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PROVISIONAL INTELLIGENCE REPORT

THE SOVIET BLOC POSITION IN PYRITES

CIA/RR PR-24

6 February 1955

DOCUMENT NO. 3
NO CHANGE IN CLASS.
 DECLASSIFIED
CLASS. CHANGED TO: TS S(C)
NEXT REVIEW DATE: 1989
AUTH: HR 70-2
DATE: 1 Oct 79 REVIEWER: 008514

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SECURITY INFORMATIONTHE SOVIET BLOC POSITION IN PYRITES*Summary and Conclusions

Pyrites is the most important raw material for the manufacture of sulfuric acid in both Western Europe and the Soviet Bloc. Sulfuric acid, the most important of all basic chemicals, in turn is used principally for the manufacture of fertilizers. In addition, however, it has innumerable strategic uses, such as metal working, refining of petroleum, and manufacture of explosives and many chemicals of military importance. The second most important use of pyrites is in the manufacture of sulfite pulp, the highly purified grades of which are used in the production of smokeless powder, rayon, and cellulose plastics and lacquers.

The sulfur content of pyrites is supplemented in the Soviet Bloc, particularly the USSR and Poland, by waste gases from nonferrous smelters. Several Satellites are intensively developing processes for production of sulfuric acid from other sulfur-bearing materials such as gypsum and kieserite.

Elemental sulfur is required in the manufacture of carbon bisulfide (for viscose rayon), of black powder, and of rubber chemicals, and in vulcanization of rubber. Equipment for burning sulfur cannot be used for roasting pyrites nor can all pyrites roasters be used to burn sulfur. East Germany is recovering sufficient elemental sulfur as a by-product from manufacture of synthetic liquid fuels to export substantial quantities to the USSR and to other Satellites, which also obtain supplies from Italy. The USSR has extensive deposits of low-grade native sulfur, most of which are located in regions remote from consuming centers. The USSR also obtains some sulfur from by-product sources.

The largest known deposits of pyrites are in Spain and extend into Portugal. Other major deposits in Western Europe occur in Italy, Yugoslavia, Cyprus, and Norway.

The Soviet Bloc as a whole and the European Satellites in particular are short of pyrites. Extensive deposits of pyrites exist in the USSR, but transportation difficulties have limited their development. Nevertheless, use of by-product and other sources of sulfur-bearing materials has rendered the USSR virtually self-sufficient in pyrites.

Smaller deposits of pyrites occur in most of the European Satellites, but these deposits are entirely inadequate to supply the demand. East Germany, Czechoslovakia, Poland, and Hungary, however, obtained nearly two-thirds of their aggregate supplies in 1949 and 1950 and one-half in 1951 from the West, principally from Spain and Yugoslavia.

These European Satellites not only are expanding production from their limited reserves of pyrites but are importing increasing quantities from Albania, Bulgaria, and Rumania, where extensive sulfur reserves are being developed under Soviet direction. Thus, the Soviet Bloc is becoming progressively less dependent on the West for its supplies of pyrites, although it is improbable that the Bloc will achieve complete independence from the West in the foreseeable future.

The greater portion of Western trade in pyrites with the European Satellites, particularly with Spain and Yugoslavia, moves in transit through third countries. The Spanish pyrites move principally to East Germany and Czechoslovakia through West Germany and to a lesser extent through the Netherlands, Belgium, and Denmark. The Yugoslavian pyrites move principally through Austria and Switzerland to Czechoslovakia.

A comparison of the official exports of pyrites from the principal producing countries in Western Europe in 1950 and 1951 to the principal consuming countries in that area with the official imports of the recipient countries shows a large excess of exports over imports. This excess confirms the existence of the transit trade through third countries which has been reported [REDACTED]

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* This report contains information available to CIA as of 1 September 1952.

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Pyrites contribute to the war potential of the Soviet Bloc, since they are used in the manufacture of many strategic end products. Because the Bloc depends on the West for a large proportion of its requirements of this mineral, Bloc war potential will be seriously impaired if it is denied these imports of pyrites.

I. Introduction.

The world shortage of sulfur has already resulted in a scarcity of pyrites, an extremely important sulfur-bearing ore. The shortage of pyrites is becoming progressively larger as the demand for sulfur and sulfur-bearing materials increases and as sulfuric acid producers, particularly in the UK, convert from sulfur to pyrites. Thus exports of pyrites from the West to the Soviet Bloc serve to deprive the West of scarce strategic materials. At the same time they supply the Soviet Bloc with those same materials of which the USSR is in short supply, thereby aiding the Soviet rearmament program.

Communist China, Manchuria, and North Korea are not included in the scope of this report, because the main industrial centers of the Bloc are not dependent on these areas for pyrites.

II. Definition and Usages.

Sulfur, one of the basic elements existing in nature, is one of the most important raw materials in the industrial economy of the world, which annually consumes an estimated 10 to 12 million tons in one form or another. It occurs both naturally as native sulfur, and in the form of many compounds.

In Continental Europe the principal sulfur-bearing material used by industry is pyrites, a natural sulfide of iron or of copper.

The largest known deposits of pyrites occur in Spain and extend into Portugal. Other major Western deposits occur in Norway, Italy, France, Western Germany, Greece, and Cyprus. In the Soviet Bloc the most important deposits occur in the Urals, the Caucasus, Rumania, Bulgaria, and Albania.

Other sources of sulfur-bearing materials used for their sulfur content include (1) copper, lead, and zinc ores, from the concentrates or blends of which sulfur dioxide is recovered; (2) pyrites-bearing coals, from which pyrites is separated, and in the coking of coal from the waste gases of which hydrogen sulfide is recovered; (3) "sour" petroleum, from the refining of which hydrogen sulfide is recovered; (4) spent oxides of municipal gas-purification plants; and (5) anhydrite (calcium sulfate) or its hydrous form, gypsum, used in a few countries only, for manufacture of sulfuric acid and ammonium sulfate.

Either elemental sulfur or pyrites may be used for manufacture of most products in which sulfur in one form or another is required. However, sulfur burners cannot be used to roast pyrites, nor can all pyrites roasters be used to burn sulfur.

The principal products in the manufacture of which pyrites are required are sulfuric acid and sulfite pulp. Sulfuric acid, the most important of all basic chemicals, is used principally for production of fertilizers (superphosphates and ammonium sulfate) and of a large number of chemicals, including many essentials for manufacture of military items; for petroleum refining, metallurgy, and metal-working (including weapons, tanks, and ships); and in the manufacture of rayon, cellulose products (film, plastics, lacquers), and explosives. Sulfite pulp, including highly purified chemical pulp or alpha cellulose, is used in the manufacture of smokeless powder, rayon, cellulose products (film, plastics, and lacquers). Other uses for the sulfur content of pyrites include that of sulfur dioxide for refrigeration, sulfite salts, bleaching vegetable fibers, refining sugar, and as a food preservative.

Products for which elemental sulfur is required include carbon bisulfide used in manufacture of viscose rayon, xanthate-type mineral flotation agents, carbon tetrachloride, vulcanization of rubber, black powder, rubber chemicals, sulfur drugs,

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and sulfur lyes. Large quantities of sulfur are also used for agricultural dusting, particularly in the countries bordering the Mediterranean Sea.

In both Western and Eastern Europe most of the sulfuric acid is made from pyrites, but in the UK most of the sulfuric acid is made from the elemental sulfur. In the USSR most of the acid is made from pyrites, supplemented by sulfur dioxide from nonferrous smelters, coke oven gases, and other minor sources. Sulfite pulp is made both with use of pyrites and of sulfur in Continental Europe, but the relative importance of these raw materials is not known.

III. Intra-Soviet Bloc Situation.

A. Over-All Situation.

The Soviet Bloc as a whole, and the European Satellites in particular, are short of pyrites. The USSR, however, imports small quantities both from the West and from its Satellites.

Table 1, derived for 1949-51 from Appendix A and for 1952-54 from individual estimates by country made in subsequent sections, summarizes the pyrites supply of the European Satellites as a whole. The data for apparent consumption (production plus imports minus exports) do not include intra-Satellite trade but do include trade with the USSR. Data on the supply position of the USSR are omitted because its production is unknown. Furthermore, its direct imports from the West are small.

Table 1

Production, Imports, Exports, Apparent Consumption, and Requirements of Pyrites by the European Satellites, 1949-54.

| | Thousand Metric Tons | | | | | |
|-------------------------|----------------------|------------|------------|------------|------------|------------|
| | 1949 | 1950 | 1951 | 1952 | 1953 | 1954 |
| Production | 191 | 283 | 416 | 489 | 541 | 538 |
| Imports from the West | | | | | | |
| Official Data | 231 | 210 | 119 | N.A. | N.A. | N.A. |
| Covert Data | 99 | 284 | 293 | N.A. | N.A. | N.A. |
| From the USSR | 0 | 0 | 12 | | | |
| Total | <u>330</u> | <u>444</u> | <u>424</u> | <u>360</u> | <u>541</u> | <u>270</u> |
| Exports | | | | | | |
| To the West | 0 | 0 | 0 | 0 | 0 | 0 |
| To the USSR | 0 | 0 | 8 | N.A. | N.A. | N.A. |
| Apparent Consumption a/ | 521 | 777 | 824 | N.A. | N.A. | N.A. |
| Requirements b/ | 671 | 849-859 | 921-951 | 928 | 910 | 847 |

a. Production plus imports minus exports.

b. From the following section.

Data for the years 1949-51 for each individual Satellite are shown in Appendix A together with USSR import data. Appendix B shows in detail for each Satellite and the USSR the imports of pyrites from the West by countries of origin, for the years 1949-51.

Production data for 1949-51 shown in these appendices are based on covert reports and informed estimates. Import sources and export statistics were obtained from the two official reports consisting either of the trade returns of the Western exporting countries or data from their delegates to the International Materials Conference (IMC), and covert sources which were believed to be reliable. [REDACTED] The estimates for 1952-54

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are principally those of the analyst. Requirements have been taken from the individual country studies which are in the following section.

The most significant trend revealed by Table 1 is the increase of 289,000 metric tons or 56 percent in apparent consumption of pyrites from 1949 to 1951. From 1949 to 1950 this increase was accomplished principally through larger imports from the West, and, from 1950 to 1951, by larger production within the Bloc.

Albania, Bulgaria, and Rumania are exporters of pyrites to other Satellites, the volume of this trade having increased from 17,000 metric tons in 1949 to 132,000 metric tons (16 percent of apparent Satellite consumption) in 1951. It appears likely that this trade will continue to increase through 1954, and, coupled with the development of other sulfur-bearing materials by the Bloc, will result in a substantial decline of pyrites imports from the West. Nevertheless, the Bloc's increasing demands for sulfur-bearing materials will still require substantial imports of pyrites from the West for some time to come.

B. Production, Requirements, and Consumption by Soviet Bloc Countries.

1. East Germany.

Production, planned production, total requirements, and apparent consumption of pyrites by East Germany, 1949-54, are shown in Table 2.

Table 2

Production, Planned Production, Total Requirements,
and Apparent Consumption of Pyrites in East Germany, 1949-54 ^{1/}*

| Thousand Metric Tons | | | | |
|----------------------|-------------------|-------------------------------|-------------------------------|------------------------------------|
| <u>Year</u> | <u>Production</u> | <u>Planned Production</u> | <u>Total Requirements</u> | <u>Apparent Consumption a/</u> |
| 1949 | 70 | 80 | 237 | 201 |
| 1950 | 80 | 90 | 340 | 309 |
| 1951 | 102 | 110 b/ | 360 | 262 |
| 1952 | 105 | N.A. | 340 | N.A. |
| 1953 | 108 | N.A. | 300 | N.A. |
| 1954 | 110 | N.A. | 250 | N.A. |

- a. Production plus imports minus exports.
b. 11 months.

