

CURRICULUM VITAE

Surname : Tracas
First name : Nicholas
Date of birth : 3rd October 1953
Place of birth : Cairo, Egypt
Nationality : Hellenic
Present position : Professor Emeritus, Physics Department,
School of Applied Mathematical and Physical Sciences,
National Technical University

A. Studies.

- B.Sc., Physics Department, University of Athens (March 1976).
- Ph.D., Sussex University, England (June 1980).

B. Previous positions.

- Scientific Associate, Physics Department, University of Athens (Sept.1981 - Sept. 1982).
- Lecturer, Physics Department, National Technical University, Athens (Sept. 1982 - Sept. 1988).
- Assistant Professor, Physics Department, National Technical University, Athens (Sept. 1988 - June 1995).
- Fellow, CERN, Theory Division (Sept. 1985 - Aug. 1987), on leave of absence from the National Technical University.
- Associate Professor Physics Department, National Technical University, Athens (June 1995 - June 2012).
- Corresponding Associate, CERN, Theory Division (7-9/1993, 7-9/1996, 7-9/2008, 9-12/2012 and 6-8/2017).

C. Other activities.

- Member of the Organizing Committee of the 1st (V. President), 2nd, 3rd (Scientific Secretary), 4th (Scientific Secretary), 5th (Scientific Secretary), 6th (Scientific Secretary) and 7th (Scientific Secretary) Hellenic School on Elementary Particle Physics, Corfu 1982, 1985, 1989, 1992, 1995, 1998 and 2001.
- Co-Editor of the Proceedings of the 1st and 3rd Hellenic School on Elementary Particle Physics, World Scientific Publishing Co, Singapore, and the 4th Hellenic School on Elementary Particle Physics, N.T.U. Editions.
- Member of the Organizing Committee of the 1984 Conference of The Greek Physical Society.
- Editor of the Proceedings of the 1988 Workshop of The Hellenic Society for the Study of High Energy Physics.
- Member of the Organizing Committee and discussion leader in the 1988 CERN School of Physics, Lefkada, Greece.
- Member of the Organizing Committee of the International Workshop of the Hellenic Society for the Study of High Energy Physics, Thessaloniki 1991, Ioannina 1992 and Athens 1994.
- Discussion leader in the 1991 JINR-CERN School of Physics, Crimea, USSR, 1991.
- Member of the International Advisory Committee of the “4 Seas Conference”, Trieste, June 1995.
- President of the Hellenic Society for the Study of High Energy Physics, 1996-1997, 1997-1998, 1998-1999.
- Coordinator of the Greek “OUTREACH” group and Greek representative in the International Particle Physics Outreach Group (IPPOG). Greek representative in the European Programme “Physics on Stage”. Coordinator of the Greek “Master Classes in Particle Physics”.
- Responsible for the Greek OUTREACH web page (www.physics.ntua.gr/POPPHYS).
- European Physical Society - HEPP Division 2003 Outreach Prize (together with Rolf Landua - CERN).

D. Conferences, Workshops and Schools attended.

1. Summer School of British Universities, Glasgow 1977.
2. Rutherford Meeting, 1978.
3. Cosseners Meeting, Cosseners 1979.
4. 1st Hellenic School on Elementary Particle Physics, Corfu 1982.
5. Summer School on Supersymmetry, Trieste 1983.
6. High Energy Physics Conference, Brighton 1983.
7. Summer School on Supersymmetry, Bonn 1984
8. Workshop in NRCPS Democritus, Athens 1984.
9. Rencontre de Moriond, Les Arcs 1986.
10. Workshop “From Colliders to Supercolliders”, Madison 1987.
11. Workshop “New Physics”, Trieste 1987.
12. Photon-Hadron Interaction Conference, Hamburg 1987.
13. Workshop “Polarization in LEP”, CERN 1987.
14. Greek Conference on High Energy Physics, Athens 1988.
15. Workshop “High Energy Physics Phenomenology”, Trieste 1988.
16. Workshop “Diquarks”, Torino 1988.
17. Workshop “Radiative Corrections to E-W Theory”, Brighton 1989.
18. 3rd Hellenic School on Elementary Particle Physics, Corfu 1989.
19. International Workshop on Current Problems in Elementary Particle Physics, Ioannina 1990.
20. International Workshop of the Hellenic Society for the Study of High Energy Physics, Thessaloniki 1991.
21. International Workshop of the Hellenic Society for the Study of High Energy Physics, Ioannina 1992.
22. 4th Hellenic School on Elementary Particle Physics, Corfu 1992.
23. Rencontre de Moriond, Les Arcs 1993.
24. International Workshop of the Hellenic Society for the Study of High Energy Physics, Crete 1993.
25. International Workshop of the Hellenic Society for the Study of High Energy Physics, Athens 1994.
26. International Workshop of the Hellenic Society for the Study of High Energy Physics, Thessaloniki 1995.
27. Workshop “LEP 200”, Geneva 1995.

