

Robert Andrew Walker

RESEARCH AND SCHOLARLY ACTIVITY

RESEARCH POSITIONS:

Graduate Assistant, Department of Sociology and Anthropology, Kent State University, 1980 to 1982.

Laboratory Assistant, NSF Grant BNS-7912514, Paleobiology of the Pliocene Hominidae from Hadar, Ethiopia: An Anatomical, Biomechanical and Morphometric Analysis. Kent State University, 1982.

Research Assistant, NSF Grant BNS-8408126, Analysis of Non-metric Craniodental Traits in Living and Fossil Hominoids. Kent State University, 1984 to 1986.

Research Anthropologist, U.S. Army Natick Research, Development, and Engineering Center, Natick, Massachusetts, July, 1987 to August, 1990.

Postdoctoral Fellow, Northwestern University Medical School, Department of Cell, Molecular, and Structural Biology, August, 1990 to December, 1991.

Professor of Anatomy, Department of Basic Sciences, New York Chiropractic College, Seneca Falls, New York, from September 1, 1999. Associate Professor, from January, 1995 to August, 1999. Assistant Professor from January, 1992 to December, 1994.

RESEARCH INTERESTS AND GOALS:

My primary research interests are in the interactions of human and primate functional morphology, skeletal biomechanics, and the histomorphometrics of cortical bone. The focus of my research falls into two broad categories. First, I am particularly interested in the effects of age on skeletal homeostasis, and the application of age-, racial-, and gender- specific changes in bone micro- and macrostructure, and their applications to forensic age, sex, and racial identification of human skeletal remains. **Second, I am involved in research on basic patterns of remodeling in the mammalian skeleton, and have established a calcified tissue microscopy laboratory within the New York Chiropractic College Anatomy Department. Current research carried out in this laboratory focuses upon the mechanisms affecting patterns of remodeling seen in cortical bone histomorphology and histomorphometry. The elucidation of these factors has applications related to human health and well-being, to human health care education, and to the forensic and archeological applications of skeletal biology.*

PUBLICATIONS:

- Walker, R.A., and C.O. Lovejoy (1985) Radiographic Changes in the clavicle and proximal femur and their use in the determination of skeletal age at death. *American Journal of Physical Anthropology* 68:67-78.
- Meindl, R.S., C.O. Lovejoy, R.P. Mensforth, and R.A. Walker (1985) A revised method of age determination using the os pubis, with a review and tests of accuracy of other methods of pubic symphyseal aging. *American Journal of Physical Anthropology* 68:29-45.
- Gordon, C.C., T. Churchill, C.E. Clauser, B. Bradtmiller, J.T. McConville, I. Tebbetts, and R.A. Walker (1989) *1988 Anthropometric Survey of U.S. Army Personnel: Summary Statistics Interim Report*. U.S. Army Natick Research, Development and Engineering Center Technical Report NATICK/TR-89/027, Natick, Massachusetts.
- Gordon, C.C., T. Churchill, C.E. Clauser, B. Bradtmiller, J.T. McConville, I. Tebbetts, and R.A. Walker (1989) *1988 Anthropometric Survey of U.S. Army Personnel: Methods and Summary Statistics*. U.S. Army Natick Research, Development and Engineering Center Technical Report NATICK/TR-89/044, Natick, Massachusetts.
- Cheverud, J., C.C. Gordon, R.A. Walker, C. Jacquish, L. Kohn, A. Moore, and N. Yamashita (1990) *1988 Anthropometric Survey of U.S. Army Personnel: Bivariate Frequency Tables*. U.S. Army Natick Research, Development and Engineering Center Technical Report NATICK/TR-90/031, Natick, Massachusetts.
- Cheverud, J., C.C. Gordon, R.A. Walker, C. Jacquish, L. Kohn, A. Moore, and N. Yamashita (1990) *1988 Anthropometric Survey of U.S. Army Personnel: Regression Equations and Correlation Coefficients. Part 1. Statistical Techniques, Landmark, and Measurement Definitions*. U.S. Army Natick Research, Development and Engineering Center Technical Report NATICK/TR-90/032, Natick, Massachusetts.
- Cheverud, J., C.C. Gordon, R.A. Walker, C. Jacquish, L. Kohn, A. Moore, and N. Yamashita (1990) *1988 Anthropometric Survey of U.S. Army Personnel: Regression Equations and Correlation Coefficients. Part 2. Simple and Partial Correlation Tables-Male*. U.S. Army Natick Research, Development and Engineering Center Technical Report NATICK/TR-90/033, Natick, Massachusetts.
- Cheverud, J., C.C. Gordon, R.A. Walker, C. Jacquish, L. Kohn, A. Moore, and N. Yamashita (1990) *1988 Anthropometric Survey of U.S. Army Personnel: Regression Equations and Correlation Coefficients. Part 3. Simple and Partial Correlation Tables-Female*. U.S. Army Natick Research, Development and Engineering Center Technical Report NATICK/TR-90/034, Natick, Massachusetts.

