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INTERNATIONAL URANIUM PRODUCTION
A SOUTH AFRICAN PERSPECTIVE

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INTERNATIONAL URANIUM PRODUCTION
A SOUTH AFRICAN PERSPECTIVE

At the CNA/AIF Conference held in Quebec City in September 1981 my predecessor reported on the state of the South African uranium industry at that point in time. I wish to update that report and, in particular, detail the effects that the major events experienced by our industry in the interim period have had on South African production.

RESOURCES

In discussing resources, I will rely heavily on the statistics published by the OECD Nuclear Energy Agency and the IAEA : URANIUM RESOURCES, PRODUCTION AND DEMAND (the "Red Book") and while I accept the limitation of such data, I believe it to be representative enough for the broad picture that I wish to paint.

As at 1 January 1981, South Africa was reported to have reasonably assured resources recoverable at a cost of less than \$80/kg U of 247 000 tons and recoverable at a cost of between \$80/kg U and \$130/kg U of 109 000 tons U to give a total recoverable at less than \$130/kg U of 356 000 tons. These resources placed South Africa third in the lower cost category ranking and second in the high cost category as well as second overall. The geographical distribution of reasonably assured resources in the Western World as at 1 January 1981 is shown in Fig. 1. South Africa had some 14% of the resources in the less than \$80/kg U category and some 16% of the less than \$130/kg U category.

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The reassessment of the Western World's resources as at 1 January 1983 indicates a decrease in reasonably assured resources in the less than \$80/kg category of 279 000 tons to 1 468 000 tons or a 16% decrease while the reasonably assured resources in the less than \$130/kg U category have declined by 250 000 tons to 2 043 000 tons U or an 11% decrease.

South Africa has seen a decline in its resources from 1 January 1981 to 1 January 1983 of 23% in the less than \$80/kg U category and a decline of 12% in the less than \$130/kg U category which is the experience of most other mature producers and has come about largely as a result of increasing production costs shifting resources from lower cost categories to higher cost categories. The geographical distribution of RAR resources as at 1 January 1983 is shown in Fig. 2 but what is more startling is the comparison of the ranking of countries according to their RAR in the less than \$80/kg category as at 1 January 1981 (Table 1) with similar figures for 1 January 1983 (Table 2). A comparison of the geographical distribution of resources for the two points in time emphasises the dramatic changes that have taken place in a very short period (Fig. 3).

EXPLORATION

The deterioration in the uranium price since 1980 has had a severe impact on exploration expenditure in South Africa as elsewhere in the world. In 1980 the Government and mining companies spent some \$25 million on exploration for uranium, principally in the Witwatersrand Basin, the sandstones in the Karoo and the uraniferous coal deposits in the Northern Transvaal. This figure dropped to about \$5 million in 1983 with activities being concentrated largely in the Witwatersrand

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Basin. Exploration outside this area will be of very little significance. It should be noted that the activities in the Witwatersrand Basin stem primarily from the exploration for gold but because some of the work is carried out in uranium bearing reefs, uranium resources can be expected to benefit to some extent.

PRODUCTION

Over the past few years the increased cost of extraction and keen competition from new low-cost producers has placed the established producers under severe pressure. The rate of production of uranium in the U.S. has declined dramatically during the last three years from 16 600 mt U in 1980 to 7 900 mt U in 1983 with a further forecast decline to 6 150 mt U in 1984. In this harsh climate it is remarkable that the South African production has shown very little change at all in this period, maintaining a production level of around 6 000 mt U in 1981, 1982 and 1983 after a peak production of 6 146 mt U in 1980.

Up to 1981, South Africa production had followed closely the sharp changes that had been experienced by the rest of the world (Fig. 4) with about a 14% share of Western World production and, despite some recently announced cut-backs in production, this trend should not change significantly. South Africa is expected to remain as one of the Western World's three largest producers of uranium. The 1981/83 comparative production figures for the major producers are given in Fig. 5.

