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FALLOUT PROGRAM  
QUARTERLY SUMMARY REPORT

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Strontium-90 Levels in the Diets and Bones of Children  
Progress Report - 1967

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1. INTRODUCTION

The work reported in previous Progress Reports (1,2,3,4) can be summarized and grouped as follows:

(1) Study on discrimination factors and skeletal turnover. Strontium to calcium discrimination factors and skeletal turnover rates were estimated for the first two years of life. The turnover rate, derived from strontium specific activity measurements, appeared to be high in the first months of life (7% per month) and then to slow down progressively to a value of about 1.5% per month in the second year. Discrimination factors (diet → bone) ranged from about 0.7 in the very young infants to about 0.3 in the second year of life. Although some measurements were at the time available on older age groups, the data were non systematic and insufficient to allow any estimation of discrimination or turnover parameters.

(2) Assessment of representative Strontium-90 levels. The values for diets reported previously refer to large areas in Argentina (Buenos Aires Province and the Litoral area) and are reasonably representative. Values up to 1965 were included but did not cover diets of older children.

During the period presently reported the work continued with the same objectives (metabolic studies and representative levels) along the following lines:

(a) Determination of skeletal turnover rates and strontium to calcium discrimination factors (Section 2 of this report).

New data were obtained on young children with the purpose of improving the estimates of turnover and discrimination in the first two years of life. As previously, the data relate to a "controlled" group consisting mainly of children having lived a substantial part of their life in Pediatric Hospitals or other public institutions, and for which individual diet information is reasonably acceptable.

A large part of the work refer to older age groups (from 3 to 12 years). These age groups are very interesting because any enhanced bone activity (fast growing, remodeling, etc.) could conceivably influence turnover or even discrimination. The diet information required for these older age groups cannot be obtained on individual basis and the representative values for these groups in the area were used.

(b) Strontium-90 in diets in 1966 (Section 3).

A new assessment of Sr-90 and stable strontium in total diet was carried out, including representative diets of older children which were not studied before.

## 2. STUDY ON DISCRIMINATION FACTORS AND SKELETAL TURNOVER

The data assembled for discrimination studies on Strontium-90 and natural strontium in bones are shown in Table 1. Values included in the corresponding tables of previous reports are identified with an asterisk. New values correspond to 145 bone samples, amounting to about 45% of the total number shown in Table 1.

The table also gives for each entry the relevant diet levels for the different periods of the child's life. For the younger ages (0-2 years) these levels have been derived from food analysis and diet information given by the Pediatric Hospitals. When this information was not available, the diet levels were taken to be those of the general population.

In the case of older age groups the diet estimates included in Table 1 are more indirect and should be qualified by the substantial uncertainties involved. The values were estimated using the following data and assumptions:

(a) Annual values of strontium to calcium ratios in total diet shown in Table IIa. The values of this table are discussed in Section 3 of the Report.

(b) When the period of life under consideration straddles one or more years a time weighted average of the annual levels is used.

(c) Since total diet data are not available for years before 1960 the relevant level was calculated assuming the same ratio with milk as observed in later years. Even milk data are scanty before 1957, but that period contributes negligibly to the bone levels of the older children.

Table 1 is too cumbersome to include the specific activities ( $\text{Sr}^{90}/\text{Sr}$ ) of the relevant diets, but their derivation is straightforward using the stable strontium data of Table IIa.

Turnover rates and discrimination factors can be derived from the data of Table 1 and some additional information, namely the calcium and natural strontium contents in the skeleton as a function of age. This information is shown in Figure 1 which extends to older ages the curves presented in previous Progress Reports. The Calcium curve is based on Mitchell's data, scaled down by a small correction factor (1.18) to fit the young ages which were independently estimated in previous Reports. The stable strontium curve has been derived from the calcium curve and measured Sr to Ca ratios in bones at different ages.

It can be shown that the specific activity ( $\text{Sr}^{90}/\text{Sr}$ ) in bone in any period  $j$  is related to that of the previous period  $i$  and to the level of the diet consumed by the following expression, formulated as in previous Reports:

$$B_j = \frac{B_i \cdot m_i (1-K) + D_j (\Delta m + K m_i)}{m_j} \quad (1)$$

where  $B$  is specific activity in bone ( $\text{Sr}^{90}/\text{Sr}$ )

$m$  is the total content of stable strontium in skeleton

$D$  is the specific activity in the diet

$\Delta m$  is the net stable strontium increment ( $\Delta m = m_j - m_i$ )

$K$  is the fraction of the amount of stable strontium present at  $i$  which is replaced by new strontium (total turnover in the period).

The same type of formulation can be applied to the strontium to calcium ratios introducing the corresponding discrimination factor:

$$L_j = \frac{L_i C_i (1-K) + D_j F_j (\Delta C + K C_i)}{C_j} \quad (2)$$

where  $L$  is the bone Sr/Ca ratio

$C$  is the calcium content in skeleton

$D$  is the diet Sr/Ca ratio

$F$  is the discrimination factor

$\Delta C$  is the net calcium increment ( $C_j - C_i$ )

$K$  is the total turnover in the period  $i \rightarrow j$

Turnover rates and discrimination factors were computed for the first two years of life in previous Reports using the expressions mentioned above. The calculations were made using mean bone values at different age groups because the near constancy of both daily intakes and skeletal accretion supported averaging assuming linearity.

These conditions are not applicable at older ages and when the period under consideration is long. Furthermore, diet data for these older age groups have not been obtained on individual basis and at best can be taken to be representative estimates for the age group.

It is felt, therefore, that a more reasonable approach for the estimation of turnover and discrimination in these age groups, is a regression analysis of the data of Table 1 and using the appropriate functional relation. Calculations were made replacing the total turnover ( $K$ ) by the product  $kt$ , where  $k$  is the average turnover rate in the period under consideration and  $t$  is the time actually spent by each child in the period. Clearly  $t$  ranges from 0 to the total period. The estimates of turnover obtained from relation (1) were in turn introduced in relation (2).

The results of the calculations are shown in Figures 2 (turnover rates) and 3 (discrimination factors). These figures also include new and more precise estimates for the first two years of life, taking into account the new data. These estimates and those advanced in the 1966 Progress Report agree fairly well over the five age periods in which the first two years of life were arbitrarily divided.

The turnover rate, which is very fast shortly after birth, slows down almost exponentially to an annual value of about 10% in the second year. Figure 2 shows an additional increase in turnover in the 6 to 8 and 8 to 10 years age periods. While the data are still insufficient to allow precise estimates, the increased turnover appears to be real and similar to that found by J. Rivera (5). The turnover in the 10-12 years age period is again small (less than 10% per year).

The discrimination factor between strontium and calcium varies from about 0.7 in the first months of life to about 0.3 in the second year of life. The results of Figure 3 show that the discrimination factor is substantially constant between the 4th and the 12th year of life, being very close to the conventional "adult" value of 0.25.

It should be recognized that the uncertainties associated with the results presented in Figures 2 and 3 are substantial, mainly in the 3-12 years age groups. More samples in this age range are needed, both to improve the estimates and to allow the obtention of annual values. This would be particularly interesting to define better the period of increased turnover. Another interesting and related field of study is the older ages (up to about 20 years) because of the periods of bone remodeling involved.

### 3. STRONTIUM IN DIETS

Determinations of  $\text{Sr-90}$  and stable strontium in food items, together with information on dietary composition are required to estimate the levels in total diet.

Table II summarizes the diet "structure" for several age groups in the region (Buenos Aires Province and the Litoral area). Previous Reports discussed the basic information and assumptions involved in the estimation of the diet composition in the two first years of life.

Table II includes two new age groups (4-6 and 6-8 years) which were needed for the study of turnover and discrimination. The information supporting the diet compositions estimated for these two groups is certainly much weaker than that for younger ages and for adults and is the result of informed guesses made by the National Institute of Nutrition. Inquiries made in several localities of Buenos Aires Province suggested that the diets in these age groups could be considered to be different to the adult diet and that the estimates of the National Institute of Nutrition were reasonable.

Intakes of natural strontium were derived from diet composition and measurements of  $\text{Sr/Ca}$  ratios in food items. Since stable strontium levels in food are "a priori" constant in time, all data available (including those presented in previous Reports) were used in the calculations. The results are also shown in Table II together with the  $\text{Sr/Ca}$  ratio in total diet.

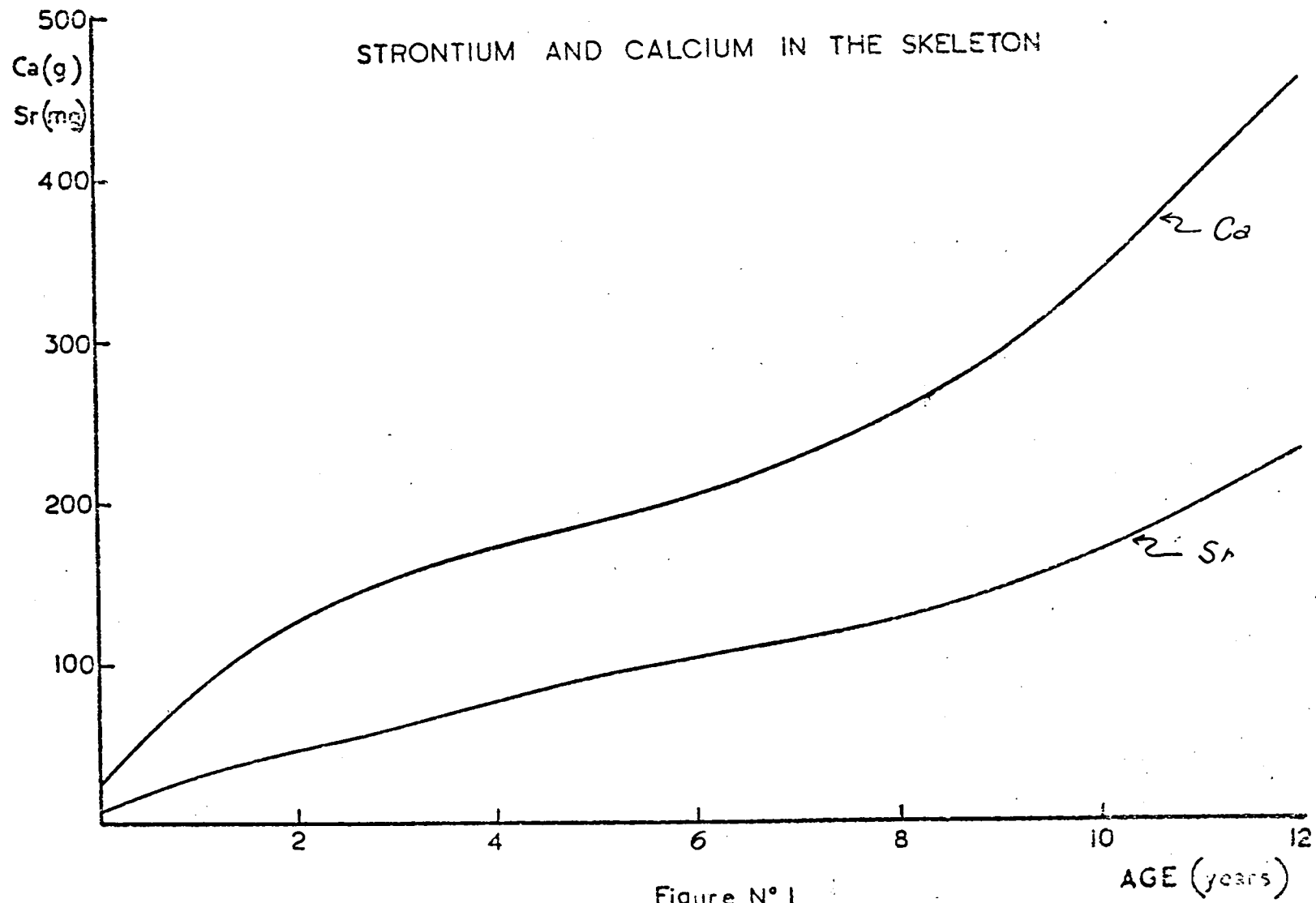
Table IIa presents the estimates of  $\text{Sr}^{90}/\text{Ca}$  ratios in total diet for different age groups, together with the values for previous years. Diet compositions of Table II were used in the calculations. Some of the levels shown in Table IIa for previous years are slightly different than the corresponding values presented in previous Reports. This is mainly due to new estimations of the importance of given diet components within each of the more general entries of Table II.