- Cheverud, J., C.C. Gordon, R.A. Walker, C. Jacquish, L. Kohn, A. Moore, and N. Yamashita (1990) *1988 Anthropometric Survey of U.S. Army Personnel: Regression Equations and Correlation Coefficients. Part 4. Bivariate Regression Tables*. U.S. Army Natick Research, Development and Engineering Center Technical Report NATICK/TR-90/035, Natick, Massachusetts.
- Cheverud, J., C.C. Gordon, R.A. Walker, C. Jacquish, L. Kohn, A. Moore, and N. Yamashita (1990) *1988 Anthropometric Survey of U.S. Army Personnel: Regression Equations and Correlation Coefficients. Part 5. Stepwise and Standard Multiple Regression Tables*. U.S. Army Natick Research, Development and Engineering Center Technical Report NATICK/TR-90/036, Natick, Massachusetts.
- Walker, R.A. (1992) Review of: *Somatotyping: Development and Application*, by J.E. Lindsay Carter and Barbara Honeyman Heath. *American Anthropologist* 94: 245-246.
- Walker, R.A. (1993) The impact of racial variation on human engineering design criteria. In: *Race, Ethnicity, and Applied Bioanthropology*, NAPA Bulletin 13: 7-21. C.C. Gordon, ed., National Association for the Practice of Anthropology, American Anthropological Association.
- Walker, R.A., C.O. Lovejoy and R.S. Meindl (1994) The histomorphological and geometric properties of human femoral cortex in individuals over 50: Implications for histomorphological determination of age-at-death. *American Journal of Human Biology* 6: 659-667.
- Walker, R.A. (2000) Properties of the cortex of the midshaft femur: Variation in three human populations (2000) *Homo: Journal of Comparative Human Biology* 51: 180-199.
- Walker, R.A., C.O. Lovejoy, M.E. Bedford, and W. Yee (2002) *Skeletal and Developmental Anatomy for Students of Chiropractic*. F.A. Davis Company, Publishers, Philadelphia, PA.
- Greiner, T.M., M.E. Bedford, and R.A. Walker (2004) Variability in the human M. spinalis and cervicis: Frequencies and definitions. *Annals of Anatomy* 186: 185-191.
- Walker, R.A. and J.P. Grod, (2006) Functional Anatomy of the Lumbar Spine. In: Morris, CE (ed.) *Low Back Syndromes: Integrated Clinical Management*, pp. 19-62. McGraw-Hill Medical Publishing Division.

IN PREPARATION:

- Walker, R.A. and C.O. Lovejoy. Intraindividual Variation in Vertebrate Appendicular Skeletal Histomorphology and Cross-sectional Geometry. Manuscript to be submitted to the *Journal of Biomechanics* or similar journal.