28. Rencontres des Morionds, Les Arcs 1995.
29. SUSY 95, Paris 1995.
30. 5th Hellenic School on Elementary Particle Physics, Corfu 1995.
31. Rencontres de la Valee d' Aosta, La Thuille, 1996.
32. International Workshop of the Hellenic Society for the Study of High Energy Physics, Ioannina 1996.
33. Rencontres des Morionds, Les Arcs 1997.
34. International Workshop of the Hellenic Society for the Study of High Energy Physics, Crete 1997.
35. International Workshop of the Hellenic Society for the Study of High Energy Physics, Athens 1998.
36. 6th Hellenic School on Elementary Particle Physics, Euroconference on Standard Model and Beyond, Corfu 1998.
37. International Workshop of the Hellenic Society for the Study of High Energy Physics, Thessaloniki, 1999.
38. XXI Rencontres de Blois, Blois, 1999.
39. Rencontres des Morionds, Les Arcs, 2000.
40. International Workshop of the Hellenic Society for the Study of High Energy Physics, Ioannina, 2000.
41. 7th Hellenic School on Elementary Particle Physics, Euroconference on Standard Model and Beyond, Corfu 2001.
42. XXInternational Symposium on Lepton and Photon Intecations at High Energies, Rome, 2001
43. Recent Developments in High Energy Physics and Cosmology, Athens 2003, Thessaloniki 2005, Olympia 2008, Thessaloniki 2009.
44. Corfu Summer Institute, Corfu 2013, 2014 and 2015.

E. Publications.

1. “Two-loop QCD Corrections to the Non-Leptonic Weak Decays”, Ph.D. Thesis, University of Sussex, 1980.
2. “Two-loop Calculations in QCD and the $\Delta E=1/2$ Rule in Non -Leptonic Weak Decays”, N. D. Tracas and N. D. Vlachos, Phys. Lett. 115B (1982)419.
3. “Possible Absorptive Corrections in Hard-Scattering Processes at Very High Energies”, N. G. Antoniou, N. D. Tracas and S. D. P. Vlassopoulos, Lett. Nuovo Cim. 37(1983)28.
4. “Diagrammatic Approach to Weak Quark Decays”, N. D. Tracas and N. D. Vlachos, Phys. Rev. D29(1984)1985.
5. “Leading Log Summation of Gluonic Corrections to Weak Quark Decays”, N. D. Tracas and N. D. Vlachos, Phys. Lett. 140B(1984) 93.