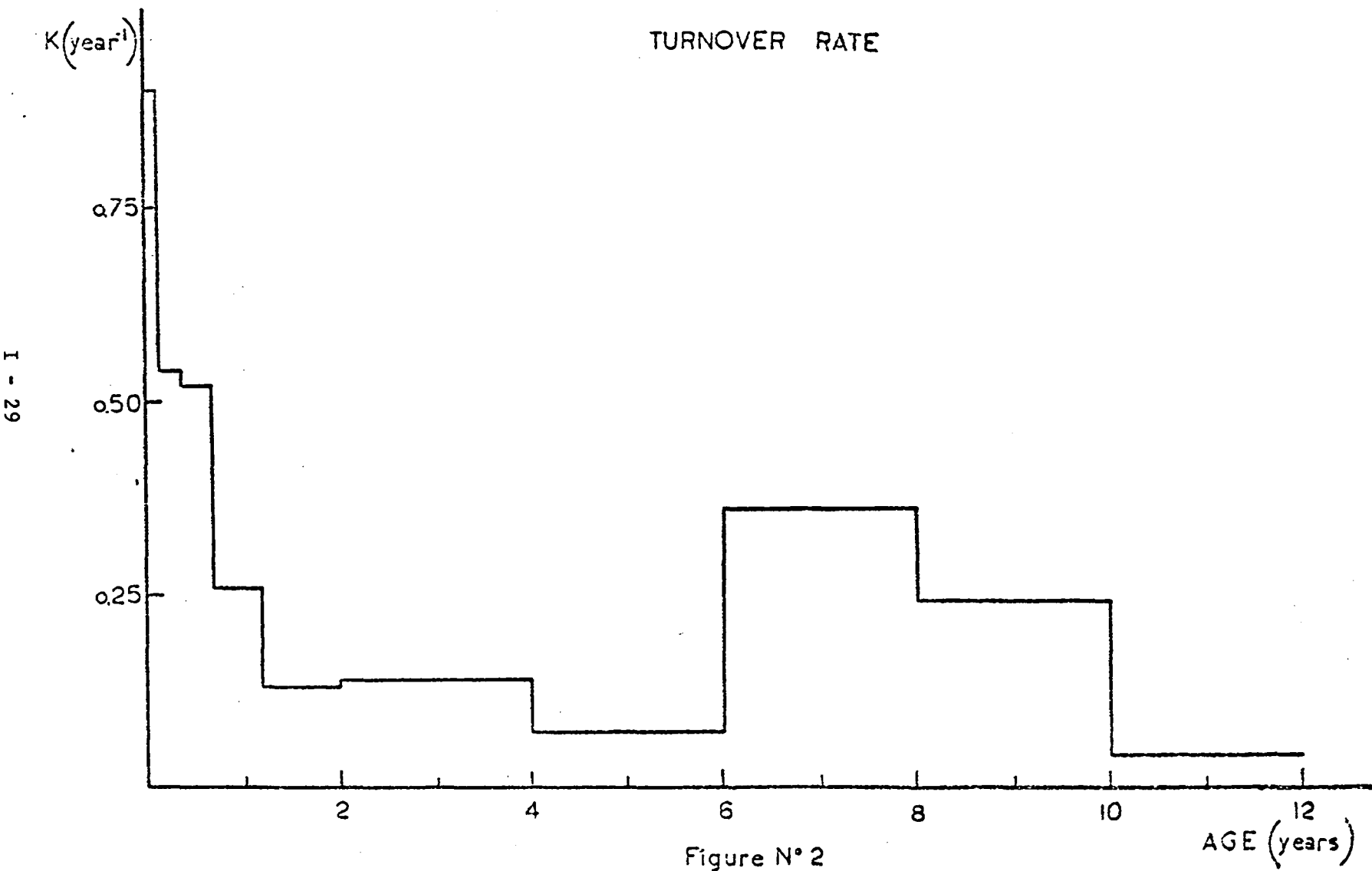
Estimates for the 4-6 and 6-8 years age groups in the period 1960-1963 are based on few measurements of  $\text{Sr-90/Ca}$  in diet components and cannot be considered to be very representative. On the other hand, the estimates for the younger age groups in the same period are on better grounds, because the determinations in food stuffs were at the time complemented by analysis of total diet samples.

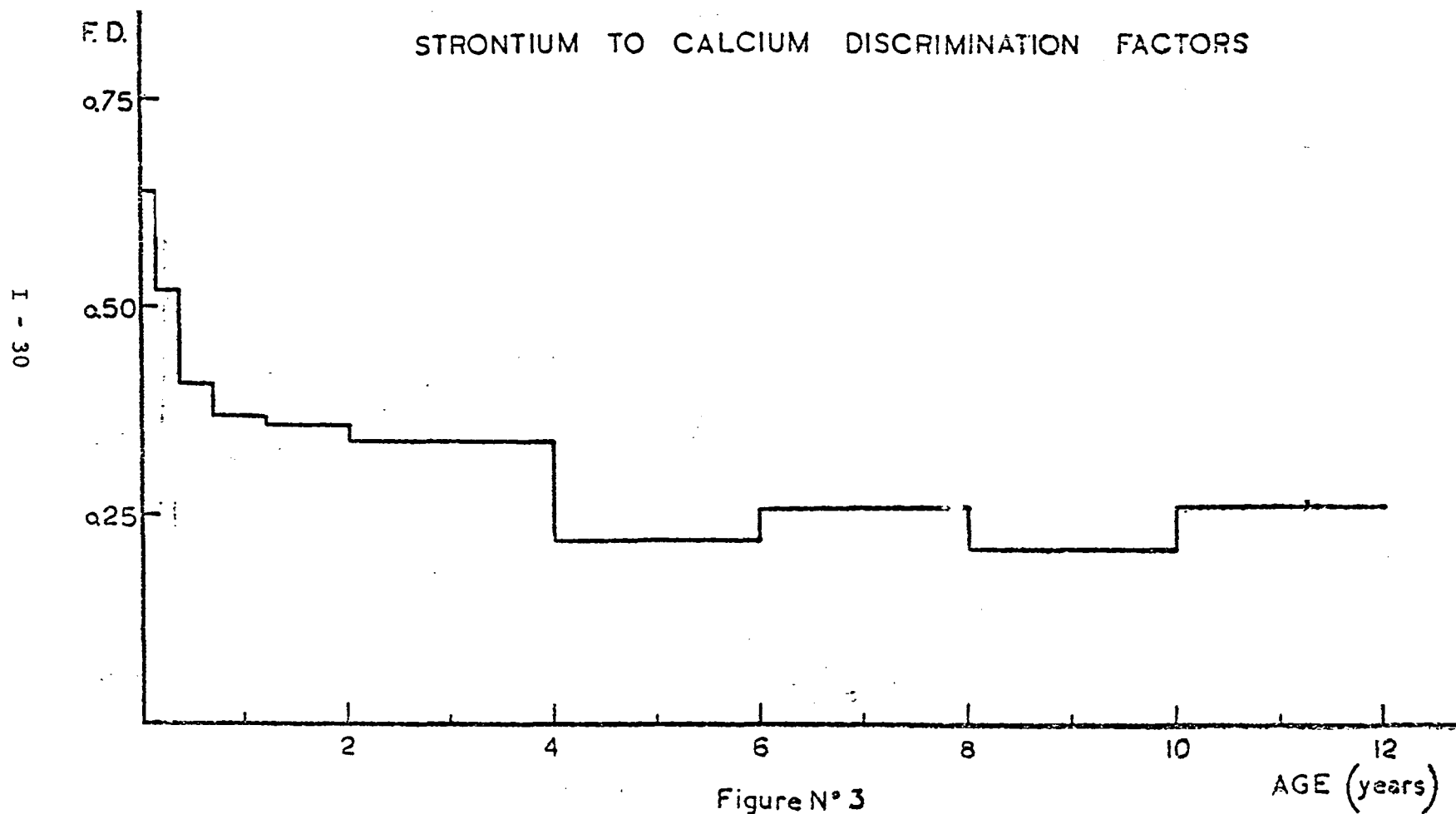
From the results shown in Table IIa, the change in time-trend suggested in 1965 is now more clearly observed. The diet levels of  $\text{Sr-90}$  in the region during 1966 appear to be significantly lower than those of 1964.

## References

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T A B L E I

STRONTIUM IN BONES AND DIETS

| Age<br>(months) | Date of<br>Birth | B O N E              |                 |                     | D I E T S            |              |               |               |               |               |              |               |
|-----------------|------------------|----------------------|-----------------|---------------------|----------------------|--------------|---------------|---------------|---------------|---------------|--------------|---------------|
|                 |                  | Sr-90/Ca<br>(pc / g) | Sr/Ca<br>(mg/g) | Sr-90/Sr<br>(pc/mg) | Sr-90/Ca<br>(pc / g) |              |               |               |               |               |              |               |
|                 |                  |                      |                 |                     | 0 - 6<br>mos.        | 6-12<br>mos. | 12-24<br>mos. | 24-48<br>mos. | 4 - 6<br>yrs. | 6 - 8<br>yrs. | 8-10<br>yrs. | 10-12<br>yrs. |
| + Stillbirth    | 5/63             | 0.99                 | 0.37            | 2.67                | -                    | -            | -             | -             | -             | -             | -            | -             |
| + Stillbirth    | 5/63             | 0.92                 | 0.31            | 2.97                | -                    | -            | -             | -             | -             | -             | -            | -             |
| + Stillbirth    | 5/63             | 0.62                 | 0.25            | 2.48                | -                    | -            | -             | -             | -             | -             | -            | -             |
| + Stillbirth    | 6/63             | 0.45                 | 0.20            | 2.25                | -                    | -            | -             | -             | -             | -             | -            | -             |
| + Stillbirth    | 6/63             | 0.46                 | 0.10            | 4.60                | -                    | -            | -             | -             | -             | -             | -            | -             |
| + Stillbirth    | 8/63             | 0.57                 | 0.12            | 4.75                | -                    | -            | -             | -             | -             | -             | -            | -             |
| + Stillbirth    | 8/63             | 0.86                 | 0.21            | 4.09                | -                    | -            | -             | -             | -             | -             | -            | -             |
| + Stillbirth    | 8/63             | 0.74                 | 0.20            | 3.70                | -                    | -            | -             | -             | -             | -             | -            | -             |
| + Stillbirth    | 9/63             | 1.04                 | 0.20            | 5.20                | -                    | -            | -             | -             | -             | -             | -            | -             |
| + Stillbirth    | 9/63             | 1.15                 | 0.21            | 5.48                | -                    | -            | -             | -             | -             | -             | -            | -             |
| + Stillbirth    | 10/63            | 1.12                 | 0.16            | 7.00                | -                    | -            | -             | -             | -             | -             | -            | -             |
| + Stillbirth    | 10/63            | 1.30                 | 0.46            | 2.83                | -                    | -            | -             | -             | -             | -             | -            | -             |

TABLE I - (cont'd)

STRONTIUM IN BONES AND DIETS

| Age<br>(months) | Date of<br>Birth | <u>B O N E</u>                          |                                      |                                          | <u>D I E T S</u>                        |              |               |               |               |               |              |               |
|-----------------|------------------|-----------------------------------------|--------------------------------------|------------------------------------------|-----------------------------------------|--------------|---------------|---------------|---------------|---------------|--------------|---------------|
|                 |                  | $\frac{\text{Sr-90/Ca}}{(\text{pc/g})}$ | $\frac{\text{Sr/Ca}}{(\text{mg/g})}$ | $\frac{\text{Sr-90/Sr}}{(\text{pc/mg})}$ | $\frac{\text{Sr-90/Ca}}{(\text{pc/g})}$ |              |               |               |               |               |              |               |
|                 |                  |                                         |                                      |                                          | 0 - 6<br>mos.                           | 6-12<br>mos. | 12-24<br>mos. | 24-48<br>mos. | 4 - 6<br>yrs. | 6 - 8<br>yrs. | 8-10<br>yrs. | 10-12<br>yrs. |
| + Stillbirth    | 10/63            | 1.21                                    | 0.22                                 | 5.50                                     | -                                       | -            | -             | -             | -             | -             | -            | -             |
| + Stillbirth    | 10/63            | 0.88                                    | 0.21                                 | 4.09                                     | -                                       | -            | -             | -             | -             | -             | -            | -             |
| + Stillbirth    | 10/63            | 0.63                                    | 0.20                                 | 3.15                                     | -                                       | -            | -             | -             | -             | -             | -            | -             |
| + Stillbirth    | 10/63            | 1.02                                    | 0.25                                 | 4.08                                     | -                                       | -            | -             | -             | -             | -             | -            | -             |
| + Stillbirth    | 11/63            | 0.85                                    | 0.20                                 | 4.25                                     | -                                       | -            | -             | -             | -             | -             | -            | -             |
| + Stillbirth    | 6/64             | 1.12                                    | 0.19                                 | 5.89                                     | -                                       | -            | -             | -             | -             | -             | -            | -             |
| + Stillbirth    | 6/64             | 1.28                                    | 0.27                                 | 4.74                                     | -                                       | -            | -             | -             | -             | -             | -            | -             |
| + Stillbirth    | 6/64             | 1.87                                    | 0.27                                 | 6.93                                     | -                                       | -            | -             | -             | -             | -             | -            | -             |
| + Stillbirth    | 6/64             | 1.75                                    | 0.25                                 | 7.00                                     | -                                       | -            | -             | -             | -             | -             | -            | -             |
| + Stillbirth    | 6/64             | 1.76                                    | 0.42                                 | 4.19                                     | -                                       | -            | -             | -             | -             | -             | -            | -             |
| + Stillbirth    | 6/64             | 0.91                                    | 0.26                                 | 3.50                                     | -                                       | -            | -             | -             | -             | -             | -            | -             |
| + Stillbirth    | 7/64             | 1.01                                    | 0.36                                 | 2.81                                     | -                                       | -            | -             | -             | -             | -             | -            | -             |