PRESENTED PAPERS:

Walker, R.A. (1990) A new method of age determination from the histological structure of cortical bone with tests of previous methods. Paper presented at the 1990 Annual Meeting of the Northeastern Anthropological Association. Burlington, Vermont, March 29, 1990.

Walker, R.A. (1990) An assessment of histological age determination techniques. Paper presented at the 59th Annual Meeting of the American Association of Physical Anthropologists. Miami, Florida, April 7, 1990. (Abstract published in *American Journal of Physical Anthropology* 81: 313 [1990]).

Walker, R.A. (1991) Variation in femoral cortical thickness in three human populations. Paper presented at the 60th Annual Meeting of the American Association of Physical Anthropologists, Milwaukee, Wisconsin, April 4, 1991. (Abstract published in *American Journal of Physical Anthropology*, Supplement 12: 179 [1991]).

Walker, R.A. (1991) The impact of racial variation on human engineering design criteria. Paper presented at the 90th Annual Meeting of the American Anthropological Association, Chicago, Illinois, November 20, 1991, as a part of the symposium: *Race, Ethnicity, and Applied Bioanthropology*.

Walker, R.A. (1992) Human variation, cortical bone histology, and the determination of skeletal age at death. Paper presented at the 61st Annual Meeting of the American Association of Physical Anthropologists, Las Vegas, Nevada, April 3, 1992. (Abstract published in *American Journal of Physical Anthropology*, Supplement 14: 169 [1992]).

Walker, R.A. (1993) Relationship of cross-sectional biomechanical properties of cortical bone to histomorphology in white Americans over 50. Paper presented at the 62nd Annual Meeting of the American Association of Physical Anthropologists, Toronto, Ontario, April 15, 1993. (Abstract published in *American Journal of Physical Anthropology*, Supplement 16: 202 [1993]).

Walker, R.A. (1996) Remodeling and cross-sectional geometric properties of human femoral cortical bone. Paper presented at the 65th Annual Meeting of the American Association of Physical Anthropologists, Research Triangle Park, North Carolina, April 11, 1996. (Abstract published in *American Journal of Physical Anthropology*, Supplement 22: 237 [1996]).

Walker, R.A. (1996) Analysis of bone mass, relative strength, and histomorphology in human femoral cortical bone: an overview. Part of the poster presentation "A multidisciplinary approach to solving problems related to bipedal human locomotion," by R. Bulbulian, D. Dishman, T. Greiner, V. Sciotti, and R. Walker, presented at the National Workshop to Develop the Chiropractic Research Agenda (funded by the U.S. Health Resources and Services Administration). Washington, D.C., July 12 to 14, 1996.

