Bureau of Mineral Resources,
Geology & Geophysics

RECORD 1985/41

METPRI

USERS' GUIDE

PRELIMINARY

Resource Assessment Division
Bureau of Mineral Resources
Geology & Geophysics

Record
1985/41

METPRI USERS' GUIDE

(Preliminary Edition)

Daily Metal Prices Database

Reference Manual

by

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Canberra, Australia, November 1985

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Acknowledgements

The authors gratefully acknowledge the considerable assistance provided by the staff of I.P. Sharp Associates Limited in the establishment of IMPRI and in the preparation of this guide

PREFACE

The METPRI Users' Guide has been issued in preliminary form mainly to assist those who are currently using the database on a regular basis. In 1986 the database coverage will be increased to include an additional eight metals. There will consequently be a revision to the Users' Guide.

METPRI was established by Brian Elliott, Head, Mineral Information and Statistics Section, Mineral Commodities Branch, and Rae Lorenz, with much of the retrospective prices being collected and input by Kim Beven. The physical implementation of the database structure and user functions was undertaken by Dr Ahnont Wongseelashote, Branch Manager of I.P. Sharp Associates Ltd Canberra.

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14 November 1985

CONTENTS

Chapter 1: PRICES

1.1 Their use in the mineral industry

Prices reflect variations in market supply/demand and are important inputs to decision making in the mineral and related industries. Prices influence decisions on capital investment and levels of production, purchasing for inventory, and substitution.

Historical price series can provide a useful base from which to project future trends. Metal price forecasts are important as inputs for decisions on mineral exploration strategies and rate of development of a mineral deposit, project feasibility studies, and marketing.

In depth analysis of price series data can provide a deeper insight into why prices change. Processing of the data can show that prices change for reasons other than a variation in the fundamental market supply/demand position. The condition of the major industrial economies, interest and currency exchange rates, and inflation, influence metal prices. By using an appropriate currency exchange rate, real price equivalents or their eqivalents in other currencies may be compared to actual market prices.

Chapter 2: THE DATA

2.1 Recording and Reporting of Price Data at BMR

The Metal Prices Index data base (METPRI) will be of considerable interest to those who monitor and study mineral prices, price variations and trends. The Mineral Commodity Section of the Bureau of Mineral Resources (BMR) collects, monitors, and publishes prices of ores, concentrates and metals as an intergral part of its mineral industry studies. METPRI provides BMR Commodity Specialists with a convenient and timely source of international metal price information for use in mineral commodity and resource assessment studies.

Metal prices have been recorded by the Minerals Branch since 1948. Prior to 1963 all commodity specialists maintained records for their commodities. In 1963 the recording of copper, lead, zinc and tin prices was centralized, nickel being added in 1976; aluminium and gold in 1979; and silver in 1980. Centralized recording of commodity prices led to the application of consistent recording methods and saved the commodity specialists a considerable amount of time. Recording of other commodity prices has remained with commodity specialists and it is expected that they too will be incorporated into a central data base as time permits.

2.2 Publication of Prices Data

The raw prices data are published by the BMR in several publications.

BMR's *Monthly Bulletin of Metal, Ore and Concentrate Prices* contains prices as at the end of the month and monthly averages. The *Australian Mineral Industry Review Quarterly* contains metal, ore, and concentrate prices extant at the end of the last month of the quarter and monthly minimum, maximum and average prices for the eight major metals included in METPRI for each month of of the quarter. The *Australian Mineral Industry Annual Review* contains annual average, minima and maxima over the previous five years along with graphs showing the daily price fluctuations over the past year. Price data are also used by BMR staff in papers prepared for conferences such as the Petroleum and Minerals Review Conference held each year in Canberra.

2.3 Automation of Price Recording and Reporting

There is a growing demand from industry, government and the public for commodity specialists to provide information on price trends and projections; comparisons of mineral prices in constant and current dollar value terms; and currency price equivalents. They are also often asked to interpret major fluctuations in prices. Manual methods of processing the data to meet the demand are too time consuming for specialists. Access to an automated data base which can process and reorganize prices data is of considerable assistance in providing an historical background to price movements, which can lead to better informed advice. There is also a need for the rapid production of graphs for reports and slide presentations. This has led to studies to find the most satisfactory method of automating the processing of data. Updating of the METPRI data base is carried out on a weekly basis with a one week timelag. It now contains daily prices for copper, lead, zinc, nickel, tin, aluminium, gold and silver, in most cases back to 1971. This makes it possible to undertake more

rigorous analyses which had previously been considered too complex and time consuming.

The following pages describe the data, the operation of the data base, special retrievals and the use of the data with other I. P. Sharp data bases.

2.4 Prices Series and Sources

The price series selected are those considered by specialists to be most representative of the market. At least one series from each of Australia, UK/Europe and the United States has been chosen for each metal, where possible. With time, some prices have become less representative as new prices are introduced. For example, following the introduction in 1979 of the LME nickel contract, the major producer price for nickel declined in importance as a pricing basis for the industry.

The Minerals Branch source most of their metal price data from the *Australian Financial Review* and the *Metal Bulletin*, which are gratefully acknowledged. The source used for each series is shown in Appendix A.

When changes in the unit of measurement or currency occur in the series, all values prior to the change are converted to the new units. For example, there was a change in 1981 in units for the Penang tin quotation from M$/picul to M$/kilogram.

2.5 Commodity Pricing

Although most metal is traded outside the London Metal Exchange (LME) markets, LME daily prices and LME contract specifications are the basis for most transactions involving sales of copper, lead, zinc, and their ores and concentrates. Adjustments in prices may be made where there are variations in product quality, freight differentials, exchange rates, quantities sold, etc.

Leading producers also quote prices for their metal product. Prices for aluminium, nickel, platinum and zinc are generally established in this way, but in recent years there has been increasing use of LME prices as a point of reference for producer pricing.

Australian metal prices are generally based on overseas market prices such as the LME or major producer price, although there are variations on the pricing formulas adopted in each case. For example, lead, copper and silver metal prices quoted by major Australian producers are related to the LME price and to variations in currency exchange rates. In contrast, the Australian price for gold, as qoted by the Perth Mint, is the Australian equivalent of the Hong Kong market opening quote.

London Metal Exchange

From 1882, the London Metal Exchange has provided a market for international traders dealing in metals. It provided an avenue for the growing practice of drawing up contracts for uniform lots and grades of metals, for delivery in three months. The three month period was based on the average time it took ships to reach London and other English ports from the U.S. and Latin America. (1)

The LME consists of 150 individuals representing about 70 companies: metal producers, large consumers, and metal merchants.(3) About 30 operators deal in the ring which has morning and afternoon sessions with two five-minute periods for each metal. Trading times are given in Appendix B. The METPRI price in each case is the official midday quote from the *Metal Bulletin*.

The LME performs three major functions:

(1) It is a market on which metal is physically traded.

(2) It provides an opportunity for producers and consumers to hedge against price movements.

(3) LME quotations represent an indicator reflecting the supply and demand situation in the international free market which is recognized throughout the world.

The LME is used by producers, fabricators, dealers, merchants, commission houses, banks, speculators and others for many purposes of which "hedging" is probably the most important. It also serves as a market of last resort for marginal metal requirements, especially for fabricators in Europe and Japan.(4)

2.51 Silver Prices

The London Spot and Forward Price is the The London Silver Market price which is published in many publications, such as *Metal Bulletin* and *Metals Week*.

The London Silver Market began in 1880 as an entrepot market (commercial centre for import and export) between U.S. silver producers and Chinese and Indian importers. It later grew to become a centre for international trade providing "hedging" facilities for silver buyers and sellers. The daily price is fixed at 12.15 p.m. when the London brokers meet at the offices of Samuel Montague. The price is widely quoted in journals and newspapers.(1)

The BHAS (Broken Hill Associated Smelters) price for silver is the "free on rail" price for metal delivered to Port Pirie. The *Australian Financial Review* quotes BHAS as the leading Australian producer. The company produces silver recovered from lead-silver ores.

The Handy and Harman price is quoted from *Metal Bulletin*. It is the lowest price at which offers can be obtained by Handy and Harman for refined silver in quantities sufficient to meet their daily requirements.(15)

The metal is in commercial bar form and meets ASTM B413-69 at 99.9% purity. The price is for nearby delivery at New York.

Handy and Harman have been highly regarded manufacturers of gold and silver products for almost 120 years. They also produce gold and silver alloys in all mill forms, and refine all types of precious metal scrap. The U.S. Bureau of Mines quotes Handy and Harman prices because they are more representative of the selling price than the COMEX price.

2.52 Aluminium Prices

Currently the most important prices in the aluminium industry are the producer list prices for domestic sales and the Alcan world export price.