TABLE I - (cont'd)

STRONTIUM IN BONES AND DIETS

| Age<br>(months) | Date of<br>Birth | <u>B O N E</u>                          |                                      |                                          | <u>D I E T S</u>                        |              |               |               |               |               |              |               |
|-----------------|------------------|-----------------------------------------|--------------------------------------|------------------------------------------|-----------------------------------------|--------------|---------------|---------------|---------------|---------------|--------------|---------------|
|                 |                  | $\frac{\text{Sr-90/Ca}}{(\text{pc/g})}$ | $\frac{\text{Sr/Ca}}{(\text{mg/g})}$ | $\frac{\text{Sr-90/Sr}}{(\text{pc/mg})}$ | $\frac{\text{Sr-90/Ca}}{(\text{pc/g})}$ |              |               |               |               |               |              |               |
|                 |                  |                                         |                                      |                                          | 0 - 6<br>mos.                           | 6-12<br>mos. | 12-24<br>mos. | 24-48<br>mos. | 4 - 6<br>yrs. | 6 - 8<br>yrs. | 8-10<br>yrs. | 10-12<br>yrs. |
| + Stillbirth    | 7/64             | 0.76                                    | 0.23                                 | 3.30                                     | -                                       | -            | -             | -             | -             | -             | -            | -             |
| + Stillbirth    | 7/64             | 1.47                                    | 0.23                                 | 6.39                                     | -                                       | -            | -             | -             | -             | -             | -            | -             |
| + Stillbirth    | 7/64             | 1.95                                    | 0.22                                 | 8.86                                     | -                                       | -            | -             | -             | -             | -             | -            | -             |
| + Stillbirth    | 7/64             | 1.24                                    | 0.28                                 | 4.77                                     | -                                       | -            | -             | -             | -             | -             | -            | -             |
| + Stillbirth    | 7/64             | 0.54                                    | 0.16                                 | 3.37                                     | -                                       | -            | -             | -             | -             | -             | -            | -             |
| + Stillbirth    | 8/64             | 0.97                                    | 0.10                                 | 9.70                                     | -                                       | -            | -             | -             | -             | -             | -            | -             |
| + Stillbirth    | 8/64             | 1.53                                    | 0.24                                 | 6.37                                     | -                                       | -            | -             | -             | -             | -             | -            | -             |
| + Stillbirth    | 8/64             | 1.17                                    | 0.33                                 | 3.55                                     | -                                       | -            | -             | -             | -             | -             | -            | -             |
| + Stillbirth    | 8/64             | 1.12                                    | 0.28                                 | 4.00                                     | -                                       | -            | -             | -             | -             | -             | -            | -             |
| + Stillbirth    | 8/64             | 1.42                                    | 0.31                                 | 4.58                                     | -                                       | -            | -             | -             | -             | -             | -            | -             |
| + Stillbirth    | 9/64             | 1.28                                    | 0.38                                 | 3.37                                     | -                                       | -            | -             | -             | -             | -             | -            | -             |
| + Stillbirth    | 9/64             | 1.18                                    | 0.28                                 | 4.21                                     | -                                       | -            | -             | -             | -             | -             | -            | -             |

TABLE I - (cont'd)

## STRONTIUM IN BONES AND DIETS

| Age<br>(months) | Date of<br>Birth | B O N E                     |                          |                              | D I E T S                   |              |               |               |               |               |              |               |
|-----------------|------------------|-----------------------------|--------------------------|------------------------------|-----------------------------|--------------|---------------|---------------|---------------|---------------|--------------|---------------|
|                 |                  | $\text{Sr-90/Ca}$<br>(pc/g) | $\text{Sr/Ca}$<br>(mg/g) | $\text{Sr-90/Sr}$<br>(pc/mg) | $\text{Sr-90/Ca}$<br>(pc/g) |              |               |               |               |               |              |               |
|                 |                  |                             |                          |                              | 0 - 8<br>mos.               | 6-12<br>mos. | 12-24<br>mos. | 24-48<br>mos. | 4 - 6<br>yrs. | 6 - 8<br>yrs. | 8-10<br>yrs. | 10-12<br>yrs. |
| + Stillbirth    | 10/64            | 1.38                        | 0.26                     | 6.00                         | -                           | -            | -             | -             | -             | -             | -            | -             |
| + Stillbirth    | 10/64            | 1.42                        | 0.23                     | 6.17                         | -                           | -            | -             | -             | -             | -             | -            | -             |
| + Stillbirth    | 10/64            | 1.05                        | 0.18                     | 5.89                         | -                           | -            | -             | -             | -             | -             | -            | -             |
| + Stillbirth    | 10/64            | 1.11                        | 0.24                     | 4.63                         | -                           | -            | -             | -             | -             | -             | -            | -             |
| + Stillbirth    | 10/64            | 1.43                        | 0.21                     | 6.81                         | -                           | -            | -             | -             | -             | -             | -            | -             |
| + Stillbirth    | 12/64            | 2.36                        | 0.42                     | 5.62                         | -                           | -            | -             | -             | -             | -             | -            | -             |
| + Stillbirth    | 2/65             | 1.49                        | 0.26                     | 5.73                         | -                           | -            | -             | -             | -             | -             | -            | -             |
| + Stillbirth    | 3/65             | 1.42                        | 0.26                     | 5.46                         | -                           | -            | -             | -             | -             | -             | -            | -             |
| + Stillbirth    | 5/65             | 1.72                        | 0.26                     | 6.62                         | -                           | -            | -             | -             | -             | -             | -            | -             |
| + Stillbirth    | 6/65             | 1.36                        | 0.42                     | 3.24                         | -                           | -            | -             | -             | -             | -             | -            | -             |
| + Stillbirth    | 6/65             | 1.85                        | 0.38                     | 4.87                         | -                           | -            | -             | -             | -             | -             | -            | -             |
| + Stillbirth    | 7/65             | 1.12                        | 0.35                     | 3.20                         | -                           | -            | -             | -             | -             | -             | -            | -             |

TABLE I - (cont'd)

STRONTIUM IN BONES AND DIETS

| Age<br>(months) | Date of<br>Birth | <u>B O N E</u>  |              |                 | <u>D I E T S</u> |              |               |               |               |               |              |               |
|-----------------|------------------|-----------------|--------------|-----------------|------------------|--------------|---------------|---------------|---------------|---------------|--------------|---------------|
|                 |                  | <u>Sr-90/Ca</u> | <u>Sr/Ca</u> | <u>Sr-90/Sr</u> | <u>Sr-90/Ca</u>  |              |               |               |               |               |              |               |
|                 |                  | (pc/g)          | (mg/g)       | (pc/mg)         | (pc/g)           |              |               |               |               |               |              |               |
|                 |                  |                 |              |                 | 0 - 6<br>mos.    | 6-12<br>mos. | 12-24<br>mos. | 24-48<br>mos. | 4 - 6<br>yrs. | 6 - 8<br>yrs. | 8-10<br>yrs. | 10-12<br>yrs. |
| + Stillbirth    | 7/65             | 1.18            | 0.33         | 3.58            | -                | -            | -             | -             | -             | -             | -            | -             |
| + Stillbirth    | 8/65             | 1.88            | 0.30         | 6.27            | -                | -            | -             | -             | -             | -             | -            | -             |
| + Stillbirth    | 8/65             | 2.08            | 0.32         | 6.50            | -                | -            | -             | -             | -             | -             | -            | -             |
| + Stillbirth    | 9/65             | 0.97            | 0.28         | 3.46            | -                | -            | -             | -             | -             | -             | -            | -             |
| + Stillbirth    | 9/65             | 1.06            | 0.28         | 4.08            | -                | -            | -             | -             | -             | -             | -            | -             |
| + Stillbirth    | 9/65             | 1.14            | 0.29         | 3.93            | -                | -            | -             | -             | -             | -             | -            | -             |
| + Stillbirth    | 9/65             | 1.63            | 0.27         | 6.04            | -                | -            | -             | -             | -             | -             | -            | -             |
| Stillbirth      | 9/65             | 1.55            | 0.38         | 4.08            | -                | -            | -             | -             | -             | -             | -            | -             |
| + Stillbirth    | 10/65            | 1.04            | 0.30         | 3.47            | -                | -            | -             | -             | -             | -             | -            | -             |
| Stillbirth      | 10/65            | 1.35            | 0.31         | 4.35            | -                | -            | -             | -             | -             | -             | -            | -             |
| Stillbirth      | 10/65            | 1.70            | 0.34         | 5.00            | -                | -            | -             | -             | -             | -             | -            | -             |
| Stillbirth      | 10/65            | 1.50            | 0.29         | 5.17            | -                | -            | -             | -             | -             | -             | -            | -             |

TABLE I - (cont'd)

STRONTIUM IN BONES AND DIETS

| A g e<br>(months) | Date of<br>Birth | B O N E              |                 |                     | D I E T S            |              |               |               |               |               |              |               |
|-------------------|------------------|----------------------|-----------------|---------------------|----------------------|--------------|---------------|---------------|---------------|---------------|--------------|---------------|
|                   |                  | Sr-90/Ca<br>(pc / g) | Sr/Ca<br>(mg/g) | Sr-90/Sr<br>(pc/mg) | Sr-90/Ca<br>(pc / g) |              |               |               |               |               |              |               |
|                   |                  |                      |                 |                     | 0 - 6<br>mos.        | 6-12<br>mos. | 12-24<br>mos. | 24-48<br>mos. | 4 - 6<br>yrs. | 6 - 8<br>yrs. | 8-10<br>yrs. | 10-12<br>yrs. |
| Stillbirth        | 10/65            | 1.42                 | 0.21            | 6.76                | -                    | -            | -             | -             | -             | -             | -            | -             |
| + Stillbirth      | 11/65            | 1.57                 | 0.27            | 5.81                | -                    | -            | -             | -             | -             | -             | -            | -             |
| Stillbirth        | 11/65            | 1.38                 | 0.31            | 4.45                | -                    | -            | -             | -             | -             | -             | -            | -             |
| Stillbirth        | 11/65            | 1.91                 | 0.27            | 7.07                | -                    | -            | -             | -             | -             | -             | -            | -             |
| Stillbirth        | 12/65            | 1.33                 | 0.30            | 4.43                | -                    | -            | -             | -             | -             | -             | -            | -             |
| Stillbirth        | 12/65            | 1.34                 | 0.27            | 4.96                | -                    | -            | -             | -             | -             | -             | -            | -             |
| Stillbirth        | 12/65            | 1.77                 | 0.32            | 5.53                | -                    | -            | -             | -             | -             | -             | -            | -             |
| Stillbirth        | 1/66             | 1.38                 | 0.42            | 3.29                | -                    | -            | -             | -             | -             | -             | -            | -             |
| Stillbirth        | 1/66             | 1.02                 | 0.30            | 3.40                | -                    | -            | -             | -             | -             | -             | -            | -             |
| Stillbirth        | 1/66             | 1.16                 | 0.26            | 4.46                | -                    | -            | -             | -             | -             | -             | -            | -             |
| Stillbirth        | 1/66             | 1.17                 | 0.26            | 4.50                | -                    | -            | -             | -             | -             | -             | -            | -             |
| Stillbirth        | 1/66             | 0.64                 | 0.21            | 3.05                | -                    | -            | -             | -             | -             | -             | -            | -             |

TABLE I - (cont'd)

## STRONTIUM IN BONES AND DIETS

| B O N E           |                  |                       |                 |                      | D I E T S             |              |               |               |               |               |              |               |   |
|-------------------|------------------|-----------------------|-----------------|----------------------|-----------------------|--------------|---------------|---------------|---------------|---------------|--------------|---------------|---|
| A g e<br>(months) | Date of<br>Birth | Sr-90/Ca<br>(pc / g ) | Sr/Ca<br>(mg/g) | Sr-90/Sr<br>(pc/mg ) | Sr-90/Ca<br>(pc / g ) |              |               |               |               |               |              |               |   |
|                   |                  |                       |                 |                      | 0 - 6<br>mos.         | 5-12<br>mos. | 12-24<br>mos. | 24-48<br>mos. | 4 - 6<br>yrs. | 6 - 8<br>yrs. | 8-10<br>yrs. | 10-12<br>yrs. |   |
| Stillbirth        | 2/66             | 1.20                  | 0.34            | 3.53                 | -                     | -            | -             | -             | -             | -             | -            | -             | - |
| Stillbirth        | 2/66             | 1.19                  | 0.38            | 3.13                 | -                     | -            | -             | -             | -             | -             | -            | -             | - |
| Stillbirth        | 3/66             | 1.53                  | 0.22            | 6.95                 | -                     | -            | -             | -             | -             | -             | -            | -             | - |
| Stillbirth        | 4/66             | 1.28                  | 0.29            | 4.41                 | -                     | -            | -             | -             | -             | -             | -            | -             | - |
| Stillbirth        | 4/66             | 0.99                  | 0.23            | 4.30                 | -                     | -            | -             | -             | -             | -             | -            | -             | - |
| Stillbirth        | 4/66             | 1.78                  | 0.38            | 4.68                 | -                     | -            | -             | -             | -             | -             | -            | -             | - |
| Stillbirth        | 5/66             | 1.18                  | 0.29            | 4.06                 | -                     | -            | -             | -             | -             | -             | -            | -             | - |
| Stillbirth        | 6/66             | 1.72                  | 0.33            | 5.21                 | -                     | -            | -             | -             | -             | -             | -            | -             | - |
| Stillbirth        | 6/66             | 1.64                  | 0.38            | 4.32                 | -                     | -            | -             | -             | -             | -             | -            | -             | - |
| Stillbirth        | 8/66             | 1.00                  | 0.36            | 2.77                 | -                     | -            | -             | -             | -             | -             | -            | -             | - |
| Stillbirth        | 8/66             | 1.20                  | 0.33            | 3.64                 | -                     | -            | -             | -             | -             | -             | -            | -             | - |
| + 0.2             | 7/64             | 1.32                  | 0.31            | 4.26                 | 4.06                  | -            | -             | -             | -             | -             | -            | -             | - |