East Germany has been steadily increasing its production of pyrites from newly discovered extensions of old workings. In 1949, it was reported that the old pyrites deposits would be exhausted in $1\frac{1}{2}$ years and that the newly discovered deposits would be exhausted in about 10 years, a situation which has caused serious concern regarding future supplies. ^{2/} The pyrites from these deposits are of low sulfur content and require admixture of small amounts of higher grade imported material for satisfactory operation of pyrites roasters. ^{3/} Some sulfur dioxide for the manufacture of sulfuric acid is obtained from copper smelters.

East Germany is compelled to import about two-thirds of its apparent consumption of pyrites, most of which comes from the West. In the years 1949-51, East Germany obtained most of its Western pyrites imports from Norway (45 percent) and Spain (36 percent), according to percentages derived from Appendix B. Although Spain supplied no pyrites in 1949, Spain furnished 43 percent of East Germany's imports from the West in 1950, and 72 percent in 1951. Lesser sources of the East German supply in these years were Sweden (in 1949 and 1950), Yugoslavia (in 1949 and 1950), Finland (in 1949), Portugal (in 1950 and 1951), and Italy (in 1950 and 1951).

The reasons for the drop in apparent consumption of pyrites from 309,000 metric tons in 1950 to 262,000 metric tons in 1951 are not clear, particularly in view of the fact that consuming industries were reported to have operated

* Footnote references in arabic numerals are to sources listed in Appendix II.

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at higher capacities in 1951 than in 1950. An accumulation of stockpile during 1950, when consuming industries were operating at relatively low capacities, seems implausible. Substitute sulfur-bearing materials may have replaced part of the pyrites, and the remainder of the reported decline in apparent consumption of pyrites from 1950 to 1951 may be due to incomplete information on imports, particularly on these reports from Bulgaria and Rumania.

A sulfuric acid plant utilizing gypsum as a source of sulfur is under construction in Wolfen, with a reported annual capacity of 147,000 metric tons. ^{4/} This plant may be completed in 1953. ^{5/} Its capacity would be equivalent to 48,000 metric tons of elemental sulfur, or 108,000 metric tons of pyrites of 45 percent sulfur content. Plans have been reported for starting construction of a second plant in Wolfen this year ^{6/} and for completion of another at a different location in 1954. ^{7/}

Production of sulfuric acid from kieserite (magnesium sulfate by-product from the refining of certain potash salts) commenced at the Oranienburg sulfuric acid plant in mid-1951, ^{8/} and construction on a similar plant at the Coswig sulfuric acid works was started this year. ^{9/} According to a trade journal item and to other reports, ^{10/} sulfuric acid produced from this material will free East Germany from the necessity of importing pyrites. Supplies of kieserite are abundant. The huge construction program required for conversion of this material to sulfuric acid makes it doubtful whether independence from imports of pyrites can be achieved for some time after 1954.

The Coswig plant has also been reported to be installing a sulfuric acid plant of 7,000 metric tons annual capacity based on by-product sulfur recovered at the Leuna plant near Merseburg. ^{11/} Had this plant been based upon pyrites, it would require about 5,100 metric tons of the mineral annually.

An ammonium sulfate process now in operation uses gypsum but does not require sulfuric acid as an intermediate product. The 1955 planned capacity in sulfuric acid equivalent is 200,000 metric tons per year. ^{12/} This amount of acid would require 144,000 metric tons of pyrites (at 45 percent sulfur content). Large amounts of this ammonium sulfate are exported to Spain, Communist China, India, and the Middle East.

Judging by inquiries by East German agents for mining equipment of US manufacture, procurement of equipment for pyrites mining and beneficiation may be a factor limiting increase in production of the mineral. A future factor will be the limited extent of the newly discovered reserves of pyrites.

Native sulfur is not mined in East Germany. Large quantities of by-product elemental sulfur are recovered principally from refinery gases of the synthetic liquid fuel plants, and smaller quantities from other wastes. Table 3 gives the planned and actual production of elemental sulfur in East Germany during 1949-51 and that estimated for 1955.

Table 3

Planned and Actual Production of By-Product Elemental Sulfur
in East Germany, 1949-51, 1955 ^{13/}

| Year | Thousand Metric Tons | |
|---------|----------------------|------------|
| | Plan | Production |
| 1949 | 32 | N.A. |
| 1950 | 54 | 62 |
| 1951 | 50 a/ | 78 |
| 1955 b/ | N.A. | 100 |

a. 11 months.

b. Estimated.

A large part of the sulfur output is sent as reparations to the USSR and Satellites, and consuming industries, particularly the viscose rayon industry, have been compelled to curtail operations at times.

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2. Czechoslovakia.

Recently discovered pyrites deposits were reported to have yielded 40,000 metric tons in 1950. Available production data, planned production, and requirements (derived from Appendix A and from estimates) are given in Table 4.

Table 4

Production, Planned Production, and Requirements
of Pyrites in Czechoslovakia, 1949-54 14/

| Year | Thousand Metric Tons | | |
|----------------|----------------------|--------------------|--------------|
| | Production | Planned Production | Requirements |
| 1949 | Small | N.A. | 250 |
| 1950 | 40,000 | N.A. | 300-310 |
| 1951 | 90,000 | 100 | 320-350 |
| 1952 <u>a/</u> | 100,000 | N.A. | 360 |
| 1953 <u>a/</u> | 120,000 | N.A. | 370 |
| 1954 <u>a/</u> | 130,000 | N.A. | 380 |

a. Estimated.

Exploitation of the pyrites mines has been given a high degree of priority. 15/ The extent of the reserves is unknown.

In 1949, 170,000 metric tons of pyrites were required for sulfuric acid production, and 80,000 metric tons for sulfite pulp. 16/ In 1951 requirements for these industries estimated to be 200,000 and 90,000 metric tons, respectively. 17/

Native sulfur has not been reported to occur in Czechoslovakia, but small amounts of by-product sulfur are recovered.

No plans for production of sulfuric acid in Czechoslovakia either from gypsum or anhydrite have been reported.

Because of Czechoslovakia's paucity of sulfur-bearing materials, it is economically more vulnerable with respect to such materials than any other Satellite. From two-thirds to three-fourths of its requirements of pyrites are imported, mostly from the West. The proportion of requirements imported from the West, however, declined from 68 percent in 1949 to about 50 percent in 1951, as indicated in Appendix B.

If East Germany develops sufficient alternate sources of sulfur-bearing materials to dispense with importing much of its requirements of pyrites, it may become possible for Czechoslovakia to obtain a larger proportion of its pyrites requirements from Albania, Bulgaria, and Rumania.

The desperate procurement situation as regards pyrites in Czechoslovakia is well illustrated by instructions to foreign agents for priority in their purchase, and numerous barter and trade agreements, purchase contracts, and negotiations made with Spain, Yugoslavia, and Italy through third-country intermediaries such as Switzerland and Austria. For example, contracts totaling 340,000 metric tons for delivery to Czechoslovakia by Yugoslavia in 1950 have been reported. 18/ but apparently only 150,000 metric tons were actually delivered.

During 1949-51, Yugoslavia furnished 48 percent of Czechoslovakia's imports of pyrites from the West, Cyprus supplied 22 percent, and Spain, Italy, Norway, Sweden, and West Germany from 5 to 7 percent each, according to the trade volumes shown in Appendix B. In this same period the principal source of supply shifted from Cyprus to Yugoslavia. Imports from Sweden and Italy decreased, and those from Spain, Norway, and West Germany increased.

3. Poland.

The estimated supply of pyrites in Poland during 1949-54 is shown in Table 5* derived in part from Appendix A and in part from estimates. Information on planned production is not available.

* Table 5 follows on p. 7.

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Table 5

Production, Requirements, and Apparent Consumption
of Pyrites in Poland, 1949-54 19/

| Year | Thousand Metric Tons | | |
|------|----------------------|--------------------|--------------------------------|
| | Production | Total Requirements | Apparent Consumption <u>a/</u> |
| 1949 | 40 | 110 | 60 |
| 1950 | 45 | 130 | 74 |
| 1951 | 50 | 150 | 117 |
| 1952 | 55 | 100 | 110 |
| 1953 | 57 | 100 | 110 |
| 1954 | 60 | 60 | 110 |

a. From Appendix A.

The leveling off of requirements and apparent consumption estimates for 1952-54 is caused by the increased production of sulfuric acid from anhydrite. An anhydrite-based sulfuric acid plant of possibly 54,000 metric tons in equivalent pyrites capacity is expected to come into production soon, and construction of another such plant was planned to be started in 1952. 20/ It is reported that on completion of these two plants about one-third of Poland's sulfuric acid will be derived from anhydrite. 21/

A considerable portion of Poland's sulfuric acid is produced from sulfur dioxide, obtained as a by-product of nonferrous metal smelters. Poland is thus relatively much less dependent upon pyrites than is East Germany or Czechoslovakia.

Although Poland is richer in sulfur-bearing ores than any of the other Satellites except possibly Albania, Bulgaria, and Rumania, it nevertheless imports from one-quarter to one-third of its apparent consumption, principally from the West, as shown in Appendix B. In 1949 and 1950 Norway and Sweden supplied practically all of Poland's Western imports of pyrites. In 1951 these countries supplied only 37.5 percent, Yugoslavia supplied an equal percentage, and Italy and West Germany furnished the remainder.

4. Hungary.

Hungary produced only 10,000 metric tons of pyrites per year before World War II. 22/ In the absence of more recent production reports, current output is estimated to be approximately 12,000 metric tons annually, as deposits are known to be of limited extent. It seems improbable that annual production will exceed 18,000 metric tons by 1954, unless new and thus far unreported deposits are discovered. The country likewise is deficient in resources of elemental sulfur. A deposit of anhydrite has been discovered, and plans call for utilization of this material for production of one-third of the country's sulfuric acid output.

Table 6* gives the production, requirements, and apparent consumption of pyrites in Hungary for 1949-54, as derived from Appendix A and from estimates.

* Table 6 follows on p. 8.

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Table 6

Production, Requirements, and Apparent Consumption of Pyrites
by Hungary, 1949-54 23/

| Year | Thousand Metric Tons | | |
|------|----------------------|--------------------|----------------------|
| | Production | Total Requirements | Apparent Consumption |
| 1949 | 10 | 35 | 20 |
| 1950 | 12 | 40 | 23 |
| 1951 | 14 | 47 | 60 |
| 1952 | 16 | 67 | N.A. |
| 1953 | 17 | 72 | N.A. |
| 1954 | 18 | 75 | N.A. |

According to Appendix B, Yugoslavia was the only reported source of Hungarian imports of pyrites from the West in 1949 and 1950. In 1951 Spain was the only reported source of supply. It is probable that imports from other Satellites, particularly Albania, have not been completely reported. Furthermore, Czechoslovakia may have re-exported to Hungary some of its imports from the West.

5. Soviet Zone of Austria.

No production of pyrites in the Soviet Zone of Austria has been reported. That production reported for all Austria is in the Western Zone. There is only one sulfuric acid plant in the Soviet Zone, and it is based on pyrites. Most if not all of the pulp mills are located in the Western Zone. The requirements and apparent consumption of pyrites in the Soviet Zone are, therefore, believed to be not much larger than those for the one sulfuric acid plant, which amount to about 4,700 metric tons per year. The capacity of this plant apparently is not being increased. Thus 6,000 metric tons per year is believed to be a reasonable estimate for the Soviet Zone's requirements and apparent consumption of pyrites for the years 1949-51, and 6,500 to 7,000 metric tons for the years 1952-54.

No imports of pyrites by the Soviet Zone from the West have been reported for 1949 and 1950. The 17,000 tons reported in 1951 came from Spain, Yugoslavia, Greece, and Italy, and no doubt a large portion was reshipped to Czechoslovakia or other Satellites. The reported imports from the other Satellites have been negligible, perhaps because full data have not been made available.