Since 1978, aluminium has been traded on the LME. Initially trade was slow, but in recent years the LME price has been used more frequently as a sales basis. Various transaction prices (prices at which single sales are made to customers and merchants) and free-market prices (quoted by dealers) are also published in trade journals.

Producer list prices change infreqently; adjustments to changes in demand are primarily made by changes in capacity utilization rates and by discounts or premiums on the list price. In contrast, the free-market prices fluctuate considerably.

There are no posted domestic or international prices for metal-grade bauxite or aluminium; most transactions are based on long-term contracts (10 to 20 years) and are not published. Contract prices often reflect transfer pricing arrangements within integrated aluminium producers and between partners of joint ventures. The quality of metal specified in the contract is a minimum purity of 99.5% aluminium with a maximum iron content of 0.40% and a maximum silica content of 0.30%. Deliveries must come from a list of approved brands in quantities of 25 tonnes with the weight of each ingot (including T-ingots) being in the range of 12-16 kg.(6) As yet, its use is relatively limited, and only an estimated 30% of aluminium traded is priced using the LME quote as basis.

The U.K. Producer Price is the non-ferrous primary metal price quoted by British Alcan Aluminium Ltd. and published in the *Metal Bulletin*. The price basis is for virgin ingots of a minimum 99.5% purity.(11)

The U.S. Producer Price is published by METAL BULLETIN as the average list price for the main North American producers of primary ingot of minimum 99.5% purity delivered in cartload lots in the U.S. market.(6)

2.53 Gold Prices

London and Zurich have for many years competed as centres for gold trading. Luxembourg has recently been favoured as an alternative as it does not impose taxes on gold trading.(8)

The London Spot Price is the London Bullion Market morning fix as published in *Metal Bulletin*. The London Bullion Market was established on 12 September 1919 to meet the demands of South African suppliers for the best price obtainable. Membership consisted of five bullion dealers who met daily to determine the price, which became known as the official "fix". Present day membership of the market remains the same. Representatives of the firms meet twice a day at 10:30 a.m. and 3:00 p.m. to establish a morning and afternoon fix which is then announced as the official price. A final close price is announced at the end of each day.(8)

The Handy and Harman Price as published by *Metal Bulletin* is the lowest price at which offers can be obtained by Handy and Harman for a minimum 99.5% purity, for nearby delivery in New York in quantities sufficient to meet their daily requirements.(15)

Perth Mint Price has been the preferred Australian price for gold since the Gold Producers Association changed its sales practice in mid-January 1980, to a weekly auction system. Prices paid at the auction are kept confidential. The Perth Mint price is the Gold Producers Association price, and is based on the Hong Kong market opening quote.(9) The *Australian Financial Review* is the source of data.

2.54 Copper Prices

Pricing of most metals, including refined copper is strongly influenced by a free market structure and the behaviour of suppliers and consumers. It depends largely on supply and demand which can be influenced by economic policy measures, political conflicts, labour disputes, exchange rate parity changes, natural disasters, and warehouse stocks.

Even where a long term sales contract is linked to the provision of finance for the development of a mine, pricing is generally based on market prices rather than predetermined prices.

There are producer prices for internal domestic sales of refined copper in several industrialised countries such as Australia, Japan, South Africa, France and Canada, as well as the U.S.A. Prices are expressed in terms of the local currency and, in the absence of government price control, are generally kept close to LME prices at prevailing rates of exchange by regular monthly or ad-hoc adjustments or changes based on a moving average of daily prices. Adjustments are made almost daily in France, bi-weekly in Japan, monthly in South Africa and periodically in Australia. The U.S.A. and Canadian producer prices move closely together and often differ substantially from the LME and COMEX prices.

The majority of sales of refined copper outside the U.S.A. are made on annual contracts (calendar year) to fabricators. Some refined copper from custom smelters and refiners, and a small amount from miners who smelt and refine their own copper, is sold to merchants and dealers. There are also "integrated producers" especially in the U.S.A., who process copper from mine to semi-fabricated product (wire, sheet, rod, tube, strip, etc.) without change of ownership.

During the 1970's, industry in Europe was increasingly using high-grade cathode as feed material rather than wirebars, used for conventional wire drawing operations. This prompted the LME in 1981 to create a new contract for high grade copper to replace the wirebars contract. Wirebars could still be delivered under the same contract at the seller's option. In fact, wirebars have continued to be used by fabricators outside Europe, despite all expectations of a decline in their use.(13)

Until 1981, BMR used the wirebars price, which was electrolytic copper or fire-refined copper in the form of high conductivity wirebars of standard dimensions in the range 90-125kg. Contracts were for 25 tonne parcels with a 2% margin. The price since 1981 is the high grade price as quoted in *Metal Bulletin*.

The U.S. producer price for refined copper is influenced by COMEX and LME quotations in the longer term, but at low price levels it is influenced more by the production costs of producers. The U.S. producer price is the selling price used by the major copper producers in the U.S.A. for sales within that

country. All producers quote a price in U.S. cents/lb for cathode; nearly all quote a price for wirebar. COMEX prices do not have a large direct role in the pricing of copper in international trade, but LME prices do have a very strong role. COMEX has a smaller physical turnover than the LME and is not particularly oriented towards the international market.

The Australian Domestic Price quoted in METPRI is set by Mount Isa Mines (MIM) and published in the *Australian Financial Review*.

2.55 Nickel Prices

From 1929 to the end of July 1977, world nickel prices were very largely based on prices for refined nickel published by INCO Ltd, the world's major producer. This price, which in general did not change frequently, served as a basic reference for the majority of nickel industry transactions including those for concentrates, matte, etc., with adjustments for items including the degree of processing of product, delivery point, currency differences, contract size and payment schedules. The remaining transactions took place on dealer markets in the U.S.A. and Europe. The prices paid at these "free markets" were much more variable and volatile, but they provided a barometer of nickel supply-demand relationships. INCO stopped publishing its prices for nickel between July 1977 and February 1979. During this period *Metals Week* published a price that became the recognised substitute for the producer price. The LME started trading nickel on a forward basis in April 1979, and trading on a cash basis was introduced in July. Since then the LME price has emerged as an accepted basis for the pricing of nickel.

The LME issues a single price for nickel at the close of trading. The nickel is traded in 6-tonne lots at minimum purity of 99.8%, as cathodes, pellets, or briquettes.

The Major Producer Price had been traditionally announced by INCO and followed by all other producers. The INCO price is for electrolytically refined nickel metal expressed in US dollars and quoted F.O.B. Port Colborne, Ontario, Canada.(10) The two major prices in METPRI are for melting grade and plating grade, as quoted in *Metal Bulletin*.

The European Market Price is the CIF Europe price quoted in *Metal Bulletin* as a range on the basis of contracts with metal dealers in the area.(11)

2.56 Lead Prices

The price of lead outside the U.S.A. during the last 30 years has been largely determined by the London Metal Exchange. The LME price is for refined pig lead assaying not less than 99.97% lead which is traded in 25-tonne lots (2)

The Australian Domestic Price, as for silver, is the BHAS Port Pirie price as quoted in the *Australian Financial Review*.

The U.S. Producer Price is the basis for pricing lead in the United States. It is a range of sales prices quoted by those North American producers posting list prices in the U.S.A.(15)

2.57 Tin Prices

There are three major world tin markets: Kuala Lumpur, London and New York. Differences in prices between these centres are normally small.(7)

The Kuala Lumpur Tin Market (KL) was established in October, 1984. It is the successor to the Straits tin market in Penang, in which the daily price set by the two smelters was determined by the quantity of concentrates offered and bids to purchase tin metal. The new market also is a physical market, but the price setting mechanism is similar to the London Bullion Market where bids and offers are balanced to achieve a single daily official spot quotation, to be issued each trading morning. Trading is limited to one tonne lots of high grade "fresh tin" of Malaysian origin.(14)

Since no great variation in the Malaysian tin price resulted from the change in market, the price series in METPRI has been continued with a change in name from Penang (PEN) to Kuala Lumpur Tin Market (KL).

LME tin prices are quoted in pounds sterling per tonne for standard grade tin (99.75% minimum purity) stored at official warehouses. All tin delivered must be of brands approved by and registered with the LME committee and be either in ingots or slabs each weighing between 12 and 50 kg. Contracts are for lots of 5 tonnes.(7)

The New York Price is equivalent to the Penang tin price plus all costs of shipping, handling, insurance and financing, excluding dealers overheads and profits, as quoted by major dealers for Straits (grade A) tin.(7)

The Australian Domestic Price is based on the Penang price and is quoted by Associated Tin Smelters as the price per tonne up to 2 p.m. E.S.T. on the day quoted.

2.58 Zinc Prices

Zinc prices on world markets are determined by the London Metal Exchange and metal producers within a particular region.