During 1980, some 87 million tons of ore were processed by 19 plants, fed by 20 mines at an average U308 grade of 0,083 kg/ton or 0,008%. During 1983 the South African industry processed some 88 million tons

of ore in 18 plants fed by 17 mines at 0,081 kg/ton or 0,003%. During this period 2 new plants were opened (Beisa & Western Areas) while 3 plants (W D Levels No. 1, W R Cons & Randfontein Millsite) ceased production. By the end of 1984 two more plants will have stopped production viz. the Merriespruit plant (a division of Harmony) and the No. 2 plant at Western Deep Levels. These plants currently account for some 5% of South African production. A major development, recently announced, is the intended closure by the end of 1984 of Beisa Mines, our single primary uranium producer which has only been in production since early 1982. The full impact of these closures will only be felt in 1985 and could, in total, reduce forecast production in that year by some 850 mt U. The current estimate for S A production for 1984 is 5 971 mt U.

A feature of the South African uranium scene which gives us a large degree of flexibility in production as well as ready access to large surface resources, is the facility to selectively dump relatively high grade uranium tailings after the extraction of gold and to selectively rework this material as well as material dumped on surface prior to the emergence of the uranium industry, during periods convenient to the producer. The quantity of this type of material being used to produce uranium is shown in Fig. 6 and uranium from this source amounted to some 28% of total production in 1983. The co-product nature of gold, uranium and pyrite in the principal uranium bearing ores in South Africa has also added to the flexibility of production and has provided significant cost advantages for uranium. These advantages will continue to ensure the South African industry a strong position for the future.

It is true that the abovementioned flexibility in production and the co-product nature of the ore has assisted us in maintaining our production levels over the past three years but the ability to keep production at high levels must also be seen as a tribute to our very successful marketing efforts, to the reputation that we enjoy as a reliable supplier and to the quality of product that we are able to deliver. We have always viewed the market as long-term and it is on this basis that we have established sound relationships with our customers and have strenuously resisted the considerable temptations that have presented themselves in terms of short-term opportunities. It is a policy that has been particularly successful and we see no reason to change it.

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Table 1.

REASONABLY ASSURED RESOURCES
RANKED ACCORDING TO SIZE OF < \$80/kg U COST RANGE

(1,000 tonnes U)

Data available 1st January, 1981

Cost range	< \$80/kg U	\$80-130/kg U	Total at < \$130/kg U
United States of America	362	243	605
Australia	294	23	317
South Africa	247	109	356
Canada	230	28	258
Niger	160	0	160
Brazil	119	0	119
Namibia	119	16	135
France	59	16	75
India	32	0	32
Algeria	26	0	26
Argentina	25	5	30
Gabon	19	2	22
Central African Republic	18	0	18
Spain	13	4	16
Japan	8	0	8
Portugal	7	2	8
Mexico	3	0	3
Turkey	3	2	5
Zaire	2	0	2
Greece	1	4	5
Germany, Federal Republic of	1	4	5
Korea, Republic of	0	11	11
Austria	0	0	0
Chile	0	0	0
Denmark	0	27	27
Egypt	0	0	0
Finland	0	3	3
Italy	0	2	2
Somalia	0	7	7
Sweden	0	38	38
United Kingdom	0	0	0
TOTAL (rounded)	1745	450	2195

Table 2.

REASONABLY ASSURED RESOURCES
RANKED ACCORDING TO SIZE OF < \$80/kg U COST RANGE

(1,000 tonnes U)

Data available 1st January, 1983

Cost range	< \$80/kg U	\$80-130/kg U	Total at < \$130/kg U
Australia	314	22	336
South Africa	191	122	313
Canada	176	9	185
Brazil	163	0	163
Niger	160	0	160
United States of America	131	276	407
Namibia	119	16	135
France	56	11	68
India	32	11	43
Algeria	26	0	26
Argentina	19	5	23
Gabon	19	5	23
Central African Republic	18	0	18
Spain	16	5	20
Japan	8	0	8
Portugal	7	2	8
Italy	3	0	3
Mexico	3	0	3
Turkey	3	2	5
Sweden	2	37	39
Germany, Federal Republic of	1	4	5
Peru	1	0	1
Greece	0	0	0
Austria	0	0	0
Chile	0	2	2
Denmark	0	27	27
Egypt	0	0	0
Finland	0	3	3
Korea, Republic of	0	10	10
Somalia	0	7	7
United Kingdom	0	0	0
Zaire	2	0	2
TOTAL (rounded)	1468	575	2043