6. Rumania.

No information is available on production of pyrites in Rumania. Estimates of production are given in Table 7.*

* Table 7 follows on p. 9.

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Table 7

Derivation of Pyrites Production Estimates for Rumania, 1949-54 a/ 24/

| | Thousand Metric Tons | | | | | |
|--|----------------------|-------------|-------------|-------------|------------|------------|
| | 1949 | 1950 | 1951 | 1952 | 1953 | 1954 |
| Known Exports 1949-51 b/ and Estimated Future Exports | 0.0 | 15.0 | 42.0 | 50.0 | 55 | 60 |
| Estimated Requirements for Sulfuric Acid Production | 26.7 | 26.7 | 28.8 | 35.0 | 42 | 50 |
| Estimated Requirements for Sulfite Pulp Production | 3.3 | 3.3 | 4.0 | 5.0 | 6 | 7 |
| Estimated Requirements for Other Industries | 1.0 | 1.0 | 1.2 | 2.0 | 3 | 4 |
| Total | <u>31.0</u> | <u>46.0</u> | <u>76.0</u> | <u>92.0</u> | <u>106</u> | <u>121</u> |
| Minus Imports c/ | 3.0 | N.A. | 10.0 | 11.0 | 12 | 13 |
| Estimated Production | 28.0 | 46.0 | 66.0 | 81.0 | 94 | 108 |

a. These figures do not allow for unknown but probably small imports from the USSR.

b. See Appendix A.

c. See Appendix B.

Of the five sulfuric acid plants in Rumania, one employs the contact process, and four use pyrites as a raw material. Rumanian pyrites have a high content of arsenic, which poisons the contact catalyst. It is believed that the Rumanian imports from Spain and Cyprus of pyrites, which have a low arsenic content, are for the contact acid plant.

7. Bulgaria.

Estimates of pyrites production in Bulgaria, derived in the same manner as those for Rumania, are given in Table 8.

Table 8

Derivation of Pyrites Production Estimates for Bulgaria, 1949-54 25/

| | Thousand Metric Tons | | | | | |
|--|----------------------|-------------|-------------|------------|--------------|------------|
| | 1949 | 1950 | 1951 | 1952 | 1953 | 1954 |
| Known Exports a/ and Estimated Future Exports | 13.0 | 36.0 | 64.0 | 90 | 100.0 | 110 |
| Estimated Requirements for Sulfuric Acid Production | 0 | 0 | 1.7 | 9 | 9.0 | 9 |
| Estimated Requirements for Sulfite Pulp Production | 1.6 | 1.6 | 1.8 | 2 | 2.5 | 3 |
| Estimated Requirements for Other Industries | 0.4 | 0.4 | 0.5 | 1 | 1.5 | 2 |
| Total | <u>15.0</u> | <u>38.0</u> | <u>68.0</u> | <u>102</u> | <u>113.0</u> | <u>124</u> |
| Minus Imports b/ | 0 | 0 | 0 | 0 | 0 | 0 |
| Estimated Production | 13.0 | 38.0 | 68.0 | 102 | 113.0 | 124 |

a. See Appendix A.

b. See Appendix B.

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8. Albania.

So far as known, no pyrites are consumed in Albania, consequently exports would be roughly equal to production. Known exports, all to the Soviet Bloc, were as follows: none in 1949, 22,000 metric tons in 1950, and 6,000 metric tons in 1951. There is reason to believe, however, that Albanian exports of pyrites have not been fully reported, particularly in 1951, when 16,000 fewer tons were reported than in 1950. For example, a trade agreement 26/ between Albania and Hungary in 1951 calls for delivery of 15,000 metric tons of pyrites to the latter country. There is no confirmation of delivery of the stated quantity. Production, which together with exploitation and equipment of the mines, has been under the direction of the Soviets, may be expected to increase annually through 1954. Allowing for incomplete export data, the following estimates are made for 1950-54 production: 1950, 22,000 metric tons; 1951, 25,000 metric tons; 1952, 30,000 metric tons; 1953, 35,000 metric tons; and 1954, 40,000 metric tons.

The extent of the pyrites reserves in Albania is unknown. All mining equipment must be imported. There are indications of the use of forced labor in the mines.

9. USSR.

No quantitative figures on production of either pyrites or elemental sulfur have come out of the Soviet Union since the close of the war. A previous CIA estimate based partly on estimated requirements of consuming industries, a prewar survey by US engineers, and other sources indicate a production in 1950 of 1.5 million metric tons in terms of elemental sulfur, of which perhaps 80.0% to 100,000 metric tons were in elemental form. 27/ The remainder, if in the form of pyrites, would be equivalent to 3.1 million metric tons of that mineral, on the basis of 45 percent sulfur content.

It is known that the USSR has large reserves of pyrites and substantial reserves of elemental sulfur. The principal deposits of pyrites occur in the Urals area and in regions from the Caucasus eastward along the southern perimeter of Siberia. More recently deposits of pyrites were discovered in the Leningrad area.

In 1935 the total pyrites reserves (all types) in the Urals were estimated to be 157 million metric tons. 28/ The Soviets claim reserves of 1 billion metric tons in the regions from the Caucasus eastward, 29/ but this estimate may be high.

The USSR has also developed to a considerable extent the recovery of pyrites from coal. In addition, substantial quantities of sulfur dioxide are recovered from nonferrous smelters and other by-product sources.

It is believed that the pyrites deposits have not been exploited sufficiently to meet the full requirements of the USSR, partly on account of transportation bottlenecks. This situation has been partially corrected by construction of sulfuric acid plants in the Urals area and development of by-product sources of sulfur dioxide.

The USSR thus appears to be nearly self-sufficient in sulfur-bearing materials. Known imports of pyrites have dropped off sharply since 1947 as shown in Table 9.

Table 9

USSR Imports of Pyrites, 1947-51

| <u>Year</u> | <u>Country of Origin</u> | <u>Quantity</u> Thousand Metric Tons |
|-------------|--------------------------|---|
| 1947 | Yugoslavia <u>X/</u> | 55 |
| 1948 | Norway <u>Z/</u> | 25 |
| 1949 | Norway <u>a/</u> | 33 |
| 1950 | Norway <u>a/</u> | 3 |
| 1951 | East Germany <u>a/</u> | 8 |

a. From Appendixes B and C.

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Although not reported in official Yugoslavian trade returns, it is believed that Yugoslavia may have exported substantial quantities of pyrites to the USSR since 1947 through third countries. The excess of officially reported Yugoslavian exports of pyrites over the Austrian and Swiss official imports from that country (given in Appendix D) confirms [redacted] reports of transit trade in pyrites from Yugoslavia to Satellites. It is well known that the Satellites reexport to the USSR numerous scarce commodities obtained from the West.

At the Moscow Economic Conference in April 1952, the USSR, as well as Czechoslovakia and Hungary, suggested to a Cyprian representative that certain goods be exchanged between the two countries, including pyrites from Cyprus. ^{32/} This suggestion may have been made for political or other reasons.

Some 10 regions strung all the way from the Crimea to the Sredinnyy Khrebet on the Pacific contain deposits of native sulfur, largely of low grade, but of recoverable significance to the Soviets. The 1935 estimate of ore in these reserves was approximately 10 million metric tons with a recoverable sulfur content not in excess of 5 million metric tons. ^{33/} In addition the Soviets are known to have been developing recovery of elemental sulfur from pyrites, refining of petroleum, and from coke oven gases.

Because of the remoteness of most of these deposits transportation difficulties are more acute than for pyrites. Sulfur from one remotely located mine is reported to be flown to Moscow.

Insufficiency of indigenous production, both in quantity and purity, is indicated by continued imports in 1947 from the US and thereafter principally of by-product sulfur from East Germany. Known imports of sulfur by the USSR were 15,000 metric tons in 1947, ^{34/} a negligible quantity in 1948, 22,000 metric tons in 1949, ^{35/} 15,000 metric tons in 1950, and 4,400 metric tons in 1951. ^{36/}

C. Intra-Bloc Trade.

With the exploitation of the pyrites resources of Albania, Bulgaria, and Rumania, the combined requirements of which are small, the other European Satellites are receiving increasing proportions of their pyrites requirements from these sources. The known exports of Albania, Bulgaria, and Rumania to the other Satellites increased from 13,000 metric tons in 1949 to 112,000 metric tons in 1951. With respect to total imports of East Germany, Czechoslovakia, and Hungary, the percentages from Albania, Bulgaria, and Rumania increased from 4 to 33 percent in the same period. A continuation of this trend in future years may be expected. Except for these recent developments, the volume of intra-Bloc trade in pyrites is small.

This intra-Bloc trade presents some transport problems, such as availability of railroad cars, of barges on the Danube, and of cargo space from Albania to Trieste.

D. Consumption by Individual Countries of the Soviet Bloc.

Estimates of apparent consumption (production plus imports from the West minus exports to the West) of each Soviet Bloc country are shown in Table 10.*

* Table 10 follows on p. 12.

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S-E-C-R-E-T

Table 10

Apparent Consumption of Pyrites in Soviet Bloc Countries, 1949-51 a/

| | Thousand Metric Tons | | |
|-----------------------------------|----------------------|--------------|--------------|
| | <u>1949</u> | <u>1950</u> | <u>1951</u> |
| East Germany | 201 | 309 | 262 |
| Czechoslovakia | 204 | 337 | 312 |
| Poland | 60 | 74 | 117 |
| Hungary | 20 | 23 | 60 |
| Rumania | 34 | 31 | 33 |
| Bulgaria | 2 | 2 | 4 |
| Albania | 0 | 0 | 19 b/ |
| Austria, Soviet Zone | N.A. | 1 | 17 c/ |
| Total, European Satellites | <u>521</u> | <u>777</u> | <u>824</u> |
| USSR d/ | 2,780 | 3,230 | 3,730 |
| Soviet Bloc Total | <u>3,301</u> | <u>4,007</u> | <u>4,554</u> |

a. Data from Appendix A.

b. Although there is no consumption of pyrites in Albania, the apparent consumption figures out to be 19,000 metric tons because only 6,000 metric tons of the estimated production of 25,000 metric tons in 1951 have been reported as exported.

c. Probably reexported in part to other Satellites.

d. Because of the lack of knowledge of the extent of pyrites production in the Soviet Union, and of its proportion of sulfur consumption derived from other sulfur-bearing materials, the estimated total USSR consumption of sulfur in all forms has been presented in the above tabulation in terms of pyrites equivalent, using a basis of 45-percent sulfur content. 37/

E. Requirements of Individual Bloc Countries, 1949-54.

The estimated pyrites requirements of individual Satellite countries for 1949-54, taken from the statistics of the supply position of these countries as shown in the preceding section, are presented in Table 11.

Table 11

Requirements of Pyrites by European Satellites, 1949-54

| | Thousand Metric Tons | | | | | |
|----------------------|----------------------|----------------|----------------|-------------|-------------|-------------|
| | <u>1949</u> | <u>1950</u> | <u>1951</u> | <u>1952</u> | <u>1953</u> | <u>1954</u> |
| East Germany | 237 | 340 | 360 | 340 | 300 | 250 |
| Czechoslovakia | 250 | 300-310 | 320-350 | 360 | 370 | 380 |
| Poland | 110 | 130 | 150 | 100 | 100 | 60 |
| Hungary | 35 | 40 | 47 | 67 | 72 | 75 |
| Austria, Soviet Zone | 6 | 6 | 6 | 7 | 7 | 7 |
| Rumania | 31 | 31 | 34 | 42 | 51 | 61 |
| Bulgaria | 2 | 2 | 4 | 12 | 13 | 14 |
| Albania | 0 | 0 | 0 | 0 | 0 | 0 |
| Total | <u>671</u> | <u>849-859</u> | <u>921-951</u> | <u>928</u> | <u>913</u> | <u>847</u> |

The statistics for East Germany in 1950 and those for Czechoslovakia for 1950 and 1951 came from covert sources. These statistics have been extrapolated to 1954 by taking into consideration estimated production, capacities of sulfuric acid plants, and, in the case of East Germany, Poland, and Hungary, they allow for the development of alternate sources of sulfur-bearing materials. The estimates for Austria, Bulgaria, and Rumania are based on reasonably accurate estimates of their requirements for sulfuric acid plus informed estimates of requirements of other industries. Albania is not known to consume any pyrites.