- Walker, R.A. (1997) Intraindividual variation in cortical thickness and histomorphology of the midshaft femur. Paper presented at the 66th Annual Meeting of the American Association of Physical Anthropologists, St. Louis, Missouri, April 3, 1997. (Abstract published in *American Journal of Physical Anthropology*, Supplement 24: 234 [1997]).
- Walker, R.A. (1998) A survey of remodeling in the mammalian skeleton: a pilot study. Paper presented at the 67th Annual Meeting of the American Association of Physical Anthropologists, Salt Lake City, Utah, April 2, 1998. (Abstract published in *American Journal of Physical Anthropology*, Supplement 26: 224-225 [1998]).
- Greiner, T.M., M.E. Bedford and R.A. Walker (1998) Variability in the human *m. spinalis capitis et cervicis*: Frequencies and definitions. Paper presented at the 67th Annual Meeting of the American Association of Physical Anthropologists, Salt Lake City, Utah, April, 1998. (Abstract published in *American Journal of Physical Anthropology*, Supplement 26: 88 [1998]).
- Walker, R.A. (1998) Intraindividual variation in mammalian appendicular skeletal histomorphology and cross-sectional geometry. Paper presented at the First Annual NYCC Research Symposium, May 22, 1998.
- Greiner, T.M., M.E. Bedford and R.A. Walker (1998) Variability in the Human *M. Spinalis Capitis et Cervicis*: Frequencies and Definitions. Paper presented at the First Annual NYCC Research Symposium, May 22, 1998.
- Philomin, R., C.T.S. Philomin, R. Schassburger, T.M. Greiner and R.A. Walker (1998) Abnormal Origin of the Right Subclavian Artery. Paper presented at the First Annual NYCC Research Symposium, May 22, 1998.
- Walker, R.A. (1999) Differential limb use and remodeling in the vertebrate skeleton. Paper presented at the Second Annual NYCC Research Symposium, February 27, 1999.
- Greiner, T.M. and R.A. Walker (1999) Preliminary Analysis of Morphometric Variation in the Human Auditory Ossicles . Paper presented at the Second Annual NYCC Research Symposium, February 27, 1999.
- Walker, R.A. and C.O. Lovejoy (1999) A survey of remodeling in the vertebrate skeleton, part II. Paper presented at the 68th Annual Meeting of the American Association of Physical Anthropologists, Columbus, Ohio, April 29, 1999. (Abstract published in *American Journal of Physical Anthropology*, Supplement 28: 272 [1999]).
- Greiner, T.M. and R.A. Walker (1999) Morphometric Variation of the Human Auditory Ossicles. Paper presented at the 68th Annual Meeting of the American Association of Physical Anthropologists, San Columbus, Ohio, April 29, 1999. (Abstract published in *American Journal of Physical Anthropology*, Supplement 28: 140 [1999]).

Walker, R.A. (2000) Variation in properties of the cortex of the midshaft femur in three human populations. Paper presented at the Third Annual NYCC Research Symposium, February 17, 2000.

Rosenman, B. and R.A. Walker (2000) Morphology of the Australopithecine Glenohumeral Joint. Paper presented at the 69th Annual Meeting of the American Association of Physical Anthropologists, San Antonio, Texas, April, 2000. (Abstract published in *American Journal of Physical Anthropology*, Supplement 30: 265 [2000].)

Walker, R.A., N. Mitlansky and C.O. Lovejoy (2001) Remodeling in the vertebrate skeleton: Variation in percentage haversian bone. Paper presented at the Fourth Annual New York Chiropractic College Research Symposium, January 30, 2001.

Walker, R.A., N. Mitlansky and C.O. Lovejoy (2001) A survey of remodeling in the vertebrate skeleton, part III. Variation in percentage haversian bone. Paper presented at the 2001 Annual Meeting of the American Association of Physical Anthropologists, Kansas City, Missouri, March 29, 2001. (Abstract published in *American Journal of Physical Anthropology*, Supplement 32: 158 [2001].)

Walker, R.A., N. Mitlyansky (2003) Variation in remodeling about the perimeter of the midshaft human femur. Paper presented at the Fourth Annual New York Chiropractic College Research Symposium, February 5, 2003.

Walker, R.A. and N. Mitlyansky (2003) Variation in remodeling about the perimeter of the midshaft human femur. Paper presented at the 2003 Annual Meeting of the American Association of Physical Anthropologists, Tempe, Arizona, April 26, 2003. (Abstract published in *American Journal of Physical Anthropology*, Supplement 36: 218 [2003].)

Greco, D.S., J. Young, and R.A. Walker (2005) Cadaveric and Histological Evaluation of Hip Arthroplasty. Paper presented at the Sixth Annual New York Chiropractic College Research Symposium, January 27, 2005.

R.A. Walker, T.M. Greiner, R. Cordes (2006) Histomorphological variation in human auditory ossicles. Paper presented at the Seventh Annual New York Chiropractic College Research Symposium, January 26, 2006.

R.A. Walker, T.M. Greiner, R. Cordes (2006) Histomorphological variation in human auditory ossicles. Paper presented at the American Association of Physical Anthropologists Annual Meeting, Fairbanks, Alaska, March 10, 2006. (Abstract published in *American Journal of Physical Anthropology*, Supplement 42: 183-184 [2006].)