GEOGRAPHICAL DISTRIBUTION OF REASONABLY ASSURED URANIUM RESOURCES (<\$130/kg U)

Data at 1st January, 1981

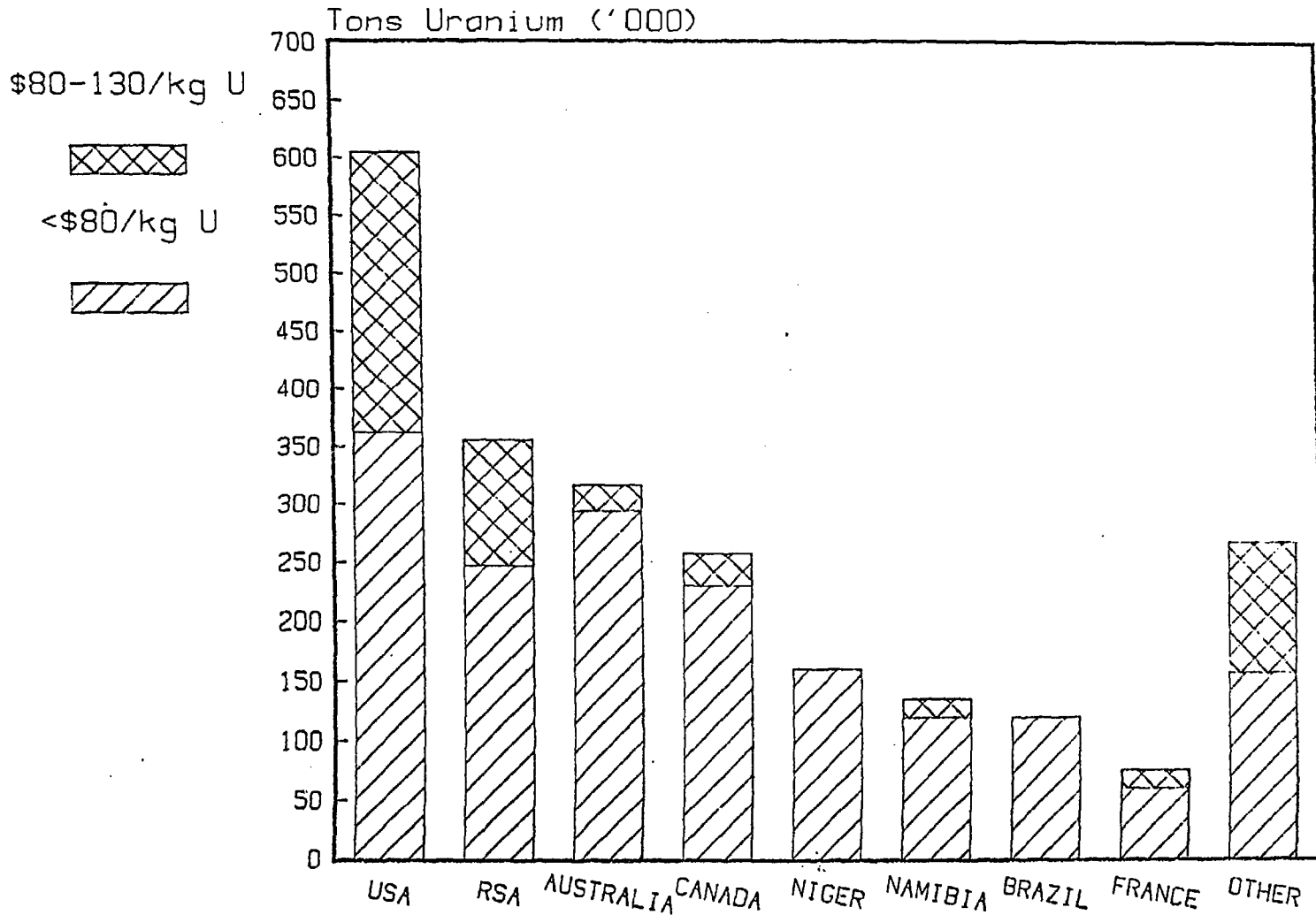


FIGURE 1

GEOGRAPHICAL DISTRIBUTION OF REASONABLY ASSURED URANIUM RESOURCES (<\$130/kg U)