6. “Prompt Photino Production at the CERN pp Collider Energies and Beyond”, N. D. Tracas and S. D. P. Vlassopoulos, Phys. Lett. 149B(1984)253.
7. “QCD Corrections in a Class of Spontaneous CP-Violating Models”, N. D. Tracas, N. D. Vlachos and G. Zoupanos, Phys. Lett. 161B(1985) 368.
8. “Effects of a Superstring Gauge Boson on High Energy e^+e^- Annihilation and ep Scattering”, V. D. Angelopoulos, J. Ellis, D. V. Nanopoulos and N. D. Tracas, Phys. Lett. 176B(1986)203.
9. “Search for New Quarks Suggested by the Superstrings”, V. D. Angelopoulos, J. Ellis, H. Kowalski, D. V. Nanopoulos, N. D. Tracas and F. Zwirner, Nucl. Phys. B292(1987)99.
10. “On the Contribution of New Interactions to the $\Delta I=1/2$ Rule in Superstring Inspired Models”, E. Papantonopoulos, N. D. Tracas and G. Zoupanos, Phys. Lett. 188B(1987)493.
11. “Contribution of the Scalar Diquark to the $\Delta I=1/2$ Rule”, G. K. Leontaris, N. D. Tracas and J. Vergados, Phys. Lett. 193B(1987) 335.
12. “Supersymmetric Radiative Corrections at the Z_0 Pole”, J. Ellis, S. Rudaz and N. D. Tracas, Phys. Lett. 192B(1987)453.
13. “Unification of Coupling Constants Without a Covering GUT”, S. Theisen, N. D. Tracas and G. Zoupanos, Z. Physik 37(1988)597.
14. “Indirect Search for Leptoquarks at Present and Future Colliders”, H. Dreiner, J. Ellis, D. V. Nanopoulos, N. D. Tracas and N. D. Vlachos, Mod. Phys. Lett. A3(1988)443.
15. “Renormalization Effects on Flavour Mixing in Supergravity Theories”, G. K. Leontaris, N. D. Tracas and J. Vergados, Phys. Lett. 206B(1988)247.
16. “Baryon Number Violation in Future Colliders”, N. D. Tracas and G. Zoupanos, Phys. Lett. 220B(1989)289.
17. “Signatures of a Scalar leptoquarks Suggested by the Superstrings, at LEP I”, N. D. Tracas and S. D. P. Vlassopoulos, Phys. Lett. 220B(1989)285.
18. “U(1)’s and Non-Perturbative Unification”, G. K. Leontaris, N. D. Tracas and C. E. Vayonakis, Mod. Phys. Lett. A 25(1989)2429.
19. “Three Loop Calculation of the β -Function for the Gross-Neveu Model”, N. D. Tracas and N. D. Vlachos, Phys. Lett. 236B(1990) 333.
20. “Analytic Results for the Gross-Neveu Model β -Function in Three Loops”, N.D. Tracas and N.D. Vlachos, Phys. Rev D43(1991)3447.
21. “The Gross-Neveu Chiral Condensate in Finite Volume”, E.G. Floratos, N.D. Tracas and N.D. Vlachos, Phys. Lett. 253B(1991)399.
22. “Higher Order Calculation and Renormalization Scheme Dependence in the 2-d Gross-Neveu Model”, N.D. Tracas and N.D. Vlachos, Phys. Lett. [4]257B(1991)140.
23. “Renormalization Group Analysis and the Top Quark Mass in the $SU(4) \times O(4)$ String Model”, G.K. Leontaris and N.D. Tracas, Phys. Lett. [4]260B(1991)339.
24. “Grand Unified String Models and Low Energy Couplings”, I. Antoniadis, G.K. Leontaris and N.D. Tracas, Phys. Lett. 279B(1992)58.