TABLE I - (cont'd)

STRONTIUM IN BONES AND DIETS

| Age<br>(months) | Date of<br>Birth | <u>B O N E</u>                          |                                      |                                          | <u>D I E T S</u>                        |              |               |               |               |               |              |               |
|-----------------|------------------|-----------------------------------------|--------------------------------------|------------------------------------------|-----------------------------------------|--------------|---------------|---------------|---------------|---------------|--------------|---------------|
|                 |                  | $\frac{\text{Sr-90/Ca}}{(\text{pc/g})}$ | $\frac{\text{Sr/Ca}}{(\text{mg/g})}$ | $\frac{\text{Sr-90/Sr}}{(\text{pc/mg})}$ | $\frac{\text{Sr-90/Ca}}{(\text{pc/g})}$ |              |               |               | 4 - 6<br>yrs. | 6 - 8<br>yrs. | 8-10<br>yrs. | 10-12<br>yrs. |
|                 |                  |                                         |                                      |                                          | 0 - 6<br>mos.                           | 6-12<br>mos. | 12-24<br>mos. | 24-48<br>mos. |               |               |              |               |
| 0.3             | 5/66             | 2.73                                    | 0.61                                 | 4.47                                     | 3.93                                    | -            | -             | -             | -             | -             | -            | -             |
| 0.4             | 3/65             | 2.24                                    | 0.25                                 | 8.96                                     | 5.01                                    | -            | -             | -             | -             | -             | -            | -             |
| 0.4             | 8/65             | 1.17                                    | 0.32                                 | 3.66                                     | 4.11                                    | -            | -             | -             | -             | -             | -            | -             |
| 0.4             | 9/65             | 1.03                                    | 0.34                                 | 3.03                                     | 4.11                                    | -            | -             | -             | -             | -             | -            | -             |
| 0.4             | 10/65            | 1.37                                    | 0.34                                 | 4.03                                     | 4.11                                    | -            | -             | -             | -             | -             | -            | -             |
| 0.5             | 9/63             | 1.42                                    | 0.33                                 | 4.30                                     | 2.73                                    | -            | -             | -             | -             | -             | -            | -             |
| 0.5             | 6/65             | 1.20                                    | 0.32                                 | 3.75                                     | 5.01                                    | -            | -             | -             | -             | -             | -            | -             |
| 0.5             | 8/66             | 1.29                                    | 0.15                                 | 8.60                                     | 4.07                                    | -            | -             | -             | -             | -             | -            | -             |
| 0.6             | 9/65             | 1.87                                    | 0.36                                 | 4.39                                     | 4.11                                    | -            | -             | -             | -             | -             | -            | -             |
| 0.7             | 7/65             | 2.49                                    | 0.44                                 | 5.66                                     | 4.11                                    | -            | -             | -             | -             | -             | -            | -             |
| 0.8             | 1/64             | 0.83                                    | 0.42                                 | 1.98                                     | 4.06                                    | -            | -             | -             | -             | -             | -            | -             |
| 0.8             | 5/65             | 2.67                                    | 0.50                                 | 5.34                                     | 5.01                                    | -            | -             | -             | -             | -             | -            | -             |

TABLE I - (cont'd)

## STRONTIUM IN BONES AND DIETS

| Age<br>(months) | Date of<br>Birth | B O N E              |                 |                     | D I E T S            |              |               |               |               |               |              |               |   |
|-----------------|------------------|----------------------|-----------------|---------------------|----------------------|--------------|---------------|---------------|---------------|---------------|--------------|---------------|---|
|                 |                  | Sr-90/Ca<br>(pc / g) | Sr/Ca<br>(mg/g) | Sr-90/Sr<br>(pc/mg) | Sr-90/Ca<br>(pc / g) |              |               |               |               |               |              |               |   |
|                 |                  |                      |                 |                     | 0 - 6<br>mos.        | 6-12<br>mos. | 12-24<br>mos. | 24-48<br>mos. | 4 - 8<br>yrs. | 6 - 8<br>yrs. | 8-10<br>yrs. | 10-12<br>yrs. |   |
| 0.8             | 10/65            | 3.40                 | 0.36            | 9.44                | 4.11                 | -            | -             | -             | -             | -             | -            | -             | - |
| + 0.9           | 6/85             | 2.11                 | 0.30            | 7.03                | 5.01                 | -            | -             | -             | -             | -             | -            | -             | - |
| 0.9             | 2/66             | 1.78                 | 0.46            | 3.87                | 3.89                 | -            | -             | -             | -             | -             | -            | -             | - |
| + 1.0           | 4/64             | 2.06                 | 0.27            | 7.63                | 4.06                 | -            | -             | -             | -             | -             | -            | -             | - |
| + 1.0           | 11/64            | 1.83                 | 0.33            | 5.55                | 4.28                 | -            | -             | -             | -             | -             | -            | -             | - |
| + 1.0           | 1/65             | 2.04                 | 0.40            | 5.10                | 5.01                 | -            | -             | -             | -             | -             | -            | -             | - |
| + 1.0           | 6/65             | 1.55                 | 0.35            | 4.43                | 5.01                 | -            | -             | -             | -             | -             | -            | -             | - |
| 1.0             | 8/65             | 1.70                 | 0.32            | 5.31                | 4.11                 | -            | -             | -             | -             | -             | -            | -             | - |
| 1.0             | 7/66             | 0.72                 | 0.14            | 5.14                | 4.07                 | -            | -             | -             | -             | -             | -            | -             | - |
| + 1.1           | 9/64             | 1.51                 | 0.26            | 5.81                | 4.28                 | -            | -             | -             | -             | -             | -            | -             | - |
| + 1.1           | 11/64            | 2.01                 | 0.34            | 5.91                | 4.28                 | -            | -             | -             | -             | -             | -            | -             | - |
| 1.1             | 5/66             | 3.15                 | 0.53            | 5.94                | 4.07                 | -            | -             | -             | -             | -             | -            | -             | - |

TABLE I - (cont'd)

## STRONTIUM IN BONES AND DIETS

|         | Age<br>(months) | Date of<br>Birth | B O N E              |                 |                     | D I E T S            |              |               |               |               |               |              |               |
|---------|-----------------|------------------|----------------------|-----------------|---------------------|----------------------|--------------|---------------|---------------|---------------|---------------|--------------|---------------|
|         |                 |                  | Sr-90/Ca<br>(pc / g) | Sr/Ca<br>(mg/g) | Sr-90/Sr<br>(pc/mg) | Sr-90/Ca<br>(pc / g) |              |               |               |               |               |              |               |
|         |                 |                  |                      |                 |                     | 0 - 6<br>mos.        | 6-12<br>mos. | 12-24<br>mos. | 24-48<br>mos. | 4 - 6<br>yrs. | 6 - 8<br>yrs. | 8-10<br>yrs. | 10-12<br>yrs. |
| I<br>40 | +               | 1.3              | 5/64                 | 1.18            | 0.29                | 4.07                 | 4.08         | -             | -             | -             | -             | -            | -             |
|         | +               | 1.3              | 5/64                 | 1.27            | 0.15                | 8.47                 | 4.06         | -             | -             | -             | -             | -            | -             |
|         | +               | 1.3              | 10/64                | 2.73            | 0.28                | 9.75                 | 4.28         | -             | -             | -             | -             | -            | -             |
|         | +               | 1.3              | 2/65                 | 2.17            | 0.38                | 5.71                 | 5.01         | -             | -             | -             | -             | -            | -             |
|         | +               | 1.3              | 2/65                 | 2.75            | 0.40                | 8.78                 | 5.01         | -             | -             | -             | -             | -            | -             |
|         | +               | 1.3              | 3/65                 | 1.61            | 0.30                | 5.37                 | 5.01         | -             | -             | -             | -             | -            | -             |
|         | +               | 1.4              | 4/65                 | 2.26            | 0.53                | 4.26                 | 5.01         | -             | -             | -             | -             | -            | -             |
|         |                 | 1.4              | 10/65                | 1.71            | 0.43                | 3.98                 | 4.11         | -             | -             | -             | -             | -            | -             |
|         |                 | 1.5              | 9/65                 | 1.98            | 0.22                | 9.00                 | 4.11         | -             | -             | -             | -             | -            | -             |
|         |                 | 1.5              | 12/85                | 0.67            | 0.29                | 2.31                 | 4.11         | -             | -             | -             | -             | -            | -             |
|         | +               | 1.6              | 10/64                | 1.20            | 0.34                | 3.53                 | 4.28         | -             | -             | -             | -             | -            | -             |
|         | +               | 1.7              | 2/64                 | 1.42            | 0.23                | 6.17                 | 4.06         | -             | -             | -             | -             | -            | -             |

TABLE I - (cont'd)

STRONTIUM IN BONES AND DIETS

|                 |                  | <u>B O N E</u>       |                 |                     | <u>D I E T S</u>     |              |               |               |               |               |              |               |   |
|-----------------|------------------|----------------------|-----------------|---------------------|----------------------|--------------|---------------|---------------|---------------|---------------|--------------|---------------|---|
| Age<br>(months) | Date of<br>Birth | Sr-90/Ca<br>(pc / g) | Sr/Ca<br>(mg/g) | Sr-90/Sr<br>(pc/mg) | Sr-90/Ca<br>(pc / g) |              |               |               |               |               |              |               |   |
|                 |                  |                      |                 |                     | 0 - 6<br>mos.        | 6-12<br>mos. | 12-24<br>mos. | 24-48<br>mos. | 4 - 6<br>yrs. | 6 - 6<br>yrs. | 8-10<br>yrs. | 10-12<br>yrs. |   |
| +               | 1.7              | 10/54                | 1.63            | 0.23                | 7.30                 | 4.28         | -             | -             | -             | -             | -            | -             | - |
|                 | 1.7              | 11/65                | 0.62            | 0.15                | 4.14                 | 4.11         | -             | -             | -             | -             | -            | -             | - |
|                 | 1.7              | 5/66                 | 1.57            | 0.25                | 6.28                 | 3.89         | -             | -             | -             | -             | -            | -             | - |
| +               | 1.8              | 9/63                 | 0.90            | 0.22                | 4.09                 | 2.73         | -             | -             | -             | -             | -            | -             | - |
|                 | 1.9              | 6/65                 | 2.32            | 0.31                | 7.48                 | 5.01         | -             | -             | -             | -             | -            | -             | - |
|                 | 1.9              | 5/66                 | 1.62            | 0.39                | 4.15                 | 3.89         | -             | -             | -             | -             | -            | -             | - |
| +               | 2.0              | 11/63                | 2.41            | 0.33                | 7.30                 | 4.06         | -             | -             | -             | -             | -            | -             | - |
| +               | 2.0              | 2/64                 | 1.60            | 0.34                | 4.71                 | 4.06         | -             | -             | -             | -             | -            | -             | - |
| +               | 2.0              | 7/64                 | 1.49            | 0.40                | 3.73                 | 4.06         | -             | -             | -             | -             | -            | -             | - |
| +               | 2.0              | 3/65                 | 2.61            | 0.57                | 4.58                 | 5.01         | -             | -             | -             | -             | -            | -             | - |
| +               | 2.0              | 4/65                 | 1.32            | 0.23                | 5.74                 | 5.01         | -             | -             | -             | -             | -            | -             | - |
| +               | 2.0              | 5/65                 | 1.31            | 0.34                | 3.85                 | 5.01         | -             | -             | -             | -             | -            | -             | - |

TABLE I - (cont'd)