Data at 1st January, 1983

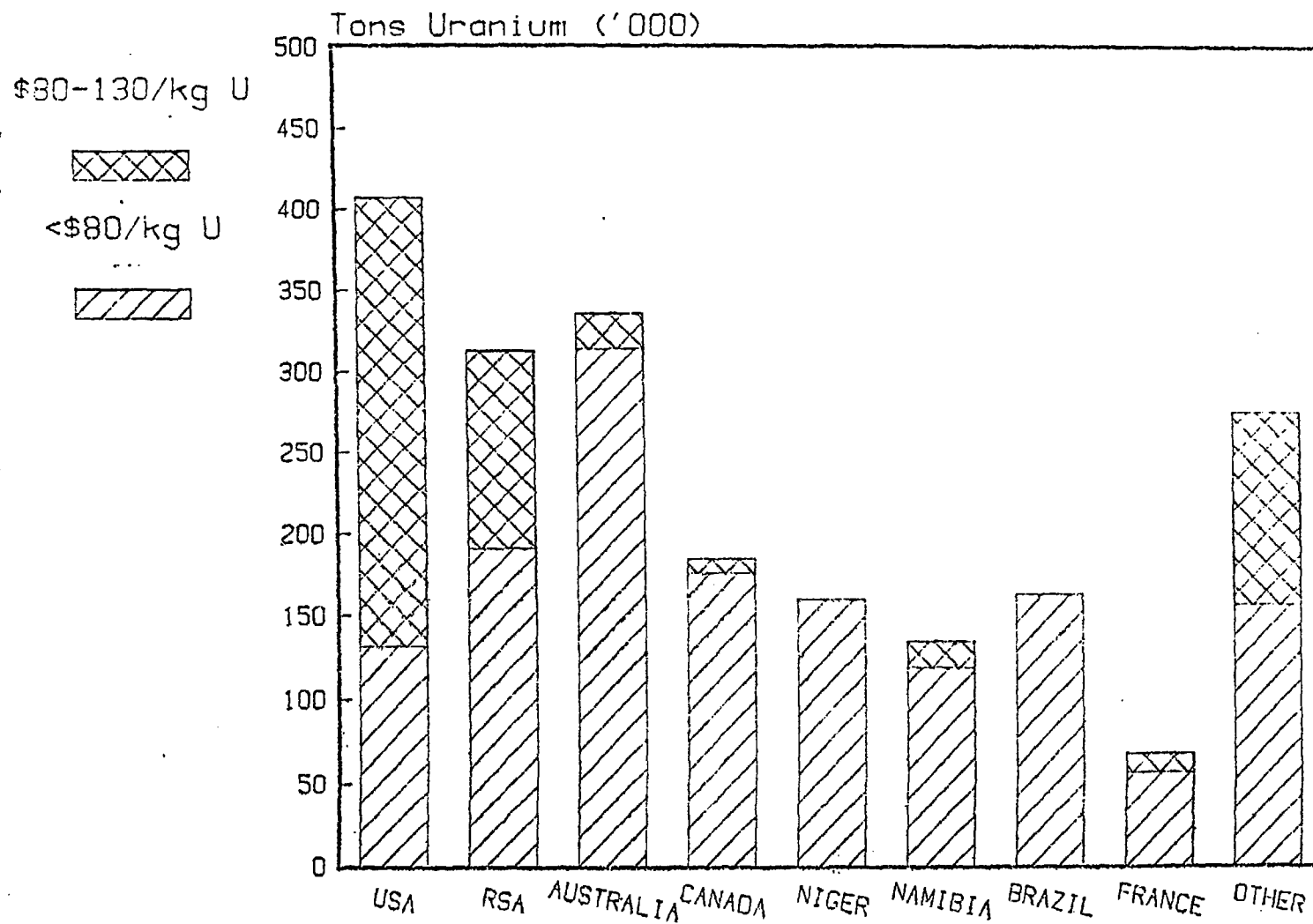
