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In a masterly analysis of the causes of the English Civil War, Lawrence Stone touches on demographic factors and suggests that in the century prior to it 'Barely half the country dwellers and hardly any inhabitants of towns' could hope to avoid in their community at least one 'psychologically devastating' epidemic, usually of plague or fever, 'during which anything between a third and a half of the population would die in a matter of months.' 'Town after town and village after village were repeatedly struck' by such epidemics, 'which tore at the very roots of the society' and added to that intellectual and emotional instability which eroded traditional values and institutions.¹

My aim is to examine how far these generalisations seem to hold good for rural parishes in the rapes of Lewes, Pevensey and Hastings, an area roughly equivalent to the county of East Sussex before the boundary changes in April 1974 (see Fig.1). During the course of research into its employment, land tenure and population between 1540 and 1640² I calculated annual totals of conceptions leading to baptism, marriages and burials for as many parishes as possible. These totals were originally aggregated by harvest year, beginning on 1 August, to allow correlation with price series etc., which are increasingly presented in this form, and it is to the harvest year, and not to the civil year, that such totals as are cited in this article refer. Indeed all dates, unless otherwise stated, will refer to harvest years.

From 1606, or in a few cases from 1611, registers and/or bishops transcripts exist until 1640 for 124 rural parishes. For the remaining twelve parishes registration is too defective to allow calculation. Six of these 124 parishes, all in the downland, have been omitted because their populations prior to 1640 were each probably below fifty. For

twenty-one of the 118 parishes remaining I have relied entirely on transcripts, which normally lack up to five years of registration, and some epidemics may lie undetected in these gaps. For almost all the other ninety-seven parishes the late W. H. Challen had correlated the registers and the transcripts. Identified as 'urban' were the parishes of Lewes, Meeching (Newhaven), Rye, Hastings and Brighton. Forty-four rural parishes possess largely complete registration from 1559, fourteen from 1560-7, nine from 1570-6 and three from 1581.

It has, therefore, been possible to identify for 118 parishes between 1606 and 1640, and for 70 parishes between 1559/81-1605, the highest annual burial total registered in each, and these totals have in turn been taken to pinpoint harvest years in which epidemic mortality was at a peak.

Two problems immediately arise, however. Firstly, a serious epidemic may have halted or disrupted registration, as at Worth in 1603 and at Brighton in 1609, where dislocation due to plague was specifically noted. In 1558-9 the influenza epidemic, which halted probate business in the archdeacon's court at Lewes for several months, coincided with much interrupted registration. Any individual annual burial total, therefore, may reflect undetected under-registration. Secondly, the use of the harvest year will obscure the impact of epidemic which straddles July and August. But fortunately serious epidemic mortality in high summer was rare in the countryside.