25. “Fractional Charges and the Renormalization Group in the $SU(4) \times O(4)$ String Model”, G.K. Leontaris and N.D. Tracas, *Z. Phys. C* 56(1992)479.
26. “Threshold Effect in Grand Unified String Models”, G.K. Leontaris and N.D. Tracas, *Phys. Lett.* 291B(1992)44.
27. “Ansatz for Quarks, Charged Leptons and Neutrino Masses in SUSY GUTs”, H. Dreiner, G.K. Leontaris and N.D. Tracas, *Modern Physics Letters A*, 22(1993)2099.
28. “Predictive Ansatz for Fermion Masses in SUSY GUT’s”, G.K. Leontaris and N.D. Tracas, *Phys. Lett.* 303B(1993)50.
29. “GUT, SUSY and Top Threshold Effects in the $SU(4) \times SU(2)_L \times SU(2)_R$ String Model”, O. Korakianitis and N.D. Tracas, *Phys. Lett.* 319B(1993) 145.
30. “One Loop Corections to the Neutralino Sector and Radiative Electroweak Breaking in the MSSM”, A.B. Lahanas, K. Tamvakis and N.D. Tracas, *Phys. Lett. B* 324(1994)387.
31. “Implications of a Heavy Top in Supersymmetric Theories”, G.K. Leontaris and N.D. Tracas, *Phys. Lett. B* 345(1995)15.
32. “Low Energy Thresholds and the Scalar Mass Spectrum in Minimal Supersymmetry”, G.K. Leontaris and N.D. Tracas, *Phys. Lett. B.* 342(1995)163.
33. “Gauge-Yukawa Unification in Asymptotically Non-Free Theories”, J. Kubo, M. Mondragon, N.D. Tracas and G. Zoupanos, *Phys. Lett. B* 342(1995)155.
34. “Soft SUSY Masses and the Dynamical Determination of the Gravitino Mass”, G.K. Leontaris and N.D. Tracas, *Phys. Lett.* 351B(1995)487.
35. “Gauge Coupling Unification and the Top Mass in String Models with $SU(4) \times O(4)$ Symmetry”, accepted for publication in *Physics Letters B*.
36. “Supercompositeness Inspired from Superstrings”, P. Dimopoulos, G.K. Leontaris and N.D. Tracas, IOA.01/96, NTUA 54-96, hep-ph 9604265, accepted for publication in *Z für Physik*.
37. “Duality Constraints on Supersymmetric Unified Models and Radiative Symmetry Breaking”, G.K. Leontaris and N.D. Tracas, *Phys. Lett.* 389B(1996)515.
38. “The μ -term in Effective Supergravity Theories”, by G.K. Leontaris and N.D. Tracas, *Phys. Lett.* 394B(1997)323.
39. “Modular Weights, $U(1)$ ’s and mass Matrices”, by G.K. Leontaris and N.D. Tracas, *Phys. Lett.* 419B(1998)206.
40. “Lepton Flavour Violation in Unified Models with $U(1)$ Family Symmetries”, by G.K. Leontaris and N.D. Tracas, *Phys. Lett.* 431B(1998)90.
41. “Q-Balls and the Proton Stability in Supersymmetric Theories”, by M. Axenides, E. Floratos, G.K. Leontaris and N.D. Tracas, *Phys. Lett.* 447B(1999)67.
42. “String Unification at Intermediate Energies: Phenomenological Viability and Implications”, G.K. Leontaris and N.D. Tracas, *Phys.Lett.* 454B(1999)53.
43. “Unified Models at Intermediate Energy Scales and Kaluza-Klein Excitations”, G.K. Leontaris and N.D. Tracas, *Phys. Lett.* 470B(1999)84.

44. “On the stability of Nontopological Solitons in Supersymmetric Extensions of the Standard Model: A Numerical Approach”, A. Prikas, A. Spanou, N.D. Tracas, hep-ph/0108032.
45. “Gauge unification and Quark Masses in a Pati-Salam Model from Branes”, A. Prikas, N.D. Tracas, NJP 5 (2003) 144, hep-ph/0303258.
46. “GUT Precursors in a $SU(3)^3$ Model with $N_{COLOUR} > 3$ ”, N.D. Tracas, Mod.Phys.Lett.A19(2004) 1615-1622, hep-ph/0311183.
47. “Standard and non-standard extra matter for non-supersymmetric unification”, Alex Kehagias, N.D. Tracas, hep-ph/0506144.
48. “Towards a realistic Standard Model from D-brane configurations”, G.K. Leontaris , N.D. Tracas , N.D. Vlachos , O. Korakianitis, arXiv: 0707.3724 [hep-ph], to be published in Phys. Rev.D.
49. “Gauge Coupling Flux Thresholds, Exotic Matter and the Unification Scale in $F_5U(5)$ GUT”, G.K. Leontaris and N.D. Tracas, EPJ C67(2010)489, arXiv:0912.1557 [hep-ph].
50. “Slab Bag Fermionic Casimir effect, Chiral Boundaries and Vector Boson - Majorana Fermion Pistons”, V.K. Oikonomou and N.D. Tracas, Int.J.Mod.Phys. A25 (2010) 5935, e-Print: arXiv:0912.4825 [hep-th].
51. “Unification, KK-thresholds and the top Yukawa coupling in F-theory GUTs”, G.K. Leontaris, N.D. Tracas and G. Tsamis, Eur. Phys. J. C71 (2011) 1768, e-Print: arXiv:1102.5244 [hep-th].
52. “Coupling Reduction and the Higgs Mass”, N.D. Tracas, G. Tsamis, N.D. Vlachos and G. Zoupanos, Phys. Lett. B710 (2012) 623, e-Print: arXiv:1111.6199 [hep-ph].
53. “Reduction of Couplings in the MSSM”, M. Mondragon, N.D. Tracas and G. Zoupanos, Phys. Lett. B728 (2014) 51, e-Print: arXiv:1309.0996 hep-ph].
54. “Reduction of the Parameters in MSSM”, S. Heinemeyer, M. Mondragon, N.D. Tracas and G. Zoupanos, JHEP 1808 (2018) 150, e-Print: arXiv:1712.02729 hep-ph].
55. “Reduction of parameters in Finite Unified Theories and the MSSM”, S. Heinemeyer, M. Mondragon, N.D. Tracas and G. Zoupanos, Nucl.Phys. B927 (2018) 319-338.
56. “The LHC Higgs Boson Discovery: Updated implications for Finite Unified Theories and the SUSY breaking scale”, S. Heinemeyer, M. Mondragon, G. Patellis, N.D. Tracas and G. Zoupanos, Symmetry 10 (2018) no.3, 62, e-Print: arXiv:1802.04666 [hep-ph].
57. “Reduction of Couplings and its application in Particle Physics”, S. Heinemeyer, M. Mondragon, G. Patellis, N.D. Tracas and G. Zoupanos, Phys.Rept. 814 (2019) 1-43, e-Print: arXiv:1904.00410 [hep-ph].
58. “Updates and New Results in Models with Reduced Couplings”, S. Heinemeyer, M. Mondragon, G. Patellis, N. Tracas and G. Zoupanos, Fortsch.Phys. 68 (2020) 6, 2000028, e-Print: 2002.10983 [hep-ph].
59. “Probing Unified Theories with Reduced Couplings at Future Hadron Colliders”, S. Heinemeyer, J. Kalinowski, W. Kotlarski, M. Mondragon, G. Patellis, N.D. Tracas and G. Zoupanos, Eur.Phys.J.C 81 (2021) 2, 185, e-Print: arXiv:2011.07900.
60. “Probing Unified Theories with Reduced Couplings at Future Colliders”, S. Heinemeyer, J. Kalinowski, W. Kotlarski, M. Mondragon, G. Patellis, N.D. Tracas and G. Zoupanos, PoS EPS-HEP2021 (2022) 736, e-Print: arXiv: 2110.07261 [hep-ph].