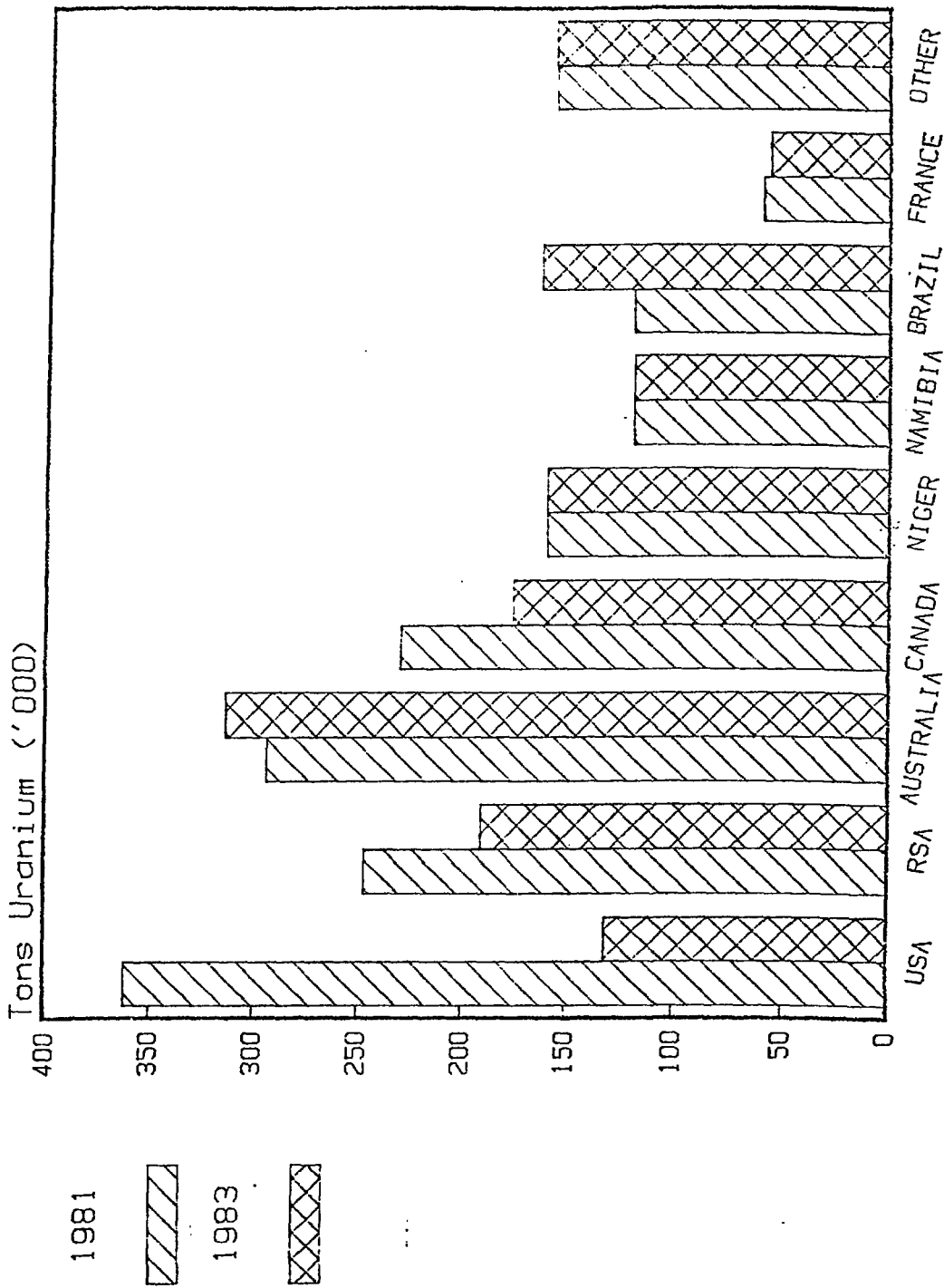


