



January 15, 2004

Dr. Troy Day
Departments of Mathematics and Biology
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Dear Search Committee,

It is my pleasure to recommend **Dr. Stephen Proulx** for the computational biology position in your department. Steve was a shared postdoctoral fellow at the University of Toronto from Jan. 2000 until September, 2001, working with Locke Rowe, Peter Abrams, Helen Rodd, and me.

Because Steve came to us directly from his thesis defense, some of his time in Toronto was spent putting the finishing touches on manuscripts arising from thesis chapters. One of the main aspects of this research was Steve's exploration of the effects of mate choice and sexual selection on adaptive evolution. Some of his PhD work developed novel ideas about how mate choice strategies can affect the evolution of niche breadth, particularly when the nature of selection varies spatially. He has extended some of these results by exploring their implications for the maintenance of genetic variation, and he has just published a manuscript that looks at their implications for rates of adaptation and speciation as well, with Locke Rowe, me, and another PDF (Pat Lorch). Steve has also been an integral member of a group of us who are developing theory that examines the interplay between sexual selection and life history evolution, and has recently had a paper from this research come out in Proceedings of the Royal Society on this topic as well.

Another aspect of Steve's PhD research involves evolution under demographic and environmental stochasticity, and he developed some very interesting and novel results about how demographic stochasticity affects sex ratio evolution. He and I explored similar avenues while he was with us, looking at the use, and misuse, of the geometric-mean fitness concept in evolutionary biology. I have always been impressed with how quickly Steve is able to grasp some of these difficult issues, and he never fails to have interesting insight and a unique perspective in our discussions.

More recently, Steve and I have continued a collaborative project developing theory on the evolution of parasite virulence. Nearly all theory in this area is based on game-theoretic models, whereas we have been exploring an approach that is more akin to quantitative genetics. Steve has been an invaluable colleague with this research and we now have a paper in press at the American Naturalist, illustrating how this approach provides interesting new insights into the factors that govern virulence evolution.

Finally, my recommendation would not be complete without commenting on Steve's personality. Steve abounds with new ideas and is very enthusiastic. He is an extremely interactive, community-minded person who loves to talk about science with both theorists and non-theorists alike. What's more, he is equally comfortable discussing science with botanists and zoologists, making him a valuable resource with a very broad range of interests. This is particularly important in a theoretician since they are often involved in many collaborative projects. I continue to enjoy working with Steve and I encourage you to consider him in your search for a new colleague.

Please do not hesitate to contact me if you would like further information.

Sincerely,

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Prof. James A. Glazier
Director, Biocomplexity Institute
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Dear Dr. Glazier,

I am writing this letter in support of Stephen R. Proulx's application for one of your recently advertised positions in biocomplexity. Steve was a postdoctoral fellow here at Toronto from January 2000 until the end of August 2001. He has since been at another postdoctoral position at the University of Oregon with Patrick Phillips, and has recently gotten an NIH grant to extend that position. For the postdoctoral position that Steve got, four faculty members in the Zoology Department pooled grant funds, and advertised for postdocs in Evolutionary Ecology in the fall of 2000. We received almost 80 applications, and Steve was both the top candidate and the first of three evolutionary ecologists we hired. He was pretty much a unanimous first choice among the four of us who were contributing money, two of whom were not theoreticians. Steve is a theoretician, so he and I have had a good deal of contact during the time he was here. I have also heard him give seminars, and have seen him at many weekly 'theory group' and journal club meetings. I've read most of what he has published since leaving here. I feel that I can give a fairly good assessment of his abilities.

Steve has an excellent background as a theoretical population biologist. He got joint undergraduate degrees in mathematics and biology, and did his PhD at Utah with one of the best young theoreticians in the country, Fred Adler. He has had a wide range of experience doing field work as well, having collaborated in work ranging from desert ecology, to seed abortion in yucca plants, to elephant seal behavior. He has also done collaborative work on the analysis of molecular genetic data. He is conversant with a wide range of mathematical tools.

Steve did not do a great deal of publishing as a graduate student. However, the two articles he published while a student were both very substantial and highly original pieces of work, both published in top journals (American Naturalist and Theoretical

Population Biology). Although it took him some time to get going, Steve ended up doing a lot of writing during his second year here, and now has had four articles published, all dealing with aspects of sexual selection, based on that he carried out here. There is still one more paper in preparation. Steve is not likely to win contests based on numbers of publications per year, but the papers he has published are substantial, highly original pieces of work.

Much of Steve's thesis work involved mate choice and sexual selection. However, that work, like most of the projects he has started as a postdoc, is characterized by an unusual and highly original combination of ideas from different subdisciplines. His *American Naturalist* article examined the relationship between niche breadth and mating systems, two topics that had seldom been examined together in the past. That work showed that evolutionarily favored levels of costly mate choice could greatly expand the range of resources used by a species, as the result of enhanced local adaptation. He has continued to work on sexual selection. Other work he did here with Troy Day has also looked at how finite population size influences the outcome of frequency dependent selection, an important topic that surprisingly had not been examined in a general way since Gillespie's partial treatment of the subject in the late 1970's. Since leaving, he has done some important work on the evolution of gene regulation, gene networks, and the evolutionary dynamics of pathogens.

Steve has had a range of teaching experiences as a graduate student, including lecturing in a mathematical biology course. In his second year here he taught in our senior seminar course in evolution with Troy Day. Although I have not had any direct contact with his teaching, his imaginative use of scenes from an Austin Powers movie to illustrate his seminar on sexual selection suggests to me that he would be a popular teacher. More to the point, he is able to describe mathematical ideas in an accessible way. He was definitely the most stimulating and insightful of the graduate students and postdocs who participated in our weekly theory and journal club meetings while he was here.

If we had a position for another theoretical ecologist/evolutionist here, I'm sure that Steve would be a strong contender. He had several interviews for tenure track faculty positions, and I suspect he will land a permanent position soon.

Sincerely,

Peter A. Abrams
Professor of Zoology