61. “New results in models with reduced coupling”, S. Heinemeyer, J. Kalinowski, W. Kotlarski, M. Mondragon, G. Patellis, N.D. Tracas and G. Zoupanos, *Int.J.Mod.Phys.A* 37 (2022) 07, 2240010.
62. “From the Unification of Conformal and Fuzzy Gravities with Internal Interactions to the SO(10) GUT and the Particle Physics Standard Model”, G. Patellis, N. Tracas, G. Zoupanos, *Eur.Phys.J.C* 85 (2025) 3, 328, e-Print: 2412.02786 [hep-th].
63. “IPPOG: a global network for particle physics outreach and education (IPPOG Collaboration”, Pedro Abreu, Claire Adam, Calin Alexa et al, *Eur.Phys.J.Plus* 141 (2026) 2, 177, e-Print: arXiv:2509.17643 [physics.ed-ph].

F. Publications to Proceedings.

1. “Beyond the Standard Model. Summary report of the Physics-2 Working Group”, V. D. Angelopoulos et al, *Proceedings of the Workshop on Physics at Future Accelerators, La Thuile and Geneva*, vol I, CERN 87-07(1987).
2. “ e^+e^- Colliders: The Window to Z’s Beyond the Total Energy”, N. D. Tracas and P. M. Zerwas, *ibid*, vol II.
3. “Decays of Higgs Bosons to Neutralinos and Charginos in the Minimal Supersymmetric Model: Calculations and Phenomenology”, G. F. Gunion et al, *Proceedings of 1987 Workshop on Colliders and Supercolliders, Madison WI, World Scientific Publishing Co.*
4. “Superstrings: Group Report”, R. Arnowitt et al, *Proceedings of 1987 Workshop on Colliders and Supercolliders, Madison WI, World Scientific Publishing Co.*
5. “Signatures of New Quarks Suggested by the Superstrings”, N. D. Tracas, *Proceedings of the Workshop on DIQUARKS, Torino, 1988, World Scientific Publishing Co.*
6. “Superstrings Inspired Phenomenological Models” and “Phenomenology of the New Quarks”, N. D. Tracas, *Proceedings of the Greek Conference on High Energy Physics, Athens, 1988.*
7. “The β -Function of the Gross-Neveu Model”, N. D. Tracas and N.D. Vlachos, *Proceedings of the 3rd Hellenic School on Elementary Particle Physics, Corfu, 1989, World Scientific Publishing Co.*
8. “The Non-Perturbative Unification Scenario”, D. Kapetanakis, S. Theisen, N. D. Tracas and G. Zoupanos, *Proceedings of the XII Warsaw Symposium on Elementary Particle Physics, Warsaw, 1989.*
9. “Next-to-Leading N Calculations in the 2-d Gross-Neveu Model”, N.D. Tracas, *Proceedings of the International Workshop on Current Problems in Elementary Particle Physics, Ioannina 1990, North Holland Publ.*
10. “Ansatz for Quarks, Charged Leptons and Neutrino Masses in SUSY GUTs”, *Proceedings of the 4th Hellenic School on Elementary Particle Physics, Corfu, 2-20.9.1992.*
11. “Fermion Mass Matrices and the Top Quark”, *Proceedings of Rencontre de Moriond, Les Arcs, 1993.*
12. “Stringy Constraints on Effective Supergravity Models”, *HEP in the Eve of the 21st Century, Crete, 1997.*
13. “Stringy Constraints on Effective Supergravity Models”, *Proceedings of Rencontre de Moriond, Les Arcs, 1997.*