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Estimates of the pyrites requirements of the USSR have not been made, since more information is needed on such points as the proportion of its total sulfur requirements in the form of pyrites (as distinguished from other forms of sulfur), and the rates of operation of its principal consuming industries in relation to their capacities. Reports on individual plants in the USSR, however, indicate that the over-all requirements of the country are in excess of the consumption, but by how much is not known.

Table 11 shows increases in pyrites requirements of the Satellites through 1951 and decreases thereafter through 1954. Beginning in 1952 the trend is expected to be downward, both because of increased production and development of alternate sulfur-bearing materials by the Satellites.

IV. Soviet Bloc Trade with the West.

The European Satellites depend principally for pyrites on imports from the West. This dependence has been decreasing, however, as Satellite production of pyrites and development of alternate sources of sulfur-bearing materials have increased. In the 3 years 1949-51, according to the statistics in Appendix A, the Satellites' imports of pyrites from the West have decreased from 63 to 51 percent of their estimated apparent consumption. In the same period these imports have decreased from 95 to 76 percent of its aggregate imports from the West and from within the Bloc.

According to Appendix B, which shows the Bloc's imports of pyrites from the West by countries of origin, Norway was the principal source of the European Satellite imports in 1949 with 107,000 metric tons, or 33 percent of the total. Other important sources in that year were Cyprus (23 percent), Yugoslavia (15 percent), Sweden (7 percent), and Finland (7 percent).

In 1950 Yugoslavia furnished 180,000 metric tons (36 percent), Norway 114,000 metric tons (23 percent), and Spain 90,000 metric tons (18 percent) of the pyrites imports from the West to the European Satellites. In descending order of importance, Cyprus, Italy, and Sweden furnished most of the remainder.

In 1951 Spain exported 135,000 metric tons (33 percent) to the Satellites, Yugoslavia 130,000 metric tons (32 percent), and Norway 82,000 metric tons (20 percent). West Germany, Italy, and Cyprus furnished most of the remainder. In the period 1949-51 the West exported very little pyrites directly to the USSR — 33,000 metric tons in 1949, 3,000 metric tons in 1950, and none in 1951. The extent to which the West exports to the Satellites have been reshipped to the USSR is not known. It is quite possible, however, that some of this pyrites, particularly from Yugoslavia, ultimately reached the USSR.

A large part of Western exports of pyrites to the European Satellites moved in transit through Western European countries. Official statistics of the exporting countries do not show the ultimate destinations of this trade which is discussed in the following section.

A. Discrepancies in Trade Statistics.

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In order to obtain a check on the validity of [redacted] Western exports of pyrites to the Soviet Bloc, particularly the transit trade, a tabulation was compiled of exports of pyrites by the principal producing countries to individual Western European countries and of the imports of the recipient nations by countries of origin. These statistics will be found in Appendix D. The only exporting countries which have been included, however, are those in which significant differences occur with respect to imports of the recipient countries.

In the preparation of Appendix D only official statistics were used. These statistics consist of the published official trade returns of the respective governments except where noted, in which cases they were obtained from the International Materials Conference (IMC). For comparison, [redacted] exports to Bloc countries are shown for each exporting country.

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A major difficulty with statistics of Spain, Portugal, and Cyprus is the lack of breakdown of their exports to Germany as between East and West Germany.

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In comparing the two sets of trade figures it should be borne in mind that certain lags exist between them, such as the differences in time both between departure and arrival dates of cargoes and in the statistical recordings of the shipments. These lags, however, would tend to compensate each other at the beginning and end of each year.

The principal discrepancies between the two sets of statistics seem to stem from transit shipments through Western European countries. None of these countries officially report this trade, [REDACTED]

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Table 12 summarizes the detailed statistics of Appendix D by presenting the excesses or deficits of the exporting countries over or under the imports of the recipient countries, and shows for comparison, [REDACTED] shipments from the exporting countries to the Soviet Bloc.

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Table 12

Excess of Deficit of Pyrites Exports of Certain Producing Countries over Imports of Western European Countries and [REDACTED] Exports of these Countries to the Soviet Bloc, 1950-51

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| Exporting Country | Thousand Metric Tons | | | | | | |
|-------------------|----------------------|----------|------------------|------------|------------|------------------|------------|
| | 1950 | | | 1951 | | | |
| | Excess | Deficit | Ex-ports to Bloc | Excess | Deficit | Ex-ports to Bloc | Ex- |
| Cyprus | 73 | 0 | 0 | | 22 | | 0 |
| Italy | 7 | 0 | 10 | 17 | | | 12 |
| Portugal | 61 | 0 | 4 | | 62 | | 1 |
| Spain | 104 | 0 | 90 | 151 | | | 135 |
| Yugoslavia | 175 | 0 | 180 | | 141 | | 130 |
| Total | 420 | 0 | 284 | 168 | 225 | | 278 |

Net Excess or Deficit of Ex-
porting over Im-
porting Country
Statistics

420 Excess

81 Deficit

An examination of the individual country statistics presented in Appendix D will serve to explain some of the apparent discrepancies and to confirm certain covert reports of transit shipments of pyrites to Satellites.

The principal discrepancies occur in the export trade between Spain and Yugoslavia and the import trade of Austria, Switzerland, and West Germany. These are discussed under the respective importing country sections.

1. Exporting Countries.

a. Cyprus.

Appendix D shows that Cyprus exported 73,000 metric tons more pyrites to Western Europe in 1950 than the countries in that area reported as imported from Cyprus and in 1951, 22,000 metric tons less, with a net excess of 51,000 metric tons for the 2 years. The principal discrepancies in the two sets of figures are those involving France and the Netherlands and are discussed in the sections on those countries.

b. Italy.

Italy is both an importer and exporter of pyrites and in recent years has changed from a net exporter to a net importer. In 1950 its official exports of pyrites exceeded the imports of recipient countries by 7,000 metric tons

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and in 1951 by 17,000 metric tons. These excesses tend to confirm the 10,000 and 12,000 metric tons [redacted] exported to Satellites by Italy in the respective years. The principal discrepancies involve Austria in 1950 and the Netherlands in 1951 and are discussed under those recipient countries.

c. Portugal.

The excess of Portuguese exports in 1950 and the deficit in 1950 compared with the trade data of the importing countries are due to the totals of several discrepancies in the respective years. The principal differences in 1950 are largely compensated for by discrepancies in the opposite direction in 1951. It is quite possible, therefore, that the time lags (physical and statistical) are mainly responsible for the differences in the respective years. Portuguese exports to the Soviet Bloc have revealed only insignificant shipments in 1949-51. In February, 1952, however, a barter offer was reported to have been made by a Swiss intermediary for 2,000 metric tons of pyrites from Portugal, but of Spanish origin. 38/

d. Spain.

The excess of Spanish exports over the imports of the recipient countries is far greater than similar excesses of any other country. The excesses amounted to 104,000 metric tons in 1950 and 151,000 metric tons in 1951. These excesses confirm [redacted] shipments from Spain to the Satellites of 90,000 and 135,000 metric tons respectively in those years. Most of these shipments went in transit through West Germany, in the section on which they are discussed.

e. Yugoslavia.

The trade figures for Yugoslavia shown in Appendix D are difficult to interpret because of the large excess of exports (175,000 metric tons) by that country over imports reported by recipient countries in 1950, and a moderate deficit (57,000 metric tons) in 1951. In both years the shipments of pyrites by Yugoslavia to the Bloc were large and went principally to Czechoslovakia. In 1950 total [redacted] shipments from Yugoslavia to the Bloc were 180,000 metric tons and in 1951, 130,000 metric tons, or 310,000 metric tons for the 2 years, compared with 336,000 metric tons total Yugoslavian pyrites to all countries in the same years. It is further reported that Swiss and Austrian intermediaries arranged in behalf of Czechoslovakia for the purchase of large quantities of Yugoslavian pyrites in exchange for Czechoslovak coke. 39/

2. Importing Countries.

a. Austria.

There are several indications which give strong evidence of Austrian transit trade in pyrites from the West to the Soviet Bloc in 1950. First, shipments of exporting countries to Austria in 1950 were nearly double the Austrian imports from those countries as reported by the IFC. In 1951, however, the two sets of trade figures are approximately the same. Second, Austrian consumption of pyrites as reported by the IFC was much less than the imports less Austrian exports in 1950. Table 13 gives salient statistics.*

* Table 13 follows on p. 16.

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Table 13

Imports and Consumption of Pyrites by Austria
1950-51

| | Thousand Metric Tons | |
|--|----------------------|-------|
| | 1950 | 1951 |
| (1) Austrian Imports a/ | 77 | 143 |
| (2) Exporting Countries' Exports to Austria b/ | 147 | 144 |
| Austrian Consumption a/ | 63 | 55 |
| (3) Production in Soviet Zone of Austria | 0 | 0 |
| (4) Austrian Exports a/ | 7 | 96 c/ |
| Apparent Consumption | | |
| (1) plus (3) minus (4) | 70 | 43 |
| (2) plus (3) minus (4) | 140 | 48 |

a. IMC statistics.

b. Data from Appendix D.

c. Most of this was shipped to West Germany for use in manufacture of sulfuric acid on a toll basis.

The principal discrepancy in the two sources of trade data concern shipments by Yugoslavia. In 1950 Yugoslavia officially reports exports of 92,500 metric tons of pyrites to Austria, whereas IMC reports Austrian imports of only 34,500 metric tons from Yugoslavia in that year. In 1951 the figures are in virtual agreement.

As previously stated, covertly reported receipts of pyrites in Satellites (principally Czechoslovakia) from Yugoslavia show 180,000 metric tons in 1950 and 130,000 metric tons in 1951, but of these quantities Austria is shown as receiving none in 1950 and only 5,000 metric tons in 1951. This further confirms that some of the Yugoslavian exports are transhipped through Austria to other Bloc countries.

Smaller excesses of exports reported by the exporting country over imports reported by Austria in 1950 occur in trade with Italy (13,500 metric tons excess) and Spain (13,000 metric tons excess).

25X1X4 [redacted] does not reveal any Italian exports of pyrites to Austria in 1950 but does report 10,000 metric tons to East Germany and 8,000 metric tons in excess of official Italian exports to Czechoslovakia in that year, all or part of which might have been transhipped to Austria.

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Similarly, there is no [redacted] confirmation of Spanish shipments of pyrites to Austria in 1950.

b. Belgium-Luxembourg.

In 1950 Belgium-Luxembourg officially reported 40,000 metric tons more imports from Spain than the latter country reported as exported to Belgium-Luxembourg. In 1951 there was a difference of 29,000 metric tons in the other direction. These differences might be accounted for by time lag, stockpile changes, or transshipment to Satellites. Antwerp is known to be an important port of transshipment for many commodities going to the Satellites, and pyrites have been mentioned in connection with this trade. Total official exports to Belgium-Luxembourg exceeded IMC reported consumption of pyrites by 21,000 metric tons in 1950 but equaled such exports in 1951. The evidence tends to confirm reports that pyrites have gone to the Soviet Bloc through Antwerp.