Walker, R.A., C.O. Lovejoy, R. Cordes (2007) Histomorphological **Variation in the Human Appendicular Skeleton**. Paper presented at the Seventh Annual New York Chiropractic College Research Symposium, January 25, 2007.

Walker, R.A., C.O. Lovejoy, R. Cordes (2007) Histomorphological **Variation in the Human Appendicular Skeleton**. Paper presented at the American Association of Physical Anthropologists Annual Meeting, Philadelphia, PA, March 29, 2007. (Abstract published in *American Journal of Physical Anthropology*, Supplement 44: 241-242 [2007].)

INVITED PRESENTED PAPER:

Walker, R.A. and T.M. Greiner (2000) Bone Histomorphometric Correlates of Biomechanics, Limb Use Patterns, and Bone Function. Invited paper presented at the 2000 Annual Meeting of the American Association of Physical Anthropologists as a part of the “Current and Future Applications of Bone Histology to Biological Anthropology” symposium. (Abstract published in *American Journal of Physical Anthropology*, Supplement 30: 313 [2000].)

INVITED LECTURES (no published abstracts):

Human femoral anatomy and bipedal locomotion. Los Angeles College of Chiropractic, Los Angeles, California, July 11, 1991.

Geographic and biological variation in the cross-sectional properties of human bone. Department of Cell, Molecular, and Structural Biology, Northwestern University Medical School, Chicago, Illinois, November 20, 1991.

Variation in cortical thickness and histomorphology of the human femur. Research Department Presentation, New York Chiropractic College, May 20, 1997.

Human cortical bone: Variations in populations and age groups in cross sectional morphology and histomorphology. Keuka College, Keuka Park, New York, November 30, 2001.

OTHER SCHOLARLY ACTIVITIES:

Review manuscripts for *Collegium Antropologicum*, Zagreb, Croatia.

Grant Reviewer, Consortium for Chiropractic Research, December, 1993 to date.

Grant Reviewer, National Science Foundation, January 1994 to date.

Grant Reviewer, L.S.B. Leakey Foundation, January 1997 to date.

Abstract Reviewer, submissions of faculty papers for the 1998 Association of Chiropractic Colleges Educational Conference.

Chair, Poster Session: Skeletal Biology III. Annual Meeting of the American Association of Physical Anthropologists, Salt Lake City Utah, April 3, 1998.

Examination Writer, National Board Part I Basic Science Spinal Anatomy Test Committee,
National Board of Chiropractic Examiners, Greeley, Colorado. April, 1998 to April, 2001.

Regional Coordinator, American Association of Clinical Anatomists, Survey of Graduate
Anatomy Programs, Eastern North American Chiropractic Colleges. From August, 1998.

Reviewer, *The Head Neck, and Trunk*, 6th Edition, by John H. Warfel, for Lippincott, Williams
and Wilkins, June, 1999.

Abstract Reviewer, submissions of faculty papers for the 2000 Association of Chiropractic
Colleges Educational Conference.

Abstract Reviewer, submissions of faculty papers for the 2004 Association of Chiropractic
Colleges Educational Conference.

Paper Reviewer, submitted papers for the 2004 Digital Human Modeling Symposium organized by
the Society of Automotive Engineers, January, 2004.

Member, American Anatomical Association's "Ask the Experts" panel, American Anatomical
Association web site: <http://www.anatomy.org/i4a/faq/?pageid=509> . From January, 2004.

Review manuscripts for *Clinical Anatomy*, beginning June, 2004.

Paper Reviewer, submitted papers for the 2005 Digital Human Modeling Symposium organized by
the Society of Automotive Engineers, March, 2005.

Abstract Reviewer, submissions of faculty papers for the 2006 Association of Chiropractic
Colleges Educational Conference.

Principal author of proposal to the Office of Higher Education of New York Office of College and
University Evaluation for an NYCC Master of Science in Clinical Anatomy, 2005-2006.