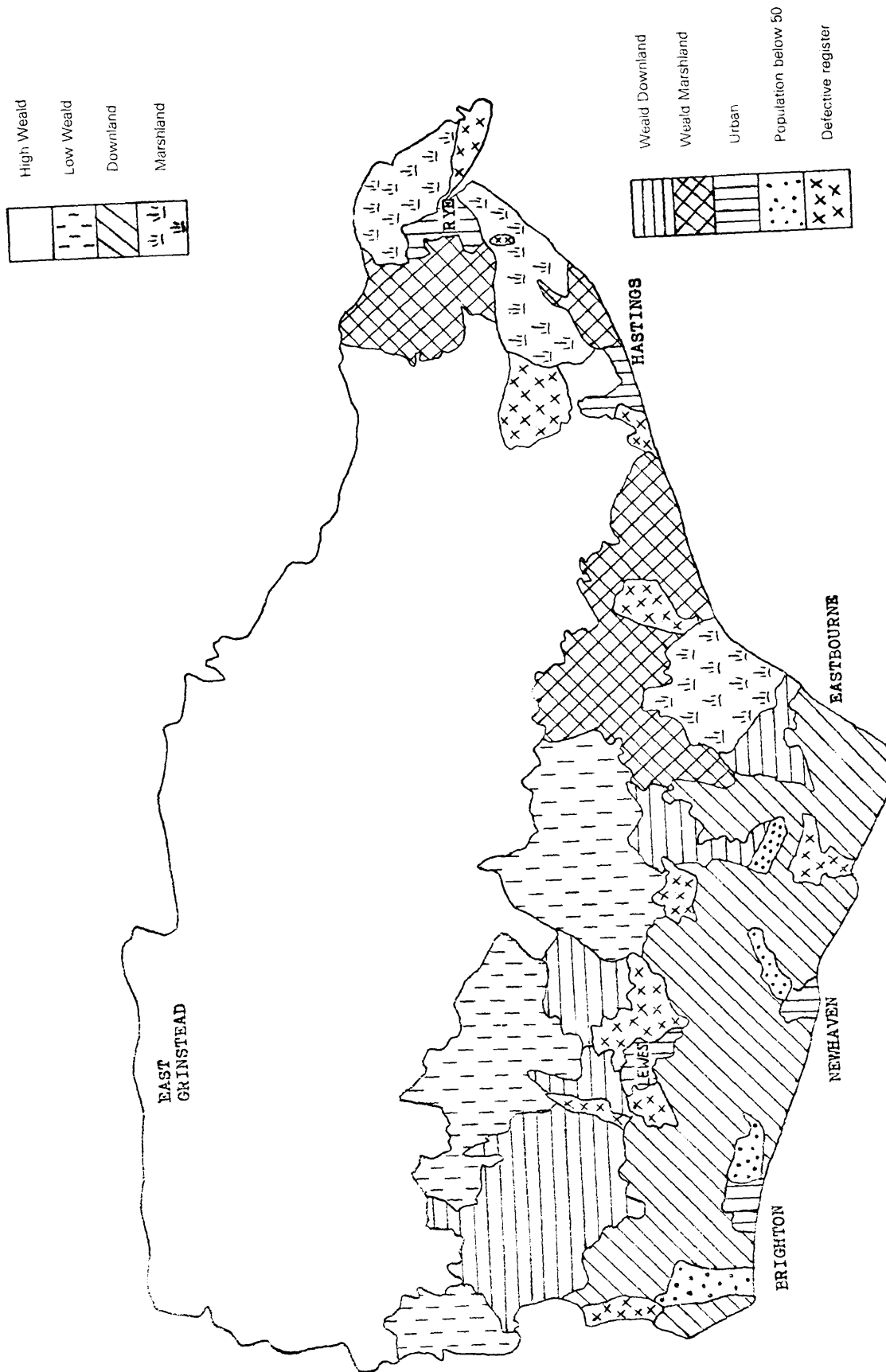
A major methodological hurdle, however, has been the calculation of burial rates per thousand. Few indices of parochial population survive for eastern Sussex during this period, other than some communicant returns for civil year 1603,³ mainly for downland parishes. The basis for the rates used is as follows. I averaged the annual conceptions leading to baptism for each parish over a period of ten or twenty years and assumed a baptism rate of fifty per thousand to produce notional parochial totals of population. Using these, annual burial totals could be converted into estimated burial rates. By choosing a high baptism rate I minimised the chances of any serious over-estimation of population and under-estimation of the burial rates.

As a check on estimated population totals for 1606-1640, based on the number of conceptions leading to baptism for 1621-1640, I inflated fifty-one communicant totals for civil year 1603 and 114 for civil year 1676⁴, assuming that communicants accounted for sixty per cent of total population. A comparison of these estimates for 1621-1640 and 1676 in 114 parishes revealed that in fifty-five the difference between the two estimates was less than twenty per cent. Of the other fifty-nine parishes where the difference exceeded twenty per cent, in nineteen cases it was the 1621-1640 estimates which were higher and in forty the 1676 estimates were higher. Where the two figures diverged widely, the 1603 estimate tended to confirm the 1621-1640 figure.

A further problem was raised by Professor Stone's reference to 'community'. Burial data can be analysed only by parish, and parishes differed widely in size and settlement pattern and in economic and social structure. I therefore divided the 118 parishes examined in 1606-1640 into groups based on agrarian characteristics⁵.