In early 1952 a Swiss intermediary placed orders in behalf of Czechoslovakia for 60,000 metric tons of pyrites, of which the first 15,000 metric tons were to be shipped through Antwerp for consignment to the intermediary. Under decree of 11 April 1952, however, transit of uncasted pyrites through Belgium-Luxembourg required licenses after 18 April 1952. 40/

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c. Denmark.

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Official Danish imports of pyrites reported by IMC in 1950 were 8,000 metric tons less than the exporting country official exports to Denmark but only 2,000 metric tons less in 1951. [redacted] Denmark shipped 3,000 metric tons of pyrites to East Germany in 1951. A trade agreement signed 12 December 1951 between Denmark and East Germany provides for shipment of 20,000 metric tons of pyrites to East Germany, yet Denmark produces no pyrites. Therefore, any shipments of pyrites by Denmark to the Bloc must be either transit trade or re-exports.

d. France.

Official statistics of exporting countries show an excess of 68,000 metric tons of pyrites shipments to France over official French trade returns of imports from those countries in 1950 and a deficit of 38,000 metric tons in 1951. The only significant difference between the two sources of statistics is in the trade with Cyprus. The net difference in this trade for the two years is a 7,000 metric ton excess for the Cyprus exports. This amounts to only about two cargoes and could be accounted for by departures from Cyprus late in 1950 and arrived in France after the turn of the year.

There is no evidence of any French shipments or transshipments of pyrites to the Soviet Bloc in 1950 or 1951. In 1952, however, France is reported to have sold 20,000 metric tons of pyrites of Yugoslavian origin to Poland, to be shipped from a Yugoslavian port directly to Odynia. 41/ Again in 1952 large but unspecified quantities of pyrites are reported to have been purchased in France, Belgium, Luxembourg, and the Netherlands for Poland by a Swiss intermediary. 42/

e. West Germany.

As previously stated, exports of Spain, Portugal, and Cyprus to Germany do not show data for East and West Germany separately. The German import statistics are for West Germany only. Spain, Portugal, and to a lesser extent Italy, show substantial excesses of exports to all Germany, over West German imports from those countries as shown in Table 14.

Table 14

Pyrites Trade of Germany with Spain, Portugal, and Italy, 1950-51 a/

| | Thousand Metric Tons | | | |
|---|----------------------|--|---------------------|------------|
| | 1950 | | 1951 | |
| Exporting Country Exports to Germany (All Zones) | West German Imports | Exporting Country Exports to Germany (All Zones) | West German Imports | |
| Spain | 394 | 355 | 458 | 363 |
| Portugal | 84 | 45 | 51 | 60 |
| Italy b/ | 0 | 5 | 11 | 10 |
| Yugoslavia b/ | 1 | 23 | 93 | 93 |
| Total | <u>479</u> | <u>428</u> | <u>613</u> | <u>526</u> |
| Excess of Exporting over Importing Country Statistics | 51 Excess | | 54 Excess | |

a. Data from Appendix B.

b. To West Germany only.

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Although no direct shipments of pyrites from Spain to the Satellites have been either officially [redacted] reported, large transit shipments through Hamburg (West Germany) to East Germany and Czechoslovakia have been [redacted] reported. In 1951 this transit trade amounted to 89,000 metric tons to East Germany

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and 29,000 metric tons to Czechoslovakia, or a total of 118,000 metric tons. This quantity compares with 95,000 metric tons excess of Spanish exports to all Germany over West German imports from Spain in that year.

Appendix E shows ship-by-ship arrivals of this 118,000 metric tons of Spanish pyrites in Hamburg, together with the country destinations of the cargoes. Further confirmation of the Spanish-East German trade in pyrites is to be found in the trade agreements between these two countries whereby Spain exports pyrites to East Germany in return for ammonium sulfate, paraffin, and chemicals.

Ship-by-ship transit trade through West Germany has not been fully reported for 1950. The Spanish exports of pyrites to all Germany in that year exceeded the West German imports from Spain in the same year by 35,000 metric tons, which confirms only part of the [redacted] trade of 90,000 metric tons in 1950.

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No adequate explanation is seen for the excess of Portuguese exports of pyrites to Germany (all zones) over the West German imports from that country, unless it is the time lag between departures and arrivals of shipments, or unless there were direct shipments [redacted] to East Germany. The sole [redacted] shipments of pyrites from Portugal to the Satellites amounted to only 4,000 metric tons in 1950 and 1,000 metric tons in 1951.

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[redacted] East Germany received 10,000 metric tons of pyrites from Italy in 1950 and 12,000 metric tons in 1951. Italy, however, reported no exports of pyrites to West Germany in 1950, only 11,000 metric tons in 1951, and none directly to East Germany in either year.

f. The Netherlands.

In both 1950 and 1951 exporting countries shipped more pyrites to the Netherlands than was officially reported by the Netherlands as having been imported from those countries. The exports to the Netherlands were 346,000 metric tons, and the imports by that country were 318,000 metric tons in 1950. The corresponding figures for 1951 were 441,000 and 400,000 tons respectively.

The only significant discrepancies between the two sources of statistics relate to the trade with Spain and Cyprus. As shown in Appendix D, Spain exported 24,000 metric tons more to the Netherlands in 1950, and 31,000 metric tons more in 1951 than the Netherlands reported as having imported from Spain. The Cyprus exports show excesses of 6,000 metric tons in 1950 and 20,000 metric tons in 1951 over the Netherlands receipts.

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No [redacted] information has been received on transit trade of Spanish pyrites through the Netherlands to the Soviet Bloc. However, existence of the transit trade is confirmed by a dispatch from The Hague, which describes a concentration of a large number of Czechoslovak freight cars in Rotterdam for the transport of Spanish ore and pyrites to Czechoslovakia. 43/

Further confirmation of this transit trade is found in the fact that exports of pyrites to the Netherlands exceeded the IBC reported consumption of pyrites by 36,000 metric tons in 1950, and by 41,000 metric tons in 1951. These excesses amounted to 12 percent of reported consumption (327,000 tons gross weight) in 1950, and 10 percent (369,000 tons gross weight) in 1951. Whether or not these excesses were added to stockpile is not known.

No covert trade in pyrites from Cyprus to the Soviet Bloc was reported either for 1950 or 1951.

g. Switzerland.

According to official trade returns of the countries involved, the exporting countries shipped 76,000 metric tons more pyrites to Switzerland in 1950 than Switzerland reported as imported from the same countries, and 24,000 metric tons more in 1951. Nearly all of these excesses are accounted for by the trade with Yugoslavia.

In 1950 Yugoslavia exported 80,000 metric tons of pyrites to Switzerland, which reported no imports from that country; and in 1951, Yugoslavia

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exported 19,000 metric tons to Switzerland which reported receipts of only 100 metric tons from Yugoslavia in that year.

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As Yugoslavia was the principal source of Czechoslovakian imports from the West in 1950 and 1951, [redacted] the conclusion is reached that part of the Yugoslavian exports to Switzerland moved in transit to Czechoslovakia or other Bloc countries. As stated under the section on Austria, part of the Yugoslavian exports moved through Austria. Additional evidence confirming existence of this trade is found in [redacted] reports that financing of Yugoslavian as well as Spanish pyrites for Czechoslovakia was handled by Swiss and Austrian intermediaries, although the shipping routes were not specified in these reports. 25X1X4

Still further confirmation of this transit trade lies in the fact that Swiss imports of pyrites are substantially larger than Swiss consumption. Total Swiss imports of pyrites from all sources were 57,000 metric tons in 1950 and 93,000 metric tons in 1951, but consumption according to ILC was only 46,000 metric tons and 80,000 metric tons in the respective years. The increase in 1951 consumption is partly accounted for by the shift of a sulfuric acid plant (designed to use either sulfur or pyrites) from sulfur to pyrites.

B. Trade Agreements between Soviet Bloc Countries.

Numerous trade agreements have been signed in recent years between European Satellites and Western countries for the purpose of obtaining, among other scarce materials, pyrites. Most of them involve exchange of commodities such as coal, cellulose, timber, and ammonium sulfate which are wanted by certain countries in the West. Similar agreements have been concluded with respect to sulfur and sulfuric acid.

Although the agreements concerning pyrites were not necessarily fulfilled, they do present evidence tending to support a substantial part of Western exports of this commodity to the Soviet Bloc. These agreements are listed in Table 15.*

* Table 15 follows on p. 20.

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Table 15

Trade Agreements between Soviet Bloc and Non-Soviet Bloc Countries
Involving Pyrites, Sulfur, or Sulfuric Acid 44/

| Countries | Dates of Coverage of Agreement | Item | Amount (Metric Tons) |
|--------------------------|-----------------------------------|-------------------|----------------------------|
| Bulgaria | | | |
| from Italy | Unknown | Sulfur | 500 <u>a/</u> |
| Czechoslovakia | | | |
| from Austria | 1 Nov 1950 to 30 Oct 1951 | Pyrites | Not Specified |
| from Finland | 28 Oct 1949 to 30 Sep 1950 | Pyrites | 10,000 |
| from Italy | <u>b/</u> | <u>b/</u> | <u>b/</u> |
| from Norway | Approved 17 Jun 1950 | Pyrites | 10,000 |
| from Norway | 1 Oct 1950 to 30 Sep 1951 | Pyrites | 25,000 |
| from Norway | 9 Nov 1951 to 9 Nov 1952 | Pyrites | 25,000 |
| from Sweden | 1 Feb 1949 to 31 Jan 1950 | Pyrites | 10,000 |
| East Germany <u>c/</u> | | | |
| from Denmark <u>d/</u> * | Approved 12 Dec 1951 | Pyrites | 20,000 <u>e/</u> |
| from Finland | Unknown | Pyrites | <u>f/</u> |
| from Italy | June 1949 to completion | Pyrites | 6,250 |
| from Norway | 1949 | Pyrites | 100,000 |
| from Norway | 1951 | Pyrites | Unknown |
| from Norway | 1952 | Pyrites | 60,000 |
| from Spain <u>h/</u> | Unknown | Pyrites | 100,000 <u>i/</u> |
| from Spain <u>j/</u> | Approved by Spain 19 Jun 1951 | Pyrites | 50,000 <u>i/</u> |
| Hungary | | | |
| from Italy | 9 Feb 1950 to 31 Dec 1952 | Pyrites | 6,000 |
| from Italy <u>k/</u> | Unknown | Pyrites | 13,000 <u>l/</u> <u>m/</u> |
| from Italy <u>k/</u> | Unknown | Sulfur | 2,500 <u>m/</u> |
| from Italy <u>k/</u> | Unknown | Sulfuric Acid | 5,000 <u>n/</u> |
| Poland | | | |
| from Austria | Unknown | Pyrites | 60,000 |
| from Finland | 1949 | Pyrites <u>n/</u> | 8,000 |
| from Italy | 15 Jun 1949 to 14 Jun 1952 | Sulfur | 10,500 |
| from Italy | 15 Jun 1949 to 14 Jun 1952 | Sulfuric Acid | 9,000 |
| from Norway | Jan to Jun 1951 | Pyrites | 10,000 |
| from Norway | 8 Apr 1952 to 7 Apr 1953 | Pyrites | 15,000 |
| from Sweden | 3 Nov 1949 to 31 Oct 1950 | Iron | 10,000 |
| from Sweden | 1 Nov 1950 to 31 Oct 1951 | Pyrites | |
| from Sweden | 1 Nov 1951 to 31 Oct 1952 | Iron | 10,000 |
| from Sweden | | Pyrites | <u>o/</u> |
| Rumania | | | |
| from Italy | 29 Dec 1950 to 28 Dec 1951 | Sulfur | 3,200 <u>p/</u> |
| from Italy | 29 Dec 1951 to 19 Dec 1952 | Sulfur | 3,200 <u>p/</u> |
| USSR | | | |
| from Norway | 1949 | Pyrites | 25,000 |

a. At a cost of \$50,000.

b. Various private compensation agreements have been concluded, of which the details are not known. The most current agreement concerns 60 million lire of sulfur (about 1,000 metric tons) and 25 million lire of pyrites (about 2,500 metric tons).

c. Agreements with Sweden include 2,000 tons of ammonium sulfate to be sent to Sweden in fiscal 1950, and 3,000 tons to be sent in the calendar year 1952. Apparently no pyrites, sulfur, or sulfuric acid is to be sent to East Germany in return.

