

Peter W. Lucas

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Present Position

Professor Department of Anthropology, George Washington University

Previous Positions: Professor (Reader) (1996-2005), Anatomy Department, University of Hong Kong; Senior Lecturer, Anatomy Department, University of Hong Kong (1992-6); Senior Lecturer, Anatomy Department, National University of Singapore (1988-1992); Lecturer, Anatomy Department, National University of Singapore (1983-8); Medical Research Council (GB) postdoctoral training fellowship at Guy's Hospital London (1980-3); Medical Research Council (GB) postgraduate studentship at University College London (1976-80).

Degrees

1976 *B.Sc. Hons. 1st Class* Anthropology (University College London)
 1980 *Ph.D.* Physical Anthropology (University of London)
 2002 *D.Sc.* Comparative Oral Biology: Form and Function (University of London)

Academic honours

July 1976 Daryll Forde Award for Anthropology (top undergraduate prize in Anthropology, University College London)

May-June 1980 Newland-Pedley fellowship (Guy's Hospital, London: awarded for receiving an MRC fellowship)

May 1996 Best Teacher in Anatomy (University of Hong Kong: voted for by medical students)

July 1998 Outstanding Researcher award (University of Hong Kong: awarded by the vice-chancellor, value HK\$500,000, awarded for 'excellent' rating on the results of an RGC Grant)

Teaching Activities

From **1983-1992** in Singapore, I taught gross anatomy of the whole body. In addition, I did most microanatomy and some embryology and neuroanatomy practicals in several of those years. I also ran a course in anatomy for pharmacy students from 1984-1991.

From **1992-1997** in Hong Kong, I was in charge of the gross anatomy course for medical students. During this time, a plastination laboratory was set up to aid medical, dental, speech and hearing, nursing and pharmacy students. In **1997**, the medical course converted to problem-based learning and virtually all the gross anatomy teaching was stopped. I continued to teach what gross anatomy still existed to medical students in their course, but from **1998-2004**, I also ran optional courses in gross anatomy (called 'special modules') for medical students. These were extremely popular and both this factor and an incident in a neighboring university led to the revival of some dissectional gross anatomy, resulting in a state-of-the-art laboratory being built in **2002** based on an operating theater model. This was voted the most popular aspect of the medical curriculum by students and, by the time that I left, most of the trunk was again being dissected. In **1997** though, I took the opportunity to start running anatomy for dental students, running all their gross anatomy (basically head & neck with some thorax and relevant injection sites) and about 50% of the oral anatomy. However, in **1998**, the dental course followed suit and also converted to problem-based learning, but in much more of a pure form. Most anatomy, histology and neuroanatomy was eliminated and there were no (actually, still are no) official lectures to dental students in any subject. Nevertheless, I persevered, 'taught' long practicals on all anatomical aspects (including oral development and relevant neuroanatomy) and maintained strong links to dental students servicing their needs throughout their educational program.

Since **2005** in GW, amongst other courses, I have taught Human Evolutionary Anatomy, Human Functional Anatomy, Primatology, Graduate PBL and facilitated three graduate seminar series. I have also been a laboratory instructor in gross anatomy to medical students.

Educational research

For a period in Hong Kong (**1995-7**), I entered into 'sideline' educational research, initiated to examine the

effectiveness of a new gross anatomy course that we designed in the department. [This course was dumped after 1997 by the faculty changes described above.] A key factor in Hong Kong was language ability, all teaching being in English with conversation in Cantonese. We thus joined forces with linguists to create a large range of techniques that might offer an objective assessment of learning situations in English. The project was curtailed by the advent of problem-based learning and by several staff leaving, but several conference presentations (one international in Orlando, FL) and two brief publications resulted.

Funding

1995-7 Action Learning Project held by English Centre (by D. Williamson) with M. Lenstrup (research assistant) and Anatomy Department (JF Prinz, PW Lucas, H Yip & G Tipoe) part-share of HK\$400,000 (University Grants Committee of Hong Kong)

Reviewed manuscripts for: *Acta Odontologica Scandinavica, Agricultural and Forest Entomology, American Journal of Botany, American Journal of Physical Anthropology, American Journal of Primatology, American Naturalist, Animal Behavior, Archives of Oral Biology, Australian Journal of Botany, Behavioral Ecology and Sociobiology, Biological Journal of the Linnaean Society, Biological Reviews, Brain, Behavior and Evolution, Cereal Chemistry, Chemical Senses, Current Anthropology, European Journal of Oral Sciences, Folia Primatologica, Food Hydrocolloids, Functional Ecology, International Journal of Primatology, Journal of Dental Research, Journal of Experimental Biology, Journal of Human Evolution, Journal of Materials Science, Journal of Oral Rehabilitation, Journal of Texture Studies, Journal of Theoretical Biology, Journal of Tropical Ecology, Journal of Tropical Forest Science, Journal of Zoology, Nature, Physiology & Behavior, Proceedings of the Royal Society London (both series A [Physical Sciences] & B [Biological Sciences]), Singapore Medical Journal, South African Journal of Science, Scanning Microscopy, The New Phytologist, Trends in Food Science and Technology & Der Zoologische Anzeiger.*

Reviewed grants for: National Science Foundation, National Geographic Society, L.S.B. Leakey Foundation, Wellcome Trust, BBSRC (UK), NERC (UK), Israel Scientific Foundation, Australian Research Council (small grants scheme) and Croucher Foundation (Hong Kong).

RESEARCH

Main theme: *The function and evolution of the mouth in humans, primates and other mammals*

- My specific focus is on feeding and food choice in mammals, particularly in humans and other primates, and anatomical and physiological adaptations that have evolved in relation to that. This stems from a longterm interest in dentistry and the evolution of the mouth. This has broadened from an initial focus on dental function, chewing and swallowing to consider any other physical and chemical factors that influence food preference. My interests encompass a wide spectrum of activities with an emphasis on ingenuity and the continual search for new approaches and collaborations on both theoretical and technical planes. Individual projects have been designed so that their relevance to researchers in related disciplines (e.g. ecology, vertebrate paleontology, primatology, physical anthropology, oral biology, food science and materials science) is maintained. I've done this (a) to challenge myself, (b) to attract collaborators and (c) to keep the maximum number of funding options open.

Publications

Ph.D. Thesis: *Adaptation and Form of the Mammalian Dentition with special reference to Primates and the Evolution of Man.* May 1980, University of London.

Books

1. **Lucas PW** (2004) *How Teeth Work* A research-level book that aimed to be a definitive statement on oral function. Cambridge University Press. 372 pages. [2007: produced in paperback] [Website:

<http://www.cambridge.org/aus/catalogue/catalogue.asp?isbn=0521562368>; **Principal reviews:** *Nature* (2004) 431: 400-401 and *Science* (2004) 306: 2045. [The optimization approach advocated in my book was supported by: Sutherland WJ (2005) The best solution. *Nature* 435: 569.]