## STRONTIUM IN BONES AND DIETS

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| B O N E         |                  |                      |                 |                     | D I E T S            |              |               |               |               |               |              |               |
|-----------------|------------------|----------------------|-----------------|---------------------|----------------------|--------------|---------------|---------------|---------------|---------------|--------------|---------------|
| Age<br>(months) | Date of<br>Birth | Sr-90/Ca<br>(pc / g) | Sr/Ca<br>(mg/g) | Sr-90/Sr<br>(pc/mg) | Sr-90/Ca<br>(pc / g) |              |               |               |               |               |              |               |
|                 |                  |                      |                 |                     | 0 - 6<br>mos.        | 6-12<br>mos. | 12-24<br>mos. | 24-48<br>mos. | 4 - 6<br>yrs. | 6 - 8<br>yrs. | 8-10<br>yrs. | 10-12<br>yrs. |
| +               | 2.0              | 3/65                 | 1.68            | 0.38                | 4.42                 | 5.01         | -             | -             | -             | -             | -            | -             |
|                 | 2.0              | 10/65                | 1.07            | 0.32                | 3.34                 | 4.11         | -             | -             | -             | -             | -            | -             |
|                 | 2.0              | 1/66                 | 1.68            | 0.33                | 5.03                 | 3.89         | -             | -             | -             | -             | -            | -             |
|                 | 2.1              | 1/66                 | 1.18            | 0.51                | 2.31                 | 3.89         | -             | -             | -             | -             | -            | -             |
|                 | 2.1              | 3/66                 | 2.36            | 0.31                | 7.61                 | 3.89         | -             | -             | -             | -             | -            | -             |
| +               | 2.2              | 10/64                | 2.45            | 0.48                | 5.10                 | 4.28         | -             | -             | -             | -             | -            | -             |
| +               | 2.2              | 12/64                | 3.00            | 0.39                | 7.69                 | 4.28         | -             | -             | -             | -             | -            | -             |
| +               | 2.3              | 3/64                 | 2.27            | 0.37                | 6.13                 | 4.06         | -             | -             | -             | -             | -            | -             |
| +               | 2.3              | 6/64                 | 1.64            | 0.31                | 5.29                 | 4.06         | -             | -             | -             | -             | -            | -             |
|                 | 2.3              | 8/65                 | 1.40            | 0.36                | 3.88                 | 4.11         | -             | -             | -             | -             | -            | -             |
|                 | 2.3              | 2/66                 | 0.98            | 0.14                | 7.00                 | 3.89         | -             | -             | -             | -             | -            | -             |
| +               | 2.4              | 2/64                 | 1.97            | 0.33                | 5.97                 | 4.06         | -             | -             | -             | -             | -            | -             |

TABLE I - (cont'd)

## STRONTIUM IN BONES AND DIETS

| B O N E           |                  |                      |                 |                     | D I E T S            |              |               |               |               |               |              |               |   |
|-------------------|------------------|----------------------|-----------------|---------------------|----------------------|--------------|---------------|---------------|---------------|---------------|--------------|---------------|---|
| A g e<br>(months) | Date of<br>Birth | Sr-90/Ca<br>(pc / g) | Sr/Ca<br>(mg/g) | Sr-90/Sr<br>(pc/mg) | Sr-90/Ca<br>(pc / g) |              |               |               |               |               |              |               |   |
|                   |                  |                      |                 |                     | 0 - 6<br>mos.        | 6-12<br>mos. | 12-24<br>mos. | 24-48<br>mos. | 4 - 6<br>yrs. | 6 - 8<br>yrs. | 8-10<br>yrs. | 10-12<br>yrs. |   |
| +                 | 2.4              | 3/84                 | 1.40            | 0.33                | 4.24                 | 4.06         | -             | -             | -             | -             | -            | -             | - |
| +                 | 2.4              | 4/84                 | 1.73            | 0.37                | 4.68                 | 4.06         | -             | -             | -             | -             | -            | -             | - |
| +                 | 2.5              | 4/85                 | 1.60            | 0.30                | 5.33                 | 5.01         | -             | -             | -             | -             | -            | -             | - |
| +                 | 2.8              | 8/84                 | 1.77            | 0.18                | 9.83                 | 4.28         | -             | -             | -             | -             | -            | -             | - |
|                   | 2.8              | 5/85                 | 1.40            | 0.15                | 9.33                 | 5.01         | -             | -             | -             | -             | -            | -             | - |
| +                 | 2.9              | 5/64                 | 1.62            | 0.24                | 6.75                 | 4.06         | -             | -             | -             | -             | -            | -             | - |
| +                 | 3.0              | 9/63                 | 1.87            | 0.32                | 5.84                 | 2.73         | -             | -             | -             | -             | -            | -             | - |
| +                 | 3.0              | 10/63                | 1.42            | 0.35                | 4.06                 | 2.73         | -             | -             | -             | -             | -            | -             | - |
| +                 | 3.0              | 1/64                 | 1.50            | 0.27                | 5.55                 | 4.06         | -             | -             | -             | -             | -            | -             | - |
| +                 | 3.0              | 7/64                 | 2.11            | 0.29                | 7.28                 | 4.28         | -             | -             | -             | -             | -            | -             | - |
| +                 | 3.0              | 12/64                | 1.96            | 0.42                | 4.67                 | 4.28         | -             | -             | -             | -             | -            | -             | - |
|                   | 3.1              | 4/66                 | 1.24            | 0.36                | 3.44                 | 3.98         | -             | -             | -             | -             | -            | -             | - |

TABLE I - (cont'd)

STRONTIUM IN BONES AND DIETS

| Age<br>(months) | Date of<br>Birth | <u>B O N E</u>  |              |                 | <u>D I E T S</u> |      |       |       |       |       |      |       |
|-----------------|------------------|-----------------|--------------|-----------------|------------------|------|-------|-------|-------|-------|------|-------|
|                 |                  | <u>Sr-90/Ca</u> | <u>Sr/Ca</u> | <u>Sr-90/Sr</u> | <u>Sr-90/Ca</u>  |      |       |       |       |       |      |       |
|                 |                  | (pc / g)        | (mg/g)       | (pc/mg)         | 0 - 6            | 8-12 | 12-24 | 24-48 | 4 - 6 | 8 - 9 | 8-10 | 10-12 |
|                 |                  |                 |              |                 | mos.             | mos. | mos.  | mos.  | yrs.  | yrs.  | yrs. | yrs.  |
| +               | 3.2              | 7/63            | 1.84         | 0.31            | 5.93             | 2.73 | -     | -     | -     | -     | -    | -     |
| +               | 3.2              | 1/64            | 2.10         | 0.35            | 6.00             | 4.06 | -     | -     | -     | -     | -    | -     |
| +               | 3.2              | 4/65            | 2.26         | 0.36            | 6.28             | 5.01 | -     | -     | -     | -     | -    | -     |
|                 | 3.2              | 10/65           | 1.18         | 0.23            | 5.13             | 4.06 | -     | -     | -     | -     | -    | -     |
|                 | 3.4              | 2/65            | 1.95         | 0.34            | 5.73             | 5.01 | -     | -     | -     | -     | -    | -     |
| +               | 3.5              | 2/64            | 1.89         | 0.35            | 5.40             | 4.06 | -     | -     | -     | -     | -    | -     |
| +               | 3.6              | 1/63            | 0.53         | 0.25            | 2.12             | 2.73 | -     | -     | -     | -     | -    | -     |
|                 | 3.6              | 7/65            | 2.38         | 0.42            | 5.67             | 4.11 | -     | -     | -     | -     | -    | -     |
| +               | 3.7              | 1/65            | 2.13         | 0.35            | 6.09             | 5.01 | -     | -     | -     | -     | -    | -     |
|                 | 3.8              | 10/65           | 2.42         | 0.40            | 6.05             | 4.06 | -     | -     | -     | -     | -    | -     |
|                 | 3.8              | 4/66            | 2.50         | 0.50            | 5.00             | 3.98 | -     | -     | -     | -     | -    | -     |
| +               | 3.9              | 2/64            | 1.87         | 0.29            | 6.45             | 4.06 | -     | -     | -     | -     | -    | -     |

TABLE I - (cont'd)

STRONTIUM IN BONES AND DIETS

| Age<br>(months) | Date of<br>Birth | <u>B O N E</u>       |                 |                     | <u>D I E T S</u>     |              |               |               |               |               |              |               |
|-----------------|------------------|----------------------|-----------------|---------------------|----------------------|--------------|---------------|---------------|---------------|---------------|--------------|---------------|
|                 |                  | Sr-90/Ca<br>(pc / g) | Sr/Ca<br>(mg/g) | Sr-90/Sr<br>(pc/mg) | Sr-90/Ca<br>(pc / g) |              |               |               |               |               |              |               |
|                 |                  |                      |                 |                     | 0 - 6<br>mos.        | 6-12<br>mos. | 12-24<br>mos. | 24-48<br>mos. | 4 - 6<br>yrs. | 6 - 8<br>yrs. | 8-10<br>yrs. | 10-12<br>yrs. |
| +               | 3.9              | 9/64                 | 1.94            | 0.46                | 4.22                 | 4.28         | -             | -             | -             | -             | -            | -             |
|                 | 3.9              | 4/65                 | 1.71            | 0.37                | 4.62                 | 5.01         | -             | -             | -             | -             | -            | -             |
|                 | 3.9              | 7/65                 | 2.00            | 0.35                | 5.71                 | 4.11         | -             | -             | -             | -             | -            | -             |
| +               | 4.0              | 9/63                 | 1.24            | 0.40                | 3.10                 | 3.28         | -             | -             | -             | -             | -            | -             |
| +               | 4.0              | 9/63                 | 1.77            | 0.36                | 4.92                 | 3.28         | -             | -             | -             | -             | -            | -             |
| +               | 4.0              | 10/64                | 1.94            | 0.37                | 5.24                 | 5.22         | -             | -             | -             | -             | -            | -             |
| +               | 4.0              | 10/84                | 1.70            | 0.39                | 4.36                 | 5.22         | -             | -             | -             | -             | -            | -             |
| +               | 4.0              | 12/64                | 1.44            | 0.31                | 4.65                 | 5.13         | -             | -             | -             | -             | -            | -             |
| +               | 4.0              | 2/65                 | 1.22            | 0.31                | 3.94                 | 5.01         | -             | -             | -             | -             | -            | -             |
|                 | 4.0              | 8/65                 | 2.30            | 0.42                | 5.48                 | 4.11         | -             | -             | -             | -             | -            | -             |
|                 | 4.0              | 12/65                | 1.58            | 0.27                | 5.85                 | 3.89         | -             | -             | -             | -             | -            | -             |
| +               | 4.2              | 8/64                 | 1.96            | 0.36                | 5.44                 | 4.28         | -             | -             | -             | -             | -            | -             |

TABLE I - (cont'd)

STRONTIUM IN BONES AND DIETS

I - 46

| B O N E         |                  |                       |                 |                     |       | D I E T S             |              |               |               |               |               |              |               |
|-----------------|------------------|-----------------------|-----------------|---------------------|-------|-----------------------|--------------|---------------|---------------|---------------|---------------|--------------|---------------|
| Age<br>(months) | Date of<br>Birth | Sr-90/Ca<br>(pc / g ) | Sr/Ca<br>(mg/g) | Sr-90/Sr<br>(pc/mg) |       | Sr-90/Ca<br>(pc / g ) |              |               |               |               |               |              |               |
|                 |                  |                       |                 |                     |       | 0 - 6<br>mos.         | 6-12<br>mos. | 12-24<br>mos. | 24-48<br>mos. | 4 - 6<br>yrs. | 6 - 8<br>yrs. | 8-10<br>yrs. | 10-12<br>yrs. |
| +               | 4, 4             | 3/64                  | 1.19            | 0.28                | 4.25  | 4.08                  | -            | -             | -             | -             | -             | -            | -             |
|                 | 4.5              | 2/65                  | 3.02            | 0.31                | 9.74  | 5.01                  | -            | -             | -             | -             | -             | -            | -             |
| +               | 4.8              | 12/63                 | 2.13            | 0.39                | 5.48  | 2.73                  | -            | -             | -             | -             | -             | -            | -             |
| +               | 4.8              | 6/64                  | 2.07            | 0.26                | 7.98  | 4.28                  | -            | -             | -             | -             | -             | -            | -             |
| +               | 5.0              | 6/64                  | 1.88            | 0.26                | 7.23  | 4.28                  | -            | -             | -             | -             | -             | -            | -             |
| +               | 5.0              | 2/65                  | 1.54            | 0.40                | 3.85  | 5.01                  | -            | -             | -             | -             | -             | -            | -             |
| +               | 5.2              | 8/64                  | 2.06            | 0.32                | 6.44  | 4.28                  | -            | -             | -             | -             | -             | -            | -             |
|                 | 5.2              | 6/65                  | 1.69            | 0.30                | 5.63  | 4.11                  | -            | -             | -             | -             | -             | -            | -             |
|                 | 5.2              | 9/65                  | 2.47            | 0.39                | 6.33  | 3.95                  | -            | -             | -             | -             | -             | -            | -             |
| +               | 5.3              | 5/64                  | 3.06            | 0.28                | 10.93 | 4.28                  | -            | -             | -             | -             | -             | -            | -             |
| +               | 5.3              | 2/65                  | 2.07            | 0.28                | 7.39  | 5.01                  | -            | -             | -             | -             | -             | -            | -             |
| +               | 5.4              | 6/64                  | 2.80            | 0.25                | 11.20 | 4.28                  | -            | -             | -             | -             | -             | -            | -             |

TABLE I - (cont'd)