LME zinc prices are quoted in pounds sterling per tonne for standard zinc assaying a minimum 98% zinc content. Contracts are for 25 tonne lots.(3)

The U.S. producer price for zinc is the top and bottom of the range of sales quoted by those North American producers posting list prices in the U.S.A.(17) On 29 September 1980, the U.S. producer price changed from Prime Western to U.S. high grade.(3)

The European Producer Price as quoted by *Metal Bulletin* is an evaluation of selling prices announced by producers selling zinc metal in Europe for a minimum quality of 98% CIF Europe.(11)

The Australian Domestic Price for zinc is the Electrolytic Zinc Co. price for Prime Western (maximum 1.6% lead and a minimum 0.08% iron,) as quoted in the *Australian Financial Review*.

Chapter 3: THE DATA BASE

An outline of METPRI content can be found in Appendix A.

METPRI consists of three attributes: Date, Metals, and Prices.

3.1 Date

Prices data for METPRI are entered for the five working days of each week, Monday to Friday. Days when no trading occurs, such as public holidays, will contain zero values. Dates in METPRI are accessed in the form:

day month year.

For example, one day would be accessed as follows:

```
DAILY DATED AT 1 1 83
```

Data for more than one day would be obtained by entering:

```
1 2 3 4 5 DAILY DATED 1 1 83 TO 31 1 83
```

3.2 Metals

There are eight metals specified in this attribute: aluminium, copper, gold, lead, nickel, silver, tin and zinc. They are referred to by their codes (e.g., *AU* for gold). Table 1 lists the codes and labels for each metal.

3.3 Prices

Twenty-four prices are specified in this attribute. They are referred to by their codes (e.g., *LMC* for London Metal Exchange cash).

3.4 Online Information

A brief description of METPRI may be obtained while using I.P. Sharp's InfoService, by typing *METPRI 'DESCRIBE'* after entering the 39 *MAGIC* system (see Chapter 4).

A complete list of codes can be obtained by keying in *METPRI 'DIRECTORY'*.

A table showing the latest periods entered for each price is obtained as follows: *METPRI 'STATUS'*.

Prices in METPRI may be retrieved, manipulated, analysed and formatted as tables or graphs using a suite of programs called 39 *MAGIC*. MAGIC was designed by I.P. Sharp Associates for use with all their time series data bases. This means that users of METPRI can access any of the other I.P. Sharp data bases while using MAGIC, and combine the data from these time series with METPRI data.

A detailed account of how to use MAGIC is provided in the I.P. Sharp publication *MAGIC User Manual*, and further assistance may be obtained from your local I.P.Sharp branch office.

The following routines illustrate how to access METPRI using MAGIC. Once connected to the I.P. Sharp systsem, the first step is to invoke MAGIC by typing)*LOAD* 39 *MAGIC*. The next step is to set a timeframe, and specify the *AUTOLABEL* command if labels for the data are required. The next step is to specify the data base (e.g., METPRI) and the prices required. This is done in the format: *METPRI 'codes'*, where *codes* is a combination of valid metal and price codes. See Table 1 for a complete list of codes. Metal codes and prices codes are separated by a slash (e.g., *'AL/AP'*), and each code by a comma (e.g., *'AG,AU/LDS,LDG,HHS,HHG'*).

METPRI allows similar price codes to be truncated. For example, *LM* retrieves both *LMC* and *LMF*, and *US* retrieves *USPL, USPH, USML, USMH*. (Do not use the truncation *LD* unless both gold and silver prices are to be retrieved).

4.1 Tables of Daily Prices

In the following examples, we have assumed, for convenience of exposition, that each example is independent from one another, and that a user has either typed)*LOAD* 39 *MAGIC* at the start of each example, or has entered *CLEAR* and *RESETOPTIONS*, where appropriate.

The first example below, tables all available prices from 18 June 1984 to the present date:

```
1 2 3 4 5 DAILY, DATED 17 8 85
AUTOLABEL
TABLE METPRI 'CU,PB,ZN/LM'
```

	COPPER		LEAD		ZINC	
	LME CASH POUND/TO	LME FORWARD POUND/TO	LME CASH POUND/TO	LME FORWARD POUND/TO	LME CASH POUND/TO	LME FORWARD POUND/TO
19AUG85	1,013	1,039	291.25	294.50	527.00	
20AUG85	1,002	1,029	299.75	298.50	531.00	
21AUG85	1,005	1,033	298.00	300.00	527.00	
22AUG85	997	1,026	298.25	302.00	514.00	
23AUG85	997	1,022	295.25	298.25	510.00	

26*AUG*85					
27*AUG*85	998	1,024	302.50	303.00	501.50
28*AUG*85	995	1,021	301.00	302.00	492.00
29*AUG*85	1,003	1,028	300.50	303.00	496.00
30*AUG*85	1,006	1,029	307.00	305.00	493.00
2*SEP*85	1,011	1,037	302.00	302.00	498.00
3*SEP*85	1,015	1,041	298.00	301.00	512.00
4*SEP*85	1,006	1,033	299.50	300.50	500.00
5*SEP*85	1,008	1,034	298.00	298.50	506.00
6*SEP*85	1,029	1,054	300.00	300.50	525.00
9*SEP*85	1,047	1,073	298.50	299.00	525.00
10*SEP*85	1,045	1,072	298.00	302.00	526.00
11*SEP*85	1,026	1,054	303.00	303.00	514.00
12*SEP*85	1,042	1,069	304.50	304.50	532.00
13*SEP*85	1,026	1,050	297.50	301.00	511.00
16*SEP*85	1,026	1,052	299.00	302.50	523.00
17*SEP*85	1,017	1,041	297.50	303.75	516.00
18*SEP*85	1,013	1,037	296.50	304.00	517.00
19*SEP*85	1,008	1,032	289.50	298.75	515.00
20*SEP*85	991	1,016	289.50	297.25	503.00
23*SEP*85	946	972	285.50	294.00	475.50
24*SEP*85	951	976	286.25	294.00	465.00
25*SEP*85	956	981	285.00	293.50	460.00
26*SEP*85	952	977	282.50	290.50	450.00
27*SEP*85	963	988	276.50	285.50	457.00
30*SEP*85	960	987	277.00	286.00	470.00
1*OCT*85	962	988	278.50	287.00	456.00
2*OCT*85	966	991	278.50	286.75	444.00

The next example tables all the gold prices for May 1984:

```
1 2 3 4 5 DAILY,DATED 1 5 84 TO 31 5 84
AUTOLABEL
TABLE METPRI 'AU'
```

	GOLD		
	HANDY AND HARMAN US$/TROY	*PERTH MINT A$/TROY.*	*LONDON SPOT US$/TROY OZ.*
1*MAY*84	376.50	409.05	376.40
2*MAY*84	377.35	407.20	377.35
3*MAY*84	378.50	407.40	378.30
4*MAY*84	376.50	407.40	378.30

7MAY84	374.50	409.00	
8MAY84	371.50	409.65	371.50
9MAY84	372.60	409.65	372.65
10MAY84	371.75	411.80	370.10
11MAY84	372.50	414.50	373.00
14MAY84	372.55	414.90	371.20
15MAY84	373.25	416.00	373.35
16MAY84	375.25	416.70	374.80
17MAY84	376.50	418.50	376.65
18MAY84	375.60	420.00	375.00
21MAY84	380.75	426.10	380.35
22MAY84	379.50	424.65	379.15
23MAY84	378.55	420.00	378.50
24MAY84	375.65	418.60	375.30
25MAY84	384.20	419.00	380.50
28MAY84		443.70	
29MAY84	385.60	433.70	385.50
30MAY84	386.40	431.50	384.75
31MAY84	384.25	429.45	383.45

The following example tables all metal prices for 29 June 1984:

```
1 2 3 4 5 DAILY DATED AT 29 6 84
AUTOLABEL
DISPLAY METPRI 'ALL'
```

	29JUN84
SILVER	
BHAS A$/KG	317.12
HANDY AND HARMAN US CENT/TROY.OZ.	838
LONDON SPOT PENCE/TROY OZ.	620.50
LONDON FORWARD PENCE/TROY.OZ.	634.40
ALUMINIUM	
LME CASH POUND/TONNE	927.50
LME FORWARD POUND/TONNE	946.50
UK PRODUCER POUND/TONNE	1,100
US PRODUCER RANGE LOW US CENT/POUND	81
US PRODUCER RANGE HIGH US CENT/POUND	81
GOLD	
HANDY AND HARMAN US$/TROY.OZ.	373.05
PERTH MINT A$/TROY.OZ.	430
LONDON SPOT US$/TROY OZ.	375.25
COPPER	
AUSTRALIA DOMESTIC A$/TONNE	1,560
LME CASH POUND/TONNE	1,001
LME FORWARD POUND/TONNE	1,017
US PRODUCER RANGE LOW US CENT/POUND	64.50
US PRODUCER RANGE HIGH US CENT/POUND	66