2. Prinz JF, de Wijk RA & Lucas PW (in preparation) *Making Sense of Food*.

Book Chapters and Contributions

1. Lucas PW (1980) Biomaterials as foods. In: *The Mechanical Properties of Biological Materials* (eds. JFV Vincent & JD Currey) Cambridge University Press, Cambridge, pp. 463-464.
2. Lucas PW (1982) Basic principles of tooth design. In: *Teeth: Form, Function and Evolution* (ed. B Kurtén) Columbia University Press, New York, pp. 154-162.
3. Lucas PW & Luke DA (1982) Chewing it over - basic principles of food breakdown. In: *Food Acquisition and Processing in Primates* (eds. DJ Chivers, BA Wood & A Bilsborough) Plenum Press, New York, pp. 283-302.
4. Lucas PW, Corlett RT & Luke DA (1986) Sexual dimorphism of teeth in anthropoid primates. In: *Sexual Dimorphism in Living and Fossil Primates* (eds. M Pickford & AB Chiarelli) Il Sedicismo, Firenze, pp. 23-39. [reprint of journal article 14]
5. Lucas PW, Corlett RT & Luke DA (1986) New approach to postcanine tooth size applied to Plio-pleistocene hominids. In: *Primate Evolution* (eds. JG Else & PC Lee) Cambridge University Press, Cambridge, pp. 191-201.
6. Heath MR. & Lucas PW (1988) Oral perception of texture. In: *Food Structure - Its Creation and Evaluation* (eds. JMV Blanchard & JR Mitchell) Butterworths, London, pp. 465-481.
7. Lucas PW (1989) A new theory relating seed processing by primates to their relative tooth sizes. In: *The Growing Scope of Human Biology* (eds. LH Schmitt, L Freedman & NW Bruce) Centre for Human Biology, University of Western Australia, Perth, pp. 37-49.
8. Lucas PW & Corlett RT (1991) Quantitative aspects of the relationship between dentitions and diets. In: *Feeding and the Texture of Food* (eds. JFV Vincent & PJ Lillford) Cambridge University Press, Cambridge, pp. 93-121.
9. Lucas PW (1991) Fundamental physical properties of fruits and seeds in the diet of Southeast Asian primates. In: *Primate Today* (eds. A Ehara *et al.*) Elsevier, Amsterdam, pp. 125-128.
10. Lucas PW, Arrandale S, Henderson L & Peters CR (1991) Forces produced by orang-utans with their teeth. In: *Primate Today* (eds. A Ehara *et al.*) Elsevier, Amsterdam, pp. 705-706.
11. Lucas PW (1994) Categorisation of food items for oral processing. In: *The Digestive System in Mammals* (eds. DJ Chivers & P Langer), Cambridge University Press, Cambridge, pp. 197-218.
12. Lucas PW & Teaford MF (1994) Functional morphology of colobine teeth. In: *Colobine Monkeys: Their Ecology, Behaviour and Evolution* (eds. AG Davies & JF Oates), Cambridge University Press, Cambridge, pp. 171-203.
13. Williamson L & Lucas PW (1994) The effect of moisture content on the mechanical properties of a seed shell. In: *Plant Biomechanics* (eds. B Thibeau). Elsevier, Paris, p. 195.
14. Lucas PW, Cheng PY, Choong MF, Darvell BW, Hill DA, Lee PKD, Tan HTW, Turner IM, Pereira BP, Peters CR, Williamson L & Yuen TDB (1997) The toughness of plant tissues. In: *Proceedings of Plant Biomechanics 97* (eds. G Jeronimidis & JFV Vincent). Centre for Biomimetics, University of Reading, England, pp. 109-114.
15. Lucas PW & Peters CR (2000) Function of postcanine tooth shape in mammals. In: *Development, Function and Evolution of Teeth* (eds. MF Teaford, MM Smith & M Ferguson) Cambridge University Press, Cambridge, pp. 482-489.
16. Lucas PW, Darvell BW, Lee PKD, Yamashita N & Yuen TDB (2000) A portable mechanical field tester for ecological studies. In: *Plant Biomechanics 2000* (eds. H-C Spatz & T Speck), Georg Thieme Verlag, Stuttgart, pp. 541-545.
17. Lucas PW, Osorio D, Yamashita N, Prinz JF, Dominy NJ & Darvell BW (2003) Dietary analysis I: Physics. In: *Field and Laboratory Methods in Primatology* (eds. J Setchell & D Curtis), pp. 184-198. Cambridge University Press, Cambridge.
18. Lucas PW, Corlett RT, Dominy NJ, Essackjee HC, Riba-Hernandez P, Stoner KE & Yamashita N (2003) Dietary analysis II: Chemistry. In: *Field and Laboratory Methods in Primatology* (eds. J Setchell & D Curtis), pp. 199-213. Cambridge University Press, Cambridge.

19. **Lucas PW** (2004) Plant mechanics and primate dental adaptations: an overview. In: *Shaping Primate Evolution* (eds. F Anapol, N Jablonski & RZ German), pp. 193-205. Cambridge University Press, Cambridge.
20. **Lucas PW** (2006) Facial dwarfing and dental crowding in relation to diet. In *Integrative Approaches to Human Health and Evolution* (eds. TG Bromage, A Vidal, E Aguirre & A Perez-Ochoa), pp. 74-82. Amsterdam: Elsevier Press (International Congress Series).
21. **Lucas PW**, Dominy NJ, Osorio D, Peterson-Pereira W, Riba-Hernandez P, Solis-Madrigal S, Stoner KE & Yamashita N (2006) Perspectives on color vision. In *Primate Origins* (eds. MJ Ravosa & M Dagosto), pp. 805-819. Kluwer.
22. **Lucas PW** (2007) The evolution of the hominin diet from a dental functional perspective. In: *The Evolution of Hominin Diets: The Known, the Unknown, and the Unknowable* (ed. PS Ungar), pp. 31-38. Oxford University Press.
23. Dominy NJ, **Lucas PW** & Supardi Noor N (2007) Primate sensory systems and foraging behavior. In: *Feeding Ecology in Apes and other Primates* (eds. G Hohmann, M Robbins & C Boesch) pp. 489-509. Cambridge University Press, Cambridge.
24. Sui ZQ, Corke H, Oyen ML & **Lucas PW** (2007) Fracture and energy partitioning in uncooked and cooked noodles. In *Mechanics of Biological and Bio-Inspired Materials* (eds. C Viney, K Katti, C Hellmich & U Wegst). Materials Research Society Symposium Proceedings **975E**, Warrendale, PA. [nominated for poster prize at MRS Fall 2006 meeting]
25. **Lucas PW**, Cook R & Lowrey TK (2007) How baby plants avoid getting hurt and blossom into adulthood: the story of a tropical seed. In *Mechanics of Biological and Bio-Inspired Materials* (eds. C Viney, K Katti, C Hellmich & U Wegst). Materials Research Society Symposium Proceedings **975E**, Warrendale, PA. [voted Outstanding Research Paper in the proceedings of MRS symposium DD]
26. Agrawal KR, Ang KY, Sui Z, Tan HTW & **Lucas PW** (2008) Methods of ingestion and incisal designs. In: *Technique and Application in Dental Anthropology* (eds. JD Irish & GC Nelson), pp. 349-363. Cambridge: Cambridge University Press.
27. Vinyard CJ, Wall CE, Williams SH, Mork AL, Garner BA, César de Oliveira Melo L, Valença-Montenegro MM, Bernardo Maranhao Valle Y, Oliveira Monteiro da Cruz MA, **Lucas PW**, Schmitt D, Taylor AB & Hylander WL. The evolutionary morphology of tree gouging in marmosets. In *The Smallest Anthropoids: The Marmoset/Callimico Radiation* (eds. LC Davis, SM Ford & LM Porter) Springer: New York. **In press.**
28. **Lucas PW**, Sui ZQ, Ang KY, Tan HTW, King SH, Sadler B & Peri N. Meals vs. snacks and the human dentition and diet during the Palaeolithic. In: *The Evolution of Hominid Diets: Integrating Approaches to the Study of Palaeolithic Subsistence* (eds. J-J Hublin & MP Richards). Dordrecht: Springer. **In press.**
29. **Lucas PW**. Foraging behavior of tropical primates. In: *Encyclopedia of Life Support Systems* (Eolss Publishers Co. Ltd.). **In press.**