* Footnotes d through p for this table follow on p. 21.

- d. Agreement between Danish businessman and East German government. This same agreement provided for \$170,000 of ammonium sulfate to be sent from Denmark to East Germany.
- e. At a cost of \$600,000.
- f. Finland was requested to give first consideration to East German pyrite requirements as soon as Finland is in a position to export this item.
- g. An approximate figure; cost was \$100,000.
- h. This same agreement provided for 12,500 tons of ammonium sulfate to be sent to Spain from East Germany.
- i. Of Spanish origin through a Swiss firm.
- j. This same agreement provided for 7,250 tons of ammonium sulfate to be sent to Spain from East Germany.
- k. Source is a newspaper report of unknown accuracy.
- l. Of Spanish origin.
- m. Yearly.
- n. Iron pyrites, with sulfur content of 40 to 43 percent.
- o. Amount to be agreed upon.
- p. At a cost of 200 million lire.

C. Principle Means and Routes by Which Pyrites Enter the Bloc from the West.

Following are brief descriptions of the principal trade routes by which pyrites move from the Western countries to the Bloc.

1. Spain.

The greater part of the trade moves by ship from Huelva, Cartagena, and Bilbao in Spain, to Hamburg, whence it goes by rail to East Germany and Czechoslovakia. Unknown but probably smaller quantities are similarly transported through Antwerp and Rotterdam. Small exports to Rumania have also gone via Hamburg and thence by rail. Some shipments to Poland have entered at Baltic ports, and some have transited through Hamburg.

2. Norway.

Exports to East Germany presumably go from Lalm and Hallangen by ship from Norwegian ports through German Baltic ports, and thence by rail. Shipments to Poland and Czechoslovakia enter through Stettin, Wismar, or Rostock.

3. Sweden.

At least some if not most of the pyrites exports to East Germany from Sweden go by car ferry from Swedish ports to Denmark, and continue to Germany by rail. Other shipments may go directly by ship to Wismar, Rostock, or Stettin. Exports destined for Poland and Czechoslovakia enter through Stettin.

4. West Germany.

Pyrites has been reported as moving to Poland by sea to Gdynia and Stettin or presumably by rail via Tuplice.

5. Italy.

Most of the pyrites exports to Czechoslovakia and Poland apparently go by sea and enter through the port of Stettin. Some shipments to Czechoslovakia, however, have gone by rail via Tarvisio on the Austro-Italian border. Shipments to East Germany and the Soviet Zone of Austria also presumably move by rail.

6. Portugal.

In the absence of definite information it is probable that exports to East Germany, the only Bloc country to which shipments have been reported, move in the same manner as those from Spain.

7. Greece.

The only reported shipments from Greece have been to the Soviet Zone of Austria by ship to Trieste, and thence by rail.

8. Cyprus.

No definite information is available as to whether the trade route to Czechoslovakia, the principal Bloc buyer, is by sea to Baltic ports or to Trieste and thence by rail.

9. Yugoslavia.

25X1X4

25X1X4 Most of the Yugoslavian exports to the Satellites go to Czechoslovakia, with smaller quantities to East Germany, Poland, and Hungary. Little firm information has been received showing the routes followed by this trade. Some pyrites have moved to Poland via rail to Trieste and thence by ship to Gdynia or Danzig. As Yugoslavian official statistics show larger exports to Austria and Switzerland but none to Czechoslovakia in 1950 and 1951, it is believed that the pyrites move in transit through these countries to the Satellites. Barges have been reported at Smederevo, Yugoslavian city on the Danube, as loading pyrites for Czechoslovakia. ^{45/} The roundabout route for transporting Yugoslavian pyrites to Czechoslovakia via Switzerland may have been necessary because of financial risks or in order to circumvent export controls of licenses.

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APPENDIX A

SUMMARY OF SOVIET BLOC PRODUCTION, a/ IMPORTS, b/ EXPORTS, c/ AND APPARENT CONSUMPTION d/ OF PYRITES, BY COUNTRIES, 1949-51

| | | | | | | | | | | Thousand Metric Tons | |
|----------------------|--------------|----------------|-----------|-----------|----------|----------|----------|-----------------------|---------------------------|----------------------|------------|
| | East Germany | Czechoslovakia | Poland | Hungary | Rumania | Bulgaria | Albania | Austria (Soviet Zone) | European Satellites Total | USSR | Bloc Total |
| <u>1949</u> | | | | | | | | | | | |
| Production | 70 | 25 | 40 | 30 | 31 | 15 | 0 | 0 | 192 | N.A. | N.A. |
| Imports | | | | | | | | | | | |
| From within the Bloc | 7 | 10 | 0 | 0 | 0 | 0 | 0 | Negligible | 17 | 0 | 17 |
| From the West | | | | | | | | | | | |
| Official Data | 91 | 116 | 24 | 0 | 0 | 0 | 0 | 0 | 231 | 33 | 264 |
| 25X1X4 | 33 | 53 | 0 | 30 | 3 | 0 | 0 | N.A. | 99 | 0 | 99 |
| Total Imports | <u>151</u> | <u>179</u> | <u>24</u> | <u>30</u> | <u>3</u> | <u>0</u> | <u>0</u> | <u>0</u> | <u>347</u> | <u>33</u> | <u>380</u> |
| Exports | | | | | | | | | | | |
| To Bloc | 0 | 0 | 4 | 0 | 0 | 13 | 0 | 0 | 17 | 0 | 17 |
| To West | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Apparent Consumption | 201 | 204 | 60 | 20 | 34 | 2 | 0 | N.A. | 523 | N.A. | N.A. |
| <u>1950</u> | | | | | | | | | | | |
| Production | 80 | 40 | 45 | 12 | 46 | 38 | 22 | 0 | 283 | N.A. | N.A. |
| Imports | | | | | | | | | | | |
| From within the Bloc | 20 | 51 | 0 | 1 | 0 | 0 | 0 | 1 | 73 | 0 | 73 |
| From the West | | | | | | | | | | | |
| Official Data | 85 | 96 | 29 | 0 | 0 | 0 | 0 | N.A. | 210 | 0 | 210 |
| 25X1X4 | 224 | 150 | 0 | 10 | 0 | 0 | 0 | N.A. | 284 | 0 | 284 |
| Total Imports | <u>229</u> | <u>297</u> | <u>29</u> | <u>11</u> | <u>0</u> | <u>0</u> | <u>0</u> | <u>1</u> | <u>567</u> | <u>31</u> | <u>598</u> |

* Footnotes for this table follow on p. 24.

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SUMMARY OF SOVIET BLOC PRODUCTION, a/ IMPORTS, b/ EXPORTS, c/ AND APPARENT CONSUMPTION d/ OF PYRITES, BY COUNTRIES, 1949-51
(Continued)

| | East Germany | Czechoslovakia | Poland | Hungary | Rumania | Bulgaria | Albania | Austria (Soviet Zone) | Thousand Metric Tons | | | |
|----------------------|--------------|----------------|--------|---------|---------|----------|---------|--------------------------|---------------------------------|------|---------------|--|
| | | | | | | | | | European Satellites Total | USSR | Bloc Total | |
| 1950 (Continued) | | | | | | | | | | | | |
| Exports | | | | | | | | | | | | |
| To Bloc | 0 | 0 | 0 | 0 | 15 | 36 | 19 | 0 | 73 | 0 | 73 | |
| To the west | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Apparent Consumption | 309 | 337 | 74 | 23 | 31 | 2 | 0 | 1 | 777 | N.A. | N.A. | |
| 1951 | | | | | | | | | | | | |
| Production | 103 | 90 | 50 | 14 | 66 | 68 | 25 | 0 | 416 | N.A. | N.A. | |
| Imports | | | | | | | | | | | | |
| From within the Bloc | 27 | 52 | 17 | 46 | 0 | 0 | 0 | N.A. | 132 | 8 | 140 | |
| From the west | 58 | 47 | 20 | 0 | 0 | 0 | 0 | N.A. | 119 | 0 | 119 | |
| Official Data | 100 | 129 | 30 | 0 | 9 | 0 | 0 | 17 | 285 | 0 | 285 | |
| Total Imports | 175 | 222 | 67 | 46 | 9 | 0 | 0 | 17 | 526 | 8 | 534 | |
| Exports | | | | | | | | | | | | |
| To Bloc | 16 | 0 | 0 | 0 | 42 | 64 | 6 | 0 | 128 | 12 | 140 | |
| To the west | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Apparent Consumption | 262 | 312 | 117 | 60 | 33 | 4 | 19 e/ | 17 | 824 | N.A. | N.A. | |

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a. Documented in text under the respective countries.
 b. Imports from countries within the Bloc are as documented in Appendix C; imports (official) from the West are taken from official trade returns of the exporting countries, or from IMC; and imports (covert) from the West are fully documented in Appendix B.
 c. Exports from countries within the Bloc are documented in Appendix C.
 d. Production plus imports minus exports. No allowance made for stockpiling.
 e. Shown as apparent consumption, since only 6,000 metric tons was reported exported and estimated production was 25,000 metric tons.

APPENDIX B

IMPORTS OF PYRETHS BY SOVIET BLOC COUNTRIES FROM WESTERN COUNTRIES, 1949-51 a/ 16/

| Year | Exporting Country | Thousand Metric Tons | | | | | | | | | | |
|--------|-------------------|----------------------|----------------|--------|---------|---------|----------|---------|-----------------------|---------------------------|------|------------|
| | | East Germany | Czechoslovakia | Poland | Hungary | Romania | Bulgaria | Albania | Austria (Soviet Zone) | European Satellites Total | USSR | Bloc Total |
| 1949 | Official Data | 0 | N.A. | 0 | 0 | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. |
| 25X1X4 | Yugoslavia | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Official Data | 9 | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. |
| 25X1X4 | Italy | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. |
| | Official Data | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 25X1X4 | Spain | 0 | 20 | 0 | 0 | 0 | 0 | 0 | 0 | 20 | 0 | 20 |
| | Official Data | 0 | (20) | 0 | 0 | 0 | 0 | 0 | 0 | (20) | 0 | (20) |
| 25X1X4 | Portugal | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. |
| | Official Data | 0 | 13 | 0 | 0 | 0 | 0 | 0 | 0 | 13 | 0 | 13 |
| 25X1X4 | Norway | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Official Data | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 25X1X4 | Sweden | 86 | 6 | 17 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Official Data | (95) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 25X1X4 | | 5 | 17 | 3 | 0 | 0 | 0 | 0 | 0 | 109 | 33 | 142 |
| | | (3) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | | | | | | 25 | 0 | 25 |
| | | | | | | | | | | 0 | 0 | 0 |

* Footnotes for this table follow on p. 29.