NICKEL	
LME CASH POUND/TONNE	3,525
LME FORWARD POUND/TONNE	3,600
EUROPEAN MARKET RANGE LOW US$/POUND	2.12
EUROPEAN MARKET RANGE HIGH US$/POUND	2.22
MAJOR PRODUCER MELTING GRADE US$/POUND	3.20
MAJOR PRODUCER PLATING GRADE US$/POUND	3.29
LEAD	
AUSTRALIA DOMESTIC A$/TONNE	525
LME CASH POUND/TONNE	388
LME FORWARD POUND/TONNE	379.50
US PRODUCER RANGE LOW US CENT/POUND	30
US PRODUCER RANGE HIGH US CENT/POUND	34
TIN	
AUSTRALIA DOMESTIC A$/TONNE	16,433
LME CASH POUND/TONNE	9,338
LME FORWARD POUND/TONNE	9,286
US NEW YORK RANGE LOW US CENT/POUND	584
US NEW YORK RANGE HIGH US CENT/POUND	590
KUALA LUMPUR TIN MARKET M$/KG	29.20
ZINC	
AUSTRALIA DOMESTIC A$/TONNE	1,257
EUROPEAN PRODUCER US$/TONNE	1,040
LME CASH POUND/TONNE	640
US PRODUCER RANGE LOW US CENT/POUND	50.50
US PRODUCER RANGE HIGH US CENT/POUND	53

4.2 Weekly, Monthly, Quarterly and Annual Time Periods

When setting weekly, monthly, quarterly or annual time periods, either the *NOYEAREND* option is specified, or one of the options below must be set as year-end option. The option numbers are as follows:

1 Average
2 Last value
3 First value
4 Minimum
5 Maximum

An example showing weekly averages for all metals which have Australian prices, follows:

```
5 WEEKLY, DATED 1 3 84 TO 30 3 84
AUTOLABEL
NOYEAREND
TABLE 1 METPRI 'AD,AP,BHAS,PM'
```

	SILVER	ALUMINIU	GOLD	COPPER	LEAD	TIN	ZINC
	BHAS A$/KG	AUSTRALI PRODUCER A$/TONNE	PERTH MINT A$/TROY.	AUSTRALI DOMESTIC A$/TONNE	AUSTRALI DOMESTIC A$/TONNE	AUSTRALI DOMESTIC A$/TONNE	AUSTRALI DOMESTIC A$/TONNE
2MAR84	1,654	8,750	2,111	7,700	2,500	74,247	5,850
9MAR84	1,683	8,750	1,692	7,700	2,500	74,740	5,790
16MAR84	1,645	8,750	2,070	7,760	2,500	74,658	5,790
23MAR84	1,615	8,750	2,071	7,820	2,500	74,652	5,790
30MAR84	1,633	8,750	2,069	8,000	2,500	75,714	5,790

The following example tables the monthly maximum price of all London Metal Exchange prices:

```
MONTHLY,DATED 7 84 TO 12 84
AUTOLABEL
NOYEAREND
DISPLAY 5 METPRI 'LM'
```

	JUL/84	AUG/84	SEP/84	OCT/84	NOV/84	DEC/84
ALUMINIUM						
LME CASH POUND/TONNE						
MAXIMUM	908.00	890.00	826.00	928.50	954.00	943.00
LME FORWARD POUND/TONNE						
MAXIMUM	928.00	.915.00	849.50	954.00	979.00	967.00
COPPER						
LME CASH POUND/TONNE						
MAXIMUM	1,031	1,044	1,045	1,077	1,110	1,141
LME FORWARD POUND/TONNE						
MAXIMUM	1,046	1,060	1,064	1,103	1,130	1,147
NICKEL						
LME CASH POUND/TONNE						
MAXIMUM	3,605	3,695	3,865	4,060	3,953	4,260
LME FORWARD POUND/TONNE						
MAXIMUM	3,692	3,775	3,960	4,130	4,030	4,195
LEAD						
LME CASH POUND/TONNE						
MAXIMUM	386.00	373.00	336.00	348.00	368.50	400.00
LME FORWARD POUND/TONNE						
MAXIMUM	381.50	372.50	345.50	355.00	360.00	335.00
TIN						
LME CASH POUND/TONNE						
MAXIMUM	9,510	9,550	9,895	9,820	9,840	9,966
LME FORWARD POUND/TONNE						
MAXIMUM	9,425	9,455	9,801	9,815	9,810	9,925
ZINC						
LME CASH POUND/TONNE						
MAXIMUM	672	651	631	644	647	687

The next example gives quarterly minimum prices for copper:

```
QUARTERLY DATED 1 83 TO 2 84
AUTOLABEL
NOYEAREND
TABLE 4 METPRI 'CU'
```

	AUSTRAL	LME CAS	LME FOR	US PROD	US PROD
	MINIMUM	MINIMUM	MINIMUM	MINIMUM	MINIMUM
1ST/83	1,540	933	960	73.00	76.00
2ND/83	1,860	1,058	1,085	77.50	78.00
3RD/83	1,760	989	1,015	71.50	73.00
4TH/83	1,520	905	929	65.00	67.00
1ST/84	1,520	942	967	64.00	64.50
2ND/84	1,560	971	992	63.00	66.00

An example tabling the last price each year for tin, follows:

```
YEARLY,DATED 74 TO 84
AUTOLABEL
NOYEAREND
TABLE 2 METPRI 'SN'
```

	AUSTRAL	LME CAS	LME FOR	US NEW	US NEW	KUALA L
	FIRST VALUE	FIRST VALUE	FIRST VALUE	FIRST VALUE	FIRST VALUE	FIRST VALUE
1974	3,966	2,875	2,573	292.50	292.50	13.56
1975	5,361	3,025	2,923	309.00	354.00	15.05
1976	5,292	3,076	3,138	290.00	307.00	15.82
1977	8,517	5,265	5,325	405.00	413.00	21.85
1978	11,027	6,240	6,245	550.00	570.00	27.78
1979	12,711	6,945	6,820	660.00	667.00	30.09
1980	15,247	7,560	7,335	788.00	795.00	34.90
1981	13,208	6,295	6,380	684.00	698.00	32.27
1982	15,069	8,330	7,925	690.00	725.00	34.00
1983	14,222	7,410	7,425	554.00	556.00	29.15
1984	15,485	8,465	8,630	567.00	575.00	29.16

When more than one option is required, use the numbers corresponding to the options on the left hand side, for example:

```
1 4 5 METPRI 'AG/BHAS'
```

This will retrieve the average, minimum and maximum for that series. See the beginning of this section for a complete list of options and their corresponding values.

4.3 Currency Conversion

METPRI prices may be converted from the quoted currency to any other currency within MAGIC. The I.P. Sharp CURRENCY data base may be used to derive exchange rates, by utilizing MAGIC arithmetic keywords to carry out the conversion.

The conversion of nickel prices on the London Metal Exchange to the Australian equivalent in dollars per kilogram, is shown below:

```
1 2 3 4 5 DAILY, DATED 25 3 85 TO 29 3 85
TITLE 'NICKEL PRICES'
LABEL 'LME CASH (POUND PER TONNE), AUSTRALIAN EQUIVALENT'
1 PUT METPRI 'NI/LMC'
2 PUT CURRENCY 'MBGBP'
3 PUT (ITEM 2) DIVIDED BY 100
4 PUT (ITEM 1) TIMES (ITEM 3) DIVIDED BY 1000
TABLE ITEM 1 4
```

NICKEL PRICES

	LME CASH (POUND PER TONNE)	*AUSTRALI EQUIVALE*
25*MAR*85	4,475	7.55
26*MAR*85	4,435	7.46
27*MAR*85	4,340	7.35
28*MAR*85	4,305	7.47
29*MAR*85	4,240	7.45

4.4 Real Price Calculations

The use of price indexes to deflate metal prices is a simple procedure in MAGIC. A number of I.P. Sharp data bases contain price index time series. The index preferred by BMR is the consumer price index. A paper outlining the reasons for BMR's preference is included as Appendix D, along with a range of deflators available through I.P. Sharp's InfoService.

The example below gives the quarterly average LME copper price and its real price equivalent for 1984 to 1985. The commands used for real price calculations follow:

```
QUARTERLY, DATED 1 84 TO 2 85
NOYEAREND
TITLE 'COPPER PRICES'
LABEL 'LME CASH, REAL PRICE EQUIVALENT'
FOOTNOTE 'U.K. CONSUMER PRICE INDEX USED AS DEFLATOR'
1 PUT 1 METPRI 'CU/LMC'
2 PUT IFS '64/U.K'
3 PUT (ITEM 1) TIMES (,ITEM 2)[1] DIVIDED BY ITEM 2
DISPLAY ITEM 1 3
```

COPPER PRICES

	1ST/84	2ND/84	3RD/84	4TH/84
LME CASH	1,001	1,029	1,018	1,078
REAL PRICE EQUIVALENT	1,001	1,008	990	1,035

	1ST/85	2ND/85
LME CASH	1,236	1,187
REAL PRICE EQUIVALENT	1,171	1,087

U.K. CONSUMER PRICE INDEX USED AS DEFLATOR

4.5 Indexing Prices

METPRI prices may be converted to a common starting point of 100 by using the MAGIC keyword *INDEX*. In the next example, the LME nickel price is compared with its currency equivalents in Australia and in the United States. The Australian equivalent is in $A per kilogram, and the U.S. equivalent is in $US per pound.