Journal Articles (peer-reviewed)

1. **Lucas PW** (1979) The dental-dietary adaptations of mammals. *N Jb Geol Palaont* 8: 486-512.
2. **Lucas PW** (1981) An analysis of canine size and jaw shape in some Old and New World non-human primates. *J Zool* 195: 437-448.
3. **Lucas PW** (1982) An analysis of the canine tooth size of old world higher primates in relation to facial length and body weight. *Archs Oral Biol* 27: 493- 496.
4. **Lucas PW** & Luke DA (1983) Methods for analysing the breakdown of food during human mastication. *Archs Oral Biol* 28: 813-819.
5. **Lucas PW** & Luke DA (1983) Computer simulation of the breakdown of carrot particles during human mastication. *Archs Oral Biol* 28: 821-826.
6. Luke DA & **Lucas PW** (1983) The significance of cusps. *J Oral Rehabil* 10: 197-210.
7. **Lucas PW** & Luke DA Optimal mouthful for food comminution in human mastication. *Archs Oral Biol* 29: 205-210.
8. **Lucas PW**, Corlett RT & Luke DA (1985) Plio-pleistocene hominids: an approach combining masticatory and ecological analysis. *J Hum Evol* 14: 187-202.
9. Luke DA & **Lucas PW** (1985) Chewing efficiency in relation to occlusal and other variations in the dentition. *Brit Dent J* 159: 401-403.

10. **Lucas PW**, Ow RKK, Ritchie GM, Chew CL & Keng SB (1986) Relationship between jaw movement and food comminution in human mastication. *J Dent Res* 65: 400-404.
11. **Lucas PW** & Luke DA (1986) Is food particle size a criterion for the initiation of swallowing? *J Oral Rehabil* 13: 127-136.
12. **Lucas PW**, Luke DA, Voon FCT, Chew CL & Ow RKK (1986) Food breakdown patterns produced by human subjects possessing artificial and natural teeth. *J Oral Rehabil* 13: 205-214.
13. Voon FCT, **Lucas PW**, Luke DA & Chew KL (1986) A simulation approach to understanding the masticatory process. *J Theoret Biol* 119: 251-262.
14. **Lucas PW**, Corlett RT & Luke DA (1986) Sexual dimorphism of teeth in anthropoid primates. *Hum Evol* 1: 23-39.
15. **Lucas PW**, Corlett RT & Luke DA (1986) Postcanine tooth size and diet in anthropoids. *Z Morph Anthropol* 76: 253-276.
16. **Lucas PW** & Loh HS (1986) Are the incremental lines in human cementum laid down annually? *Ann Acad Med Sing* 15: 384-386.
17. **Lucas PW**, Luke DA, Voon FCT, Chew CL & Ow RKK (1987) Patrones de fragmentacion de los alimentos en sujetos con denticion natural y en portadores de dientes artificiales. *Arch Odonto-Estomatol* 3: 269-275. [translation of journal article 12 into Spanish]
18. Heath MR & **Lucas PW** (1987) Mastication - the need for collaboration. *J Texture Stud* 18: 112-123.
19. Chew CL **Lucas PW**, Keng SB, Ow RKK & Tay DKL (1988) The effect of food texture on the replication of jaw movements in mastication. *J Dent* 16: 210-214.
20. **Lucas PW**, Hails CJ & Corlett RT (1988) Status of the banded langur (*Presbytis femoralis femoralis*) in Singapore. *Primate Conservation* 9: 136-138.
21. **Lucas PW** (1989) Significance of *Mezzettia leptopoda* fruits eaten by orang-utans for dental microwear analysis. *Folia Primatol* 52: 185-190.
22. Corlett RT & **Lucas PW** (1989) Consumption of *Camposperma auriculatum* fruit by vertebrates in Singapore. *Malay Nat J* 42: 273-276.
23. Corlett RT & **Lucas PW** (1990) Alternative seed-handling strategies in primates: seed-spitting by long-tailed macaques. *Oecologia* 82: 166-171.
24. **Lucas PW** & Pereira B (1990) Estimation of the fracture toughness of leaves. *Func Ecol* 4: 819-820.
25. **Lucas PW** & Pereira B (1991) Thickness effect in cutting systems. *J Mater Sci Lett* 10: 235-236.
26. **Lucas PW**, Lowrey TK, Pereira B, Sarafis V & Kuhn W (1991) The ecology of *Mezzettia leptopoda* Hk. f. et Thoms. (Annonaceae) seeds as viewed from a mechanical perspective. *Func Ecol* 5: 345-353.
27. **Lucas PW**, Choong MF, Tan HTW, Turner IM & Berrick AJ (1991) Fracture toughness of the leaf of the dicotyledonous angiosperm, *Calophyllum inophyllum* L. *Phil Trans R Soc Lond B* 334: 95-106.
28. Diaz-Tay J, Jayasinghe N, **Lucas PW**, McCallum JC & Jones JT (1991) Association between surface electromyography of human jaw closing muscle and quantified food breakdown. *Archs Oral Biol* 36: 893-898.
29. **Lucas PW** & Corlett RT (1991) The relationship between the diet of *Macaca fascicularis* and forest phenology. *Folia Primatol* 57: 201-215.
30. **Lucas PW** & Corlett RT (1992) Notes on the treatment of palm fruits by long-tailed macaques (*Macaca fascicularis* Raffles). *Principes* 36: 45-48.
31. Choong MF, **Lucas PW**, Ong JYS, Pereira BP, Tan HTW & Turner IM (1992) Leaf fracture toughness and sclerophylly: their correlations and ecological implications. *New Phytol* 121: 597-610.
32. **Lucas PW**, Oates CG & Lee WP (1993) Fracture toughness of mung bean gels. *J Mater Sci* 28: 1137-1142.
33. Sim BJ, **Lucas PW**, Pereira BP, Oates CG (1993) Mechanical and sensory assessment of the texture of refrigerator-stored spring roll pastry. *J Texture Stud* 24: 27-44.
34. **Lucas PW** (1993) Introduction. *Int J Primatol* 14: 201-205.
35. Turner IM, Choong MF, Tan HTW & **Lucas PW** (1993) How tough are sclerophylls? *Ann Bot* 71: 343-345.
36. Oates CG, **Lucas PW** & Lee WP (1993) How brittle are gels? *Carb Poly* 20: 189-194.
37. **Lucas PW**, Peters CR & Arrandale S (1994) Seed-breaking forces exerted by orang-utans with their teeth in captivity and a new technique for estimating forces produced in the wild. *Am J Phys Anthropol* 94: 365-378.
38. Williamson L & **Lucas PW** (1995) The effect of moisture content on the mechanical properties of a seed shell. *J Mater Sci* 30: 162-166.
39. **Lucas PW** (1995) Long-tailed macaques. [issue on Bukit Timah Nature Reserve: *Rainforest in the City*] *Gardens Bull Singapore*, suppl. 3: 105-119.

