increase by 30 percent in 1981 when the expanded sponge plant becomes operational.

Oremet also enjoys a unique position because of its product mix, and is able to capitalize on price shifts. It puts out about 65 percent of its production in bulky, 10,000-pound ingots, according to company Vice President Frank Caputo. The 35 percent balance is in mill products such as billets and bars.

Ingots sell for about \$5 per pound while the mill products bring about \$10 a pound. "We are presently aiming to shift our product mix to about 50 per-

titanium put Oremet in black

cent ingots and 50 percent mill products to bring up our revenue," Caputo said. This would increase the average revenue per unit from about \$5.50 to \$7.50.

Oremet is quite sensitive to price changes which, like many other industrial materials, have climbed rapidly recently.

"We have a backlog of \$31 million in firm prices only until Jan. 1," Caputo said last week. "We are not giving out firm prices more than six months in advance. We got hurt early in the year by doing that when we didn't think prices would hold up. We gave firm prices and didn't stockpile."

Now Oremet is using its own sponge as well as imported sponge through its own melt shop and stockpiling what it doesn't need to fill orders or put on the market.

Oremet has a couple other advantages, according to Caputo. It has perfected a technology which permits it to use low-cost titanium scrap to blend with sponge. The Oremet yard contains huge bales of titanium scrap, "only the best," said Caputo.

The Albany company is also the only producer qualified by the major jet engine manufacturers to use titanium turnings, according to Caputo. "Our titanium meets the highest quality standards of the industry," he added.

"We actually know where every bit of material comes from including the recycled material," he said. "We also know who handled it in each step of the process. We keep a record of all that and it is inspected by our customers."

A report by a New York investment firm on the titanium market predicts Oremet sales will reach \$45 million this year, rise to \$75 million in the 1980 fiscal year and to \$120 in the 1981 fiscal year.

Net income is predicted to reach \$5 million, or \$1 per share this year, \$12 million and \$2.50 next year and \$19 million and \$4 the following year.

Unfortunately for those who like to play the market, there isn't much Oremet stock available for the public. It has just under 3 million shares of common stock outstanding. However, the float, or shares available for public trading, is only about 1 million.

Most of it is owned by Armco Inc., Middletown, Ohio, one of the nation's leading steel producers. Armco has proved an angel for the Albany company and now it has a veritable treasure in its hands.

Sunday Oregonian

BUSINESS

The sponge plant was completely refurbished in 1976 with the loan to pay for the costs guaranteed by Armco. In return, the steel company received an option to buy 1.8 million shares of authorized unissued stock at \$1 to \$1.75 per share.

Armco already owns 700,000 shares, or 23.39 percent of the outstanding stock. In addition, it has agreed to buy 571,429 shares of stock owned by First National Bank of Oregon. This will give it a total of 1,271,429 shares, or 42.5 percent.

Should the option be exercised, Armco would have 53 percent of the outstanding stock.

Armco originally showed an interest in Oremet because it wanted to diversify into the titanium field. Its ownership provides a source of funds for Oremet and the Albany company has a free rein in its operations. Three Armco execu-

tives are on the board of directors.

The other principal owner is Ladish Co., Cudahy, Wis., which owns 550,000 shares or 18 percent. It is a privately held company and the second largest forging house in the U.S. As such, it is a principal customer of Oremet, buying some \$6.3 million in merchandise the last fiscal year. Ladish has two executives on the Oremet board of directors.

Oremet's history dates back to 1956 when the mayor of Albany led a drive to add industry to the city. Stephen Shelton, who was head of the Bureau of Mines at the time, said, "Why don't you put in a titanium plant?"

The idea took hold and the company was formed with Shelton as president. He and a number of others from the Bureau of Mines formed the nucleus. Shelton retired in 1968 and Peters, who was a veteran of the titanium industry, became president.

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Titanium

September 30, 1974

Mr. Douglas Applegate
Owens Corning Fiberglass
P.O. Box 415
Granville, Ohio 43023

Dear Mr. Applegate:

In response to your telephone call, here are some thoughts on the availability of titanium in Oregon.

The enclosed tear sheets from our Bulletin 64 summarize things pretty well. I say "our" Bulletin since we cooperatively produced it with the U.S. Geological Survey and put our own cover on some of the copies.

As I mentioned over the phone, the production of titanium minerals from the black sands along the southern Oregon coast is a matter of economics rather than metallurgy. Given markets for most of the co-products, I believe that ilmenite and rutile could be produced in substantial quantities at a competitive cost.

The picture with respect to titanium in the ferruginous bauxites of northwest Oregon hinges upon the eventual exploitation of this rather extensive deposit. Although the TiO content of the raw ore is rather low, the removal of the alumina, followed by extraction of the iron, would leave a rather concentrated titanium-rich slurry. I need not point out that this slurry would carry no mining or preliminary milling charge since these would be absorbed by the alumina.

If, after perusing the enclosed material you have any other questions, please get back to us and we will assist you as much as possible.

Sincerely yours,

Ralph S. Mason
Deputy State Geologist

RSM:lk
Encl.

TITANIUM

In this review, we are concerned essentially with the titanium ores used for industrial purposes, principally as a pigment. Although titanium metal is more glamorous, and the ore supplies needed for its production are more critical, the ore used in pigment manufacture is still ten times as great as that used in metal.

At the present time the ores used for pigment are principally ilmenite and the titaniferous slag manufactured at Sorrel, Quebec, by the smelting of a titaniferous hematite by the Quebec Iron and Titanium Company. Rutile is the raw material used for the manufacture of titanium tetrachloride (the starting material for titanium metal) by all but one of the larger metal manufacturers. That one uses the weakly-magnetic fraction of the titanium minerals in the Florida sand deposit called Trail Ridge.

Improvements in the supply situation resulted from the following developments. Metal and Thermit Company purchased an 800-acre tract five miles west of Montpelier, Virginia, and is constructing a plant to produce 10,000 tons of rutile annually. National Lead Company announced a 25 percent expansion of its ilmenite mine and mill at Tahawus, New York. A large but low grade deposit of ilmenite and rutile was discovered in Sierra Leone, just below the confluence of the Mabile River, near Port Loko. This deposit of rutile and ilmenite in clay and sand from an ancient marine sediment may hold several million tons of rutile and ilmenite. The deposits are being explored by British Titan Products Company and Columbia Southern Chemical Corporation. Deposits of fossil stream placers in sandstones near Escalante, Utah, and Gallup, New Mexico, were under exploration, but the titanium mineral is very

fine and may be difficult to recover. In November the state geologist of New Jersey announced the discovery of old river bars containing concentrations of titanium minerals in Ocean Country, New Jersey, close to several pigment manufacturing plants. Interestingly enough, the ilmenite has weathered sufficiently so that enough iron has been leached out to yield analyses of the clean ilmenite up to nearly 60 percent TiO_2 . Unfortunately the belated discovery found the area subdivided and built up for residential and public purposes.

Active exploration is still under way at the deposits of rutile in Oaxaca, under development by Republic Steel Company.