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A SOMEWHAT FUZZY SNAPSHOT OF EMPLOYMENT IN PALEONTOLOGY IN THE UNITED STATES.

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In one of my favorite Sidney Harris cartoons, a dispirited looking gentleman at a cocktail party remarks "My mistake was going into cosmology for the money." (Sidney Harris is a long-time contributor to the American Scientist and the New Yorker magazines). Of course, none of us went into paleontology for the money (if you did, you were sadly misled). Nevertheless, the implicit assumption was that after years of college and graduate school, there would be at least a modicum of financial security waiting for us in the groves of academia or the aisles of a museum. The goal of this short essay is neither to give false hope or undue pessimism to eager students now entering our profession nor to prognosticate on the short- or long-term job market. What I do want to do is provide a snapshot of what the current status of employment is among the current generation of American paleontologists and provide a possible baseline for future comparisons.

The last synoptic overview of academic paleontology in the United States was published by Karl Flessa and Dena Smith in 1997 as part of Paleontology in the 21st Century (Flessa and Smith 1997). In this document, they compared employment in 564 degree granting academic institutions listed in both the 1980 and 1996 American Geological Institute Directory of Geoscience Departments. They compared trends in paleontology with those in geochemistry and geophysics. Their chief conclusions were that although the total number of paleontologists remained relatively stable, they had proportionately lost ground relative to the other two disciplines, in particular at assistant professor level. They also noted that most institutions that had a paleontologist had only one of them ("the typical lone paleontologist.")

With the help of Cindy Martinez of AGI, I have been able to obtain the original database of paleontologists used in 2007 version of the Directory (names removed). This allows a more detailed picture of the current makeup of the profession than was readily available to Flessa and Smith. The database includes two- and four-year colleges, universities, state surveys, and museums in the United States. Unfortunately, there is no detailed listing for the USGS and most other federal government agencies. Although some data is available for foreign institutions, it is of highly uneven coverage.

I have also been able to obtain the membership directory of the Paleontological Society from Roger Thomas and an analysis of the SVP membership list by Joshua Blustein that provides further information. In particular, these latter two data sources allow estimates of the number of paleontologists employed in departments of biology, zoology, botany, and anatomy to be made.

The AGI database includes paleontologists within eleven "specialty codes" based on self-identification. These are: general paleontology, paleostratigraphy (herein called biostratigraphy), micropaleontology, paleobotany, palynology, quantitative paleontology, vertebrate paleontology, invertebrate paleontology, paleobiology, "paleoecology & paleoclimatology," and geobiology. The database also includes rank identifications for each faculty members. I have reduced the twenty coded categories by merging similar ranks; for example, lecturers and instructors have been combined, as have adjunct and visiting professors. The "Other

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category" includes various museum curatorial ranks as well as state survey staff. It should be noted that many of these individuals hold joint or adjunct appointments and thus may occur twice in the database.

The distribution of American paleontologists by research interests and ranks in the AGI database is given in Table 1. I have also included the number listed by discipline outside of the United States, broken down by research interest only. A number of patterns stand out. First of all, there are about 4.5 times as many full professors than assistant professors and more than twice as many emeritus professors. This pattern is particularly striking in biostratigraphy, where there are only three assistant professors, as opposed to 31 professors and 34 emeritus faculty. This may be reflection of the precipitate decline of the employment of paleontologists in the petroleum industry (Farley and Armentrout 2000). A similar pattern can be seen in palynology. At the same time, the "youngest" subdiscipline is paleoecology and paleoclimatology, which makes up the largest group of assistant professors. Many of these faculty work on Neogene climates and environments and are thus attractive hires to departments refocusing on global change and related environmental science issues. This may also be responsible for the hires in the area of "geobiology."

The single largest subdiscipline in the database is vertebrate paleontology, making up nearly 20% of the total. The large number of adjuncts is quite noticeable, suggesting that many vertebrate paleontologists actually have primary appointments in museums or biological science departments, rather than geoscience departments.

A rough estimate of the latter number can be obtained from the SVP and PS membership directories. Both of these databases were queried for "zoology," "biology," "biological sciences," "anat-

Table 1. Distribution of research interests by rank in the AGI directory database. Research interests correspond to AGI speciality codes 401-411. Rank categories have been somewhat merged: Lecturers = lecturers + instructors; Associate professors include associate scientists; Professors include those listed as chairs, heads, and directors; Adjuncts include visiting professors; Other category research associates, curators and other museum staff, and survey scientists. Scientists outside of the United States not-broken down by rank.