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IMPORTS OF PYRITES BY SOVIET BLOC COUNTRIES FROM WESTERN COUNTRIES, 1949-51 a/ b/
(Continued)

| Year | Exporting Country | Thousand Metric Tons | | | | | | | | | | | |
|--------|---------------------|----------------------|----------------|--------|---------|---------|----------|---------|--------------------------|---------------------------------|------|---------------|---|
| | | East Germany | Czechoslovakia | Poland | Hungary | Rumania | Bulgaria | Albania | Austria (Soviet Zone) | European Satellites Total | USSR | Bloc Total | |
| 1949 | Finland | N.A. | 0 | h | 0 | 0 | 0 | 0 | 0 | 0 | h | 0 | h |
| 25X1X4 | Official Data | 2h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | h | 0 | h | |
| | Cyprus | N.A. | 73 | 0 | 0 | 0 | 0 | 0 | 0 | 2h | 0 | 2h | |
| 25X1X4 | Official Data | N.A. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 73 | 0 | 73 | |
| 25X1X4 | Total Official Data | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 3 | 0 | 3 | |
| | | 91 | 116 | 2h | 0 | 0 | 0 | 0 | 0 | 231 | 33 | 264 | |
| | | 33 | 23 | 0 | 10 | 3 | 0 | 0 | 0 | 99 | 0 | 99 | |
| | Grand Total | 124 | 169 | 2h | 10 | 3 | 0 | 0 | 0 | 330 | 33 | 363 | |

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IMPORTS OF PYRITES BY SOVIET BLOC COUNTRIES FROM WESTERN COUNTRIES, 1949-51 ^{3/46}
(Continued)

| Year | Exporting Country | East Germany | Czechoslovakia | Poland | Hungary | Rumania | Bulgaria | Albania | Austria (Soviet Zone) | Thousand Metric Tons | | |
|--------|-------------------|--------------|----------------|--------|---------|---------|----------|---------|--------------------------|---------------------------------|------|---------------|
| | | | | | | | | | | European Satellites Total | USSR | Bloc Total |
| 1950 | West Germany | | | | | | | | | | | |
| 25X1X4 | Official Data | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 0 | 6 |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 25X1X4 | Yugoslavia | | | | | | | | | | | |
| | Official Data | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 20 | 150 | 0 | 10 | 0 | 0 | 0 | 0 | 180 | 0 | 180 |
| 25X1X4 | Greece | | | | | | | | | | | |
| | Official Data | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 25X1X4 | Italy | | | | | | | | | | | |
| | Official Data | N.A. | 17 | 0 | 0 | 0 | 0 | 0 | N.A. | 17 | 0 | 17 |
| | | 10 | (25) | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 0 | 10 |
| 25X1X4 | Spain | | | | | | | | | | | |
| | Official Data | N.A. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 90 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 90 | 0 | 90 |
| 25X1X4 | Portugal | | | | | | | | | | | |
| | Official Data | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 4 |
| 25X1X4 | Norway | | | | | | | | | | | |
| | Official Data | 80 | 12 | 22 | 0 | 0 | 0 | 0 | 0 | 114 | 0 | 114 |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 3 |
| 25X1X4 | Sweden | | | | | | | | | | | |
| | Official Data | 5 | 14 | 7 | 0 | 0 | 0 | 0 | 0 | 26 | 0 | 26 |
| | | (5) | (10) | (11) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 25X1X4 | Finland | | | | | | | | | | | |
| | Official Data | 0 | N.A. | N.A. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

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IMPORTS OF PYRITES BY SOVIET BLOC COUNTRIES FROM WESTERN COUNTRIES, 1949-51² / 46/
(Continued)

| Year | Exporting Country | Thousand Metric Tons | | | | | | | | | | |
|--------|---------------------|----------------------|----------------|--------|---------|---------|----------|---------|--------------------------|---------------------------------|------|---------------|
| | | East Germany | Czechoslovakia | Poland | Hungary | Rumania | Bulgaria | Albania | Austria (Soviet Zone) | European Satellites Total | USSR | Bloc Total |
| 1950 | Cyprus | | | | | | | | | | | |
| 25X1X4 | Official Data | N.A. | 47 | 0 | 0 | 0 | 0 | 0 | 0 | 47 | 0 | 47 |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 25X1X4 | Total Official Data | 85 | 96 | 29 | 0 | 0 | 0 | 0 | 0 | 210 | 0 | 210 |
| | | 124 | 150 | 70 | 10 | 0 | 0 | 0 | 0 | 284 | 0 | 284 |
| | Grand Total | 209 | 246 | 29 | 10 | 0 | 0 | 0 | 0 | 494 | 3 | 497 |
| 1951 | West Germany | | | | | | | | | | | |
| 25X1X4 | Official Data | 0 | 19 | 0 | 0 | 0 | 0 | 0 | 0 | 19 | 0 | 19 |
| | | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 5 |
| 25X1X4 | Yugoslavia | | | | | | | | | | | |
| | Official Data | 0 | 0 | 0 | 0 | 0 | 0 | 0 | N.A. | 0 | 0 | 0 |
| | | 0 | 100 | 25 | 0 | 0 | 0 | 0 | 5 | 130 | 0 | 130 |
| | Greece | | | | | | | | | | | |
| 25X1X4 | Official Data | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 25X1X4 | Italy | | | | | | | | | | | |
| | Official Data | N.A. | 0 | 10 | 0 | 0 | 0 | 0 | 4 | 4 | 0 | 4 |
| | | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 0 | 10 |
| 25X1X4 | Spain | | | | | | | | | | | |
| | Official Data | N.A. | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 12 | 0 | 12 |
| | | 89 | 29 | 0 | 2 | 9 | 0 | 0 | 6 | 135 | 0 | 135 |
| 25X1X4 | Portugal | | | | | | | | | | | |
| | Official Data | N.A. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 |

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IMPORTS OF PYRITES BY SOVIET BLOC COUNTRIES FROM WESTERN COUNTRIES, 1949-51a/16/
(Continued)

| Year | Exporting Country | Thousand Metric Tons | | | | | | | | | | |
|--------|---------------------|----------------------|----------------|--------|---------|---------|----------|---------|--------------------------|---------------------------------|------|---------------|
| | | East Germany | Czechoslovakia | Poland | Hungary | Rumania | Bulgaria | Albania | Austria (Soviet Zone) | European Satellites Total | USSR | Bloc Total |
| 1951 | Norway | | | | | | | | | | | |
| 25X1X4 | Official Data | 58 | 14 | 10 | 0 | 0 | 0 | 0 | 0 | 82 | 0 | 82 |
| | (b) (7) (C) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 25X1X4 | Sweden | | | | | | | | | | | |
| | Official Data | N.A. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 25X1X4 | (b) (7) (C) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Finland | | | | | | | | | | | |
| 25X1X4 | Official Data | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | (b) (7) (C) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 25X1X4 | Cyprus | | | | | | | | | | | |
| | Official Data | N.A. | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 8 | 0 | 8 |
| 25X1X4 | (b) (7) (C) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Denmark | | | | | | | | | | | |
| 25X1X4 | Official Data | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | (b) (7) (C) | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 0 | 6 |
| 25X1X4 | Total Official Data | 58 | 41 | 20 | 0 | 0 | 0 | 0 | 0 | 119 | 0 | 119 |
| | (b) (7) (C) | 106 | 129 | 30 | 2 | 9 | 0 | 0 | 17 | 293 | 0 | 293 |
| | Grand Total | 164 | 170 | 50 | 2 | 9 | 0 | 0 | 17 | 412 | 0 | 412 |

25X1X4

a. All official data are from official trade returns of the respective exporting countries or from I.M.C. statistics have been inserted in parentheses but are not included in the totals. shipments confirmed by official

25X1X4

IMPORTS OF PRIMITES BY SOVIET BLOC COUNTRIES FROM BLOC COUNTRIES, 1949-51 47/

APPENDIX C

| Year | Exporting Country | Thousand Metric Tons | | | | | | | | | |
|-------|-------------------|----------------------|----------------|--------|---------|---------|----------------------------------|---------------------------|------|------------|--|
| | | East Germany | Czechoslovakia | Poland | Hungary | Rumania | Austria (Soviet Zone) Negligible | European Satellites Total | USSR | Bloc Total | |
| 1949 | Bulgaria | 4 | 0 | 0 | 0 | 0 | 0 | 13 | N.A. | 13 | |
| | Poland | 0 | 0 | N.A. | 0 | 0 | 0 | 4 | 0 | 4 | |
| | Rumania | 0 | 0 | 0 | 0 | N.A. | 0 | 0 | N.A. | 0 | |
| | Total | 7 | 10 | 0 | 0 | 0 | Negligible | 17 | 0 | 17 | |
| 1950 | Albania | 0 | 21 | 0 | 1 | 0 | 0 | 22 | N.A. | 22 | |
| | Bulgaria | 20 | 12 | 0 | 0 | 0 | 1 | 36 | N.A. | 36 | |
| | Rumania | 0 | 15 | 0 | 0 | N.A. | 0 | 15 | N.A. | 15 | |
| | Total | 20 | 51 | 0 | 1 | 0 | 1 | 73 | N.A. | 73 | |
| 1951 | Albania | 0 | Negligible | 0 | 6 | 0 | 0 | 6 | N.A. | 6 | |
| | Bulgaria | 17 | 40 | 7 | 0 | 0 | 0 | 64 | N.A. | 64 | |
| | East Germany | 0 | 0 | 8 | 0 | 0 | 0 | 8 | 8 | 16 | |
| | Rumania | 0 | 0 | 2 | 40 | 0 | 0 | 42 | N.A. | 42 | |
| | USSR | 0 | 12 | 0 | 0 | 0 | 0 | 12 | N.A. | 12 | |
| Total | 17 | 52 | 17 | 46 | 0 | 0 | 132 | 8 | 140 | | |

APPENDIX D

TRAFFIC IN PYRITES IN WESTERN EUROPE -- REPORTS OF EXPORTING COUNTRIES
 COMPARED WITH REPORTS OF IMPORTING COUNTRIES, 1950-51 a/*

| Countries | 1950 | | 1951 | |
|--|---------------------------|---------------------------|---------------------------|---------------------------|
| | Exporting Country Exports | Importing Country Imports | Exporting Country Exports | Importing Country Imports |
| <u>Exports from Cyprus to</u> | | | | |
| France | 293 | 242 | 215 | 273 |
| Germany (All Zones) | 109 | 100 b/ | 142 | 153 b/ |
| Italy | 77 | 70 | 95 | 92 |
| Netherlands | 70 | 64 | 109 | 78 |
| Switzerland | 0 | 0 | 32 | 32 |
| UK | 16 | 16 | 53 | 40 c/ |
| Total | 565 | 492 | 646 | 668 |
| Excess or Deficit of Exporting over Importing Country Statistics | 73 Excess | | 22 Deficit | |
| Exports to Bloc Countries | 0 | | 0 | |
| <u>Exports from Italy to</u> | | | | |
| West Germany | 0 | 5 | 11 | 10 |
| Netherlands | 0 | 0 | 61 | 43 |
| Switzerland | 42 | 43 | 40 | 42 |
| Austria | 27 | 14 b/ | 0 | 0 b/ |
| Total | 69 | 62 | 112 | 95 |
| Excess or Deficit of Exporting over Importing Country Statistics | 7 Excess | | 17 Deficit | |
| Exports to Bloc Countries | 10 | | 12 | |

* Footnotes for this table follow on p. 33.