40. Corlett RT & **Lucas PW** (1995) Mammals. [issue on Bukit Timah Nature Reserve: *Rainforest in the City*] *Gardens Bull Singapore*, suppl. 3: 93-104.
41. **Lucas PW**, Darvell BW, Lee PKD, Yuen TDB & Choong MF (1995) The toughness of plant cell walls. *Phil Trans R Soc Lond B* 348: 363-372.
42. Prinz JF & **Lucas PW** (1995) Swallow thresholds in humans. *Archs Oral Biol* 40: 401-403.
43. **Lucas PW** & Teaford MF (1995) Significance of silica in leaves eaten by long-tailed macaques (*Macaca fascicularis*). *Folia Primatol.* 64: 30-36.
44. Hill DA, **Lucas PW** & Cheng PY (1995) Bite forces used by Japanese macaques (*Macaca fuscata yakui*) on Yakushima Island, Japan to open aphid-induced galls on *Distylium racemosum* (Hamamelidaceae). *J Zool* 237: 57-63.
45. Hill DA & **Lucas PW** (1996) Toughness and fiber content of major leaf foods of wild Japanese macaques (*Macaca fuscata yakui*) in Yakushima. *Am J Primatol* 38: 221-231.
46. Darvell BW, Lee PKD, Yuen TDB & **Lucas PW** (1996) A portable fracture toughness tester for biological materials. *Meas Sci Technol* 7: 954-962.
47. Pereira BP, **Lucas PW** & Teoh SH (1997) Ranking the fracture toughness of mammalian soft tissues using the scissors cutting test. *J Biomech* 30: 91-94.
48. **Lucas PW**, Tan HTW & Cheng PY (1997) The toughness of secondary cell wall and woody tissue. *Phil Trans R Soc Lond B* 352: 341-352.
49. Agrawal KR, **Lucas PW**, Prinz JF & Bruce IC (1997) Mechanical properties of foods responsible for resisting food breakdown in the human mouth. *Archs Oral Biol* 42: 1-9.
50. Prinz JF & **Lucas PW** (1997) Mastication and swallowing: an optimization model. *Proc R Soc Lond B* 264: 1715-1721.
51. **Lucas PW**, Lenstrup M, Prinz J, Williamson D, Yip H & Tipoe G (1997) Language as a barrier to the acquisition of anatomical knowledge. *Med Ed* 31: 81-86.
52. Prinz JF, Yip HY, Tipoe GL, **Lucas PW** & Lenstrup M (1998) Techniques for rapid quantitative assessment of activity levels in small-group tutorials. *Med Ed* 32: 422-425.
53. **Lucas PW** & Corlett RT (1998) Seed dispersal by long-tailed macaques. *Am J Primatol* 45: 29-44.
54. **Lucas PW**, Darvell BW, Lee PKD, Yuen TDB & Choong MF (1998) Colour cues for leaf food selection by long-tailed macaques (*Macaca fascicularis*) with a new suggestion for the evolution of trichromatic colour vision. *Folia Primatol* 69: 139-152.
55. Agrawal KR, **Lucas PW**, Bruce IC & Prinz JF (1998) Food properties that influence neuromuscular activity during human mastication. *J Dent Res* 77: 1931-1938.
56. Agrawal KR, **Lucas PW** & Bruce IC (2000) The effect of food fragmentation index on mandibular closing angle in human mastication. *Archs Oral Biol* 45: 577-584.
57. Becker P, Choong MF, **Lucas PW**, Turner IM, Tyree MT, Wong SC & Yong JWH (2000) A comparison of leaf form between tree species from two tropical rain forests in Brunei. *Biotropica* 32: 53-61.
58. **Lucas PW**, Turner IM, Dominy NJ & Yamashita N (2000) Mechanical defences to herbivory. *Ann Bot* 86: 913-920.
59. Prinz JF & **Lucas PW** (2000) Saliva tannin interactions. *J Oral Rehabil* 27: 991-994.
60. **Lucas PW**, Beta T, Darvell BW, Dominy NJ, Essackjee HC, Lee PKD, Osorio D, Ramsden L, Yamashita N & Yuen TDB (2001) Field kit to characterize physical, chemical and spatial aspects of potential foods of primates. *Folia Primatol* 72: 11-15.
61. Dominy NJ & **Lucas PW** (2001) The ecological value of trichromatic vision to primates. *Nature* 410: 383-386.
62. Prinz JF & **Lucas PW** (2001) 'The first bite of the cherry' - intra-oral manipulation prior to the first bite in humans. *J Oral Rehabil* 28: 614-617.
63. Dominy NJ, **Lucas PW**, Osorio D & Yamashita N (2001) The sensory ecology of primate food perception. *Evol Anthropol* 10: 171-186.
64. **Lucas PW**, Prinz JF, Agrawal KR & Bruce IM (2002) Food physics and oral physiology. *Food Qual Pref* 13: 203-213.
65. Dominy NJ, **Lucas PW**, Ramsden L, Riba-Hernandez P, Stoner KE & Turner IM (2002) Why are young leaves red? *Oikos* 98: 163-176.
66. Agrawal KR & **Lucas PW** (2002) A review: neural control of mastication in humans as influenced by food texture. *Indian J Dent Res* 13: 125-134.
67. Agrawal KR & **Lucas PW** (2003) Mechanics of the first bite. *Proc R Soc Lond B* 270: 1277-1282.