An example of using indexing follows:

```
1 2 3 4 5 DAILY DATED 1 3 85 TO 30 4 85
TITLE 'NICKEL PRICES'
TITLE 'RELATIVE PERFOMANCE (INDEXED 3 1 82)'
LABEL 'LME CASH, AUSTRALIAN EQUIVALENT, U.S. EQUIVALENT'
1 PUT METPRI 'NI/LMC'
2 3 PUT CURRENCY 'MBGBP,NGBP'
4 5 PUT (ITEM 1) TIMES (ITEM 2 3) DIVIDED BY 1000
TABLE 4 3 85 INDEX ITEM 1 4 5
```

NICKEL PRICES
RELATIVE PERFORMANCE (INDEXED 3 1 82)

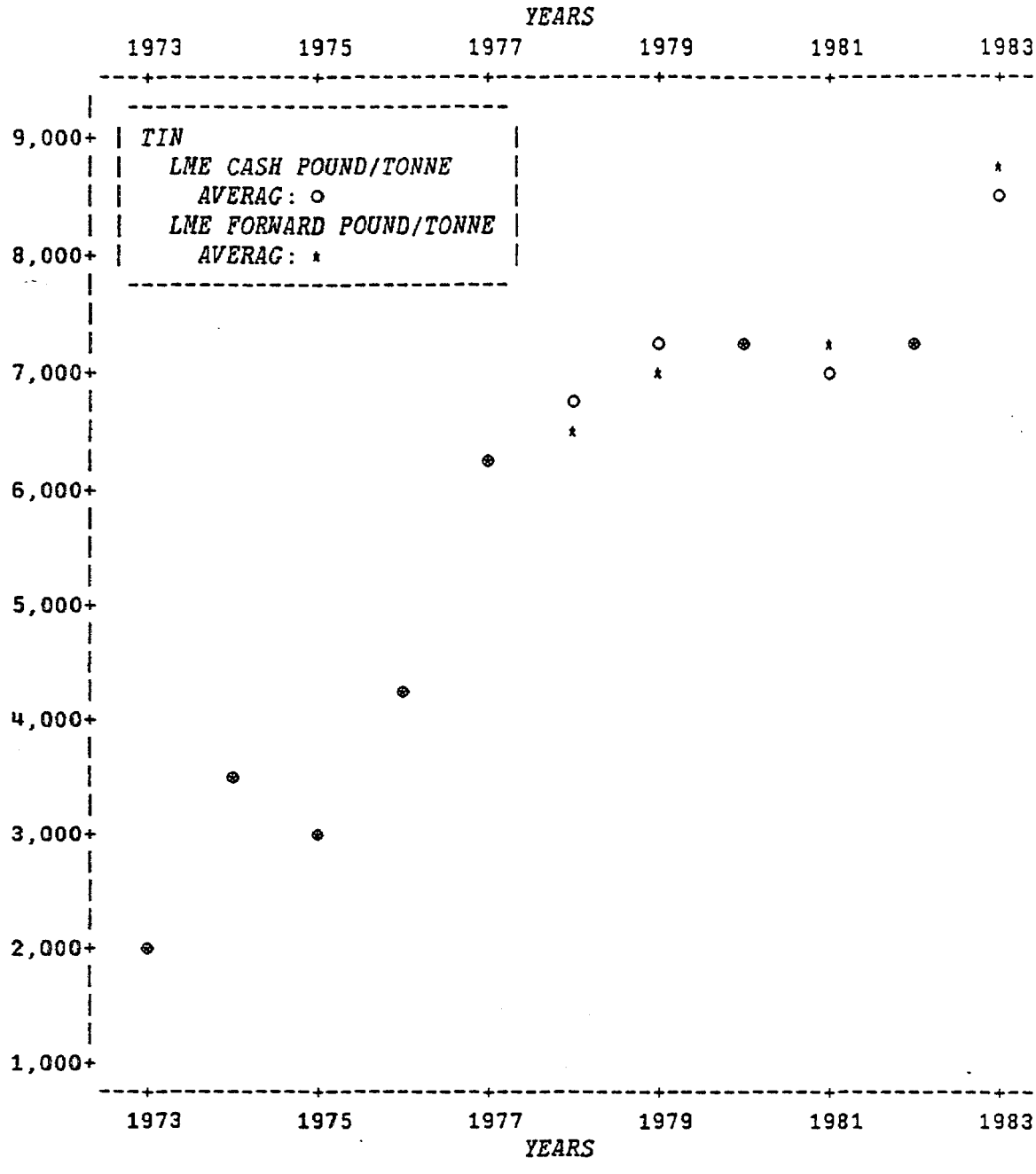
	LME CASH	AUSTRALI EQUIVALE	U.S. EQUIVALE
1MAR85	99.58	99.49	99.98
4MAR85	100.00	100.00	100.00
5MAR85	100.94	101.00	99.69
6MAR85	101.36	103.39	101.76
7MAR85	101.46	103.09	101.43
8MAR85	100.94	102.61	100.59
11MAR85	99.06	100.28	100.99
12MAR85	98.33	100.12	100.25
13MAR85	97.75	100.99	99.42
14MAR85	98.85	101.61	100.04
15MAR85	99.06	102.53	100.57

18MAR85	98.33	101.58	101.86
19MAR85	94.83	99.61	100.85
20MAR85	95.41	102.95	102.86
21MAR85	95.20	103.43	105.84
22MAR85	93.53	103.55	102.72
25MAR85	93.33	103.34	102.36
26MAR85	92.49	102.17	102.39
27MAR85	90.51	100.69	104.91
28MAR85	89.78	102.34	103.18
29MAR85	88.43	101.95	102.36
1APR85	90.09	104.98	103.07
2APR85	92.01	109.07	103.84
3APR85	91.35	108.79	104.08
4APR85	95.52	117.73	106.77
5APR85			
8APR85			
9APR85	95.72	115.52	108.48
10APR85	93.74	111.21	106.68
11APR85	91.76	109.43	107.52
12APR85	90.62	111.34	106.47
15APR85	89.68	110.58	107.13
16APR85	89.05	111.14	106.55
17APR85	87.90	110.78	104.87
18APR85	88.95	116.71	107.76
19APR85	89.89	119.13	108.85
22APR85	89.78	119.79	107.46
23APR85	91.76	120.86	107.60
24APR85	99.17	124.62	114.24
25APR85	98.02		110.49
26APR85	96.39	114.26	109.78
29APR85	93.53	112.28	107.75
30APR85	94.89	119.50	110.29

4.6 Producing Plots

The result carried out in MAGIC may be displayed as either a table or a plot. Simple plots can be produced by substituting the keyword *PLOT* for *TABLE* or *DISPLAY*. For example:

```
YEARLY, DATED 73 TO 83
AUTOLABEL
NOYEAREND
PLOT 1 METPRI 'SN/LM'
```



Within MAGIC, a program called SUPERPLOT is available to produce more varied plots. A detailed account of how to use SUPERPLOT may be found in the I. P. Sharp publication *SUPERPLOT User's Guide*. Also, SUPERPLOT courses are held by I. P. Sharp Associates.

A typical series of SUPERPLOT commands, using a Hewlett Packard 7475 flatbed plotter, would be:

```
1 2 3 4 5 DAILY, DATED 1 9 84 TO 31 12 84
TITLE 'LONDON SILVER MARKET PRICE'
LABEL 'SPOT, FORWARD'
PUT METPRI 'AG/LDS,LDF'
DSUPERPLOT'TERM,HP7475A'
DSUPERPLOT'SIZE, 23 16, OUTSIDE'
DSUPERPLOT'UNITS, CM'
DSUPERPLOT'LINE, 1, STR, BLACK, SOLID, ;2, STR, BLACK, DOT, ,1'
DSUPERPLOT'YLABEL, PENCE PER TROY OZ'
PLOT ABOVE
```

4.7 Assistance

For up-to-date information on additional features of METPRI retrieval commands, enter *METPRI 'HELP'*.

Help is available should any problems arise in the use of MAGIC or SUPERPLOT by contacting your local I. P. Sharp office.

