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It would not have been possible from physical examination alone at the time of the resurvey, to conclude that the Rongelap and Ailingnae groups had been exposed to penetrating gamma and external beta radiation. The people were in average good health on physical examination. The residual pigment changes from previous skin lesions were not prominent. The mean peripheral blood counts were within the range of normal for individual counts, although definitely below the mean values for the control groups. The bone marrow findings were in no way diagnostic, and thus a diagnosis of previous exposure would be difficult if not impossible without a medical history.

The marked improvement in the appearance of the skin of most of the exposed individuals is in conformity with the superficial nature of the earlier lesions which resulted principally from exposure to soft radiation. Even the deeper skin lesions showed healing in all cases, with only minimal remaining evidence of damage in the form of scarring and pigment aberrations.

The contrasting residual change of hyperpigmentation in the neck lesions and depigmentation in the foot lesions is worthy of comment. In general, the foot lesions were more severe than the neck lesions. It might be assumed that the chromatophores in the reticular layer of the dermis of the feet were destroyed so that repigmentation was impossible. On the other hand, the chromatophores of the neck apparently were not

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completely destroyed, and thus repigmentation resulted.

It is significant that no secondary breakdown of tissue had occurred in either the superficial or deep lesions, although there was suggestive evidence of atrophy in the deep foot lesions, and of atrophy and telangiectasia in the persistent ear lesion. It is possible that the deep lesions, particularly that on the ear of one individual, may still breakdown, requiring consideration of excision and repair. With regard to prognosis over the next several years, there are factors for and against the future development of further lesions, or cancer of the skin in these people. A favorable prognosis is suggested by: (a) the superficial nature of most of the lesions with rapid healing and little scarring; (b) lack of gross telangiectasia or extensive vascular changes which would portend chronic radiodermatitis; (c) the lack of marked histologic changes after six months; and (d) the fact the negroid skin is reported to be less prone to develop malignancy. The prognosis still must be guarded, however, when one considers (a) the large number of young people exposed with long life expectancy, probably exceed the induction period for cancer development; (b) the continuous exposure to tropical sunlight; (c) the possible influence of the sublethal whole-body exposure; and (d) the persistent aberrations in pigmentation.

The apparent delay in recovery of mean peripheral blood counts to normal values has been discussed (1), and apparently is in keeping with previous experience on human exposures. Depression appears more protracted in human beings than in large animals.

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The radioactivity in the urine of the exposed individuals had decreased rapidly with time and was barely detectable at 6 months. This rate of elimination, coupled with the initial estimates of a low degree of internal contamination (1), minimizes the possibility that chronic irradiation effects from this source will occur.

6.2 Conclusions

Re-examination of the Kongsap and Ailingnae people 6 months after exposure to fallout radiation revealed the following:

1. Skin lesions were completely healed, and only a few hyperpigmented or depigmented scarred areas remained at the sites of the most severe early lesions. There was no evidence of secondary breakdown of any lesions.
2. Regrowth of hair was essentially complete. No changes in hair color or texture were noted.
3. Residual bluish discoloration of the fingernails was observed in 3 individuals.
4. No other findings on physical examination or X-ray examination of the chest were ascribable to radiation exposure.
5. The total white, neutrophils, lymphocyte, and platelet counts remained depressed below control levels.
6. No significant abnormalities were detected in bone marrow samples aspirated from 22 exposed, and 20 control individuals.
7. Minimal amounts of residual gross beta activity were detectable in the urine of approximately one-third of the exposed individuals.

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5.3 Recommendations

1. It is recommended that the following procedures be considered for future medical resurveys:

- a. Complete serological studies on all exposed and control individuals.
- b. Stool examinations for parasites.
- c. Complete ophthalmological examinations with photographs of lenses.

2. When additional X-ray pictures are contemplated, consideration should be given to including a portable X-ray machine in the equipment. The machine at the Majuro hospital at present is old and badly in need of repairs.

3. Information of considerable importance can be obtained by continued observation of the exposed Marshallese people; however, possible late effects cannot be properly evaluated in the absence of an adequate control population. The lack of suitable controls in the Nagasaki-Hiroshima data has been a most serious difficulty in evaluating changes that have appeared. During the present resurvey a control population thought to be adequate was established and examined. It is strongly recommended that consideration be given to the adequacy of this population; and if it is felt to be adequate, that measures be taken to insure continued observation of the control individuals. Consultation with Dr. Hardin Jones in relation to radiation and longevity is recommended.

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