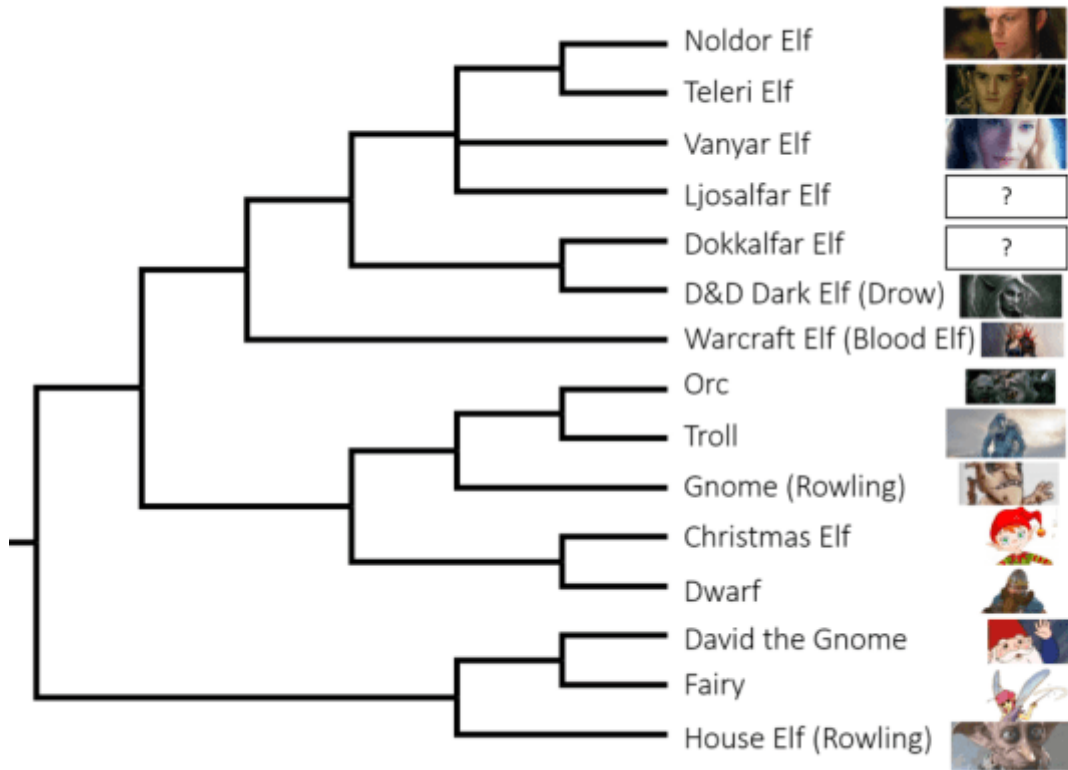




populations. In the software [Mesquite](#), we assembled a matrix of 26 categorical characters (Table 1 – see the bottom of the page-not included in this handout) from various literature sources. This character matrix was used to construct a strict consensus of the 100 most parsimonious trees (SPR rearrangement algorithm). The tree was rooted such that gnomes, fairies, dwarves, trolls, and orcs were all contained in the outgroup.

### Phylogenetic Tree



### Please answer the following questions.....

\*\*\*First note that a monophyletic or “good evolutionary group” is a group that includes an ancestor and ALL descendent lineages.

1. Given the tree above are all the organisms called Elves grouped together as a “good evolutionary group” (a monophyletic group)? Why or why not?
2. Circle the large group of Elves which DO make up a monophyletic or good evolutionary group?
3. The three Tolkien Elf species (three with photos at top) are most closely related to (share a recent common ancestor with) what Elf of Nordic mythology? \_\_\_\_\_
4. The other Elf from Nordic mythology (Dokkalfar) was found in this phylogeny to be more closely related to (or was found to share a recent common ancestor with) \_\_\_\_\_.

5. All the Elves mentioned in the questions above are a sister clade to which kind of elf?

\_\_\_\_\_

6. The Drow elves of the Dungeons and Dragons universe were proposed to be most closely related to the Tolkien elves. Is this relationship supported in the phylogeny above? Why or why not?

7. Some researchers have theorized that Elves were the origin of Orcs (or that Elves share a recent common ancestor with Orcs). This phylogeny clearly shows that Orcs are more closely related to

(or share a recent common ancestor with) \_\_\_\_\_ and not Elves.

8. Are the organisms called Gnomes a monophyletic group? Why or why not?

9. The phylogeny shows Fairies and Gnomes are closely related. Does this surprise you given what you know about the morphology (physical appearance/structure) of these two?

The authors conclude by pointing out...Do these conclusions make sense? No need to answer just check your understanding of their conclusions.

*Although more extensive taxonomic revisions are necessary we propose a number of new classifications.*

- 1. House elves (Rowling) should be considered house gnomes, and fairies are a highly evolved form of gnome that have achieved flight. We use new gnomeclature to refer to the Gnome+Fairy clade as Pixies.*
- 2. Christmas elves are in fact a type of dwarf, whose skills in stone craft have been adopted for toy making. Ancient Christmas elves probably made primitive stone toys.*
- 3. J.K. Rowlings gnomes, although having affinities for gardens, may in fact be distant relatives of orcs and trolls. We hesitantly suggest this, however, since this species has a large number of highly derived traits and secondary losses, which could potentially confound the analysis.*