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"A Bavarian comparison"

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The Charles Close Society was founded in 1980 to bring together all those with an interest in the maps and history of the Ordnance Survey of Great Britain and its counterparts in the island of Ireland. The Society takes its name from Colonel Sir Charles Arden-Close, OS Director General from 1911 to 1922, and initiator of many of the maps now sought after by collectors.

The Society publishes a wide range of books and booklets on historic OS map series and its journal, *Sheetlines*, is recognised internationally for its specialist articles on Ordnance Survey-related topics.

A Bavarian comparison

R C Wheeler

The idea of a national survey on regular sheet lines to something like the one-inch scale is French. In England the French example was emulated, in countries such as the Netherlands it was imposed; in other places the process might be described as 'fraternal assistance'. I propose to examine one of the countries in this third category, partly because there is a convenient book [1] which prints verbatim a lot of the surviving material, but mainly because it appears to illustrate an alternative path of historical development which the Ordnance Survey might have followed.

Bavaria had suffered between 1795 and 1801 from being a battlefield between France and Austria. The new Elector, Maximilian IV Joseph, threw in his lot with France by a treaty of 24 August 1801 and until 1813 remained France's most reliable ally among the German states. A Topographical Bureau had been created in 1800 as an instrument of cartographic pillage. Bonne was made its director in January 1801 and in the course of that year its role changed to the production of a map of Bavaria based on the material it had collected. This project appears to have continued under the Army of the Rhine at Strasbourg and resulted in the 1:100,000 Carte de la Bavière, which, insofar as it was completed, was a handsome map, well suited for military use. The Munich version of this same project led in due course to the Bavarian 1:50,000 atlas.

The country needed maps both for military and for civil purposes. The principal civil requirement was for a cadaster that could provide a new basis for the land tax; the laying out of new roads and canals was seen as a further application. To press ahead with these civil applications, a Cadaster Bureau was set up in 1801 alongside the Topographical Bureau. The former would undertake detailed survey, based on points fixed by the latter.

With the immediate needs for military maps and for a cadaster being addressed by others, Bonne could turn his hand to science. A base was laid out near Munich, more than 21km long, and was laboriously measured. Bonne's length agrees quite closely with modern figures - though it would be closer still had he not made the mistake of subtracting a temperature correction rather than adding it. Whereas in England Mudge was happy to publish maps quickly and worry about the projection later, Bonne was determined to use a conic projection (his own, naturally) based on a figure of the earth that he himself had measured. Seemingly it would not do to assume that the Bavarian world had the same dimensions as the French one, despite France having the advantage of a much longer arc to measure. Or maybe Bonne as a scientist was unwilling to use a rival's results. This meant that no maps could be published until triangulation of the arc was complete. In fact, when the measurement of the arc was complete, Bonne seems to have doubted his own result and decided to split the difference

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[1] Alfons Habermeyer, *Die Topographische Landesaufnahme von Bayern in Wandel der Zeit*, 1993 - copy available at Cambridge.

between his figure and the French one.

The Foreign Ministry, under which the bureau was placed, became restive at the amounts it was paying for no tangible result. (Putting the bureau under the Foreign Ministry was itself an interesting choice, as though the main reason for the bureau's existence was to keep France sweet.) In 1806, the bureau produced its first publication, a plan of Munich at 1:1666. It is a handsome plan, but a diversion from the bureau's main objective. One wonders whether it antagonised the private surveyors who might otherwise have produced such a plan, or whether in the uncertainties of war no private individual was prepared to risk such a venture.

The following year, Bonne was eased out and the organisation became the Statistical-Topographic Bureau, acquiring a second section whose task was to produce all manner of statistics about the localities being mapped. One is reminded of Ireland, but the Bavarian account was kept within manageable dimensions. Bare statistics were larded with details that conveyed the character of a place while remaining of military relevance. For example, we learn that Göggingen, though only having 153 houses, possessed a dance hall with its own billiard room.

Eventually, in April 1812, the first two sheets of the planned 126-sheet 1:50,000 Atlas were published. Five years later, the number had risen to nine. Since the Bureau had been formed, Bavaria had become a kingdom and its boundaries had changed three times; it is perhaps fortunate that most of the mapping activities were in the central part of the country, unaffected by these changes.

The decade following Bonne's departure was not a happy one: the Foreign Ministry tended to cut budgets when it was looking for savings, leading to surveyors being employed but unable to do any fieldwork because the funds for this had been withdrawn; after 1815 the Ministry presumably saw little value in the Survey's output. Consequently, in 1817 the Survey was transferred to the Army, becoming part of the Quartermaster-General's staff. The new arrangements worked well. Most of the surveyors were now regimental officers; that meant that in war they went back to their regiments but for almost half a century Bavaria was at peace. The arrangements also meant that the surveyors' salaries were a charge on the overall army budget. The army saw a survey posting as good training: quite a few cadets were attached for this reason. The main General Staff also involved the Survey in its staff rides, for giving staff officers an understanding of the tactical importance of topography. There are parallels here to the Ordnance Survey, and one is reminded of Mudge's involvement in the training of cadets. The new Director understood the need for results too. Several sheets appeared quite quickly; most of the work had been done under the previous administration but they had been left unfinished.

