To quantify the state of the art is an important task, since this is the only way to point out deficits in the general set-up of a science. The usual approach to obtain such quantification is to rate publications by rank of the journals in which they are published. Certainly, that approach will give a general picture of the quality of scientific work done so far. But as far as archaeology is concerned, a spatial concept is of interest, that provides an idea how well an archaeological landscape is known. In this paper an alternative approach will be put forward that uses a database of an archaeological survey, actually its data model, to develop a measure for the state of the art of an archaeological landscape.

The database used for this purpose is the National Archaeological Survey (NAS) run by the Austrian Federal Commission on Historical Monuments. Its data model (MAYER 1996, 2002) discerns between topographical places and sites, where the latter contains - among others - information on dating, location, cultural affiliation and class of site (like settlement, burial place, deposit and stray finds) grouped by class of site and dating.

<table>
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<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
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<td>coordinates</td>
<td>parcel of land</td>
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<td>period 2 (Iron Age)</td>
<td>period 3 (Early Iron Age)</td>
<td>phase (Ha C,..)</td>
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<td>cultural affiliation</td>
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<td>known</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>class of site</td>
<td>unknown</td>
<td>context</td>
<td>settlement, burial place</td>
<td>specification of the latter</td>
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</tr>
</tbody>
</table>

Table 1 Scores

Databases of archaeological sites provide a huge amount of information on the archaeological landscape. This information does not only refer to the location of a site but also to exactness of dating, number of reports and their temporal distribution thus providing an important source for assessing the state of the art in an archaeological perspective. To analyse this information, each site is scored according to formal aspects (location, dating etc.) as prescribed by the data model of the database to which the information is stored and weighted against the maximum possible score of a site.

The spatial distribution of the scores is then analysed by means of Geostatistics, spatial autocorrelation and Geographically Weighted Regression (GWR) to provide an overview over the knowledge of the archaeological landscape under investigation.

The paper will present a study of about 25,000 sites from about 9,000 geographical units in Austria where information is taken from the National Archaeological Survey conducted by the Federal Commission on Historical Monuments, Vienna. Aim of the study is to explain the local differences in knowledge of Austria’s archaeological landscape such determining regions of poor archaeological provision.

As an illustration of some methodological aspects of the approach introduced here, scores of prehistoric sites will be used that stem from the parts of Austria already covered by the NAS. The study area comprises 44,613.58 km² that is 53.18% of the Austrian territory. 5,640 out of 10,082 mapable places are considered. A full account of the results obtained from the analysis of all data will be given by a mapping project and be published in the Fundberichte aus Österreich.

The distribution of the sum of scores is of major importance for the methodological aspects of this approach to quantify the state of art. Firstly, the scores used here are discrete, meaning that only 13 distinct values can be attributed. Of course, a finer terminological grid would produce a greater variety in the values, therefore the distribution of scores is a distribution in blocked form. Secondly, this distribu-
tion gives an idea how we can rate the state of the art as good or bad: It is clear that a better state of the art than found in the working area would have a higher average score. If the state of the art is homogenous through the working area, the standard deviation would be small. Further, if the average of scores gets close to the maximum obtainable score, the distribution may be skewed to the right. Of course, life would be easier if the scores would be normally distributed which they are not. Therefore, we cannot use the three first moments of a normal distribution (average, standard deviation and skewness) but at least we can replace them by their robust counterparts.

By virtue of the problem, we are dealing with a spatial phenomenon. Therefore, the overall distribution of scores calculated from the working area does not describe the state art in a region satisfactorily. Applying kriging (Cressie 1993:29) as a method of spatial analysis to the data, we obtain a spatial picture of the general situation. But this picture is as informative as deceptive. In fact the cross validation coefficient of the underlying model is only about 0.45. Although a highly significant value, the determination coefficient is only about 20%. Of course, one wonders where the rest of the variation has gone. Looking at the variogram we see that the variation within the data sets off on an already high value at low distances and the spatial dependency is measurable only to rather small distances (about 1.8 km). This means, that good knowledge of one site does not necessarily guarantee a good knowledge of a site nearby. What about exactness of location, class of site, dating and cultural affiliation? Exactness of location as well as class of site showed simply no spatial dependency. This is because the scores of these two attributes of the sites have very low standard deviations, the exactness of location due to the excellent archive work done with the archaeological survey, class of site because most of the sites are known only by surface finds. The map shown in Figure 1 shows the spatial distribution of the sum of cultural affiliation and exactness of dating. The other variables are ignored for being of less importance. The correlation between estimated and actual data is only about 0.5 for reasons discussed already. Clearly "good knowledge" is quite rare.

Undoubtedly, the quantification of the state of art in archaeology by the proposed approach has produced very interesting insight into Austrian archaeology, although results presented are not necessary good news.
REFERENCES


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