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Nineteenth century genetic structure of Selsey, West Sussex

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RESUMO

O objectivo deste trabalho é alargar o âmbito de trabalhos anteriores que mostraram que, na população histórica de uma paróquia da costa leste da Inglaterra (Fylingdales, North Yorkshire) a distribuição de apelidos e, implicitamente, a estrutura genética é distinta entre diferentes grupos ocupacionais. Utilizam-se os dados tirados dos censos de Selsey, West Sussex, no século XIX. Selsey foi, até ao século XV, uma comunidade isolada por terrenos pantanosos na península de Manhood, a cerca de 15 Km a sul de Chichester e alimentando um número de grupos ocupacionais que incluía tanto o comércio marítimo como o de produtos agrícolas e empresarial.

O coeficiente de Lasker de «afinidade» por isonímia (R_i) e o escalonamento multidimensional e não métrico dos resultados, são usados para demonstrar a estrutura genética. Este trabalho alarga-se ao exame do modo como a troca marital entre grupos ocupacionais pode mascarar o seu aparente relacionamento por isonímia.

Palavras-chave: Isonímia; Migração; Ocupação

ABSTRACT

Our aim is to extend earlier work which showed that in the historical population of a parish on the east coast of England, (Fylingdales, North Yorkshire) the distribution of surnames and, by implication, the genetic structure is distinctive among different occupational groups. We use data extracted from the nineteenth century censuses of Selsey, West Sussex. Until the present century Selsey was a community isolated by marshy ground on the Manhood peninsula some 15 Km south of Chichester, and supporting a number of occupational classes including maritime, agricultural and entrepreneurial trades. Lasker's coefficient of relationship by isonymy (R_i) and non-metrical multidimensional scaling of the results are used to demonstrate genetic structure. We extend this work further by examining the way in which marital exchange between occupational groups may belie their apparent relationships by isonymy.

Key-words: Isonymy; Migration; Occupation.

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INTRODUCTION

Lasker's approach to measuring the genetic structure of historical populations by calculating the coefficient of relationship by isonymy (R_i) from surname distributions is notable as much for its economy of computational effort as for the simplicity of its required database, which is no more than a listing by name of the individuals who comprise the population (LASKER, 1977). These advantages have encouraged its widespread and to our minds valuable application in spite of its tendency to overestimate kinship through the assumption that surnames are monophyletic and possibly to misrepresent kinship owing to the inequality of male and female migration patterns.

In previous papers (SMITH and HUDSON, 1984; SMITH *et al.*, 1984) the claim was made that for a coastal parish in the north of England (Fylingdales, North Yorkshire) the patterns of surname distribution during the nineteenth century indicate a community consistently subdivided by occupation. One surname group comprised fishermen, sailors and shipowners, a second consisted of farmers and agricultural labourers, whilst a third was made up of tradesmen, craftsmen and professionals. This pattern of surname relationship was relatively stable from 1841-1881, with the maritime community markedly the most conservative (Fig. 1).

Here, we extend this work by a comparative analysis of a parish on the south coast of England, Selsey in West Sussex. The choice of Selsey gives substantial geographical contrast to Fylingdales but yet still provides a population which can be divided into a few main job categories all of which are relatively numerous. It seemed especially worthwhile to choose a population with fishermen as they have been characterised as isolated groups both in Fylingdales and elsewhere (SMITH *et al.* 1984; CLARK 1982, HARVEY *et al.* 1986). A second part of the analysis tests the assumption employed in R_i estimation, that male and female migration rates are equivalent.

HISTORICAL BACKGROUND

Selsey is situated on the peninsula of the Manhood, 15 Km south of Chichester. Built upon a ridge of raised land, it is surrounded by sea on two sides and on a third (to the north) by low marshy ground. In the nineteenth century Selsey was little more than a small village — the biggest population at census was about nine hundred — sustained almost entirely by agriculture and fishing. The Selsey peninsula provided a wide variety of fish including «Selsey cockles» and other shellfish. With the harbour closure in 1873 the cockle industry was finished, but although dredging for oysters also declined towards the ends of the nineteenth century the annual income from fish sold locally was still considerable.