FIGURE 2

FIGURE 3

GEOGRAPHICAL DISTRIBUTION OF REASONABLY ASSURED URANIUM RESOURCES (<\$80/kg U)
 Comparison of Data at 1st January, 1981 to Data at 1st January, 1983



PRODUCTION OF URANIUM: WESTERN WORLD AND SOUTH AFRICA

Tons Uranium ('000)

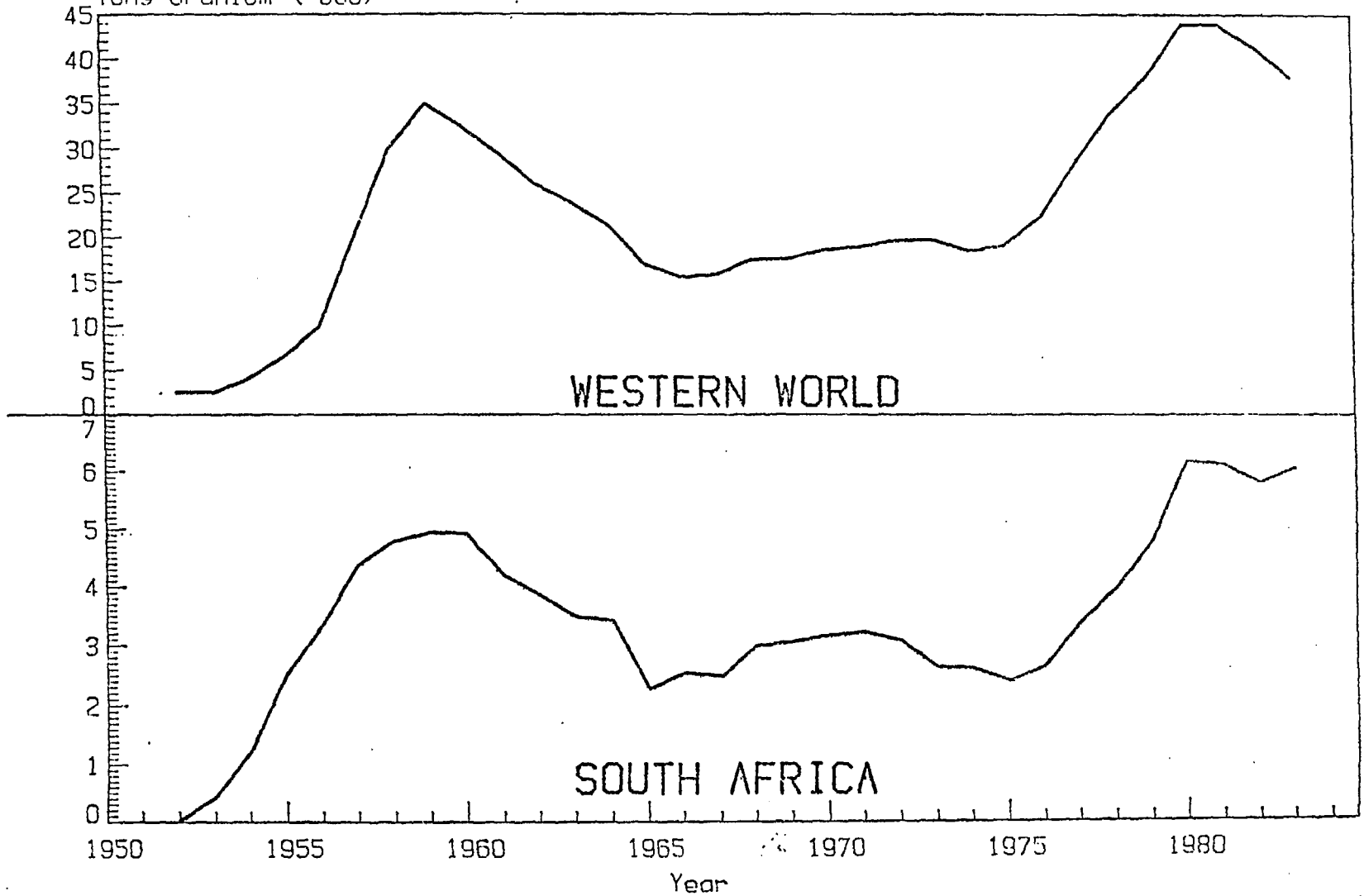
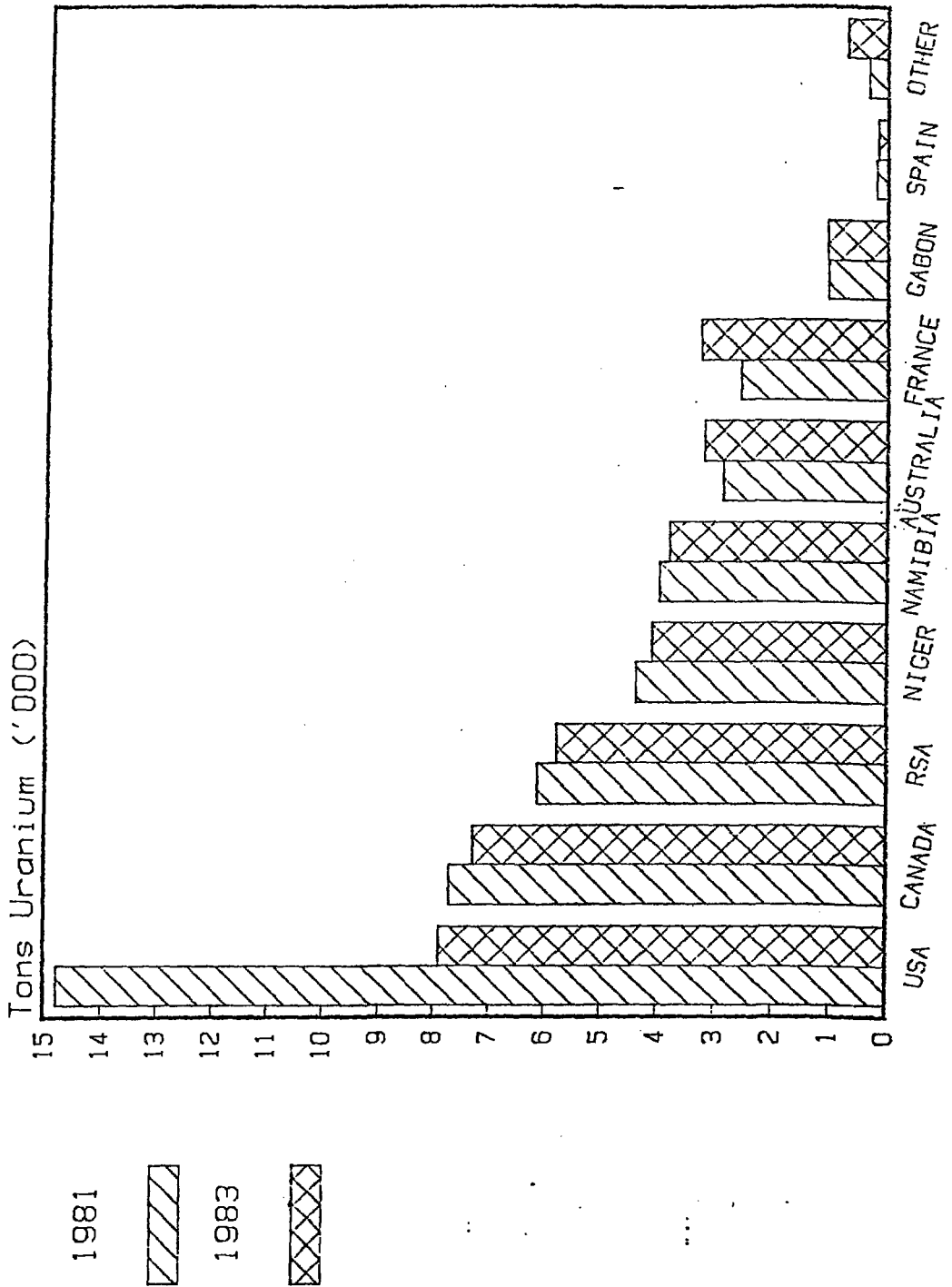


FIGURE 4

ANNUAL URANIUM PROD. BY COUNTRY

Comparison of 1981 to 1983

FIGURE 5



EST. SOURCES OF U PROD. FOR RSA (Excluding Palabora Mining Co.)