Prior to 1817, the Cadastral Survey had complained about the topographic survey's output: the fixed points they were provided with were too few and too inaccurate. The former complaint is understandable enough: an organisation producing maps at 1:5000 will always want far more points than a topographic

survey cares to provide. The latter is more puzzling: it might be explained by the fact that the topographic surveyors also undertook plane-tabling and may have used it for lower-order points; however, a letter of June 1819 from Soldner at the Cadastral Bureau seems to imply a more general dissatisfaction. At any rate, the Cadastral Survey had been undertaking its own triangulation - and also used its own (Soldner) projection. In 1820 an attempt was made to merge the two nets: the Cadastral Survey was to be responsible for 1st-order triangulation, with lower-order work being done jointly.

This left the military topographic bureau with little more than the task of providing the relief, initially shown with hachures, drawn after the system of Lehmann, in which the amount of black is proportional to the slope of the ground. The bureau also employed the draughtsmen and engravers who produced the 1:50,000 sheets and it dealt with the business of publishing them. That final stage seems to have been more troublesome than in the UK, with argument over the spelling of place names leading to numerous corrections to the plates. Electrotyping was introduced only in 1879 and even then was limited by the hydro-electric power source used.

The engraving and printing of the maps were undertaken with unusual care. The roads are easily distinguished from the finer hachures through printing in dark black, whereas the finer hachures come out as grey or even a greenish-brown. This is not achieved though colour-separation (although this was introduced later) but seems to arise from the manner of engraving combined with the nature of the ink. It would appear that the lines engraved for roads were able to admit the particles of lamp-black - or whatever it was that provided the blackness - which were duly transferred to the paper, whereas the finer hachures only took in the more liquid parts of the ink.[2] Various types of paper were investigated. That used initially came from the Vosges and was proudly described in 1811 as being the self-same paper used for copper plates by the Imperial (ie Napoleonic) Commission for the Monuments of Egypt. It is certainly true that over the four decades from the 1820s a consistent type of heavy cartridge paper is used throughout.

In terms of their content, though, the maps lack the interest of the OS Old Series. There is little in the way of antiquities, or of industry. Even the railways, when they appear, seem to be plonked down on the face of the map rather than related to the topography they pass through. Apart from woodland, there is a symbol which seems to be used indiscriminately for meadow, rough pasture and heath. The villages tend to be somewhat formless clusters of houses; some of them do not seem to have any meadow or pasture, which seems improbable: perhaps smallish areas of meadow were omitted from the map. It is as though the interest in depicting relief swamped all other considerations. The series seems to cry out for reduction to 1:100,000, and that is indeed what happened, not long

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[2] The sheets I have examined are CUL Maps 257.01, a collection started by the War Office before the completion of the series in 1867 and continued by the addition of the final sheets when they were published.

after the completion of the atlas (1867) and German unification (1871), when Bavaria took responsibility for 80 of the 674 sheets of the new 100k Karte des Deutschen Reiches.

The cadastral survey sheets at 1:5000 were drawn on stone as early as 1808 and the massive collection of 26,000 lithographic stones remains in Munich.[3] A 1:25k reduction was drawn, a *Positionskarte* being formed from 4x4 cadastral plans. This appears originally to have been an index sheet for office use. Some were attractively drawn in colour; others were more in the nature of sketches. Originally they were the source from which the detail of the 1:50,000 was drawn, although later on the original cadastral plans were used directly. Once the 1:50,000 atlas had been completed, work started on updating and contouring it. As part of this process, new *Positionskarten* from this date had contours added to them by the Topographic survey. About this time the new 25k sheets started to be made available for sale. From 1901, they became a three-colour product (relief in brown, water in blue) with hill-shading (*Schummering*). This was part of a project for a 1:25,000 series covering the whole of Germany. The survey insisted on revision and redrawing before it would publish any of these sheets and estimated a total cost of 5.5M marks for 888 sheets; consequently only the southern part of Bavaria was ever published. In the inter-war period part of northern Bavaria was published on the lines of the Prussian *Messtischblätte*. The centre part was still unpublished in 1945.

As contouring became available, the 1:50,000 was issued likewise in 3-colour form. Indeed it was offered in a variety of forms including a cheap monochrome version printed by offset-litho methods. But as late as 1939 a large part of the country was still uncontoured.

Seen from a UK perspective, it seems odd to put trig and large-scales in one organisation, contouring and small-scales in another. In fact in 1930 the topographic survey organisation was merged into the old cadastral survey which had by then been renamed the Landesvermessungsamt. Seen from a Bavarian perspective it seems remarkable that Colby managed to transform what had been an English topographical survey organisation into what was a sort of cadastral survey of Ireland and then move the Irish operation back to England. Indeed, one can argue that the six-inch scale in Lancashire & Yorkshire was too large for military use and too small for land-management or to support a cadaster. The view (held by the Duke of Wellington, amongst others)[4] that the one-inch should stop at the Preston-Hull line because the six-inch was available further north seems from a Munich viewpoint to be utter madness. Everything the Bavarian surveys ever started was eventually completed, albeit (sometimes) on different sheet-lines.

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3 I Mumford, *Milestones in Lithographed cartography from 1800* (University of Reading thesis) provides useful information about their production.

4 R Oliver, *The Ordnance Survey in the Nineteenth Century*, Charles Close Society, 2014,149.