The historian of Selsey, Heron-Allen (1911), found that «the fishermen of Selsey form a curiously isolated and independent body, having little or nothing to do with the village proper». Though there was no guild of fisher-

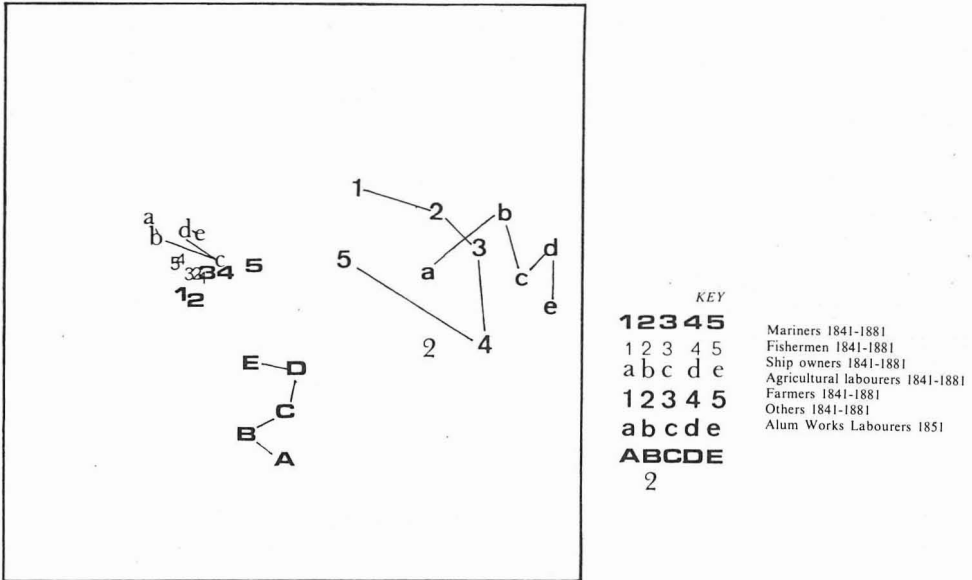


Fig. 1 — NMMS plot of isonymic relationships between occupations, 1841-1881, Fylingdales.

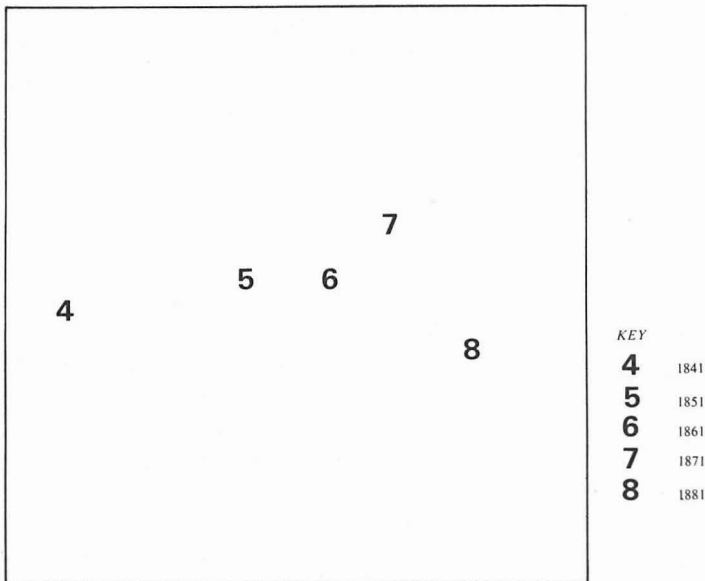


Fig. 2 — NMMS plot of isonymic relationships between census populations 1841-1881.

man as such, in practice they operated a closed shop, and a «foreigner» (i.e. a man from another parish) could join the trade initially only as a mate to an established fisherman and thence, gradually, work his way into the community. We have no equivalent particulars of employment in agricultures in Selsey though, like the Chichester district as a whole, it was prosperous in the mid-nineteenth century, and the new Corn Market, built in Chichester in 1835, became one of the south's chief trading centres. The only other noteworthy employer in nineteenth century Selsey was Mr. Pullinger, whose mousetrap factory was established in the 1850's. Although this enjoyed a considerable reputation with sales of over a million mousetraps by 1882 (WOLFF, 1883) it employed a maximum of only forty workers, and of these but a minority are to be found in the Selsey censuses — fifteen in 1861, seventeen in 1871.

