## nature

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## **Counting astronomers in Europe**

ASTRONOMERS sometimes like to count the number of objects in a portion of sky, and compare it with the numbers in other regions. They find the task beset with difficulties: how to define the objects, how to allow for changing obscurations in the different parts of the sky, and —most of all—how to draw conclusions from the results. This week the European Science Foundation publishes a survey of astronomers, comparing numbers and age distributions among the countries of Europe; and they seem to have come across much the same difficulties.

First there was a problem in defining "astronomers". In January 1977 the Astronomy Committee of the ESF sent out a circular asking member organisations for numbers and age distributions of "holders of PhDs or persons of equivalent competence working actively as scientists in a field of astronomy". The UK, for example, reporting through the UK's Science Research Council, included space scientists and aeronomers; other countries may have restricted themselves to the ground-based astronomers. Measurement techniques also varied, with ten of the reports coming through official bodies and six through individual astronomers. Different countries presented their data in different ways.

Furthermore the careers of astronomers vary greatly among ESF members. In Sweden, for example, a PhD is often not awarded until the student has done the equivalent of a few years' post-doctoral work in the UK. He or she is thus highly committed to astronomy, which may explain the Swedish experience that PhDs find great difficulty in obtaining jobs outside astronomy or teaching. There is even great variation among the Swedish universities; according to the ESF report 74% of PhDs from Stockholm, but only 18% from Uppsala remain in astronomy. Again, the UK, with 724 astronomers, stressed to the ESF "the high technological competence (involving computers, electronics and communications) of young astronomers" and did not see any difficulty in their finding "congenial employment outside astronomy"; whereas Austria, with 31 astronomers, believes astronomers to be "less attractive to industry than other physicists".

Nevertheless—with all these variations—the figures are interesting, if difficult to interpret. There appear to be 2,400 astronomers in the ESF's 16-member Europe, consisting of most EEC countries plus Austria, Greece, Norway, Portugal, Spain, Sweden, Switzerland, and Yugoslavia; there were 1,300 in the US in 1973. 60% of the European astronomers are under 40 years of age, 50% of them 30 to 40. 75%have tenure ("a permanent or semi-permanent post"). The tenured astronomers average 41 years of age; the nontenured 32. There are some interesting differences between countries. For example Italy has 32 non-tenured astronomers at an average age of 27, but 250 tenured with an average age of 36; while Austria has 18 non-tenured at 32, but only 14 tenured at 50. Italy has increased its numbers of astronomers by 165% since 1965, the report notes.

If the figures are to be believed—and their compiler, Dr M. O. Ottosson, thinks they are accurate to "10 to 20%"—the UK leads Europe in the number of astrono-

mers per million inhabitants: 13, to the Netherlands 10. The least astronomical are Portugal (0.6) and Spain (1.3). The UK also has the largest total number—724—with West Germany and France next at 438 and 424. Portugal and Norway have the fewest—5 and 12. Spain has 45 astronomers, for a population of 36 million.

Coming to jobs, the report estimates that there will be some 350 retirements among European astronomers over the next 15 years. "Taking other factors into account, including the creation of new posts", the report estimates there will be some 50 jobs per year. This it compares with the 220 astronomy PhDs emerging each year.

The latter comparison—mild compared with the ratio in some other disciplines such as high energy physics or molecular biology—may have led the Astronomy Committee Chairman, Professor R. Lüst of West Germany, to comment in his preface that "projections for the future show discouraging figures concerning the employment possibilities for young PhDs in astronomy and the development they predict is a rapid decrease of the population in the younger age groups."

But such a view was not without its dissenters. The UK astronomer Professor F. Graham Smith has since remarked that the view is "disastrous" for it may discourage people from taking up astronomy. And in the UK at least Professor Graham Smith considers astronomy to be an excellent training ground, particularly through astronomical technology, for students seeking further employment. Jodrell Bank has been very successful in placing such people, for example. Over the past 20 years, three quarters of PhD astronomers have found other jobs, Professor Graham Smith believes. The report was held back in its initial version until something of this view could be represented in it; in the event it is represented, in several places, but the preface takes a different line.

Whatever the merits of this case, the astronomy manpower report seems to have raised a question for the ESF. How should it tackle and report on such studies in the future? The ESF has had considerable success with its survey of research expenditure in its member countries, but the accounting procedures in the various countries are a good deal more alike than their systems for assessing manpower. Yet this important issue—in all fields, not just astronomy—deserves European comparison precisely because the experiences in Europe are so different. Only where there are differences can there be lessons.

The ESF is in a perfect position to draw these comparitive lessons. But it has a tiny staff (around 10) and cannot be expected to produce the kind of mammoth, comprehensive report that emerges occasionally from the US National Academy of Sciences. Anyway, adopting the philosophy of its President, Sir Brian Flowers, it takes 100 times the effort to produce results that are 10 times as significant. That being the case, and differences being the significant element in this matter, it may have been better if the ESF had produced edited versions of the country reports—despite their differences in approach—with additional notes of comparison and explanation. It would no doubt still be very interesting to ESF members if it were to circulate such a document.

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