Field / Rank	General	Biostratigraphy	Micropaleontology	Paleobotany	Palynology	Quantitative	Vertebrate	Invertebrate	Paleobiology	Paleoecology/Paleclimalotolgoy	Geobiology	Totals
Lecturer	9	3	5	0	1	0	8	4	2	6	1	39
Assistant Professor	10	3	7	2	1	0	13	10	5	20	10	81
Associate Professor	12	9	10	5	2	2	23	21	10	35	9	138
Professor	30	31	41	15	13	0	56	59	56	42	16	359
Emeritus	25	24	20	6	7	0	34	39	11	16	2	184
Adjuncts	15	7	7	10	5	0	33	13	4	15	1	110
Other	19	3	9	10	6	2	31	14	3	8	8	113
U.S. totals	**120**	**80**	**99**	**48**	**35**	**4**	**198**	**160**	**91**	**142**	**47**	**1024**
Non U.S.	57	9	25	5	19	0	22	36	6	14	8	199

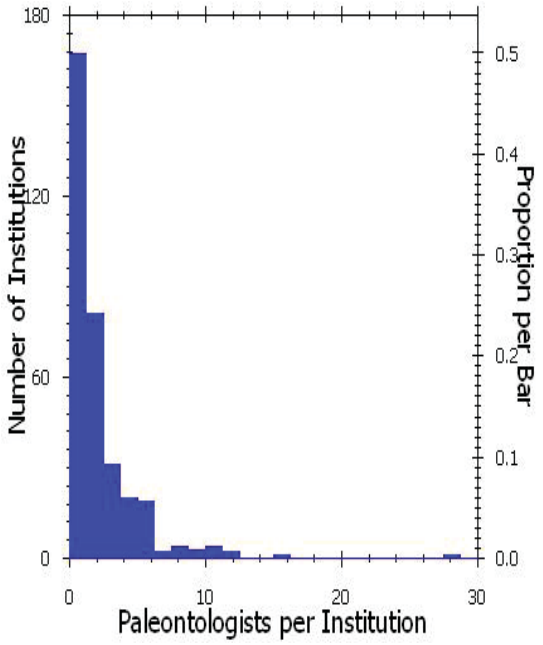
Table 2. U.S. Institutions with paleontologists in the 2007 AGI Directory.

Type of institution	Number of institutions	Paleontologists
Community college	12	21
Four-year college	63	89
University	286	723
Museum	16	139
State survey	11	19

omy," or "botany" in the department names. There are 665 full members of the PS in the United States; of these, 62 are in biological science (s. l.) departments. Of 1868 non-student members of the SVP (*not* restricted to the U.S.), 313 are these departments. Given that many paleontologists belong to both societies, and that the SVP count is not geographically restricted, there are probably on the order of 100 professional paleontologists in the U.S. that are not included in the AGI Directory.

Other demographic patterns can be obtained from the two membership directories. Of the total of 1064 U.S. members of PS (1435 total members), 210 are students and 175 are of retired or emeritus status. The SVP has 664 students out of total of 2532 members. Student interest in dinosaurs and their ilk remains strong!

Figure 1. Distribution of paleontologists in 4-year colleges and universities. The University of California at Berkeley is the outlier.



Returning to the AGI database, I attempted to breakdown the positions by type of institution, based on either institution or department name (Table 2). The categories I used were Museum, University, Four-year College, Community College, and State Survey. It can readily be seen that most paleontologists are employed at the university level.

How about the "lone paleontologist" pointed out by Flessa and Smith? The current distribution of paleontologists at the 349 four-year institutions is shown in Figure 1. Roughly half employ only one paleontologist (mine included). For universities alone, the percentage is 44%, up from the 34% figure given by Flessa and Smith. It is only in museums and a few university departments that large concentrations of paleontologists occur.

Where does this leave us? As I point out in a recent essay in *American Paleontologist* (Plotnick 2007), paleontology as a discipline has numerous strengths and opportunities but has clear weaknesses and is facing significant threats, not the lease of which is the erosion of funding and positions. The issues and suggestions raised a decade by Flessa and Smith remain. Continued efforts to address these issues, by our societies, by high profile paleontologists, such as members of the National Academy of Sciences, and by the community as a whole are necessary.

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