

## HUMAN HAIR AND STRONTIUM 90

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THE USE of human hair as an indicator of the intake and body burdens of strontium 90 in the general population is being investigated by the Public Health Service's Division of Radiological Health at the Northeastern Radiological Health Laboratory, Winchester, Mass. As opposed to human bones and other body organs, hair has proved to be readily available from all age groups at all seasons of the year—two of the basic criteria for a good sample. Hair can also be readily ashed and dissolved for radiochemical analysis. However, because the Sr-90 content of hair is low, its analysis requires care and above-average quality control to obtain correlative results.

During 1963, samples of hair from adult males and children were collected in Boston, New Orleans, and Phoenix. The first two cities were representative of areas of relatively high environmental Sr-90 levels, and the last city was representative of a relatively low Sr-90 area; this relationship was indicated by data obtained through the various nationwide sampling programs of the Public Health Service. Using the ratio of Sr-90 to stable calcium in hair as an index, data on seven samples from Boston and New Orleans ranged from 11 to 22 picocuries of Sr-90 per gram of calcium and averaged 15. Two samples from Phoenix contained concentrations of 9 and 10 pc/gm. Cor-

responding averages for monthly samples of total diets collected from children's boarding schools in these same or comparable cities over the same period of time ranged from 16 to 44 pc/gm. (average 25) for Boston and New Orleans and 4 to 9 pc/gm. (average 6) for Phoenix. Although the results are still tentative, preliminary indications are that correlations may exist between strontium 90 levels in the human diet and human hair, similar to those previously reported for rats (1).

Published information on the levels of Sr-90/stable Ca in human bones indicates about a four-fold reduction of the ratio from diet to bone (2). On the basis of the preliminary data obtained at the Northeastern Radiological Health Laboratory to date, it would appear that the reduction from diet to hair may not be as large.

Because samples collected from barber shops often contained foreign matter such as sweeping compounds and cigarette ashes, an attempt was made to obtain clean samples from women's beauty parlors. Only samples of "natural" hair were accepted because of the possibility of an effect from bleaches and dyes. Data on all the samples of women's hair, averaged below those from men and boys, collected at the same time and in the same cities. Since all samples were washed extensively before analysis, it is believed this observation reflects the fact that the female hair, being generally longer than men's hair, may have been grown prior to the 1961-62 U.S.S.R. and U.S. atmospheric weapons test series; this relationship would not seem to be the result of a difference in the amount of foreign matter in the samples.

As a result of the preliminary indications shown by these data, the Division of Radiological Health is planning to undertake a modest monthly sampling program of human hair from

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five of the institutions currently participating in the Public Health Service's nationwide network for total diet assessment (3, 4). Under this program 21 consecutive meals are collected each month from approximately 50 boarding schools throughout the United States. The study will be designed to investigate the possibility that Sr-90 levels in the hair from boys, ranging in ages from 6 to 16 and residing at these institutions, show a similar correlation with their diet. Sampling of hair from adult male populations in Phoenix, New Orleans, and Boston will also continue; this particular phase of the program will probably be expanded to include human adults' blood. In addition to supplying data on body burdens of Sr-90 it is anticipated that the blood may reveal general

information on discrimination factors between the diet and hair.

#### REFERENCES

- (1) Hopkins, B. J., Tuttle, L. W., Pories, W. J., and Strain, W. J.: Strontium-90 in hair. *Science* 139: 1064-1065, Mar. 15, 1963.
- (2) Rivera, J.: Strontium-90 in human vertebrae, March 1962-March 1963. *Radiological Health Data* 4: 570-573, November 1963.
- (3) U.S. Public Health Service: Radionuclides in institutional diet samples, January-March 1963. *Radiological Health Data* 4: 441-446, September 1963.
- (4) U.S. Public Health Service: Radionuclides in institutional diet samples, April-June 1963. *Radiological Health Data* 12: 605-610, December 1963.

## Education Notes

**Mental Health Public Relations.** A graduate education program in mental health communications leading to a master's degree entered its first phase in September 1964 when four persons began fellowships at the Newhouse Communications Center at Syracuse University, N.Y. After a year of study at the university the fellows will go to a mental health agency for the second phase, 1 year of internship.

The program, designed to produce "properly prepared specialists for the monumental task of improving the public relations of mental health," is supported by a 3-year grant of \$150,000 from the National Institute of Mental Health, Public Health Service, to the Syracuse University School of Journalism.

#### Doctorate in Social Work and Social Science.

The University of Michigan School of Social Work offers an interdepartmental doctoral program in social work and social science leading to the doctor of philosophy degree combining social work with sociology, social psychology, psychology, or economics. Students are prepared for careers in research, teaching, and policy development.