Chapter 5: REFERENCES

1. Australian Mineral Economics Pty Ltd., *1983 SILVER: World Supply and Demand Comp.* M.H Govett & M.R Harrowell

2. International Technical Services Ltd., *1972 Report on Lead for the Australian Mineral Industries Research Association* p 281-282

3. International Technical Services Ltd., *1972 Report on Zinc for the Australian Mineral Industries Research Association*

4. Australian Mineral Economics Pty Ltd., *1979 The World Copper Industry Survey, Analysis and Outlook* p 177-184

5. *Metal Bulletin Handbook, 1982 (14th edition)* p. 59

6. Australian Mineral Economics Pty Ltd., *1982. The World Aluminium Industry. Comp.* M.H. Govett & J.Larson Vol 2 p. 200-213

7. Australian Mineral Economics Pty Ltd., *1980. The World Tin Industry: Supply and Demand* p.216-218

8. Australian Mineral Economics Pty Ltd., *1982. Gold: World Supply and Demand.* p. 31-33

9. Mock, C.M. & Roarty, M.J. *1982. Gold. Austalian Mineral Industry Annual 1980.* Canb. Bureau of Mineral Resources, Geology & Geophysics p. 142

10. Australian Mineral Economics Pty Ltd., *1977. Nickel: Survey, Analysis and Outlook of Supply, Demand and Prices* p.89

11. *Metal Bulletin Handbook, 1983 Vol 1: Prices* p.22-35

12. *Copper Clouds Lifting Metal Bulletin, 26 January 1979,* p.1

13. Kramer,D.Copper contract woes. *American Metal Market, London Metal Exchange Supplement, October 11, 1983* p.6A

14. *Tin International, November 1983* p.394

15. *Metal Bulletin Handbook, 1984. Vol. 1: Prices* p.24-28

APPENDIX A

METPRI Contents and Sources

DIRECTORY PAGE 1
METPRI-DAILY METAL PRICES
AS AT 18/1/1985

METAL PRICE	CODE	CONTENT	SOURCE	COMMENTS
SILVER	AG			
BHAS A$/KG	BHAS	1971+	AUSTRALIAN FINANCIAL REVIEW	BHAS - BROKEN HILL ASSOCIATED SMELTERS (FREE-ON-RAIL PORT PIRIE)
HANDY AND HARMAN US CENT/TROY OZ	HHS	1971+	METAL BULLETIN	
LONDON SPOT PENCE/TROY OZ	LDS	1971+	METAL BULLETIN	LONDON BULLION MARKET 12.15 PM FIX.
LONDON FORWARD PENCE/TROY OZ	LDF	1971+	METAL BULLETIN	
ALUMINIUM	AL			
LME CASH POUND/TONNE	LMC	1979+	METAL BULLETIN	
LME FORWARD POUND/TONNE	LMF	1979+	METAL BULLETIN	
UK PRODUCER POUND/TONNE	UKP	1979+	METAL BULLETIN	BRITISH ALCAN ALUMINIUM LTD (VIRGIN INGOTS MIN. 99.5÷ PURITY)
US PRODUCER RANGE CENTS/POUND	USPL USPH	1971+	METAL BULLETIN	1971-1984 VIRGIN INGOT 99.5÷; 1985+ 99.7÷;MIN AND MAX QUOTED BY NORTH AMERICAN PRODUCERS POSTING LIST PRICES IN USA.
GOLD	AU			
HANDY AND HARMAN US$/TROY OZ	HHG	1971+	METAL BULLETIN	
LONDON SPOT US$/TROY OZ	LDG	1971+	METAL BULLETIN	LONDON BULLION MARKET MORNING FIX
PERTH MINT A$/TROY OZ	PM	1979+	AUSTRALIAN FINANCIAL REVIEW	HONG KONG MARKET OPENING QUOTE

DIRECTORY PAGE 2
METPRI-DAILY METAL PRICES
AS AT 18/1/1985

METAL PRICE	CODE	CONTENT	SOURCE	COMMENTS
COPPER	CU			
AUSTRALIAN DOMESTIC A$/TONNE	AD	1971+	AUSTRALIAN FINANCIAL REVIEW	MOUNT ISA MINES
LME CASH . POUND/TONNE	LMC	1971+	METAL BULLETIN	HIGH GRADE 25 TONNE WARRANTS
LME FORWARD POUND/TONNE	LMF	1971+	METAL BULLETIN	
US PRODUCER RANGE CENTS/POUND	USPL USPH	1971+	METAL BULLETIN	COPPER CATHODES;MIN AND MAX QUOTED BY NORTH-AMERICAN PRODUCERS POSTING LIST PRICES IN USA.
NICKEL	NI			
LME CASH POUND/TONNE	LMC	1979+	METAL BULLETIN	
LME FORWARD POUND/TONNE	LMF	1979+	METAL BULLETIN	
MAJOR PRODUCER US$/POUND	MPM MPP	1971+	METAL BULLETIN	MELTING AND PLATING GRADE ; F.O.B. PRICES SET BY NORTH AMERICAN PRODUCERS.
EUROPEAN MARKET RANGE US$/POUND	EML EMH	1971+	METAL BULLETIN	C.I.F. EUROPE PRICE QUOTED BY METAL DEALERS
LEAD	PB			
AUSTRALIAN DOMESTIC A$/TONNE	AD	1971+	AUSTRALIAN FINANCIAL REVIEW	BROKEN HILL ASSOCIATED SMELTERS (BHAS)-'FREE-ON-RAIL'DELIVERED PORT PIRIE
LME CASH POUND/TONNE	LMC	1971+	METAL BULLETIN	
LME FORWARD POUND/TONNE	LMF	1971+	METAL BULLETIN	
US PRODUCER RANGE US CENTS/POUND	USPL USPH	1971+	METAL BULLETIN	99.97÷LEAD;MIN AND MAX QUOTED BY THOSE NORTH AMERICAN PRODUCERS POSTING LIST PRICES IN USA.

APPENDIX A: METPRI Contents and Sources

DIRECTORY PAGE 3
METPRI-DAILY METAL PRICES
AS AT 18/1/1985

METAL PRICE	CODE	CONTENT	SOURCE	COMMENTS
TIN	SN			
AUSTRALIAN DOMESTIC A$/TONNE	AD	1972+	AUSTRALIAN FINANCIAL REVIEW	ASSOCIATED TIN SMELTERS PRICE QUOTED UP TO 2 PM
LME CASH POUND/TONNE	LMC	1971+	METAL BULLETIN	1971-1973 GRADE B (99.75÷ MIN. PURITY) 1974+ GRADE A (99.85÷ MIN. PURITY)
LME FORWARD POUND/TONNE	LMF	1971+	METAL BULLETIN	
US NEW YORK RANGE US CENTS/POUND	NYL NYH	1971+	METAL BULLETIN	IMPORTED METAL GRADE A; AMERICAN METAL MARKET EVALUATION OF DEALING AMONG NEW YORK TRADERS
KUALA LUMPUR TIN MARKET M$/KG	KL	1972+	METAL BULLETIN	BEFORE 1984, PRICE QUOTED AS'PENANG STRAITS-EX SMELTER'. BEFORE 1982,PRICES QUOTED IN RINGITT PER PICUL HAVE BEEN CONVERTED IN METPRI TO M$ PER KG.
ZINC	ZN			
AUSTRALIAN DOMESTIC A$/TONNE	AD	1971+	AUSTRALIAN FINANCIAL REVIEW	ELECTROLYTIC ZINC CO. PRIME WESTERN (MAX. 1.6÷ LEAD AND MIN. 0.08÷ IRON)
LME CASH POUND/TONNE	LMC	1971+	METAL BULLETIN	
EUROPEAN PRODUCER US$/TONNE	EP	1971+	METAL BULLETIN	EVALUATION OF SELLING PRICES BY PRODUCERS(MIN. 98÷ PURITY C.I.F.EUROPE DAILY WEIGHTED AVERAGE
US PRODUCER RANGE	USPL USPH	1971+	METAL BULLETIN	99.95÷ ZINC;MIN AND MAX QUOTED BY THOSE NORTH AMERICAN PRODUCERS POSTING LIST PRICES IN USA.

