Gene Yates has been on the Physiology Department faculties of:
- Harvard University,
- Stanford University, and then on the
- USC faculty in Biomedical Engineering, and
- UCLA; Departments of Medicine and of Chemical Engineering), where he held an endowed Professorship of Medical Engineering.

Following initial research at Harvard’s physiology lab, and returning to his Alma Mater at Stanford as a tenured professor, Yates’ new Physiology group showed a remarkable graph (published in 1961) finding that the weight of the adrenal gland was linearly related to the enzymatic activity of the liver, opening the field of enzymatic to formal engineering feedback systems. A second pioneering result showed proportional-derivative control as a means of speeding up responses to disturbances (1969). A third showed the negative feedback of corticosteroids detectable at the pituitary level (1969, 1971).

He is one of the pioneers of Biomedical Engineering and, little wonder, a founding member of the Biomedical Engineering Society (BMES); He served as the BMES president, and in 1973 founded its journal,
- *Annals* of Biomedical Engineering and holds their distinguished service award.

For the American Physiology Society, he founded its journal and also founded in 1997 the journal of the Endocrine Society,
- *American Journal of Physiology-Regulatory, Integrative and Comparative Physiology*
• *Endocrine Reviews* for the Endocrine Society. (which currently has the highest "impact factor" of any endocrine journal.)

For two of these journals he served as Editor-in Chief for 7 yr. Along the way, he organized three major international conferences:

- Self-Organizing Systems (1979, Ripple Foundation, American Institute of Biological Sciences, and National Academy of Sciences of Yugoslavia)
- Nonlinearities in Brain Function (1982, Kroc Foundation)
- Chemically Based Computer Designs [1983, National Science Foundation (NSF)]

Yates’ editing of *Self-Organizing Systems: the Emergence of Order* deriving from the 1979 conference was completed in 1987. Those at the conference “were distinguished in many fields: mathematics, control engineering, life sciences, physics, chemistry, computation, and philosophy... and Yates insisted that they write their contributions after they got home from the meeting, so they could take advantage of what they had learned there. (He wanted no stale "boilerplate" dropped off at the meeting itself merely to justify the air fare and all other expenses he had found funds to cover.) It took 7 yr to get all the manuscripts in hand. Each was reviewed by two others who had attended, chosen by the authors themselves, and, finally, also edited by Yates.” – Urquhart 2009: 239A

More recently, Yates published in 1982, 1994 and 2008 on biological clocks, not only in circadian 24 hour rhythms, but on cascades of shorter cycles that he holds as providing the primordial temporal organizations of terrestrial life. He updated Cannon’s classical “homeostasis” as a tactical biology to “homeodynamics” as a strategic “physical biology.” Principles of coherence of complexity principles are shown to be scale-independent. “[E]nergy through-puts and transformations in persistent, complex, open thermodynamic systems will necessarily be temporally organized in a cyclic matter, at all levels of organization” – on p. 238A of Urquhart’s 2009 “Living history” of Yates’s work and his 2008 article in Ecological Psychology, the ideas that underlie his present talk and paper on the brain are reviewed. In the latter his four aspects of the living state of matter summarizes: “Living systems are not primarily program driven, they are execution driven” because the information and dynamics “both emerge because new structures made during a preceding stage now constrain the behaviors that both create and are associated with the next stage.”