TRAFFIC IN PYRITES IN WESTERN EUROPE -- REPORTS OF EXPORTING COUNTRIES
 COMPARED WITH REPORTS OF IMPORTING COUNTRIES, 1950-51 a/
 (Continued)

| Countries | 1950 | | 1951 | |
|---|------------------------------|---------------------------------|------------------------------|---------------------------------|
| | Exporting Country Exports | Importing Country Imports | Exporting Country Exports | Importing Country Imports |
| <u>Exports from Portugal to</u> | | | | |
| Germany (All Zones) | 83 | 45 b/ | 51 | 60 c/ |
| Belgium-Luxembourg | 135 | 130 | 144 | 153 |
| Denmark | 8 | 7 | 13 | 11 |
| France | 219 | 198 | 199 | 240 |
| Netherlands | 46 | 50 | 49 | 49 |
| UK | 0 | 0 | 15 | 20 |
| Total | 491 | 430 | 471 | 533 |
| Excess or Deficit of Exporting over Importing Country Statistics | 61 Excess | | 62 Deficit | |
| Exports to Bloc Countries | 4 | | 1 | |
| 25X1X4 | | | | |
| <u>Exports from Spain to</u> | | | | |
| Austria | 18 | 5 | 0 | 0 |
| Belgium-Luxembourg | 150 | 178 | 228 | 199 |
| Denmark | 79 | 65 | 64 | 67 |
| France | 103 | 107 | 142 | 139 |
| Germany (All Zones) | 394 | 355 b/ | 458 | 363 c/ |
| Italy | 66 | 19 | 65 | 77 |
| Netherlands | 193 | 169 | 212 | 187 |
| Switzerland | 10 | 11 | 16 | 6 |
| UK | 176 | 176 | 267 | 271 |
| Total | 1,289 | 1,085 | 1,452 | 1,308 |

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TRAFFIC IN PYRITES IN WESTERN EUROPE -- REPORTS OF EXPORTING COUNTRIES
 COMPARED WITH REPORTS OF IMPORTING COUNTRIES, 1950-51 a/
 (Continued)

| Countries | 1950 | | 1951 | |
|---|------------------------------|---------------------------------|------------------------------|---------------------------------|
| | Exporting Country Exports | Importing Country Imports | Exporting Country Exports | Importing Country Imports |
| Exports from Spain to (Continued) | | | | |
| Excess or Deficit of Exporting over Importing Country Statistics | | | | |
| | | 104 Excess 90 | | 151 Excess 125 |
| Exports to Bloc Countries 25X1X4 | | | | |
| Austria | 93 | 34 | 11 | 105 |
| west Germany | 1 | 23 | 111 | 93 |
| Italy | 1 | 0 | 1 | N.A. |
| Switzerland | 80 | 0 | 19 | 1 |
| Denmark | 0 | 0 | 19 | 19 |
| 25X1X4 | Total | 175 | 161 | 218 |
| Excess or Deficit of Exporting over Importing Country Statistics | | | | |
| | | 118 Excess 180 | | 57 Deficit 130 |

a. This appendix is based on official trade statistics of the respective countries.
 b. west Germany only.
 c. IHC.

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TRANSHIPMENTS OF PYLITES FROM SPAIN TO EAST GERMANY AND CZECHOSLOVAKIA VIA HAMBURG, BY SHIPS, 1951-48/

APPENDIX A

| Steamer | Departure Date from Spain | Arrival Date at Hamburg | Pyrites Carries (Thousand Metric Tons) | |
|----------------------|---------------------------|-------------------------|--|----------------------|
| | | | Sent to Czechoslovakia | Sent to East Germany |
| Iciar | N.A. | 19 Jan | | 6,052 |
| Castillo Montiel | N.A. | 28 Jan | | 7,125 |
| Santa Domingo | N.A. | 4 Feb | | 4,785 |
| Abando | N.A. | 10 Mar | | 2,300 |
| Santa Domingo | N.A. | 23 Mar | | 4,652 |
| Castillo Simancas | N.A. | 26 Mar | | 7,495 |
| Castillo Montiel | N.A. | 31 Mar | | 7,763 |
| Monte Maferrati | 9 Apr | 8 Apr | | 7,300 |
| Ramon Alonzo | 19 Apr | 19 Apr | | 7,593 |
| Castillo Montiel | N.A. | 28 Apr | | 5,851 |
| Abando | 26 May | 30 Jun | | 1,100 |
| Castillo Alencia | N.A. | 6 Jun | | 2,684 |
| Castillo Berivar | N.A. | 30 Jun | | 1,000 |
| Castillo Belivar | N.A. | 12 Jul | | 5,000 |
| Castillo Alencia | 12 Sep | 4 Aug | | 4,100 |
| Urcia | N.A. | 21 Sep | 3,010 | |
| Maja a/ | 11 Oct | 6 Oct | 5,500 | |
| Kuseyin Kaplan | 10 Oct | N.A. | | 2,500 |
| Riade Ares | 11 Oct | 18 Oct | 6,600 | |
| Hestia | 15 Oct | 20 Oct | 2,000 | |
| Santa Domingo | 24 Oct | 21 Oct | 3,900 | |
| Castillo Terdesillas | 29 Oct | 1 Nov | 1,500 | |
| Azubarreta | 11 Nov | 10 Nov | | |
| Castelbruno | 9 Aug | N.A. | | |
| Manu | N.A. | N.A. | 6,116 | |
| | | 19 Jul | | 882 |
| Total | | | 28,756 | 88,952 |

as entered at Stettin.

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APPENDIX F

GAPS IN INTELLIGENCE

The most significant gaps in intelligence on the position of the Soviet Bloc in pyrites are as follows:

1. Lack of official data on transshipments of Spanish pyrites through Belgium, the Netherlands, and Denmark.
2. Lack of recent data on reserves and current production of pyrites in the USSR and European Satellites (except East Germany).
3. Lack of information on exports of Albania, Bulgaria, and Rumania in 1951 by countries of destination.
4. Lack of information on consumption and requirements of pyrites for manufacture of sulfite pulp in the USSR and Satellite countries. Such information would permit more reliable estimation of the total pyrites requirements of these countries.
5. Lack of data on reserves of elemental sulfur, and on production of elemental sulfur (including by-product sulfur) in the USSR and in each of the European Satellites (except East Germany).

Information on the extent of recovery and use of sulfur dioxide from by-product sources, particularly from nonferrous ores, in the USSR and in each European Satellite.

APPENDIX G

METHODOLOGY

Since the European Satellites are much more dependent on the West for their supplies of pyrites than is the USSR, emphasis has been placed on the supply position of the Satellites.

Production and consumption data on pyrites are spotty for all the Satellites except East Germany, and it was necessary to make estimates for the others on the basis of prewar reports giving estimates requirements for principal consuming industries; on reports giving production targets, initial production from newly exploited deposits; and on other miscellaneous reports. Consideration had also to be given to development of the use of anhydrite or gypsum and of kieserite for the manufacture of sulfuric acid, with the consequent decrease in requirements of pyrites. In the case of Albania, Bulgaria, and Rumania, production estimates were derived from the known exports less imports plus estimates of indigenous consumption.

In preparation of statistics on exports of pyrites from the West to the Soviet Bloc, official statistics of the exporting countries were employed wherever such trade was reported. As not all of the exporting countries report shipment of pyrites separately in their trade returns, it was necessary to obtain the missing information from these countries" [redacted]

25X1X4

[redacted] were employed for data on official [redacted] shipments through East Germany and the Low Countries. No duplications [redacted]

25X1X4

25X1X4

[redacted] occur in Appendix B. [redacted] shipments confirmed by official statistics have been inserted in parentheses but are not included in the totals.

25X1X4

In order to confirm the large transit trade, tabulations were made of the exports of the Western European producing countries to the consuming countries in that area, for comparison with the recipient countries' imports from the same producing countries. The excesses of the exports over the imports served to confirm [redacted] transit trade through West Germany, Austria, and Switzerland, and indicated existence of some transit movements through Belgium, the Netherlands, and Denmark. Consideration had also to be given to the recipient countries' consumption of pyrites as reported by the IMC.

25X1X4

APPENDIX H

SOURCES AND EVALUATION OF SOURCES1. Evaluation of Sources.

The principal sources from which information for this report were obtained were as follows, in descending order of importance:

25X1X4

- a. [REDACTED]
- b. Foreign Service reports of the Department of State.
- c. Official returns of Western European governments, or their IMC delegates, on their trade in pyrites.
- d. US Bureau of Mines, Department of Commerce, reports on prewar production and reserves of pyrites and sulfur.
- e. NIE 32, reserves and production of pyrites and sulfur in the USSR. These estimates in turn were based on an exhaustive study of many sources including Soviet publications, prewar surveys by US engineers, captured German intelligence documents, CIA and Army Intelligence reports, Soviet Economic Notes (prepared by the former Soviet desk of the Department of Commerce), and other miscellaneous reports.

25X1X4

- f. Army Intelligence reports.
- g. Naval Intelligence reports.
- h. [REDACTED]

The official trade returns of the Western European countries and the Foreign Service reports are considered to be reliable even though they are inadequate, they do not report transit trade separately, and in some instances exports to Germany do not show those to East and West Germany separately.

The CIA reports are believed to be generally reliable. There were some instances, however, in which reported trade in pyrites could not be confirmed or in which confirmation was not indicated by official trade statistics. In other instances, deliveries of pyrites for which purchase contracts were reported were not later confirmed, or else reported deliveries were not tied in to previously reported purchase contracts. Extreme caution was used to avoid double counting of shipments.

25X1X7□

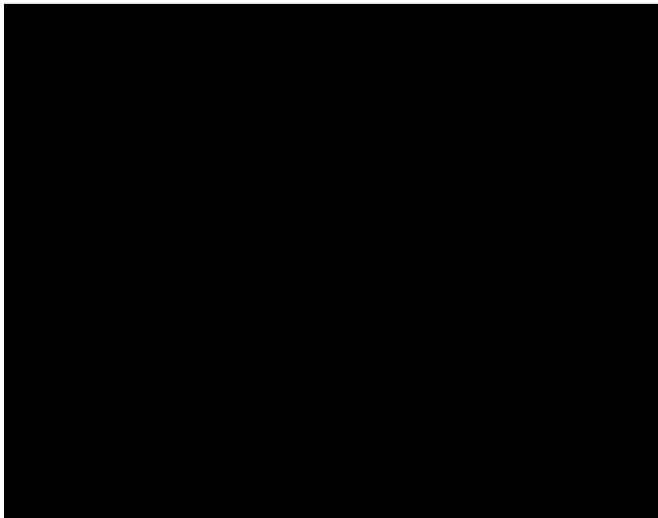
The Foreign Service reports of the Department of State and the Army and Navy Intelligence reports are believed to be generally reliable.

25X1X7□

[REDACTED] They are believed to be generally reliable although no effort has been made to check their accuracy.

The remaining sources of information are considered to be generally reliable.

225X4A2es.



25X1A2g

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- State, Vienna, Despatch 673, 18 Jan 1951.
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- State, Oslo, Despatch 497, 16 Nov 1951.
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- TOECZ A-80-Rome, 29 Jun 1949.
- State, Oslo, Despatch 540, 26 Nov 1948.
- State, Oslo, Despatch T-914, 13 Mar 1951.
- State, Oslo, Despatch 708, 21 Jan 1952.
- State, Oslo, Despatch T-7808, 13 Jun 1952.
- State, Madrid, Despatch 174, 23 Aug 1950.
- State, Madrid, Despatch T-541, 24 Nov 1951.
- State, Rome, Despatch 899, 18 Sep 1950.
- State, Rome, Despatch 1749, 28 Jan 1952.
- State, Rome, Despatch 1996, 26 Feb 1952.
- State, Paris, Despatch T-6087, 2 Apr 1952.
- State, Budapest, Despatch 384, 20 Dec 1951.
- State, Vienna, Despatch T-810, 28 Sep 1951.
- State, Vienna, Despatch T-1071, 19 Sep 1951.
- State, Vienna, Despatch T-1231, 3 Oct 1951.
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- State, Rome, Despatch 1054, 8 Aug 1949.
- State, Rome, Despatch 1909, 14 Feb 1952.
- State, Oslo, Despatch 1019, 5 Jan 1951.
- State, Oslo, Despatch T-887, 9 Apr 1952.
- State, Stockholm, Despatch 686, 26 Jun 1950.
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- State, Rome, Despatch 1736, 7 Dec 1950.
- State, Rome, Despatch 2182, 25 Jan 1951.
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- ONI Com Nav Forger 321-5-51, 25 Jul 1951.
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