APPENDIX B

London Metal Exchange Ring Trading Times

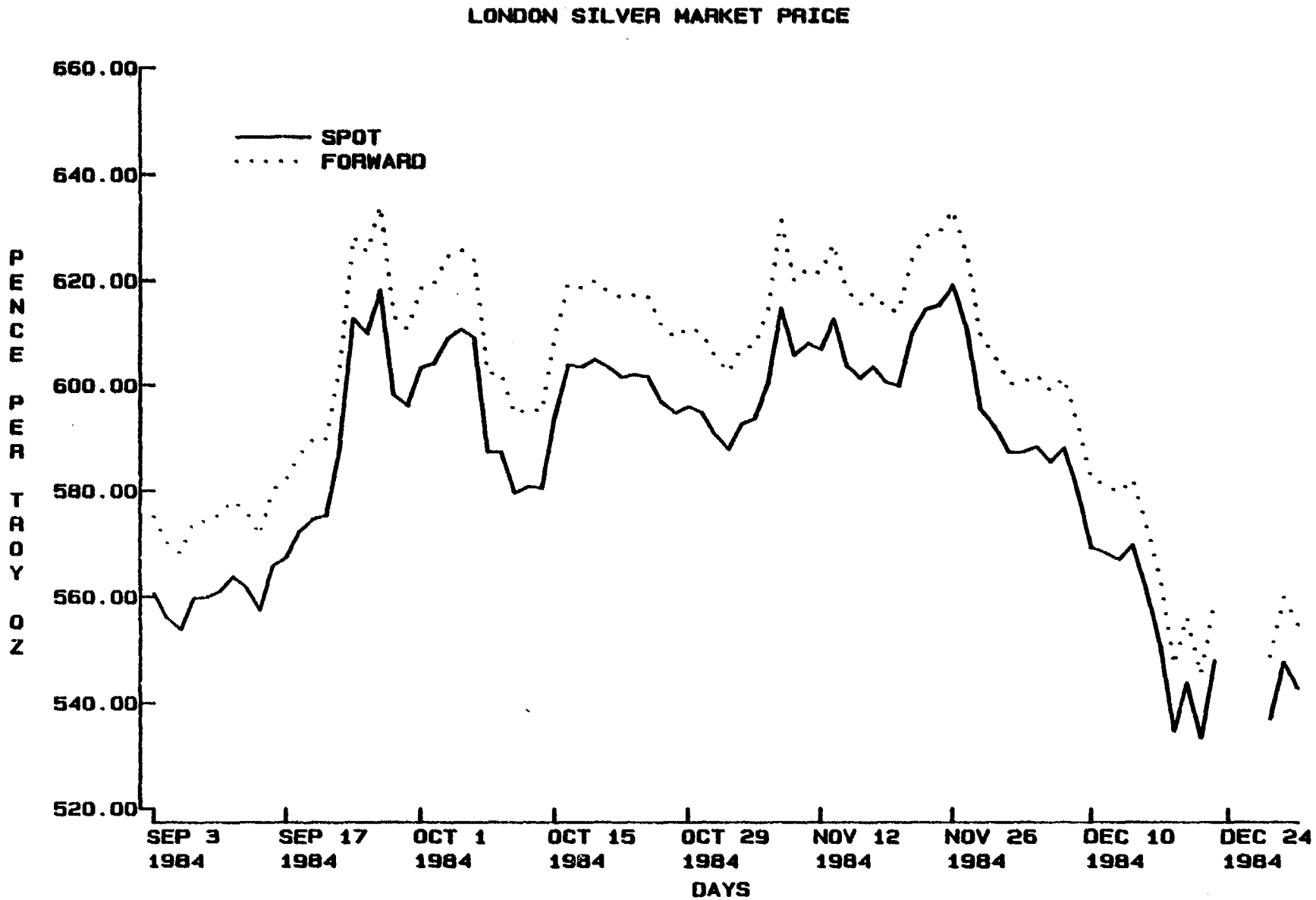
A. Official

11:45-11:50	Options (in all metals)
11:50-11:55	Silver
11:55-12:00	Aluminium
12:00-12:05	Copper
12:05-12:10	Tin
12:10-12:15	Lead
12:15-12:20	Zinc
12:20-12:25	Nickel
12:25-12:30	Interval
12:30-12:35	Copper higher grade
12:35-12:40	Copper standard cathodes
12:40-12:45	Tin
12:45-12:50	Lead
12:50-12:55	Zinc
12:55-13:00	Aluminium
13:00-13:05	Nickel
13:05-13:10	Silver

Official prices for the day are quoted after the last of the above Rings.

B: Unofficial

15:25-15:30	Lead
15:30-15:35	Zinc
15:35-15:40	Copper
15:40-15:45	Tin
15:45-15:50	Aluminium/Nickel
15:50-15:55	Silver
15:55-16:00	Interval
16:00-16:05	Lead
16:05-16:10	Zinc
16:10-16:15	Copper higher grade
16:15-16:20	Copper standard cathodes
16:20-16:25	Tin
16:25-16:30	Aluminium
16:30-16:35	Nickel
16:35-16:40	Silver


LONDON SILVER MARKET PRICE
SPOT
FORWARD
660.00
640.00
620.00
600.00
580.00
560.00
540.00
520.00
PENCE PER TROY OZ
SEP 3 1984
SEP 17 1984
OCT 1 1984
OCT 15 1984
OCT 29 1984
NOV 12 1984
NOV 26 1984
DEC 10 1984
DEC 24 1984
DAYS

APPENDIX C

Other I.P. Sharp Data Bases

Economic

ABSDATA	Australian Bureau of Statistics Time Series Data
ACCCN	Australian Customs Clearance Statistics
ACES	Australian Commercial Enterprise Statistics
AECC	Australian Export Statistics
AES	Reserve Bank of Australia Economic Statistics
AICC	Australian Import Statistics
BELDATA	Belgian Economic Statistics
BIS	Bank for International Settlements
BOP	IMF Balance of Payments Statistics
BUNDESBANK	Deutsche Bundesbank Data
CANSIM	Statistics Canada CANSIM Socio-Economic Data Base
CENSUS81	Selected 1981 Canadian Census Data
CEP	Country Economic Profiles
CITIBASE	Citicorp CITIBASE United States Economic Data
DOT	IMF Direction of Trade Statistics
EEN	European Economic News
IFO	Federal Republic of Germany Economic Outlook
IFS	IMF International Financial Statistics
IIF	Institute of International Finance Country Evaluation System
NIF10	National Income Forecasting Model of the Australian Economy Forecast Data
NPADEMOG	National Planning Association United States Demographic Forecast Data
NPAECO	National Planning Association United States Economic Forecast Data
OECDANA1	Organisation for Economic Co-operation and Development Annual National Accounts, Volume 1
OECDANA2	Organisation for Economic Co-operation and Development Annual National Accounts, Volume 2
OECDCAP	Organisation for Economic Co-operation and Development Flows and Stocks of Fixed Capital
OECDCYC	Organisation for Economic Co-operation and Development Business Surveys and Cyclical Indicators
OECDDAC	Organisation for Economic Co-operation and Development DAC Financial Flows to Developing Countries
OECDEOL	Organisation for Economic Co-operation and Development Economic Outlook
OECDEXD	Organisation for Economic Co-operation and Development DAC External Debt of Developing Countries
OECDIIA	Organisation for Economic Co-operation and Development Indicators of Industrial Activity
OECDMEI	Organisation for Economic Co-operation and Development Main Economic Indicators
OECDQLF	Organisation for Economic Co-operation and Development Quarterly Labour Force Statistics
OECDQNA	Organisation for Economic Co-operation and Development Quarterly National Accounts
OEKON	Austrian Economic Outlook
RBA	Reserve Bank of Australia Bulletin
SITC	United Nations Commodity Trade Statistics

SJRUNDT	S.J. Rundt World Risk Analysis Package
SNB	Macro-Economic Data Base of the Swiss National Bank
STATISBUND	Federal Republic of Germany Statistical Data
UKCSO	CSO United Kingdom Macro-Economic and Financial Databank
USCPI	United States Consumer Price Index
USFLOW	United States Inter-Sector Flow of Funds
USPPI	United States Producer Price Index
USPPIR	United States Producer Price Index Revision
WDEBT	World Bank Debt Tables
WGFORECAST	Woods Gordon Canadian Economic Forecast
WIIW	Eastern Bloc Countries Economic Statistics

Energy

AMES	Australian Major Energy Statistics
APIMCR	American Petroleum Institute Monthly Completion Report
ARGREP	Petroleum Argus Daily Market Report
ARGUS	Petroleum Argus Prices
CMAI	Chemical Market Associates Petrochemical Market Reports
CREW	Seismic Crew Count
DEWITT	DeWitt Petrochemical Newsletters
EDPRICE	Lundberg Survey Energy Detente International Price and Tax Series
ELECTRIC	Electric Utilities Reports
HEATW	U.S. Weekly Temperatures
HUGHES	Hughes Rotary Drilling Rig Reports
ICIS	Independent Chemical Information Services
IEA	International Energy Annual Data Base
IMPORTS	Imports of Crude Oil and Petroleum Products
IPA	International Petroleum Annual
LOR	London Oil Reports
LPGAS	Liquefied Petroleum Gas
MER	Monthly Energy Review
OEES	Austrian Energy Consumption Statistics
PETROFLASH	PETROFLASH!Crude and Product Reports
PIW	Petroleum Intelligence Weekly
QOS	Organisation for Economic Co-operation and Development Quarterly Oil Statistics
RETAIL	Lundberg Survey Retail Prices
SEDS	State Energy Data System
SOM	Lundberg Survey Share of Market
USDOE	United States Department of Energy
WHOLESALE	Lundberg Survey Wholesale Prices and Moves
WSB	Weekly Statistical Bulletin