METHODS AND MATERIALS

The surname and occupation of each working man was extracted from the census returns of 1841, 1851, 1861, 1871 and 1881. Females were excluded from the analysis owing to the peculiar distribution of female occupations and the fact that married names do not indicate common descent. The surnames were then grouped into the following occupational categories: agricultural labourer, farmer, fisherman, coastguard, and the catch-all category «other», comprising mainly, tradesmen, craftsmen and professionals. Agricultural labourers included the related occupations «farm labourers», «farm servants», «shepherds» etc.

When these occupational subdivisions of population had been established, the lists of working men's surnames were used to calculate the values of R_i over the period 1841-1881. In the second part of the analysis the names of marriage partners, and the occupations of grooms and fathers were extracted from the Anglican marriage registers 1840-1875, and matrices of transition between occupations were prepared.

RESULTS AND DISCUSSION

Before presenting and discussing these results in detail, we offer some general comments on the data. Many of the surnames vary in their spelling within and between censuses. For example, Mold, Mould, Mald; Pannel, Perrin, Perren, Pannell. These variations are probably due both to inconsistencies in recording phonetically what were still essentially spoken names and to uncertainties in deciphering the original script. To avoid combining names with possibly different origins each variant was considered separately, even though several may have represented the same lineage. We later repeated the analysis with like-sounding names combined, and found there to be substantial agreement between relationships produced by the two methods (SHERREN, 1983).

Another general consideration about Selsey surnames is that several of the most frequent appear to be peculiar to the Sussex region. According to Cottle and to Reaney these include Jenman, Ginman, Arnell, Penfold and Stubbington. GUPPY (1890) in his survey of the names of landholding farmers also mentions Penfold as an old Sussex name, associated particularly with Chichester. More locally still, some surnames may actually be identified with Selsey itself and can be traced in the earliest records. For example, HERON-ALLEN (1911) cites *Shepherd* as being one of the principal and oldest Selsey families. He also states that the *Woodland* family are first recorded as land-owners in 1295, though the family derives originally from Middlesex. Both *Shepherd* and *Woodland* appear in all the censuses from 1841 to 1881. Such is also the case for the name of *Clayton*, which HERON-ALLEN records as having been first brought to Selsey by a Mr. NEWTON CLAYTON in the reign of CHARLES I. Whilst we must not overlook the occurrence of more common and widespread names, the high frequency of relatively unusual and localised surnames in Selsey suggests a considerable degree of historical isolation (c.f. GUPPY, remarks on DEVON and CORNWALL, 1890).

The data set is not large, fewer than 1500 cases all told, and Table 1 shows a breakdown by decade and occupation. Clearly some stochastic variations might be expected, especially among farmers and coastguards. For the whole population R_i was computed between decades, and for the summed data from 1841-1881 R_i was computed between occupations. Non-metrical multidimensional scaling plots of these relationships are shown in Figures 2 and 3 respectively. Figure 2 may be viewed as the population trajectory through time, and shows a fairly steady rate of change. The pattern between occupations (Figure 3) is interesting for the great distance between the coastguards and the rest of the population. This graphically illustrates the extent to which coastguards were outsiders in a maritime community.

More detail can be read into the relationship between occupations when R_i is calculated between each job category in each decade. This yields a 25 by 25 triangular matrix which is summarised by the NMMS plot Figure 4. We can see now not only that the coastguards were remote from the rest of the population but also that they were by far the most labile group. We commented above that the farmers and coastguards both had small population sizes and might be expected to show random variations through time. The contrast here could not be more marked: the coastguard population represents short term postings of naval officers whereas the farmers are a stable land-holding group.