68. Riba-Hernandez P, Stoner KE & **Lucas PW** (2003) Preferences for different sugars in fruits consumed by spider monkeys (*Ateles geoffroyi*) in tropical humid forest in Costa Rica. *J Trop Ecol* 19: 719-726.
69. Dominy NJ, **Lucas PW** & Wright SJ (2003) Measuring the mechanics and chemistry of rain forest leaves: canopy and understory compared. *J Exp Bot* 54: 2007-2014.
70. **Lucas PW**, Dominy NJ, Riba-Hernandez P, Stoner KE, Yamashita N, Loría-Calderón E, Petersen-Pereira W, Rojas-Durán Y, Salas-Pena R, Solis-Madrigal S, Osorio D & Darvell BW (2003) Evolution and function of routine trichromatic vision in primates. *Evolution* 57: 2636-2643.
71. Dominy NJ & **Lucas PW** (2004) Significance of color, calories and climate to the visual ecology of catarrhines. *Am J Primatol* 62: 189-207.
72. **Lucas PW**, Prinz JF, Agrawal KR & Bruce IC (2004) Food texture and its effect on ingestion, mastication and swallowing. *J Texture Stud* 35: 159-170.
73. Yamashita N, Stoner KE, Riba-Hernandez P, Dominy NJ & **Lucas PW** (2005) Light levels used during feeding by primate species with different color vision phenotypes. *Behav Ecol Sociobiol* 58: 618-629.
74. Stoner KE, Riba-Hernández P & **Lucas PW** (2005) Comparative use of color vision for frugivory by sympatric species of platyrrhines. *Am J Primatol* 67: 399-409.
75. Riba-Hernández P, Stoner KE & **Lucas PW** (2005) The significance of trichromacy for detecting monosaccharide-rich fruits in the diet of Central American spider monkeys (*Ateles geoffroyi*). *Am J Primatol* 67: 411-423.
76. Teaford MF, **Lucas PW**, Ungar PS & Glander KE (2006) Mechanical defenses in leaves eaten by Costa Rican howling monkeys (*Alouatta palliata*). *Am J Phys Anthropol* 129: 99-104.
77. Cheng ACO, Yuen HKL, **Lucas PW**, Lam DSC & So KF (2006) Characterization and localization of the supraorbital and frontal exits of the supraorbital nerve in Chinese – an anatomical study. *Ophthal Plast Reconstr Surg* 22: 209-213.
78. Sui ZQ, Agrawal KR, Corke H & **Lucas PW** (2006) Biting efficiency in relation to incisal angulation. *Archs Oral Biol* 51: 491-497.
79. Ang KY, **Lucas PW** & Tan HTW (2006) Incisal orientation and biting efficiency. *J Hum Evol* 50: 663-672.
80. **Lucas PW**, Ang KY, Agrawal KR, Prinz JF & Dominy NJ (2006) A brief review of the recent evolution of the human mouth in physiological and nutritional contexts. *Physiol Behav* 89: 36-38.
81. Sui ZQ, **Lucas PW** & Corke H (2006) Optimal cooking time of noodles related to their notch-sensitivity. *J Texture Stud* 37: 428-441.
82. Ang KY, **Lucas PW** & Tan HTW (2008) A novel way of measuring the fracture toughness of leaves and other thin films using a single inclined razor blade. *New Phytol* 177: 830-837.
83. **Lucas PW**, Constantino P, Wood BA & Lawn BR (2008) Dental enamel as a dietary indicator in mammals. *BioEssays* 30: 374-285. [invited article]
84. Cheng ACO, Yuen HKL, **Lucas PW**, Lam DSC & So KF (2008) Surgical anatomy of the Chinese orbit – an anatomic study. *Ophthal Plast Reconstr Surg* 24: 136-41.
85. **Lucas PW**, Constantino PJ & Wood BA (2008) Structural and functional trends in tooth morphology within the hominid clade. *J Anat* 212: 486-500.
86. Vogel ER, van Woerden JT, **Lucas PW**, Utami Atmoko SS & van Schaik CP (2008) Functional ecology and evolution of hominoid enamel thickness: *Pan troglodytes schweinfurthii* and *Pongo pygmaeus wurmbii*. *J Hum Evol* 55: 60-74.
87. Dominy NJ, Grubb PJ, Jackson RV, **Lucas PW**, Metcalfe DJ, Svenning J-C & Turner IM (2008) In tropical lowland rain forests monocots have tougher leaves than dicots, and include a new kind of tough leaf. *Ann Bot* 101: 1363-1377.
88. Grubb PJ, Jackson RV, Barberis IM, Bee JN, Coomes DA, Dominy NJ, De La Fuente MAS, **Lucas PW**, Metcalfe DJ, Svenning J-C, Turner IM & Vargas O (2008) Monocot leaves are eaten less than dicot leaves in tropical lowland rain forests: roles for toughness and leaf presentation. *Ann Bot* 101: 1379-1389.
89. Dominy NJ, Vogel ER, Yeakel JD, Constantino P & **Lucas PW** (in press) For the hungry hominid a tuber was not hard: mechanical characteristics of plant foods in the diets of australopithecines and early *Homo*. *Evol Biol*
90. Lawn BR, Lee JJ, Constantino PJ, **Lucas PW** (in press) Predicting failure in mammalian enamel. *J Mech Behav Biomed Mat*
91. Strait DS, Weber GW, Neubauer S, Chalk J, Richmond BG, Lucas PW, Spencer MA, Schrein C, Dechow PC, Ross CF, Grosse IR, Wright BW, Constantino P, Wood BA, Lawn B, Wang Q, Slice DE, Byron C, Smith AL. (in review) The feeding biomechanics and dietary ecology of *Australopithecus africanus*. *Nature*

92. Sui ZQ, BeMiller, J, **Lucas PW** & Corke, H (**submitted**) Starch digestibility of Chinese noodles in relation to cooking time, particle size and amylase reaction time. *J Food Sci*
93. **Lucas PW**, Lowrey TF, Gaskins J & Begley M (**in prep**) To open but not be opened: the material properties of a thick-shelled seed govern its survival. *J Mater Res* [invited article]
94. Sui ZQ, Corke H, Oyen ML & **Lucas PW** (**in prep**) Fracture and energy partitioning in uncooked and cooked noodles. *J Mater Res*
95. Ang KY, **Lucas PW** & Tan HTW (**in prep**) The potential pitfalls of dual-bladed leaf fracture toughness tests.

Abstracts (in refereed journals only: in addition, two book reviews, a letter to an editor & a paper in a non-refereed journal are included)

- 1981 Lucas PW** & Luke DA Rates of food comminution. *J Dent Res* 60B: 1171.
- 1982 Lucas PW** A model of food comminution in mastication. *J Dent Res* 61: 536.
- 1982 Luke DA** & **Lucas PW** Aetiology of malocclusion. (letter to editor) *Brit Dent J* 152: 73.
- 1983 Lucas PW** Mechanisms of food comminution. *J Oral Rehabil* 10: 441-442.
- 1984 Lucas PW** & Corlett RT How to get excited about teeth. (non-refereed journal) *Singapore Scientist* 10: 12-14.
- 1985 Luke DA** & **Lucas PW** Chewing efficiency in relation to occlusal and other variations in the dentition. *J Dent Res* 64: 689.
- 1986 Lucas PW**, Luke DA & Corlett RT Molar size gradient in anthropoid primates *J Dent Res* 65: 328.
- 1987 Lucas PW**, Hails CJ & Corlett RT Singapore still has banded langurs - just. *Aust Primatol* 2(4): 12.
- 1988 Lucas PW** & Corlett RT Oral processing of fruits by long-tailed macaques. *Am J Phys Anthropol* 75: 241-242.
- 1990 Lucas PW** (book review) Ecosystems of the World. Vol. 14B. Elsevier, Amsterdam. *Primate Eye* 41: 30-31.
- 1992 Lucas PW**, Choong MF, Tan HTW, Turner IM & Ong JYS Leaf selection by anthropoid primates related to leaf fracture toughness. *Am J Phys Anthropol* suppl. 14: 114.
- 1993 Lucas PW** The ecology of a mechanically-defended seed: germination vs. predation. *J Exp Bot* 44 suppl.: 51.
- 1993 Lucas PW** Primate dentitions and the mechanical properties of fruits and seeds. *Primate Eye* 50: 11-12.
- 1994 Lucas PW** Function of mammalian teeth. *J Morphol* 220: 368-369.
- 1995 Hill DA** & **Lucas PW** Toughness of leaf parts and selective feeding by Japanese macaques and deer in Yakushima. *Folia Primatol* 64: 102-103.
- 1996 Lucas PW** & Prinz JF Mechanisms of bolus formation - their relevance to chewing and the swallow threshold. *Am J Phys Anthropol* suppl. 22: 153.
- 1996 Lucas PW** & Prinz JF Salivary lubrication - the effect of tannins. *Am J Phys. Anthropol* suppl. 22: 190.
- 1996 Lucas PW**, Tan HTW & Cheng PY The toughness of hard woods and seed shells. *J Exp Bot* suppl. 47: 91.
- 1998 Lucas PW**, Teaford MF, Glander KE & Ungar PS Physical properties of foods of *Alouatta palliata*. *Am J Phys Anthropol* suppl. 26: 152-153.
- 2000 Lucas PW** Plant mechanics and primate dental adaptations: an overview. *Am. J. Phys. Anthropol.* suppl. 30: 214-215.
- 2000 Dominy NJ**, Yamashita N, Essackjee HC, Darvell BW & Lucas PW A physico-chemical fieldkit for ecological studies. *Am. J. Phys. Anthropol.* suppl. 30: 141.
- 2002 Dominy NJ** & **Lucas PW** The sensual side of primate ecology. *Am J Phys Anthropol* 117 S34: 64.
- 2003 Dominy NJ** & **Lucas PW** Evolution of anthropoid hands. *Am J Phys Anthropol* suppl. 36: 90.
- 2003 Dominy NJ**, Lucas PW & Noor NS Primate sensory ecology: a study of fruits, fingers, and form. *Integ. Comp. Biol.* 43: 892.
- 2004 Lucas PW** (book review) *Human Diet: Its Origin and Evolution*. Bergin & Garvey, Westport, CT. *J Hum Evol* 46: 641-642.
- 2004 Vinyard CJ**, Lucas PW, Montenegro M, Melo L, Maranhão do Valle Y & Monteiro da Cruz MAO Where the wild things are: Linking lab and field work in studying tree gouging in common marmosets (*Callithrix jacchus*). *Am J Phys Anthropol* suppl. 38: 200-201.
- 2004 Lucas PW** The size of the dentition. *Am J Phys Anthropol* suppl. 38: 138.
- 2004 Dominy NJ**, Lucas PW & Supardi Noor N Sensory perception of food: a study of fruits, fingers and fermentation.. *Am J Phys Anthropol* suppl. 38: 88-89.
- 2004 Dominy NJ**, Lucas PW, Wrangham RW & Ramsden L The potential importance of fruit texture for the evolution of digital dexterity. *Folia Primatol* 75 (suppl.): 189.