STRONTIUM IN BONES AND DIETS

| Age<br>(months) | Date of<br>Birth | <u>B O N E</u>                          |                                      |                                          | <u>D I E T S</u>                        |              |               |               |               |               |              |               |
|-----------------|------------------|-----------------------------------------|--------------------------------------|------------------------------------------|-----------------------------------------|--------------|---------------|---------------|---------------|---------------|--------------|---------------|
|                 |                  | $\frac{\text{Sr-90/Ca}}{(\text{pc/g})}$ | $\frac{\text{Sr/Ca}}{(\text{mg/g})}$ | $\frac{\text{Sr-90/Sr}}{(\text{pc/mg})}$ | $\frac{\text{Sr-90/Ca}}{(\text{pc/g})}$ |              |               |               |               |               |              |               |
|                 |                  |                                         |                                      |                                          | 0 - 6<br>mos.                           | 6-12<br>mos. | 12-24<br>mos. | 24-48<br>mos. | 4 - 6<br>yrs. | 6 - 8<br>yrs. | 8-10<br>yrs. | 10-12<br>yrs. |
| 5.4             | 10/65            | 1.24                                    | 0.24                                 | 5.16                                     | 3.95                                    | -            | -             | -             | -             | -             | -            | -             |
| 5.5             | 3/65             | 2.65                                    | 0.38                                 | 6.97                                     | 5.01                                    | -            | -             | -             | -             | -             | -            | -             |
| 5.6             | 10/65            | 2.00                                    | 0.40                                 | 5.00                                     | 3.95                                    | -            | -             | -             | -             | -             | -            | -             |
| 6.9             | 1/65             | 1.68                                    | 0.45                                 | 3.73                                     | 4.10                                    | 5.81         | -             | -             | -             | -             | -            | -             |
| 6.9             | 8/65             | 2.90                                    | 0.36                                 | 8.05                                     | 3.95                                    | 4.58         | -             | -             | -             | -             | -            | -             |
| + 7.0           | 12/64            | 2.29                                    | 0.53                                 | 4.32                                     | 4.66                                    | 7.80         | -             | -             | -             | -             | -            | -             |
| 7.0             | 2/65             | 2.59                                    | 0.53                                 | 4.89                                     | 4.10                                    | 5.81         | -             | -             | -             | -             | -            | -             |
| 7.5             | 5/65             | 2.03                                    | 0.27                                 | 7.52                                     | 4.10                                    | 5.81         | -             | -             | -             | -             | -            | -             |
| + 7.6           | 7/63             | 2.90                                    | 0.37                                 | 7.84                                     | 3.67                                    | 5.86         | -             | -             | -             | -             | -            | -             |
| 7.9             | 5/65             | 1.17                                    | 0.42                                 | 2.78                                     | 4.10                                    | 5.81         | -             | -             | -             | -             | -            | -             |
| + 8.0           | 10/63            | 1.41                                    | 0.30                                 | 4.70                                     | 3.67                                    | 5.86         | -             | -             | -             | -             | -            | -             |
| + 8.0           | 3/64             | 0.95                                    | 0.25                                 | 3.80                                     | 4.06                                    | 7.25         | -             | -             | -             | -             | -            | -             |

TABLE I - (cont'd)

STRONTIUM IN BONES AND DIETS

I - 48

| <u>B O N E</u>  |                  |                             |                        |                            | <u>D I E T S</u>            |              |               |               |               |               |              |               |
|-----------------|------------------|-----------------------------|------------------------|----------------------------|-----------------------------|--------------|---------------|---------------|---------------|---------------|--------------|---------------|
| Age<br>(months) | Date of<br>Birth | <u>Sr-90/Ca</u><br>(pc / g) | <u>Sr/Ca</u><br>(mg/g) | <u>Sr-90/Sr</u><br>(pc/mg) | <u>Sr-90/Ca</u><br>(pc / g) |              |               |               |               |               |              |               |
|                 |                  |                             |                        |                            | 0 - 6<br>mos.               | 6-12<br>mos. | 12-24<br>mos. | 24-48<br>mos. | 4 - 6<br>yrs. | 6 - 8<br>yrs. | 8-10<br>yrs. | 10-12<br>yrs. |
| +               | 3.0              | 3/64                        | 1.04                   | 0.28                       | 3.71                        | 4.06         | 7.25          | -             | -             | -             | -            | -             |
| +               | 8.0              | 10/64                       | 1.05                   | 0.38                       | 2.76                        | 4.66         | 7.80          | -             | -             | -             | -            | -             |
| +               | 8.3              | 9/63                        | 1.16                   | 0.28                       | 4.14                        | 3.67         | 5.86          | -             | -             | -             | -            | -             |
| +               | 8.3              | 2/64                        | 2.43                   | 0.26                       | 9.35                        | 4.06         | 7.25          | -             | -             | -             | -            | -             |
|                 | 8.3              | 12/65                       | 2.91                   | 0.30                       | 9.70                        | 3.38         | 4.58          | -             | -             | -             | -            | -             |
| +               | 8.5              | 2/64                        | 1.94                   | 0.29                       | 6.69                        | 4.06         | 7.25          | -             | -             | -             | -            | -             |
| +               | 8.5              | 5/64                        | 3.74                   | 0.58                       | 6.45                        | 4.06         | 7.25          | -             | -             | -             | -            | -             |
|                 | 8.5              | 4/65                        | 2.43                   | 0.45                       | 5.40                        | 4.10         | 5.81          | -             | -             | -             | -            | -             |
| +               | 8.6              | 9/63                        | 2.29                   | 0.35                       | 6.54                        | 3.67         | 5.86          | -             | -             | -             | -            | -             |
|                 | 8.6              | 11/64                       | 2.70                   | 0.37                       | 7.30                        | 4.66         | 7.80          | -             | -             | -             | -            | -             |
|                 | 8.6              | 11/65                       | 1.08                   | 0.18                       | 6.00                        | 3.51         | 4.58          | -             | -             | -             | -            | -             |
| +               | 9.0              | 11/63                       | 1.47                   | 0.26                       | 5.65                        | 3.67         | 5.86          | -             | -             | -             | -            | -             |

TABLE I - (cont'd)

STRONTIUM IN BONES AND DIETS

|        | Age<br>(months) | Date of<br>Birth | <u>B O N E</u>            |                        |                            | <u>D I E T S</u>          |              |               |               |               |               |              |               |
|--------|-----------------|------------------|---------------------------|------------------------|----------------------------|---------------------------|--------------|---------------|---------------|---------------|---------------|--------------|---------------|
|        |                 |                  | <u>Sr-90/Ca</u><br>(pc/g) | <u>Sr/Ca</u><br>(mg/g) | <u>Sr-90/Sr</u><br>(pc/mg) | <u>Sr-90/Ca</u><br>(pc/g) |              |               |               |               |               |              |               |
|        |                 |                  |                           |                        |                            | 0 - 6<br>mos.             | 6-12<br>mos. | 12-24<br>mos. | 24-48<br>mos. | 4 - 6<br>yrs. | 6 - 8<br>yrs. | 8-10<br>yrs. | 10-12<br>yrs. |
| 67 - I | +               | 9.0              | 9/64                      | 2.41                   | 0.41                       | 5.88                      | 4.66         | 7.80          | -             | -             | -             | -            | -             |
|        |                 | 9.0              | 2/65                      | 1.85                   | 0.54                       | 3.43                      | 4.10         | 5.81          | -             | -             | -             | -            | -             |
|        | +               | 9.3              | 9/63                      | 2.08                   | 0.40                       | 5.20                      | 3.67         | 5.86          | -             | -             | -             | -            | -             |
|        |                 | 9.3              | 1/65                      | 2.15                   | 0.52                       | 4.13                      | 4.10         | 5.81          | -             | -             | -             | -            | -             |
|        | +               | 9.8              | 9/63                      | 2.47                   | 0.31                       | 7.97                      | 3.67         | 5.86          | -             | -             | -             | -            | -             |
|        |                 | 9.8              | 5/65                      | 1.23                   | 0.45                       | 2.73                      | 4.10         | 5.23          | -             | -             | -             | -            | -             |
|        | +               | 10.2             | 10/63                     | 1.42                   | 0.41                       | 3.46                      | 3.67         | 5.86          | -             | -             | -             | -            | -             |
|        | +               | 10.3             | 1/63                      | 1.85                   | 0.32                       | 5.77                      | 2.57         | 4.73          | -             | -             | -             | -            | -             |
|        | +               | 10.5             | 11/63                     | 1.51                   | 0.37                       | 4.08                      | 3.67         | 5.86          | -             | -             | -             | -            | -             |
|        | +               | 10.5             | 3/64                      | 2.47                   | 0.47                       | 5.26                      | 3.58         | 5.54          | -             | -             | -             | -            | -             |
|        |                 | 10.6             | 5/65                      | 2.83                   | 0.43                       | 6.58                      | 4.10         | 5.11          | -             | -             | -             | -            | -             |
|        | +               | 11.0             | 6/64                      | 2.61                   | 0.35                       | 7.46                      | 4.28         | 7.63          | -             | -             | -             | -            | -             |

TABLE I - (cont'd)

STRONTIUM IN BONES AND DIETS

| <u>B O N E</u>  |                  |                                         |                                      |                                          | <u>D I E T S</u>                        |              |               |               |               |               |              |               |
|-----------------|------------------|-----------------------------------------|--------------------------------------|------------------------------------------|-----------------------------------------|--------------|---------------|---------------|---------------|---------------|--------------|---------------|
| Age<br>(months) | Date of<br>Birth | $\frac{\text{Sr-90/Ca}}{(\text{pc/g})}$ | $\frac{\text{Sr/Ca}}{(\text{mg/g})}$ | $\frac{\text{Sr-90/Sr}}{(\text{pc/mg})}$ | $\frac{\text{Sr-90/Ca}}{(\text{pc/g})}$ |              |               |               |               |               |              |               |
|                 |                  |                                         |                                      |                                          | 0 - 6<br>mos.                           | 6-12<br>mos. | 13-24<br>mos. | 24-48<br>mos. | 4 - 6<br>yrs. | 6 - 8<br>yrs. | 3-10<br>yrs. | 10-12<br>yrs. |
| + 11.0          | 8/64             | 1.75                                    | 0.46                                 | 3.80                                     | 4.28                                    | 7.63         | -             | -             | -             | -             | -            | -             |
| + 12.0          | 8/62             | 0.91                                    | 0.40                                 | 2.27                                     | 2.73                                    | 3.71         | -             | -             | -             | -             | -            | -             |
| + 12.0          | 9/63             | 1.83                                    | 0.30                                 | 6.10                                     | 3.67                                    | 5.86         | -             | -             | -             | -             | -            | -             |
| 12.0            | 12/64            | 1.97                                    | 0.38                                 | 5.18                                     | 4.17                                    | 5.81         | -             | -             | -             | -             | -            | -             |
| 12.0            | 1/65             | 2.61                                    | 0.51                                 | 5.12                                     | 4.10                                    | 5.81         | -             | -             | -             | -             | -            | -             |
| + 13.3          | 6/64             | 2.51                                    | 0.37                                 | 6.78                                     | 4.28                                    | 7.63         | 8.15          | -             | -             | -             | -            | -             |
| + 13.5          | 5/64             | 1.96                                    | 0.41                                 | 4.85                                     | 4.28                                    | 7.63         | 8.15          | -             | -             | -             | -            | -             |
| 15.0            | 11/64            | 1.88                                    | 0.49                                 | 3.84                                     | 4.05                                    | 5.81         | 8.02          | -             | -             | -             | -            | -             |
| + 15.2          | 5/63             | 1.09                                    | 0.36                                 | 3.03                                     | 3.23                                    | 5.86         | 7.67          | -             | -             | -             | -            | -             |
| 15.5            | 7/64             | 2.98                                    | 0.42                                 | 7.10                                     | 4.28                                    | 7.63         | 8.15          | -             | -             | -             | -            | -             |
| + 15.6          | 4/64             | 2.30                                    | 0.37                                 | 6.22                                     | 3.58                                    | 5.54         | 6.10          | -             | -             | -             | -            | -             |
| + 16.0          | 5/62             | 1.24                                    | 0.43                                 | 2.88                                     | 2.73                                    | 3.71         | 5.00          | -             | -             | -             | -            | -             |

TABLE I - (cont'd)