A number of traineeships provided by the National Institute of Mental Health and by the Russell Sage Foundation provide support for this advanced study.

Stipends range from \$1,950 to \$4,700. Fellowship applications will be received up to February 15, 1965. Applications for admission only may be filed up to May 1, 1965. Write to Doctoral Program, School of Social Work, University of Michigan, Ann Arbor.



**Smoking and the Heart.** *PHS Publication No. 1103-b; 1964; leaflet; 5 cents, \$2 per 100.* Deals with various aspects of the Report on Smoking and Health of the Advisory Committee to the Surgeon General of the Public Health Service. Also cites evidence associating cigarette smoking with coronary heart disease from a Public Health Service study conducted by the National Heart Institute at Framingham, Mass., on the development and progression of heart disease. Gives a brief explanation of the complex problem of heart disease and smoking and the various kinds of heart disease. Points out that more knowledge is needed before complete answers concerning the causes, cure, and prevention of heart disease are available.

**Your Best Defense.** *PHS Publication No. 1203; 1964; leaflet.* Designed for distribution to parents, coaches, dentists, and others to enlist their support in encouraging the widespread adoption of the mouth protector. Discusses the value of the mouth protector, a safety device which protects athletes against injuries to teeth and mouth. Describes available types and emphasizes the necessity of encouraging players to wear them.

**Neurological and Sensory Disease Service Program.** *PHS Publication No. 1197; 1964; pamphlet.* Describes the organization and functions of the Neurological and Sensory Disease Service of the Public Health Service as well as the assistance offered in establishing or improving services, nationally, for the care of patients with such disorders. The purpose of the program is to stimulate the immediate application of research findings concerning the prevention or early detection, diagnosis, treatment, and rehabilitation of persons suffering from disorders of the nervous system, speech, hearing, and vision.

Pamphlet describes consultative and technical assistance, project grants, and other financial support provided for the stimulation, development, and implementation of service programs at State and community levels.

**Maternity Care Utilization and Financing. Source book of United States data, selected years, 1950-1962.** *PHS Publication No. 947-4, Health Economics Series No. 4; 1964; 201 pages; \$1.25.* Presents data previously available only in widely scattered publications as well as two sets of hospitalization data specifically developed for inclusion. The tables and charts include information about newborn as well as maternity care.

**Community Emergency Health Manpower Planning.** *PHS Publication No. 1071-I-1; 1964; 20 pages.* Presents principles for predisaster planning in the area of health manpower assessment, assignment, and training to assure efficient utilization in a national emergency. Outlines detailed steps for determining manpower requirements and their sources; organization staffing; recruiting, training, and assigning of lay skills; and the coordination of responsibilities between health and manpower authorities. Appendix A reprints Defense Mobilization Order 8540.1, March 1964, which issues the list of health manpower occupations.

**Examination of Foods for Enteropathogenic and Indicator Bacteria. Review of methodology and manual of selected procedures.** *PHS Publication No. 1142; March 1964; 123 pages; 50 cents.* Presented in two parts. Part I reviews areas of bacterial methodology and emphasizes the development and current status, in the United States, of methods for the isolation and identification of bacteria having importance as indicator organisms or causing food poisoning. Part II, a

manual, shows laboratory methods commonly used in Public Health Service laboratories to examine food samples implicated in disease outbreaks or collected for survey purposes.

**Civil Defense Emergency Hospital Custodian's Handbook.** *PHS Publication No. 1071-F-10; 1964; 28 pages.* Details the significant responsibilities of State-appointed custodian of a civil defense emergency hospital. Enumerates hazards of long-term storage and gives specific instructions for the prevention, detection, and correction of any potential or existent damaging conditions which might impair items of supply and equipment of the CDEH. Details Federal and State or community responsibilities in maintaining the hospital in a state of readiness at all times. Sets forth conditions and corresponding authorities for release of the CDEH for activation and community use. Explains the continuing Federal-State authority and responsibilities for prepositioned CDEH's throughout the United States and Federal procedures of property accountability. Appendix A gives address, telephone number, and areas covered for each of the nine HEW regional offices, and lists the addresses and telephone numbers of all civil defense medical depots; appendix B contains sample copy of CDEH Storage Agreement, parts I and II; and appendix C lists other publications on the CDEH.

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This section carries announcements of new publications prepared by the Public Health Service and of selected publications prepared with Federal support.

Unless otherwise indicated, publications for which prices are quoted are for sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C., 20402. Orders should be accompanied by cash, check, or money order and should fully identify the publication. Public Health Service publications which do not carry price quotations, as well as single sample copies of those for which prices are shown, can be obtained without charge from the Public Inquiries Branch, Public Health Service, Washington, D.C., 20201.

The Public Health Service does not supply publications other than its own.

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