- 2004 Stoner KE, Riba-Hernandez P & Lucas PW Comparative uses of colour vision for frugivory by sympatric species of platyrrhines. *Folia Primatol* 75 (suppl.): 187-188.
- 2004 Riba-Hernandez P, Stoner KE & Lucas PW The importance of trichromacy for detecting monosaccharide-rich fruits in spider monkeys. *Folia Primatol* 75 (suppl.): 188.
- 2005 Agrawal KR & Lucas PW Methods of ingestion and incisal designs. *Am J Phys Anthropol* 40 (suppl.): 66.
- 2007 Lucas PW & Wood BA Structural and functional trends in mandibular and tooth morphology within the hominid clade. *J Anat* 210: 771.
- 2007 Lucas PW, Lowrey TK & Cook RF How a prey seed tried to avoid its predator: the orangutan-Mezzettia interface. *Am J Phys Anthropol* 44 (suppl.): 160.
- 2007 Vogel ER, van Woerden JT, Lucas PW, Utami Atmoko SS & van Schaik CP The mechanical properties of hominoid foods: I. *Pongo pygmaeus wurmbii*. *Am J Phys Anthropol* 44 (suppl.): 240.
- 2007 Dominy NJ, Vogel ER, Yeakel JD, van Woerden JT, Lucas PW, van Schaik CP Mechanical properties of hominoid foods: II. Plant underground storage organs and the adaptive significance of molar enamel thickness. *Am J Phys Anthropol* 44 (suppl.): 101.
- 2008 Lucas PW, Constantino P, Wood BA & Lawn BR How enamel form may provide key information on the properties of fallback foods. *Am J Phys Anthropol* (suppl.).
- 2008 Chalk J, Wright BW, Lucas PW, Verderane MP, Fragaszy D, Visalberghi E, Izar P & Ottoni EB The mechanical properties of foods processed by *Cebus libidinosus* at Boa Vista, Brazil. *Am J Phys Anthropol* (suppl.).
- 2008 Wang Q, Strait DS, Smith, AL Chalk J, Wright BW, Dechow PC, Richmond BG, Ross CF, Spencer MA, Byron CD, Lucas P, Grosse I, Slice DE & Weber G Modeling the elastic properties of sutures in finite element analysis. *Am J Phys Anthropol* (suppl.) 135 S46: 217-218.

Research Grants

In Singapore

- 1983 Request for *Hard Tissue Cutting Equipment*. S\$20,000 (Singapore Turf Club)
- 1984-7 (with all Department of Prosthetic Dentistry) *Food breakdown in human mastication*. S\$60,000 (Singapore Turf Club) & S\$7,000 (National University of Singapore)
- 1985-7 (with Dr RT Corlett) *Seed dispersal by Macaca fascicularis*. S\$1,000 (National University of Singapore)
- 1988-9 (with all Department of Oral Surgery) *The functional assessment of masticatory ability (jaw movement and electromyography in relation to food comminution)*. S\$74,000 & S\$55,000 (National University of Singapore)
- 1989-91 (with Dr CG Oates) *Physical properties of foods in human and primate diets*. S\$12,000 (National University of Singapore)

In Hong Kong

- 1993-6 (with CR Peters, Univ. of Georgia) *The mechanical properties of plant foods (fruits, seeds and leaves) with respect to mammalian feeding patterns, with emphasis on the primates and evolution of man*. HK\$566,000 (Research Grants Council of Hong Kong), HK\$122,550 & HK\$70,000 (CRCG of University of Hong Kong) COMPLETION REPORT RATED "EXCELLENT".
- 1995-7 (with IC Bruce, Dept. of Physiology) *Oral Perception of Texture in Hong Kong Chinese*. HK\$136,000 CRCG of University of Hong Kong.
- 1995-7 (with CG Oates, Dept. of Biochemistry & IM Turner, Department of Botany, Nat. Univ. of Singapore) *Sensory Cues for Feeding by Macaques*. HK\$310,000 Research Grants Council of Hong Kong
- 1995-7 *Action Learning Project* held by English Centre (by D Williamson) with M Lenstrup (research assistant) and Anatomy Department (JF Prinz, PW Lucas, H Yip & G Tipoe); part-share of HK\$400,000 (University Grants Committee of Hong Kong).
- 1997-2001 HK\$1,495,060 *The importance of color vision for foraging strategies of primates and their relationship to the evolution of trichromatic color vision*. Research Grants Council of Hong Kong.
- 1997-2000 Named Collaborator on NSF grant #SBR-9601766 "*Effects of Tooth Use on Tooth Shape, Structure and Wear*" to MF Teaford (Johns Hopkins) and KE Glander (Duke University).
- 1999-2001 *The importance of color vision for foraging strategies of primates and their relationship to the evolution of trichromatic color vision*. US\$15,000 National Geographic Society #6584-99.

2000 Two grants for completing data analysis and holding a final symposium on “*The importance of color vision for foraging strategies of primates and their relationship to the evolution of trichromatic color vision*”. HK\$80,000 & HK\$85,000 Croucher Foundation of Hong Kong.

2001 *Adaptation of the teeth of primates to diet* HK\$80,000. CRCG of University of Hong Kong.

2001-2003 Named Collaborator on *Bark gouging by marmosets*. Grants awarded to CJ Vinyard (Duke University) by National Geographic Society and Leakey Foundation.

2004 *Deformation transitions in foods*. HK\$120,000 Seed grant funding (University of Hong Kong). [HK\$110,000 was added from other university sources.]