Forty-three parishes, occupying 417 square miles, lay in the high weald, a region of broken plateau and ridges composed of intermixed clay and sand (see Fig.1). Parochial areas tended to be large. Settlement was dispersed in hamlets and isolated farmsteads. Agriculture normally centred on dairying and cattle breeding, to which the cultivation of wheat, oats and hops was often subsidiary. Endowed with ample timber, wood-fuel, waterpower, sand, clay and iron-ore, the high weald was one of 'the natural workshops of an agrarian civilisation'⁶, and manufactured textiles, gloves, leather, glass (briefly), bricks, tiles, gunpowder, iron, armaments and timber products for local and external consumption. The region's population in 1621-1640 (assuming a baptism rate of fifty per thousand) was almost 19,000, and its population density at forty-five persons per

FIG 1 THE REGIONS OF EASTERN SUSSEX



square mile was the highest of any region in eastern Sussex. Inhabitants were sparsest on the north-western upland around Ashdown Forest. Fourteen parishes, containing almost 3,000 inhabitants in seventy-two square miles (forty-one per square mile), were sited on the low wealden plain between the downland scarpfoot and the high weald. Their settlement pattern and economy were similar to the high wealden, although iron production occurred only along the northern fringe; parochial areas were normally smaller.

Very different were the thirty-two downland parishes contained on the South Downs, the scarpfoot and the small coastal plain west of Brighton, and in the lower valleys of the Ouse and Cuckmere. Lacking timber, wood-fuel and waterpower, these communities maintained only a minimum of craftsmen and were almost entirely devoted to sheep-corn husbandry within a disintegrating open-field framework serving nucleated settlements. These thirty-two downland parishes covered only ninety-nine square miles and housed just under 4,000 people (thirty-nine per square mile). Eight parishes occupied forty-one square miles of coastal marshland and fringing upland between Westham and East Guldeford. Their rather sparse populations amounted to only 1,060 inhabitants (twenty-six per square mile), who were mainly engaged in the fattening of sheep and cattle belonging to upland wealden farmers.

Twelve parishes with perhaps 2,800 inhabitants in sixty-four square miles straddled the low weald and the downland, and a further nine with perhaps 2,600 inhabitants in sixty-one square miles straddled the weald and the marshland, uniting in a varying balance their distinctive characteristics.

That fifteen of our forty-three high wealden parishes were over twelve square miles in area, however, needs emphasis. They were not so much 'communities' as sprawling federations of communities. The presence of high epidemic mortality in one of their hamlets would obviously raise the burial rate for the parish, but not so sharply as to reflect the rise in the hamlet itself. Serious but localised mortality in these parishes would have had less impact on registration than comparable epidemic in the smaller parishes, especially the nucleated downland communities.

TABLE 1
Number of parishes experiencing high burial rates, 1606-1640

Estimated burial rates per 1,000	Number of parishes affected						Total
	High weald	Low weald	Down land	Weald Dnld	Marsh land	Weald Mshld	
99 or less	31	6	8	6	1	2	54
100-124	9	3	10	5	1	2	30
125-166	3	2	8	1	5	5	24
167-199	—	2	2	—	1	—	5
200-332	—	1	3	—	—	—	4
333 or more	—	—	1	—	—	—	1
	43	14	32	12	8	9	118

The result, set out in Table 1, of converting the highest annual burial total per parish between 1605 and 1640 into a burial rate per thousand does not substantiate Professor Stone's view that almost half the rural population experienced at least once during a lifetime within their local community an epidemic which killed between a third and a half of the inhabitants. Only at South Highton, a downland parish housing perhaps fifty people, where eighteen burials were registered in 1608, did annual burials exceed 333 per thousand during these thirty-five years. Moreover, only four parishes experienced, and then but once, a rate of 200-332, and five parishes a rate of 167-199. Eight of these nine parishes were less than 3.8 square miles in area and contained fewer than 120 inhabitants, in the downland, Iford, Tarring Neville, Folkington, Hove and Piddinghoe, in the low weald Chalvington and Twineham, and in the marshland Playden. The ninth parish, however, Hellingly in the low weald, where seventy-seven burials were registered in 1613, housed 450 inhabitants and extended over 9.3 square miles.

TABLE 2
Number of parishes experiencing high burial rates, 1559/81-1605

Estimated burial rates per 1,000	Number of parishes affected						Total
	High weald	Low weald	Down land	Weald Dnld	Marsh land	Weald Mshld	
99 or less	27	8	7	3	—	4	49
100-124	2	—	6	2	1	1	12
125-166	—	1	3	—	—	—	4
167-199	—	—	2	—	1	—	3
200 or more	—	1	—	—	—	1	2
	29	10	18	5	2	6	70

Fifty-four of the 118 rural parishes analysed never suffered a burial rate greater than ninety-nine per thousand. Thirty-one of these were in the high weald, six in the low weald and six in the weald-downland, as compared with only eight in the downland, two in the weald-marshland and one in the marshland. In part the greater immunity of the weald may reflect its dispersed settlement pattern, which probably discouraged both the outbreak and the spread of infection, and also the screening of the region from seaborne epidemic by the downland and coastal communities.