Although there is the same tendency as was observed in Fylingdales for the populations to be partitioned by occupation — the discrete clusters of fishermen, agricultural labourers and, to a lesser extent, farmers attest this — there is clearly more overlap, with the tradesmen and agricultural labourers rather close to each other in 1861, 1871 and 1881.

We turn now to the other aspect of the analysis, based on Anglican parish registers. The point of this is to compare the pattern of change of male occupation from father to son with the movement of daughters from one

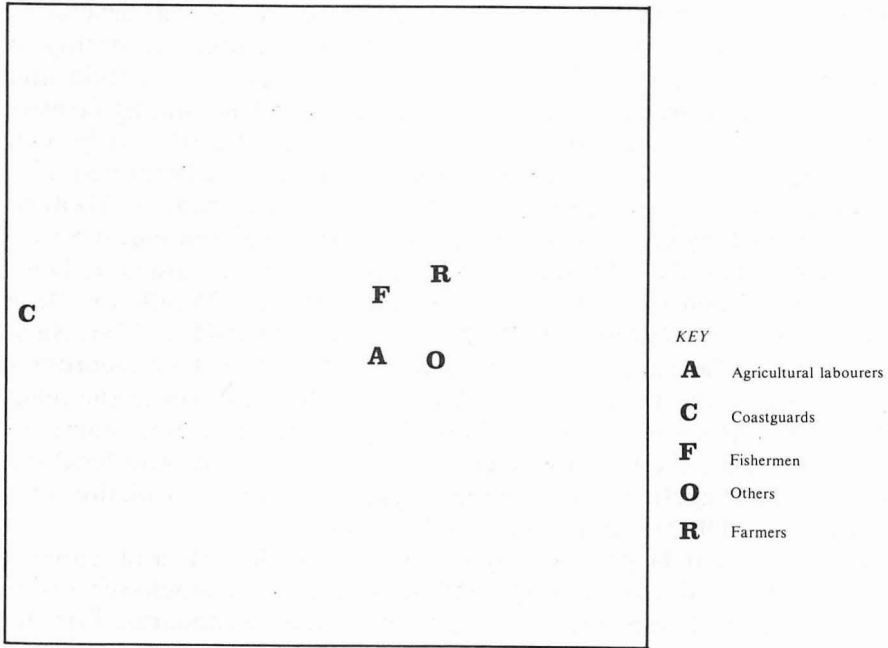


Fig. 3 — NMMS plot of isonymic relationships between occupations, whole period, Selsey.

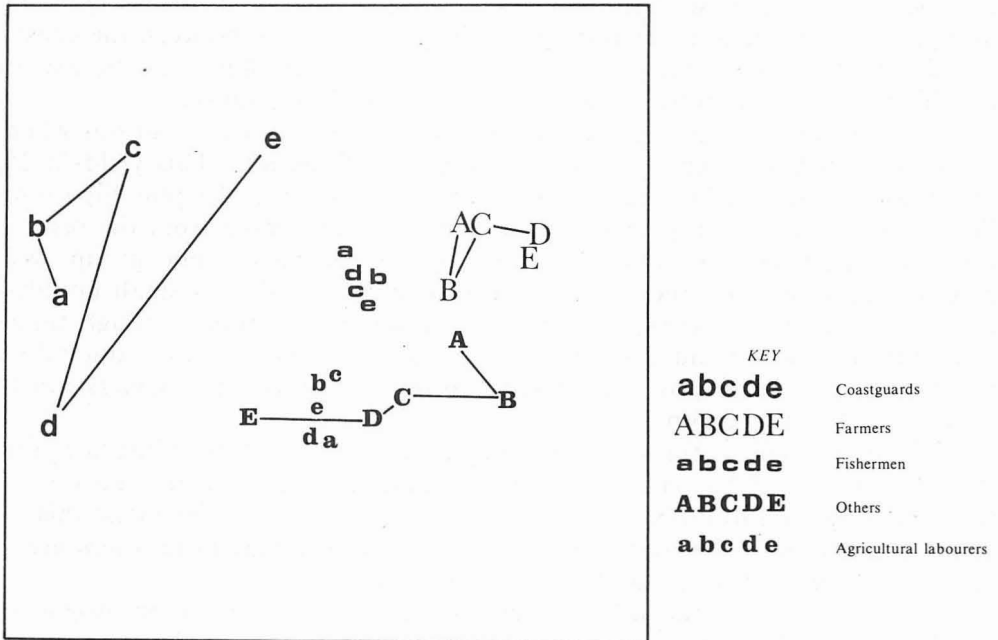


Fig. 4 — NMMS plot of isonymic relationships between occupations, 1841-1881, Selsey.