In USA

Current

2007 *Collaborative Research: Integrative analysis of hominid feeding biomechanics*. PI: BR Richmond; Co-PI: PW Lucas. Funded by NSF HOMINID program for US\$214,000.

2007 *Integrative Human biology: Dynamics of behavioral shifts in human evolution: brains, bodies and ecology*. PI: BA Wood; Co-PI: PW Lucas and three others. Funded by NSF IGERT program for US\$3.1 million.

Fieldwork Experience

1985-2003	Bukit Timah Nature Reserve, Singapore
1995	Andulau and Badas, Brunei
1997-8	La Pacifica, Costa Rica
1999	Kibale, Uganda
2002	Pasoh, Malaysia
2003	Tapacura, Brasil
2007	Carlos Botelho, Brasil

Field Technology

HKU Portable mechanical tester: Manufactured/sold at cost by Professor BW Darvell (Dental Materials Science, HKU), it was originally made for my research back in 1994. It features a suite of my data acquisition/analysis programs and has been sold to Asian (National University of Singapore) UK (University of Sussex) and US (Johns Hopkins, Duke, Berkeley, Smithsonian Tropical Research Institute, University of Illinois at Urbana-Champaign) universities for work on invertebrate herbivory, plant growth and biomechanics as well as primatology .

Field Chemistry/Color: A group of us also put together commercial equipment to measure illumination/reflectance spectra of foods and chemical measures of phenolics, protein and tannins while in the field. I wrote a set of computer programs, complementary to those in mechanics, to achieve this.

Current collaborations/assistance: Two complete fieldkits are with indigenous fieldworkers studying rare primates in remote environments:

Mauricio Talebi: *Brachyteles arachnoides* (Sao Paulo State, Brazil), **Xiao Wen** (Kunming Institute of Zoology, Chinese Academy of Sciences): *Rhinopithecus bieti* (Yunnan/Tibet)

Laboratory Technology

Current interest: Creation and implementation of tests of food materials relevant to chewing and swallowing.

Consultation Experience in Food Industry R&D

1980-1983 Unilever (Colworth, UK)

2001-2003 Wageningen Centre for Food Science (Wageningen/Zeist, Netherlands)

Invited Lectures (since 1990 only)

July 1990 by C.R. Peters to organise symposium on *The Physical and Chemical Properties of Items in the Diets of*

Primates at the Congress of the International Primatological Society in Nagoya-Kyoto, Japan.

March 1992 by D.J. Chivers & P. Langer. Selwyn College, Cambridge. Workshop on: *The Digestive System in Mammals*. (objective: to plan a book)

March 1993 by Dr A.R. Ennos (Univ. of Manchester). Society for Experimental Biology, Canterbury, U.K. Title: *The ecology of a mechanically-defended seed: germination vs. predation*.

August 1994 by M. F. Teaford (Johns Hopkins) and M. Ferguson (Univ. of Manchester). International Congress of Vertebrate Morphology, Chicago, U.S.A. Title: *Function of mammalian teeth*.

April 1995 by Johns Hopkins University, Department of Cell Biology & Anatomy. Title: *Dental Function: The Cutting Edge*.

April 1995 by University of Alberta, Edmonton, Department of Oral Biology. Title: *Teeth and Toughness: Adaptations of the Primate Mouth*.

April 1996 by C. Wall (Duke Univ.) & C. Ross (SUNY at Stony Brook). Title: *Mechanisms of Bolus Formation - their relevance to Chewing and Swallowing*. American Association of Physical Anthropologists Annual Meeting, Chapel Hill, N. Carolina, U.S.A.

May 1996 by Department of Biology, Universiti Brunei. Title: *The toughness of plant cell walls and woody tissues*.

August 1996 by P. Garber & J. Lambert (Univ. of Illinois at Champaign). Title: *Seed dispersal by long-tailed macaques*. International Primatological Society Congress, Madison, Wisconsin.

March 1997 by University of Chicago, Department of Organismal Biology and Anatomy. Title: *The relationship between tooth form and diet*.

September 1997 Member of Scientific Committee for Plant Biomechanics 97. University of Reading, U.K.

October 1997 by Carsten Niemitz (Freie Universitat, Berlin) to speak at the 5th Congress of German Primatological Society. Freie Universitat, Berlin.

December 1999 by Rob Hamer (Wageningen Centre for Food Sciences). Wageningen, Netherlands. Title: *Food physics and oral physiology*. A 'Food Summit' involving about 50 international invitees from academia, government and industry.

April 2000 by R.Z. German (University of Cincinnati) & N.G. Jablonksi (California Academy of Sciences). American Association of Physical Anthropologists meeting. San Antonio, Texas. Title: *Plant mechanics and primate dental adaptations: an overview*.

September 2000 Member of Scientific Committee for 3rd Conference on Plant Biomechanics. University of Freiburg, Germany.

September 2000 by Department of Oral Biology, University of Illinois at Chicago and by Department of Anatomy, State University of New York at Stony Brook. Title: *Mechanics of food breakdown*.

December 2001 by Marian Dagosto & M.J. Ravosa (Northwestern University). Symposium on Primate Origins. Chicago. Title: *A pocket field guide to primate color vision*.

September 2002 by K. Nishinari (Osaka) 1st Conference on Mastication and Health, Yokohama, Japan. Title: *Food physics and physiology*.

February 2003 Seminars (variously titled) at University of Southern California, University of Chicago, George Washington University/Smithsonian Institution, Harvard University, all on the topic of cooking and evolution of the human face.

February 2004 by E. Simms (UC Berkeley) Gordon conference on Plant-Herbivore Interactions, Ventura Beach, California. Title: *Getting physical: How herbivorous primates choose foods*.

February 2005 by B.A. Wood (George Washington Uni.) Annual Meeting of AAAS (Washington DC) title: *Diet in human evolution as seen from an ecological perspective* (as part of a symposium entitled 'Origin and Evolution of the Modern Human Diet').

April 2005 by T. Bromage (NYU) Symposium on "Integrative Approaches to Human Health and Evolution", sponsored by **Fundacion Ramon Areces** (Madrid, Spain). Talk: *Facial dwarfing and dental crowding in relation to diet*.

November 4-5 2005 (invited by Dr Kack-Kyun Kim) 4th Annual Meeting of the Korean Basics Dental Science Societies Association, Seoul, Korea. Talks: *'The Scientific Foundations of Dentistry'* and *'Swallowing'*.

December 14-17 2006 (invited by Dr Rob Hamer) WCFS Food Summit, Wageningen, Netherlands on *'Making Sense of Food'*. Acted as moderator/speaker/discussant. Title: *'Tools, teeth and the first bite'*.

February 17 2006 Entomology, College Park, University of Maryland (invited by Dr Bob Denno) Title: *'How plants get tough: the efficacy of mechanical defenses against animals'*.

March 15 2006 Instituto de Doñana, Sevilla (invited by Dr Conchita Alonso) Title: *'Estudios sobre las defensas*

fisicas de semillas contra predacion'.

March 23 2006 by T. Lowrey (Biology/Anthropology, University of New Mexico, Albuquerque) Title: '*What a mouthful! A new theory of tooth size in mammalian and human evolution*'.

May 17-20 2006 by Mike Richards (Max Planck Institut, Leipzig, Germany) Title: '*The relationship between the human dentition and diet during the Paleolithic*'.