As already noted, however, in the larger high wealden parishes serious epidemic, localised in a constituent hamlet, would have been only partially reflected in the parochial rate. The regional contrast as between parishes with an area of 2.1-8.0 square miles is less striking, but is still present. Ten high wealden parishes out of nineteen escaped a rate of one hundred or more, as compared with seven out of twenty-three downland parishes, one out of seven marshland parishes and one out of six weald-marshland parishes.

Marshland seems to have been especially conducive to high mortality. Five out of eight marshland parishes and five out of nine weald-marshland parishes suffered a rate of 125-166 between 1606 and 1640. Contemporaries and later commentators pronounced such areas unhealthy and subject to fever and 'ague', because of the stagnant irrigation ditches which traversed them². Certainly in most of these parishes burials per decade in 1611-1640 normally exceeded baptisms, an excess not paralleled elsewhere in eastern Sussex, except among downland parishes incorporating brookland along the lower Ouse.

Between 1606 and 1640 the highest mortality was not concentrated in two or three years of widespread epidemic. Taking highest and second highest annual burial totals together for the 118 parishes (amounting to 291 totals because of duplication), ten such totals were in 1609, forty-nine in 1611-13, thirty-eight in 1615-17, thirty-seven in 1624-6, ten in 1628 and eighty-five in 1637-9. All but two of the ten parishes, which suffered a rate of 167 or more, experienced it within these years. At Folkington the mortality in 1636 centred on an isolated plague outbreak, and at South Heighton in 1608 almost certainly so.

The nature of these epidemics is uncertain, but plague seems to have played only a marginal role. No references to it in registers or elsewhere have been found for 1611-13, 1615-17, 1628 or 1637-9. Indeed between 1606 and 1640 it grew increasingly elusive, being present in 1606 at Mayfield, in 1607 at Arlington, in 1608 at Salehurst, Battle and South Heighton (probably), in 1608-9 at Brighton where 'many hundred' allegedly died, in 1609 at Lewes, Hastings, Slaugham (probably), Cuckfield and Uckfield, where thirty-six were buried during the year out of 310 inhabitants, in 1610 at Mayfield and Ardingly (twenty-five out of 240), in 1624 at Lindfield, in 1624-5 at Rye, in 1625 at Balcombe (twenty-eight out of 210) and in 1636 at Folkington (twenty-seven out of 110).⁸

Rural epidemic in eastern Sussex between 1559 and 1605 may have been as unspectacular as between 1606 and 1640. Registration survives for seventy parishes from at least 1581, and for forty-four parishes from 1559. Table 2 shows that in only two parishes did the burial rate exceed 199 per thousand, at Bexhill in 1592 when eighty-seven out of 360 inhabitants were registered as buried, and at Isfield in July 1580 and August 1581 when the burials of thirty-two of the 160 inhabitants were recorded.

The incidence of high parochial mortality was well dispersed across the period. Out of seventy-seven highest annual burial totals (allowing for some duplication), 1592 claimed thirteen, 1559 six, 1565 five, 1604 four and 1560, 1584, 1594, 1595, 1597 and 1605 three each. Twenty-one other years shared the remaining thirty-one.

Again, it is uncertain whether plague played a major role in this attenuated epidemic activity. The disease was present in 1563 at Rye, Brighton and (probably) Bishopstone (fourteen out of 120), in 1579-80 at Rye, in 1580 at Peasmarsh (twenty-two out of 200) and Iden (eighteen out of 160), in July 1580 and August 1581 (probably) at Isfield (thirty-two out of 160), in 1582 at Fletching, Lindfield and Hailsham, in 1585 at Newhaven, in 1589 at Eastbourne and (probably) at Rye, in 1593 at Worth, in 1596 at Rye, Newhaven and (probably) Hastings, in 1597 at Heathfield, in 1598 at Rye, in 1602 at Warbleton, and in 1603 at Lindfield, Pyecombe (fifteen out of seventy), Worth, Uckfield, Heathfield and Fletching.⁶