TABLE 1. *Census numbers of working man in Selsey*

| Year | Occupation | | | | |
|------|------------|-----|-----|-----|-----|
| | AGL | FIS | FMR | CTG | OTH |
| 1841 | 85 | 70 | 16 | 25 | 54 |
| 1851 | 119 | 83 | 18 | 27 | 51 |
| 1861 | 133 | 89 | 10 | 26 | 64 |
| 1871 | 121 | 80 | 16 | 28 | 76 |
| 1881 | 93 | 79 | 24 | 28 | 70 |

TABLE 2. *Generational change in men's occupations, Selsey*

| Groom's occupation | Groom's father's occupation | | | | | Total |
|--------------------|-----------------------------|-----|-----|-----|-----|-------|
| | AGL | FIS | OTH | CTG | FMR | |
| AGL | 159 | 1 | 2 | 0 | 2 | 164 |
| FIS | 11 | 69 | 9 | 4 | 3 | 96 |
| OTH | 8 | 1 | 81 | 0 | 3 | 93 |
| CTG | 3 | 2 | 3 | 8 | 0 | 16 |
| FMR | 1 | 1 | 3 | 0 | 20 | 25 |
| Total | 182 | 74 | 98 | 12 | 28 | 394 |

TABLE 3. *Occupation of bride's father and husband, Selsey*

| Groom's occupation | Bride's father's occupation | | | | | Total |
|--------------------|-----------------------------|-----|-----|-----|-----|-------|
| | AGL | FIS | OTH | CTG | FMR | |
| AGL | 64 | 10 | 16 | 3 | 0 | 93 |
| FIS | 7 | 15 | 7 | 1 | 1 | 31 |
| OTH | 15 | 15 | 15 | 3 | 7 | 55 |
| CTG | 1 | 3 | 1 | 0 | 1 | 6 |
| FMR | 4 | 0 | 3 | 0 | 6 | 13 |
| Total | 91 | 43 | 42 | 7 | 15 | 198 |

Key to occupations: AGL = Agricultural labourers; FIS = Fisherman; FMR = Farmers; CTG = Coastguards; OTH = Others.

occupation (father's) to another (groom's) at marriage. We can readily see that if these are not equivalent the pattern of surname distribution might misrepresent biological relationship. Consider, for example, a situation where men's occupations pass from father to son, but where women always take husbands from an occupation different from their father's. In this case the surnames will indicate stability and may indicate separation between occupations; the marriage patterns belie it. R_i between occupations reflects the accumulated history of male transfers between occupations, but it may misrepresent kinship if women transfer differently from men.

Table 2 shows the generational change in men's occupation, by tabulating groom's father's occupation against groom's at marriage. Table 3 shows for brides the father's occupation by the groom's. Simple inspection reveals a difference between these, but we can formally compare them by a χ^2 test on the hypothesis (which must be sustained if R_i is to be relied upon) that women's movement between occupations is no different from men's. We use the father-son matrix to generate «expected» numbers of women's transfers. This yields a χ^2 with sixteen degrees of freedom of 994.02 ($p < .001$). Clearly the matrices do differ, the men's being more conservative than the women's. The direction of difference suggests that R_i will tend to overestimate kinship, and it would be of great interest to know whether such an occurrence is more widespread.

We hope that this paper has done two things: firstly, it has supported the idea that occupation may be an appreciable component in the genetic structure of populations; secondly, it has suggested that inferences (such as the one above) based only on surname distributions should be treated with caution in view of the assumptions on which the isonymy method is based.

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