14. “Low Energy Unification: Phenomenological Viability and its Implications”, Workshop on Recent Developments in High Energy Physics, Thessaloniki, 1999.
15. “Low Energy Unification: Phenomenological Viability and its Implications”, XXI Rencontres de Blois, Blois 1999.
16. “Intermediate Energy Unification and Kaluza-Klein Excitations”, XXXV Rencontres de Moriond, Les Arcs, 2000.
17. “Intermediate gauge coupling unification in unified models of string origin”, Workshop on Current Developments in High-Energy Physics, Ioannina 2000.
18. “Reduction of couplings in a finite GUT and the MSSM”, S. Heinemeyer, M. Mondragon, N. Tracas and G. Zoupanos, Published in: *Phys.Part.Nucl.Lett.* 11 (2014) 7, 910-919
19. “Reduction of Couplings in Quantum Field Theories with applications in Finite Theories and the MSSM”, S. Heinemeyer, M. Mondragon, N. Tracas and G. Zoupanos, Published in: *Springer Proc.Math.Stat.* 111 (2014) 177-196
20. “Finite Unified Theories: A successful example of Reduction of Couplings”, S. Heinemeyer, M. Mondragon, N. Tracas and G. Zoupanos, Published in: *PoS CORFU2014* (2015) 092
21. “Reduction of Couplings: Applications in Finite Theories and the MSSM”, S. Heinemeyer, M. Mondragon, N. Tracas and G. Zoupanos, Published in: *PoS CORFU2016* (2017) 041
22. “The Higgs boson discovery: recent implications for the Finite Unified Theories and SUSY breaking scale”, S. Heinemeyer, M. Mondragon, G. Patellis, N. Tracas and G. Zoupanos, Published in: *PoS CORFU2017* (2018) 081
23. “Reduction of Couplings: Finite Unified Theories and the reduced MSSM”, S. Heinemeyer, M. Mondragon, G. Patellis, N. Tracas and G. Zoupanos, Published in: *PoS CORFU2018* (2019) 077
24. “New Results in Theories with Reduced Coupling”, S. Heinemeyer, M. Mondragon, G. Patellis, N. Tracas, G. Zoupanos, *PoS CORFU2019* (2020) 066.

F. Outreach Activities.

1. Outreach Prize from the European Physical Society-High Energy Particle Physics Division, shared with Rolf Landua (2003).
2. Greek representative in the International Particle Physics Outreach Group, IPPOG (1997-2022).
3. Coordinator of the Greek Master Classes in Particle Physics yearly events (from 2005).
4. Responsible for the Greek Outreach page www.physics.ntua.gr/POPPHYS. Also article writer and translator, images, charts and animation builder.
5. Member of the Greek Coordinator Committee for the European Programmes “Physics on Stage 1, 2 and 3” (2000, 2001 and 2003), and “Science on Stage 1 and 2” (2005 and 2006), as well as “Science on Stage-Europe” (2010-2011).
6. Scientific coordinator and translator (in Greek) of the outreach book “The charm of strange quarks”, by R.M. Barnett, H. Muhry and E.R. Queen.