July 31-Aug 4 2006 by Dr Roland Ennos (University of Manchester) **World Congress of Biomechanics, Munich Germany** Title: '*The role of hardness and toughness in the mechanical defences of plants*'.

Sept 15 2006 New York University, Department of Anthropology [invited by Shara Bailey] '*Tools, teeth and the first bite*'.

Oct 16 2006 Johns Hopkins University School of Medicine, Department of Physical Medicine and Rehabilitation [invited by Rebecca German]. '*Chewing, digestion and the Stone Age diet*'.

Nov 12 2006 Brown University, Department of Ecology and Evolution [invited by Christine Janis]. '*Seeds of war: the biomechanical designs of predators and their prey*'.

Nov 28 2006 Materials Research Society 2006 Fall Meeting, Boston, MA. '*How baby plants avoid getting hurt and blossom into adulthood: the story of a tropical seed*'.

Jan 4 2007 Winter meeting of the Anatomical Society of Great Britain '*Structural and functional trends in mandible and tooth morphology in the hominin clade*'.

March 27–April 1 2007 American Association of Physical Anthropologists Annual Meeting. (poster) '*How a prey seed tries to avoid its predator: the orangutan-Mezzettia interface*'.

April 13 2007 Duke University, Department of Biological Anthropology and Anatomy [invited by Christine Wall]. '*Hard object feeding*'.

April 20 2007 SUNY at Stony Brook, Department of Anatomy [invited by John Fleagle]. '*Hard object feeding*'.

July 16-21 2007 Université Pierre et Marie Curie, Paris, 8th International Congress of the ICVM [workshop co-organized with Dr Callum Ross] '*Theoretical background and methods for measuring material properties of primate foods*'.

Oct 5 2007 Department of Biology, GWU. '*Developing a tropical field lab for analyzing primate diets*'.

Oct 13 2007 University of Rhode Island, Kingston, Northeast branch of Division of Vertebrate Morphology, SICB '*Enamel and diet*'.

Jan 9 2008 Department of Biology, University of California Santa Cruz '*Enamel as a dietary indicator in mammals*'.

April 1-4 2008 WG 38 Leaf Biomechanics, ARC NZ Vegetation Function Network, Department of Biological Sciences, Macquarie University, Australia. **Purpose:** *Take part in an international working group to plan a paper synthesizing information around the physical properties of leaves.*

April 14 2008 Integrative and Evolutionary Biology, University of Southern California '*Enamel as a dietary indicator in mammals*'.

Research students/ fellows

Zhongquan Sui (Sept 2003 – Oct 2007) PhD student. Interests: the definition of cooking and its effect on digestion. Subsequent career: postdoctoral fellow in Purdue University, Indiana.

Nathaniel Jay Dominy (Oct 1998–June 2001) Ph.D. *Trichromacy and the ecology of food selection in four African primates*. Subsequent career: NIH postdoctoral fellow at the Department of Ecology & Evolution, University of Chicago, now Assistant Professor, Department of Anthropology, University of California (Santa Cruz). Nate won the top graduate student prize in both the medical faculty (Stephen K.P. Chang Gold Medal) and the whole university (Li Ka Shing gold medal).

Kalpana R. Agrawal (Dec 1995- Nov 1998) Ph.D. *The influence of food texture on chewing patterns*. Subsequent career: part-time senior research assistant and lecturer, Department of Anatomy, University of Hong Kong. Currently, looking for a position.

Nicola Ann Parillon (Dec 1994- Dec 1998) Ph.D. *Sensory cues for feeding by macaques*. Subsequent career: Lecturer in Environmental Science, University of Bukoba, Tanzania.

Jonathan Franklin Prinz (Sept 1994 - Oct 1996) Ph.D. *Physical Mechanisms in the Pathogenesis of Temporomandibular Joint Sounds*. Subsequent career: Postdoctoral fellow at London Hospital Dental School, London; then Lecturer in Anatomy in Medical Sciences, Queen Mary Westfield College, University of London; then Senior Scientist, Wageningen Centre for Food Sciences; now Senior Scientist, TNO, Utrecht, Netherlands.

Choong Mei Fun (Feb 1993- July 1997). Ph.D. *Patterns of Herbivory in Tropical Fagaceae*. Subsequent career: R&D at Givaudan Roure (Singapore); then postdoctoral fellow in Marine Biology at the National University of Singapore; now Lecturer, Republic Polytechnic, Singapore.

David Anthony Hill (Jan 1994-April 1995) Postdoctoral Fellow. Subsequent career: Lecturer in School of Biological Sciences, University of Sussex.

Christyna Solhan (Sept 2007-present) current GWU PhD student.

Nayuta Yamashita (Oct 1998-Aug 2000) Postdoctoral Fellow. Subsequent career: Assistant Professor in Department of Anthropology, University of Southern California.

Barth Wright (Sept 2005-Aug 2006) Postdoctoral Fellow. Subsequent career: Assistant Professor in Department of Anatomy, Kansas City University of Medicine and Biosciences.

Paul Constantino (Sept 2007-present) current GWU Postdoctoral Fellow.

Recent Publicity IN JOURNALS: R.M. Alexander (1998) News of chews: the optimization of mastication. *Nature* 391: 329. (News and Views article that featured papers by JF Prinz & KR Agrawal exclusively.) J.E. Lambert (1999) Primate color vision research. *Evol. Anthropol.* 8: 39-41 (this featured the 1997 RGC project and the 1998 workshop at HKU). A.S. Moffat (2002) *Science* 295: 613-615. Our theory of colour vision was featured briefly in the BBC documentary series “*The Life of Mammals*”. P. Ungar (2008) Strong teeth, strong seeds. *Nature* 452: 703-704. (News and Views article that featured BioEssays paper).

GENERAL MEDIA INTEREST (from 2001 onwards): Numerous online news sites including New York Times, National Geographic Society, CNN, BBC, ABC, Nature News Service, Complexity Digest, Cosmiverse, Wired, California Academy of Sciences, Science-Presse [Canada], ABC [Australia], Le Nouvel Observateur [France], Spiegel [Germany], Der Teggespiegel [Germany], Universonline [Italy], Alcon Journal [Argentina], Jornal da Ciencia [Brazil], Anir [Cuba], Hürriyetim [Turkey]. In print: *Sciences et Avenir* (France): Avril, 2001 p. 28: Les singes en voient de toutes les couleurs. *The Philadelphia Inquirer* (USA): March 19, 2001 p. 10: Study links ability to tell colors to needs when foraging for food. *South China Morning Post* (Hong Kong): March 19, 2001: Light thrown on human vision. *Sontags Zeitung* (Switzerland): March 18, 2001 p. 95: Ein affe sieht rot. *Folha de Sao Paulo* (Brazil): March 15, 2001 p. A23: Visão de primatas ajuda alimentação. *NRC Handelsblad* (Netherlands): February 23, 2002: Kleurenzien bij dieren ontstond door jacht op eiwitrijk blad. *Nature Australia* (2002) 27(4): 7-8. Seeing red. *The Economist* Oct 12th, 2002 p.80. A youthful blush. *Science News* (USA) Oct 11th 2003 Visionary Research. *The New York Times* Feb 22nd 2005 A Theory to Chew On, but Not Too Heartily. *The New Scientist* May 19th 2008: Five things humans no longer need.