## STRONTIUM IN BONES AND DIETS

| Age<br>(months) | Date of<br>Birth | B O N E            |                 |                     | D I E T S          |              |               |               |               |               |              |               |
|-----------------|------------------|--------------------|-----------------|---------------------|--------------------|--------------|---------------|---------------|---------------|---------------|--------------|---------------|
|                 |                  | Sr-90/Ca<br>(pc/g) | Sr/Ca<br>(mg/g) | Sr-90/Sr<br>(pc/mg) | Sr-90/Ca<br>(pc/g) |              |               |               |               |               |              |               |
|                 |                  |                    |                 |                     | 0 - 6<br>mos.      | 6-12<br>mos. | 12-24<br>mos. | 24-48<br>mos. | 4 - 6<br>yrs. | 6 - 8<br>yrs. | 8-10<br>yrs. | 10-12<br>yrs. |
| + 16.0          | 1/63             | 2.05               | 0.30            | 6.83                | 2.57               | 4.73         | 6.20          | -             | -             | -             | -            | -             |
| + 16.0          | 6/63             | 1.74               | 0.32            | 5.44                | 3.28               | 5.86         | 7.66          | -             | -             | -             | -            | -             |
| + 16.0          | 8/63             | 2.32               | 0.54            | 4.30                | 3.67               | 5.86         | 7.66          | -             | -             | -             | -            | -             |
| 16.0            | 8/64             | 3.50               | 0.50            | 7.00                | 4.28               | 7.63         | 8.15          | -             | -             | -             | -            | -             |
| 16.0            | 8/64             | 2.85               | 0.47            | 6.06                | 4.28               | 7.63         | 8.15          | -             | -             | -             | -            | -             |
| 16.0            | 11/64            | 2.13               | 0.43            | 4.95                | 4.05               | 5.81         | 6.33          | -             | -             | -             | -            | -             |
| + 16.2          | 11/62            | 1.95               | 0.32            | 6.09                | 2.65               | 4.73         | 5.00          | -             | -             | -             | -            | -             |
| 16.4            | 11/64            | 2.40               | 0.43            | 5.58                | 4.05               | 5.81         | 6.22          | -             | -             | -             | -            | -             |
| 17.2            | 7/64             | 2.41               | 0.43            | 5.60                | 4.28               | 7.63         | 8.15          | -             | -             | -             | -            | -             |
| + 17.8          | 12/62            | 1.36               | 0.27            | 5.04                | 2.65               | 4.73         | 5.00          | -             | -             | -             | -            | -             |
| + 17.9          | 10/63            | 1.75               | 0.34            | 5.15                | 3.67               | 5.86         | 7.66          | -             | -             | -             | -            | -             |
| + 20.0          | 4/63             | 1.34               | 0.39            | 3.44                | 3.28               | 5.86         | 7.87          | -             | -             | -             | -            | -             |

TABLE I - (cont'd)

## STRONTIUM IN BONES AND DIETS

| Age<br>(months) | Date of<br>Birth | B O N E            |                 |                     | D I E T S          |              |               |               |               |               |              |               |
|-----------------|------------------|--------------------|-----------------|---------------------|--------------------|--------------|---------------|---------------|---------------|---------------|--------------|---------------|
|                 |                  | Sr-90/Ca<br>(pc/g) | Sr/Ca<br>(mg/g) | Sr-90/Sr<br>(pc/mg) | Sr-90/Ca<br>(pc/g) |              |               |               |               |               |              |               |
|                 |                  |                    |                 |                     | 0 - 6<br>mos.      | 6-12<br>mos. | 12-24<br>mos. | 24-48<br>mos. | 4 - 6<br>yrs. | 6 - 8<br>yrs. | 8-10<br>yrs. | 10-12<br>yrs. |
| + 20.0          | 8/63             | 2.18               | 0.37            | 5.89                | 3.67               | 5.86         | 7.67          | -             | -             | -             | -            | -             |
| + 20.0          | 9/63             | 2.51               | 0.46            | 5.46                | 3.67               | 5.86         | 7.67          | -             | -             | -             | -            | -             |
| + 21.0          | 1/62             | 1.99               | 0.34            | 5.85                | 2.73               | 3.71         | 5.00          | -             | -             | -             | -            | -             |
| + 21.0          | 2/63             | 1.03               | 0.30            | 3.43                | 2.57               | 4.73         | 6.20          | -             | -             | -             | -            | -             |
| + 21.0          | 9/63             | 1.49               | 0.30            | 4.97                | 3.67               | 5.86         | 7.67          | -             | -             | -             | -            | -             |
| 21.0            | 3/64             | 2.52               | 0.60            | 4.20                | 3.93               | 5.65         | 7.08          | -             | -             | -             | -            | -             |
| 22.5            | 12/63            | 1.67               | 0.43            | 3.88                | 3.66               | 5.57         | 7.07          | -             | -             | -             | -            | -             |
| + 24.0          | 3/63             | 1.79               | 0.35            | 5.11                | 2.57               | 4.73         | 5.20          | -             | -             | -             | -            | -             |
| + 24.0          | 5/63             | 1.75               | 0.37            | 4.73                | 3.28               | 5.86         | 7.67          | -             | -             | -             | -            | -             |
| 24.0            | 5/63             | 1.71               | 0.59            | 2.90                | 3.28               | 5.86         | 7.67          | -             | -             | -             | -            | -             |
| + 26.0          | 11/62            | 1.85               | 0.41            | 4.51                | 2.65               | 4.73         | 5.00          | 5.75          | -             | -             | -            | -             |
| 27.0            | 7/63             | 2.17               | 0.40            | 5.42                | 3.67               | 5.86         | 2.67          | 5.92          | -             | -             | -            | -             |

TABLE I - (cont'd)

## STRONTIUM IN BONES AND DIETS

| Age<br>(months) | Date of<br>Birth | B O N E            |                 |                     | D I E T S          |              |               |               |               |               |              |               |
|-----------------|------------------|--------------------|-----------------|---------------------|--------------------|--------------|---------------|---------------|---------------|---------------|--------------|---------------|
|                 |                  | Sr-90/Ca<br>(pc/g) | Sr/Ca<br>(mg/g) | Sr-90/Sr<br>(pc/mg) | Sr-90/Ca<br>(pc/g) |              |               |               |               |               |              |               |
|                 |                  |                    |                 |                     | 0 - 6<br>mos.      | 6-12<br>mos. | 12-24<br>mos. | 24-48<br>mos. | 4 - 6<br>yrs. | 6 - 8<br>yrs. | 8-10<br>yrs. | 10-12<br>yrs. |
| 28.5            | 1/63             | 2.19               | 0.45            | 4.87                | 2.57               | 4.73         | 6.20          | 6.12          | -             | -             | -            | -             |
| 30.2            | 8/63             | 1.48               | 0.49            | 3.02                | 3.67               | 5.86         | 7.67          | 5.92          | -             | -             | -            | -             |
| + 32.0          | 2/62             | 1.94               | 0.49            | 3.96                | 2.73               | 3.71         | 5.00          | 5.30          | -             | -             | -            | -             |
| + 33.0          | 5/63             | 1.51               | 0.39            | 3.87                | 3.28               | 5.86         | 7.67          | 5.92          | -             | -             | -            | -             |
| 33.5            | 2/63             | 2.26               | 0.36            | 6.28                | 2.57               | 4.73         | 6.20          | 6.12          | -             | -             | -            | -             |
| 34.0            | 11/61            | 1.90               | 0.41            | 4.63                | 1.91               | 2.91         | 3.99          | 6.45          | -             | -             | -            | -             |
| 34.0            | 12/61            | 1.75               | 0.39            | 4.49                | 1.91               | 2.91         | 3.99          | 6.45          | -             | -             | -            | -             |
| 36.0            | 4/62             | 2.93               | 0.47            | 5.08                | 2.73               | 3.71         | 5.00          | 5.30          | -             | -             | -            | -             |
| 36.0            | 7/62             | 1.25               | 0.27            | 4.63                | 2.73               | 3.71         | 5.00          | 5.30          | -             | -             | -            | -             |
| 36.0            | 6/63             | 2.09               | 0.31            | 6.74                | 3.28               | 5.86         | 7.67          | 5.92          | -             | -             | -            | -             |
| 36.6            | 4/62             | 1.68               | 0.43            | 3.50                | 2.73               | 3.71         | 5.00          | 6.40          | -             | -             | -            | -             |
| 39.5            | 9/61             | 1.14               | 0.40            | 2.85                | 1.91               | 2.91         | 3.99          | 6.92          | -             | -             | -            | -             |
| 44.0            | 3/62             | 1.36               | 0.47            | 2.89                | 2.73               | 3.71         | 5.00          | 6.40          | -             | -             | -            | -             |

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TABLE I - (cont'd)

## STRONTIUM IN BONES AND DIETS

| Age<br>(years) | Date of<br>Birth | B O N E                                 |                                      |                                          | D I E T S     |              |               |                                         |               |               |              |               |
|----------------|------------------|-----------------------------------------|--------------------------------------|------------------------------------------|---------------|--------------|---------------|-----------------------------------------|---------------|---------------|--------------|---------------|
|                |                  | $\frac{\text{Sr-90/Ca}}{(\text{pc/g})}$ | $\frac{\text{Sr/Ca}}{(\text{mg/g})}$ | $\frac{\text{Sr-90/Sr}}{(\text{pc/mg})}$ |               |              |               | $\frac{\text{Sr-90/Ca}}{(\text{pc/g})}$ |               |               |              |               |
|                |                  |                                         |                                      |                                          | 0 - 8<br>mos. | 6-12<br>mos. | 12-24<br>mos. | 24-48<br>mos.                           | 4 - 6<br>yrs. | 6 - 8<br>yrs. | 8-10<br>yrs. | 10-12<br>yrs. |
| 4              | 4/60             | 2.00                                    | 0.68                                 | 2.94                                     | 1.19          | 2.00         | 3.01          | 4.44                                    | -             | -             | -            | -             |
| 4              | 9/60             | 1.89                                    | 0.45                                 | 4.20                                     | 1.41          | 2.31         | 3.37          | 5.31                                    | -             | -             | -            | -             |
| 4              | 9/60             | 1.28                                    | 0.65                                 | 1.97                                     | 1.41          | 2.31         | 3.37          | 5.31                                    | -             | -             | -            | -             |
| 4              | 12/60            | 1.41                                    | 0.51                                 | 2.76                                     | 1.55          | 2.31         | 3.50          | 5.60                                    | -             | -             | -            | -             |
| 4              | 11/61            | 1.77                                    | 0.45                                 | 3.93                                     | 1.91          | 2.91         | 3.99          | 7.00                                    | -             | -             | -            | -             |
| 4              | 11/61            | 1.46                                    | 0.38                                 | 3.84                                     | 1.91          | 2.91         | 3.99          | 7.00                                    | -             | -             | -            | -             |
| 4              | 3/62             | 1.48                                    | 0.39                                 | 3.79                                     | 2.73          | 3.71         | 5.00          | 6.57                                    | -             | -             | -            | -             |
| 4              | 5/62             | 1.74                                    | 0.43                                 | 4.05                                     | 2.73          | 3.71         | 5.00          | 6.15                                    | -             | -             | -            | -             |
| 5              | 6/59             | 1.17                                    | 0.35                                 | 3.34                                     | 1.03          | 1.65         | 2.37          | 4.02                                    | 4.80          | -             | -            | -             |
| 5              | 2/60             | 1.76                                    | 0.35                                 | 5.03                                     | 1.19          | 1.79         | 2.87          | 4.82                                    | 5.93          | -             | -            | -             |
| 5              | 9/60             | 0.97                                    | 0.35                                 | 2.77                                     | 1.41          | 2.31         | 3.37          | 5.47                                    | 6.85          | -             | -            | -             |
| 6              | 10/58            | 1.18                                    | 0.30                                 | 3.93                                     | 1.20          | 1.46         | 2.00          | 3.32                                    | 5.24          | -             | -            | -             |

TABLE I - (cont'd)

STRONTIUM IN BONES AND DIETS

| Age<br>(years) | Date of<br>Birth | <u>B O N E</u>                          |                                      |                                          | <u>D I E T S</u>                        |              |               |               |               |               |              |               |
|----------------|------------------|-----------------------------------------|--------------------------------------|------------------------------------------|-----------------------------------------|--------------|---------------|---------------|---------------|---------------|--------------|---------------|
|                |                  | $\frac{\text{Sr-90/Ca}}{(\text{pc/g})}$ | $\frac{\text{Sr/Ca}}{(\text{mg/g})}$ | $\frac{\text{Sr-90/Sr}}{(\text{pc/mg})}$ | $\frac{\text{Sr-90/Ca}}{(\text{pc/g})}$ |              |               |               |               |               |              |               |
|                |                  |                                         |                                      |                                          | 0 - 6<br>mos.                           | 6-12<br>mos. | 12-24<br>mos. | 24-48<br>mos. | 4 - 6<br>yrs. | 6 - 8<br>yrs. | 8-10<br>yrs. | 10-12<br>yrs. |
| 6              | 1/59             | 1.56                                    | 0.63                                 | 2.48                                     | 1.03                                    | 1.46         | 2.06          | 3.50          | 3.58          | -             | -            | -             |
| 6              | 6/59             | 1.20                                    | 0.47                                 | 2.55                                     | 1.03                                    | 1.65         | 2.38          | 4.02          | 6.10          | -             | -            | -             |
| 6              | 7/58             | 1.30                                    | 0.48                                 | 2.71                                     | 1.03                                    | 1.69         | 2.44          | 4.12          | 6.18          | -             | -            | -             |
| 6              | 7/59             | 1.06                                    | 0.46                                 | 2.30                                     | 1.03                                    | 1.69         | 2.44          | 4.12          | 6.18          | -             | -            | -             |
| 6              | 4/60             | 0.99                                    | 0.33                                 | 3.00                                     | 1.19                                    | 2.00         | 3.01          | 4.44          | 6.12          | -             | -            | -             |
| 7              | 8/57             | 1.40                                    | 0.57                                 | 2.46                                     | 1.20                                    | 1.92         | 2.02          | 2.54          | 4.09          | 5.10          | -            | -             |
| 7              | 4/58             | 0.64                                    | 0.38                                 | 1.68                                     | 1.36                                    | 1.69         | 1.86          | 2.98          | 4.90          | 6.22          | -            | -             |
| 7              | 10/58            | 1.87                                    | 0.52                                 | 3.60                                     | 1.20                                    | 1.46         | 2.00          | 3.32          | 5.47          | 7.02          | -            | -             |
| 8              | 7/57             | 0.87                                    | 0.49                                 | 1.78                                     | 1.17                                    | 1.92         | 2.06          | 2.50          | 3.99          | 6.07          | -            | -             |
| 8              | 10/57            | 1.30                                    | 0.56                                 | 2.32                                     | 1.27                                    | 1.92         | 1.83          | 2.63          | 4.30          | 6.32          | -            | -             |
| 8              | 2/58             | 1.39                                    | 0.20                                 | 6.95                                     | 1.36                                    | 1.84         | 1.80          | 2.82          | 4.70          | 6.57          | -            | -             |
| 8              | 3/58             | 1.37                                    | 0.24                                 | 5.70                                     | 1.36                                    | 1.77         | 1.83          | 2.83          | 4.80          | 6.57          | -            | -             |

