Tips for potential students of Bob MacPherson[1]

Here are some dos and don'ts (mostly don'ts) if you think you want to work with Bob. Some are a bit dated, and apply to Bob's years at MIT. However, they should be easily adaptable to IAS/Princeton.

1. *Don't ever sit in the big chair.* Instead, sit on the couch, unless of course Bob is lying down on the couch. In this case don't sit in the big chair either; just stand uncomfortably near the board.

2. *Bring lots of change for the vending machine.* An essential event in many nights with Bob is the trip to the vending machine, and you don't want to be caught short. There's an enormous Ziploc bag of change hidden in his filing cabinet, but he keeps a sharp eye on it so you'd better bring your own. Also, when at the vending machine, be prepared for him to agonize over his choice for several minutes, and then to select the *same item* each time without fail.[2]

3. *Don't attempt to make an appointment with Bob by telephone, letter, or email.* If you have read *Catch-22* and are familiar with the character Major Major Major Major, then you have some idea of how Bob's appointments process works. A variation on this rule is *If the phone rings in Bob's office while you're with him, don't answer it.* Instead, just let it ring and sit there with him and watch it.

4. *If he sits several minutes in complete silence, don't say anything.* This is not a good time to make small talk. Also don't try to apply mouth-to-mouth or anything like that. He's fine. Just wait it out. This is also not a good time to root around in the filing cabinet looking for change.

5. *If he leaves the room suddenly without announcement, don't do anything.* Just wait; he'll most likely be back. Indeed, sometimes he will leave in the middle of a sentence, then return ten minutes later to complete the sentence as if nothing happened. It's best to pretend that nothing happened. *Exception:* if he doesn't return after a half hour or so, then you have missed the last train to Braintree (and probably to Alewife too). Just turn out the lights and lock up on your way out. And this is a good time to get change from his filing cabinet.

6. *The answer to your question is . . .* From time to time you will need to ask Bob a question. No matter what your question is, the answer will be one of the following, accompanied by a suitable picture:

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[1]These remarks were delivered at Bob's 60th birthday conference at IAS in Fall 2004. Needless to say, I (Paul Gunnells) take full responsibility for them, including the True Stories section at the end.

[2]I don't remember what it was . . . Bob claims it was orange juice.

(a) The Whitney cusp

(b) The pinched torus

(c) The Grassmannian $G(2,4)$

(d) The singular Schubert variety in the Grassmannian $G(2,4)$

(e) A small resolution of the singular Schubert variety in the Grassmannian $G(2,4)$

(f) The hypersimplex $\Delta(2,4)$

(g) Langlands duality (yes, he can draw a picture of this)

You will notice that his answer doesn't answer your question. In fact, after reflection you will realize that his answer answers the *question you should have asked*, and it is your task to determine this question.[3] This will happen over and over again for several years, with the time it takes you to figure out the correct question regularly decreasing. When you reach the point when you can figure out the correct question on your own without having to ask him, then it is time to graduate.

7. *Under no circumstances should you imitate Bob in matters of dress or when you give a talk.* No beards, no Tevas with socks.

8. *Parting advice.* Here are some quick tips taken from real life experiences of real life Bob students:

   (a) Don't leave your thesis in your car (it might get stolen).

   (b) Make sure that when you submit your thesis it includes an introduction and uses verbs.

   (c) Don't make an appointment with your advisor in a foreign country and then show up 2 1/2 months late.

   (d) Make sure your thesis hasn't already appeared in an obscure journal like *Mathematische Annalen* or *Duke*.

   (e) Never refer to any mathematical problem by "But it's *just combinatorics.*"

   (f) Finally, never ever agree to give remarks like this at banquet for your advisor.

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[3]Which is absolutely the correct question, and which his answer answers correctly.