By contrast to such spasmodic and localised epidemic, rates derived from registration for 1558, defective though most of it may be, suggest a more universally high epidemic mortality than was to occur between 1561 and 1640. Out of fourteen registers, which seem to contain an unbroken series, five yielded rates of 100-124 and seven of 125-199; seven defective registers yielded rates of 100-199, and one of 220. The generalised character of this epidemic, usually identified as influenza¹⁰, is further reflected by the heavy mortality in such large high wealden parishes as Maresfield, where forty-six out of 390 inhabitants were recorded as buried, Framfield (seventy-three out of 590) and Fletching (103 out of 540). Because registration remained widely dislocated in 1559, the extent of continued epidemic activity is unclear.

This analysis suggests, therefore, that countrymen in eastern Sussex prior to the Civil War were not likely to have experienced the devastation of their communities by epidemic in a matter of months. An annual rate of 167 or more per thousand was comparatively rare and very largely confined to the smaller parishes. Rural households were undoubtedly destroyed by epidemic, especially plague, but few, if any, rural communities can confidently be described as having been torn up by the roots.

The trauma of a death rate reaching 333 or 500 per thousand may have been rare even in the urban communities of eastern Sussex. Burial registration is largely continuous at Hastings from 1560, at Brighton from 1603 and in four out of six Lewes parishes from 1606. Each of these communities certainly housed more than a thousand people, yet their highest annual burial totals were 183 at Hastings in 1563, seventy at Brighton in 1622 and 112 at Lewes in 1638, although at Brighton 'many hundred' allegedly died during an unregistered plague outbreak in 1608-9. At Rye, however, which returned 2,468 inhabitants in 1565¹¹ 705 burials were registered in 1563 and 600 in 1579. At least there the devastation, both physical and psychological, must have come close to that envisaged by Professor Stone, although few inhabitants can have carried its scars into the Civil War.

It may be objected, of course, that even if the burial rates established by this rather crude methodology are plausible, nonetheless the psychological impact of epidemic should be judged, not by the numbers killed, but by the age-groups in a community which are eroded, since the destruction of the young and the old would generate less trauma than the elimination of vigorous adults. To achieve such a refinement of analysis would require a corresponding refinement of technique, but that lies beyond the scope of this article.

Notes

1. Lawrence Stone, *The Causes of the English Revolution 1529-1642*, 1972, p. 111.
2. C. E. Brent, *Employment, Land Tenure and Population in Eastern Sussex, 1540-1640*, Sussex University D. Phil. Thesis, 1973. See especially chapters five and six.
3. W. C. Renshaw, 'Miscellaneous Records', *Sussex Record Society*, vol. iv, (1904), pp. 3-17.
4. J. H. Cooper, 'A Religious Census of Sussex in 1676', *Sussex Archaeological Collections*, vol. xlv, 1902, pp. 142-148.
5. Joan Thirsk (ed.), *The Agrarian History of England and Wales*, vol. iv, 1967, pp. 1-122.
6. *Ibid*, p. 427.
7. East Sussex Record Office (Hereafter ESRO) XE6/12. Rev. Arthur Young, *General View of the Agriculture of the County of Sussex*, second edition 1813, p. 459.
8. Plague references are from the appropriate parish register, except for: Battle, 1608, Salehurst parish register; Brighton, 1608-9, West Sussex Record Office, Ep11/5/10/86, and British Library, Add. MS. 33142/140; Lewes and Hastings, 1609, W. H. Godfrey, 'Thomas and Brian Twine', *Sussex Notes and Queries*, vol. iii, 1930, pp. 42, 82; Uckfield, 1609, British Library, Add MS. 33142/149; Lindfield, 1624, ESRO, QR/E/21/146; Rye, 1624-5, ESRO, RYE 47/101/22; Folkington, 1636, bishops transcripts.
9. Plague references are again from the appropriate parish register, except for: Rye, 1563, ESRO, 1/3/51; Brighton, 1563, ESRO, W/A/5/324; Rye, 1579-80, ESRO, RYE 1/4/309, 320; Rye, 1596, ESRO, RYE 1/6/66, 83, 87, 158.
10. F. J. Fisher, 'Influenza and Inflation in Tudor England', *Economic History Review*, vol. xviii, 1965, pp. 120-9.
11. Public Record Office, S.P. 12/38/28.