Financial

ACOMDAILY	Australian Commodities
AGDATA	Agricultural Commodities
ARATE	Australian Financial Markets
ASE	Australian Stock Exchanges Indices
CDNBOND	Canadian Bonds
CDNOPTIONS	Canadian Stock Options
COMERT1	Australian Financial Data
COMMBOND	Commonwealth Bank Bond Index

APPENDIX C: Other I.P. Sharp Data Bases

COMMODITY	Commodities
CURRENCY	Daily Currency Exchange Rates
DISCLOSURE	Disclosure Corporate Information
DOIDB	Department of Insurance
DPEQUITY	Duff and Phelps Equity Ideas
DPFIXED	Duff and Phelps Fixed Income Ratings
EXSHARE	EXSHARE International Securities Information
EXSTAT	EXSTAT Corporate Information
FPBOND	Financial Post Bonds
FPCORP	Financial Post Canadian Corporate Data
FPSTOCK	Financial Post Securities
FRBW	Federal Reserve Board Weekly Statistics
FTACT	Financial Times Actuaries Share Indices
FTSTOCK	Financial Times Share Information
FXPRO	Foreign Currency Projections
HKSTOCK	Hong Kong Stock Exchange
JSCHEDULE	Canadian Chartered Banks, Monthly Statements of Assets and Liabilities
METPRI	Daily Metal Prices
MRATE	Money Market Rates
NASTOCK	North American Stock Market
OSCHEDULE	Canadian Chartered Banks, Quarterly Income Statements
SINGSTOCK	Stock Exchange of Singapore
STATEX	Sydney Stock Exchange STATEX Service
SYDSTOCK	Sydney Stock Exchange Share Prices
TSE300	Toronto Stock Exchange 300 Index and Stock Statistics
TSEINTRA	Toronto Stock Exchange Intra-Day Information for Stocks and Indices
TSELIVE	Toronto Stock Exchange Real Time Information for Stocks and Indices
USBOND	United States Bonds
USOPTIONS	United States Stock Options
USSTOCK	United States Stock Market
WBANK	Bank of Canada Weekly Financial Statistics
YSCHEDULE	Canadian Chartered Banks, Annual Financial Statements

Aviation

AEA	Association of European Airlines Financial and Traffic Statistics
AISL	Aircraft Accident Statistics
COMMUTER	Commuter Flight Statistics and Online Origin and Destination Data
COPS	Canadian Operating Statistics
ER586	ER586 Service Segment Traffic Statistics
FORM41	Financial and Traffic Statistics for U.S. Certificated Airlines
ICAO	ICAO Traffic Statistics
INS	United States International Air Travel Statistics
OAG	Official Airline Guide
OAND	Origin and Destination Traffic Statistics (Tables 8, 10 and 12)
T9S	Combined T9/Service Segment Traffic Statistics

APPENDIX D

Deflators

A deflator is a price index which expresses the relationship between current and constant prices, in index form. It is used to convert a current price series to constant price (e.g., 1975) equivalents.

Price deflation is just one method of obtaining a value of output at constant prices. It is not the only method, nor, for that matter, the best method for the mining industry.

Quantity revaluation is used in preference. This is where the output of component mine products is valued at some base year prices. This method is preferable for the mining industry for three reasons:

1. Mine products are fairly homogeneous and lend themselves to quantity revaluation. Whereas a car built ten years ago cannot be equated with today's car, mineral products can be equated much more easily; today's hematite does not differ all that much from hematite mined in the past, although quality changes can occur (i.e., assay content can vary).

2. Quantity data are easier to collect than price data for the current period. We do not show value data for mine output in the AMIQ because there is a delay between production and sale of mine products, and values cannot be determined until a sale is concluded.

3. Mine products are limited in number, unlike manufactured goods which have a more diverse range, introduction of new products, and discontinuation of obsolete goods. As a result, the output of the manufacturing industry can only be measured in value terms if the series is not to suffer from a lack of coverage.

Where the value of output is obtained by quantity revaluation techniques, the deflator is obtained as a by-product, often at a later date, when current price value data becomes available. The deflator is obtained by comparing the relationship between current and constant price value of output. Quantity revaluation is the most accurate method of obtaining constant price output series. We at BMR have the information necessary to carry out this type of exercise and to be able to produce constant price output series in either dollar amount or index number form. This can be done for individual industries (e.g., iron ore), or for the mining sector as a whole.

The second method of obtaining a measure of output at constant prices, and which corresponds to the topic of this discussion, is by price deflation. This is where the value of output at current prices is aggregated, and deflated by a price index to convert it to a base year price equivalent. There are two kinds of price deflators:

1. Explicit price index. This is a price index based on the movement of prices in the particular industry that is to be deflated.

2. Implicit price index. Where an appropriate price index is not available (e.g., nickel) due to confidentiality, a price deflator based on the closest related commodity can be used (e.g., a price index of iron ore can be used as a deflator). Such an implicit price index can, of course, be obtained as a by-product of quantity revaluation.

A deflator, then, simply expresses the relationship between current and constant price series of a particular series. It does not attempt to explain the relationship, and cannot distinguish between different causes for such price changes.

In some studies, BMR attempts to distinguish between price changes due to changes in cost (i.e., inflation) and changes in market prices (i.e., Supply/Demand situation). The effect of market prices is calculated as the difference between pure inflation, and price changes in the industry concerned. The object of this discussion, then, appears to be to find the best measure of inflation, since any industry price indexes will, of course, include the affects of market prices.

The best measure of pure inflation available to BMR is the CPI. Nevertheless, it does pose serious shortcomings. It is, after all, a consumer price index. Food prices are affected, for example, by seasonality, pest infestations, etc., which may increase the CPI due to increases in the cost of potatoes, tomatoes, etc. These have no bearing on costs in the mining industry. Changes in builders awards, for example, may force up the price of housing, thereby increasing the CPI. This may or may not affect the mining industry, depending on whether the awards are allowed to flow on the mining sector. Use of the CPI as a measure for cost increases in the mining sector is a fairly hairy excercise.

What alternatives are there to the CPI? Probably none. The CPI remains the best measure of inflation that we have. Indexes based on goods or activities closer to the mining industry concerned, or even mining itself, will include the affects of market prices which we are trying to isolate.

Deflators Available on I.P. Sharp InfoService

Data Bases

ABSDATA	Australian Bureau of Statistical Data
AES	Australian Economic Statistics
OECDMEI	OECD Main Economic Indicators
IFS	International Financial Statistics

Deflators

GDP	Gross Domestic Product at current price
CPI	Consumer Price Index
WPI	Wholesale Price Index
XPI	Export Price Index
MPI	Import Price Index

Frequency

A	Annual
Q	Quarterly
M	Monthly

DATA BASES

ABSDATA/AES CODE					OECDMEI CODE			IFS CODE		
AUSTRALIA	ABSDATA									
GDP	MAR.	1959	Q	NGDP	1960	AQ	1000.102	1957	AQ	99B/AUL
CPI	MAR.	1980	Q	PC8	1960	AQM	475000.19H	1957	AQ	64/AUL
WPI					1960	AQM	470000.19H	1957	AQM	63/AUL
XPI	JUL.	1974	M	PX				1957	AQM	74..D/AUL
MPI	DEC.	1980	M	PMAG				1957	AQM	75..D/AUL
UNITED STATES	AES									
GDP		1950	A	S17AUS	1960	AQ	1000.052	1957	AQ	99B/USA
CPI		1949	A	S24AUS	1960	AQM	475000.19H	1957	M	64/USA
WPI					1960	AQM	470000.19H	1957	AQM	63/USA
XPI								1957	AQM	74..D/USA
MPI								1957	AQM	75..D/USA
UNITED KINGDOM										
GDP		1952	A	S17AUK	1960	AQ	3000.102	1957	AQ	99B/U.K
CPI		1949	A	S24AUK	1960	AQM	475000.19H	1957	M	64/U.K
WPI					1960	AQM	470000.19H	1957	AQM	63/U.K
XPI								1957	AQM	74..D/U.K
MPI								1957	AQM	75..D/U.K
JAPAN										
GDP		1952	A	S17JAP	1960	AQ	1000.002	1957	AQ	99B/JAP
CPI		1949	A	S24JAP	1960	AQM	475000.19H	1957	M	64/JAP
WPI					1960	AQM	470000.19H	1957	AQM	63/JAP
XPI								1957	AQM	74..D/JAP
MPI								1957	AQM	75..D/JAP