TABLE I - (cont'd)

## STRONTIUM IN BONES AND DIETS

| Age<br>(years) | Date of<br>Birth | B O N E            |                 |                     | D I E T S          |              |               |               |               |               |              |               |
|----------------|------------------|--------------------|-----------------|---------------------|--------------------|--------------|---------------|---------------|---------------|---------------|--------------|---------------|
|                |                  | Sr-90/Ca<br>(pc/g) | Sr/Ca<br>(mg/g) | Sr-90/Sr<br>(pc/mg) | Sr-90/Ca<br>(pc/g) |              |               |               |               |               |              |               |
|                |                  |                    |                 |                     | 0 - 6<br>mos.      | 6-12<br>mos. | 12-24<br>mos. | 24-48<br>mos. | 4 - 6<br>yrs. | 6 - 8<br>yrs. | 8-10<br>yrs. | 10-12<br>yrs. |
| 9              | 1/56             | 1.55               | 0.49            | 3.16                | 1.10               | 1.56         | 2.02          | 2.23          | 2.74          | 4.54          | 8.40         | -             |
| 9              | 5/56             | 1.54               | 0.29            | 5.31                | 1.10               | 1.63         | 2.12          | 2.23          | 2.94          | 4.91          | 8.50         | -             |
| 9              | 7/56             | 0.60               | 0.28            | 2.14                | 1.10               | 1.67         | 2.18          | 2.23          | 3.05          | 5.10          | 8.54         | -             |
| 9              | 12/56            | 1.96               | 0.76            | 2.58                | 1.15               | 1.67         | 2.31          | 2.22          | 3.30          | 5.56          | 8.66         | -             |
| 10             | 1/54             | 1.67               | 0.39            | 4.28                | 0.38               | 0.54         | 0.87          | 2.15          | 2.19          | 2.74          | 4.72         | -             |
| 10             | 1/55             | 2.68               | 0.68            | 3.94                | 0.50               | 0.71         | 1.90          | 2.14          | 2.41          | 3.30          | 6.73         | -             |
| 10             | 4/55             | 1.05               | 0.80            | 1.31                | 0.50               | 1.14         | 1.94          | 2.17          | 2.49          | 3.60          | 7.18         | -             |
| 10             | 6/55             | 1.24               | 0.71            | 1.75                | 0.50               | 1.42         | 1.95          | 2.18          | 2.54          | 3.34          | 7.48         | -             |
| 10             | 2/56             | 1.57               | 0.36            | 4.40                | 1.10               | 1.58         | 2.04          | 2.23          | 2.79          | 4.63          | 8.48         | -             |
| 11             | 9/54             | 1.88               | 0.43            | 4.37                | 0.42               | 0.71         | 1.56          | 2.15          | 2.33          | 3.08          | 6.08         | 8.59          |
| 12             | 1/52             | 1.63               | 0.65            | 2.51                | 0.00               | 0.00         | 1.08          | 1.08          | 1.92          | 2.17          | 3.02         | 4.72          |
| 12             | 11/52            | 1.30               | 0.43            | 3.02                | 0.42               | 0.89         | 0.73          | 1.43          | 2.12          | 2.34          | 3.79         | 6.39          |

TABLE I - (cont'd)

## STRONTIUM IN BONES AND DIETS

| Age<br>(years) | Date of<br>Birth | B O N E                                 |                                      |                                          | D I E T S     |              |               |                                         |               |               |              |               |
|----------------|------------------|-----------------------------------------|--------------------------------------|------------------------------------------|---------------|--------------|---------------|-----------------------------------------|---------------|---------------|--------------|---------------|
|                |                  | $\frac{\text{Sr-90/Ca}}{(\text{pc/g})}$ | $\frac{\text{Sr/Ca}}{(\text{mg/g})}$ | $\frac{\text{Sr-90/Sr}}{(\text{pc/mg})}$ |               |              |               | $\frac{\text{Sr-90/Ca}}{(\text{pc/g})}$ |               |               |              |               |
|                |                  |                                         |                                      |                                          | 0 - 6<br>mos. | 6-12<br>mos. | 12-24<br>mos. | 24-48<br>mos.                           | 4 - 6<br>yrs. | 6 - 8<br>yrs. | 8-10<br>yrs. | 10-12<br>yrs. |
| 12             | 12/52            | 1.18                                    | 0.87                                 | 1.36                                     | 0.52          | 0.89         | 0.69          | 1.46                                    | 2.14          | 2.35          | 3.86         | 6.56          |
| 13             | 1/53             | 1.95                                    | 0.72                                 | 2.71                                     | 0.63          | 0.89         | 0.66          | 1.50                                    | 2.15          | 2.38          | 3.94         | 6.72          |
| 12             | 5/53             | 1.08                                    | 0.33                                 | 3.27                                     | 0.63          | 0.66         | 0.73          | 1.72                                    | 2.17          | 2.48          | 4.20         | 7.33          |
| 12             | 6/53             | 1.18                                    | 0.60                                 | 1.97                                     | 0.63          | 0.60         | 0.74          | 1.77                                    | 2.16          | 2.50          | 4.27         | 7.48          |
| 12             | 1/54             | 1.03                                    | 0.57                                 | 1.81                                     | 0.38          | 0.54         | 0.87          | 2.12                                    | 2.16          | 2.68          | 4.72         | 8.54          |
| 12             | 11/54            | 2.39                                    | 0.48                                 | 4.98                                     | 0.46          | 0.71         | 1.72          | 2.15                                    | 2.37          | 3.20          | 6.39         | 7.92          |

+ Data on these samples were already included in former progress reports.

**TABLE II**  
**DIET COMPOSITION AND NATURAL STRONTIUM**

| <u>Age 0-3 months</u>              | <u>Ca g/day</u> | <u>Sr mg/day</u> |
|------------------------------------|-----------------|------------------|
| Breast feeding                     | 0.47            | 0.11             |
| Milk                               | 0.28            | 0.23             |
| Formula and other<br>special foods | 0.25            | 0.23             |
| <b>TOTAL</b>                       | <b>1.00</b>     | <b>0.57</b>      |

Sr level in total diet = 0.57 mg Sr/gCa

| <u>Age 3-6 months</u>              |             |             |
|------------------------------------|-------------|-------------|
| Breast feeding                     | 0.16        | 0.04        |
| Milk                               | 0.37        | 0.31        |
| Formula and other<br>special foods | 0.45        | 0.42        |
| Potatoes                           | 0.01        | 0.02        |
| <b>TOTAL</b>                       | <b>0.99</b> | <b>0.79</b> |

Sr level in total diet = 0.80 mg Sr/gCa

| <u>Age 6-9 months</u>         |             |             |
|-------------------------------|-------------|-------------|
| Milk and milk products        | 0.80        | 0.65        |
| Cereals                       | < 0.01      | 0.01        |
| Fruit and leafy<br>vegetables | 0.01        | 0.03        |
| Root vegetables               | 0.02        | 0.03        |
| Miscellaneous                 | 0.05        | 0.29        |
| <b>TOTAL</b>                  | <b>0.88</b> | <b>1.01</b> |

Sr level in total diet = 1.15 mg Sr/gCa

TABLE II (cont'd)  
DIET COMPOSITION AND NATURAL STRONTIUM

| <u>Age 9-12 months</u>     | <u>Ca g/day</u> | <u>Sr mg/day</u> |
|----------------------------|-----------------|------------------|
| Milk and milk products     | 0.60            | 0.65             |
| Cereals                    | 0.01            | 0.01             |
| Fruit and leafy vegetables | 0.02            | 0.04             |
| Root vegetables            | 0.02            | 0.03             |
| Miscellaneous              | 0.07            | 0.34             |
| <b>TOTAL</b>               | <b>0.81</b>     | <b>1.07</b>      |

Sr level in total diet = 1.18 mg Sr/gCa

| <u>Age 12-24 months</u>    |             |             |
|----------------------------|-------------|-------------|
| Milk and milk products     | 0.65        | 0.54        |
| Cereals                    | 0.01        | 0.02        |
| Fruit and leafy vegetables | 0.02        | 0.04        |
| Root vegetables            | 0.02        | 0.03        |
| Miscellaneous              | 0.07        | 0.37        |
| <b>TOTAL</b>               | <b>0.77</b> | <b>1.00</b> |

Sr level in total diet = 1.30 mg Sr/gCa

| <u>Age 2-4 years</u>       |             |             |
|----------------------------|-------------|-------------|
| Milk and milk products     | 0.60        | 0.50        |
| Cereals                    | 0.01        | 0.05        |
| Fruit and leafy vegetables | 0.05        | 0.06        |
| Root vegetables            | 0.03        | 0.15        |
| Miscellaneous              | 0.05        | 0.23        |
| <b>TOTAL</b>               | <b>0.74</b> | <b>0.99</b> |

Sr level in total diet = 1.34 mg Sr/gCa

TABLE II (cont'd)

DIET COMPOSITION AND NATURAL STRONTIUM

| <u>Age 4-8 years</u>          | <u>Ca g/day</u> | <u>Sr mg/day</u> |
|-------------------------------|-----------------|------------------|
| Milk and milk products        | 0.55            | 0.46             |
| Cereals                       | 0.04            | 0.16             |
| Fruit and leafy<br>vegetables | 0.04            | 0.06             |
| Root vegetables               | 0.04            | 0.18             |
| Miscellaneous                 | 0.05            | 0.21             |
| <b>TOTAL</b>                  | <b>0.72</b>     | <b>1.07</b>      |

Sr level in total diet = 1.49 mg Sr/gCa

| <u>Age 6-8 years</u>          |             |             |
|-------------------------------|-------------|-------------|
| Milk and milk products        | 0.55        | 0.46        |
| Cereals                       | 0.04        | 0.20        |
| Fruit and leafy<br>vegetables | 0.04        | 0.05        |
| Root vegetables               | 0.06        | 0.22        |
| Miscellaneous                 | 0.04        | 0.19        |
| <b>TOTAL</b>                  | <b>0.73</b> | <b>1.12</b> |

Sr level in total diet = 1.53 mg Sr/gCa

| <u>Adults</u>                 |             |             |
|-------------------------------|-------------|-------------|
| Milk and milk products        | 0.40        | 0.34        |
| Cereals                       | 0.07        | 0.30        |
| Fruit and leafy<br>vegetables | 0.09        | 0.06        |
| Root vegetables               | 0.09        | 0.40        |
| Miscellaneous                 | 0.05        | 0.30        |
| <b>TOTAL</b>                  | <b>0.70</b> | <b>1.40</b> |

Sr level in total diet = 2.00 mg Sr/gCa

T A B L E II a

ESTIMATED STRONTIUM LEVELS IN TOTAL DIET

| <u>Age Group</u> | <u>Stable Sr</u><br>(mg/gCa) | <u>Sr-90</u><br>(pc/gCa) |             |             |             |             |             |             |
|------------------|------------------------------|--------------------------|-------------|-------------|-------------|-------------|-------------|-------------|
|                  |                              | <u>1960</u>              | <u>1961</u> | <u>1962</u> | <u>1963</u> | <u>1964</u> | <u>1965</u> | <u>1966</u> |
| 0-6 months       | 0.68                         | 1.40                     | 1.82        | 2.16        | 2.78        | 4.10        | 3.88        | 3.40        |
| 6-12 months      | 1.17                         | 2.01                     | 2.46        | 3.10        | 3.99        | 6.22        | 5.95        | 4.88        |
| 12-24 months     | 1.30                         | 2.26                     | 2.79        | 3.52        | 4.26        | 6.67        | 6.14        | 5.70        |
| 24-48 months     | 1.34                         | 2.15                     | 2.85        | 3.70        | 4.31        | 7.11        | 7.04        | 5.94        |
| 4-6 years        | 1.49                         | 2.19                     | 2.99        | 3.76        | 4.33        | 7.19        | 7.76        | 6.02        |
| 6-8 years        | 1.53                         | 2.21                     | 3.04        | 3.72        | 4.35        | 7.18        | 7.67        | 6.06        |
| Adults           | 2.00                         | 2.85                     | 3.68        | 5.18        | 5.96        | 8.80        | 8.97        | 6.80        |