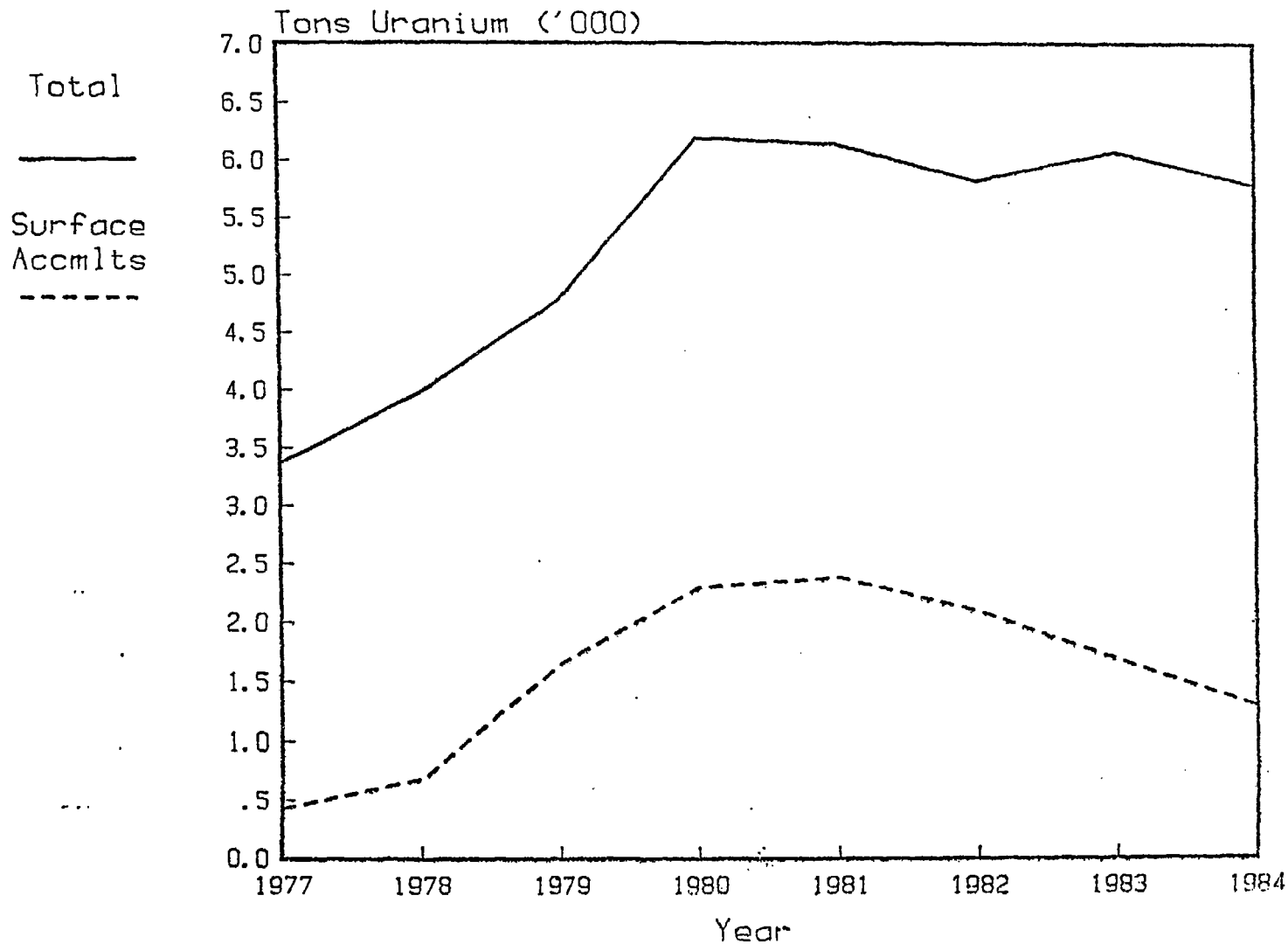


FIGURE 6