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Veröffentlichungsversion / Published Version

Zeitschriftenartikel / journal article

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Empfohlene Zitierung / Suggested Citation:

Smith, P. (1992). A quantitative evaluation of demographic, gender and social transformation theories of the rise of European witch hunting 1300-1500. *Historical Social Research*, 17(4), 99-127. <https://doi.org/10.12759/hsr.17.1992.4.99-127>

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A Quantitative Evaluation of Demographic, Gender and Social Transformation Theories of the Rise of European Witch Hunting 1300-1500

*Philip Smith**

Abstract: The purpose of this paper is to shed light on the European witch craze in the period 1300-1500 by attempting to evaluate two sets of theories. Among the significant findings are that substantial differences exist between the patterns of witchcraft persecution before and after 1420, that differing regions have patterns of witchcraft, and that these patterns are also shaped by demographic factors. These demographic factors relate to the interplay of urban characteristics of witchcraft hunting. One of the most important recommendations of this paper is that future research pays more attention to the role of urbanization processes in defining witch persecution.

Introduction

Despite many years of research, the European witch craze of late-medieval and early-modern times remains a fascinating enigma, a »secret of world history« (Genz, 1954, p.36). Such is the rudimentary nature of our knowledge, that we are still uncertain of the number of witches executed in the period of the witch craze, which extends from around 1400 to 1700. One estimate is that nearly one million women were charged with witchcraft, and that some 50% of them died. (Heinsohn and Steiger 1982 p.208). Although numerous theories have been proposed to explain the puzzle, they have never been systematically tested by comparative statistical analyses over a large number of cases. One consequence of this is that there is little consensus as to the relative merits of the

* My thanks to Matthijs Kalmijn and Bruce Western for advice on earlier drafts of this paper and generous help with time, advice and computing. I would also like to thank George Sabagh, the participants in the U.C.L.A. Macro-Sociology Seminar and the anonymous reviewer of *Historical Social Research* for comments on various drafts of this paper. Please send all correspondence to Philip Smith, Department of Sociology, University of California, Los Angeles, 405 Hilgard Avenue, Los Angeles Ca 90024-1551.

various competing explanations. The purpose of this paper is to shed a little light onto this dark corner of European social history by attempting to evaluate two sets of theories. In order to make this task manageable I focus on the period 1300 - 1500 in which the pattern of witch persecutions first emerged.

In the section that follows I attempt a brief survey of the existing literature. From this body of work I synthesize two broad hypotheses which seem to provide the most plausible explanation of witch hunting in Europe. In the second section I introduce the data and go on to formulate hypotheses regarding general relationships in the data as predicted by the various theories. (1) In the final section I discuss the results and indicate areas for future research.

Explanations of European Witchcraft

As with any social phenomenon of complex determination, there are numerous competing hypotheses purporting to explain the historical and structural origins of European witch persecutions. Some of these, whilst doubtlessly full of interesting insights, are not of direct relevance to this paper. They concentrate on micro-level phenomena that can explain the foundations for belief in the reality of witches, their purported abilities and the experience of witchcraft. For example, psychiatric and psychoanalytical historians have suggested that either witches or their persecutors were mentally ill (Andreski 1982, Heinsohn and Steiger 1982, Zilboorg 1935). Medical historians have pointed out that many types of witchcraft experience could have arisen from the use of hallucinogenic drugs (Forbes 1960, Dielthelm 1970). Whatever their merits in explaining certain aspects of the nexus of belief and experience, one must conclude that as they identify features that are constant across time, space and gender boundaries such theories are inadequate for explaining temporal, spatial and gendered variability in the distribution of witch persecutions as wider secular patterns (Ben-Yehuda 1985).

An adequate theory of the origins and dynamics of the European witch craze must be able to account for the following three sets of characteristics. Firstly, its temporal dimension. Contrary to popular belief, during the early and high middle-ages witch hunts and trials were not common. However, from the early-15th century onwards witches were persecuted with increasing frequency. Although initial anti-witch activity usually consisted of the trial of individuals, by the early-16th century a pattern of mass trials and denunciations came to be the norm. Whipped into a frenzy by the counter-reformation, witch hunting grew to epidemic proportions from 1550 until the end of the 30 Years War in 1649. From that point on persecutions gradually became more sporadic and after 1700 witch trials are virtually unheard of. Secondly, the pattern of persecutions varied widely throughout Europe. For example, even before the counter-reformation Switzerland and Southern Germany experienced massive

levels of persecution, whilst Spain, Portugal and Scandinavia experienced hardly any. Finally, a disproportionate number of the victims were women. In order to answer these types of problems it is necessary to look to those theories that address more macro-level social processes than those identified by psychologists, psychiatrists and medical historians. Broadly speaking, there are two sets of theories that contain the rudiments of an adequate explanation of these characteristics of the European witch craze: those that focus of the gender and power in the wake of massive demographic changes in the social infrastructure, and those that examine the needs of groups in particular, and societies in general, to establish their identity in a time of rapid social change and transformation.

Demographic/power explanations tend to be based upon neo-Marxian assumptions about the structure and organization of society. Theorists within this tradition point to two important consequences of the Black Death. Firstly, it fundamentally restructured the feudal labor market. Secondly, in its wake the social and economic position and status of women was fundamentally altered. The Black Death, which arrived in western Europe in 1347 and returned in successive waves for the succeeding 50 years, killed between 30 and 50% of the European population (Russell 1972). Following the massive deaths population levels did not increase rapidly during the first half of the 15th century, but rather remained stagnant in most areas of Europe even though conditions for population expansion were favorable (Helleiner 1969). Why not? The failure of the population to expand, it has been argued, can be attributed to the changing social position and lifestyle expectations of women. Following the death of relatives, many surviving women inherited a good deal of money and gained new levels of independence, turning away from their traditional roles as mothers and wives (Chojnacki 1974). One consequence of this was the unique pattern of European marriages noted by Hajnal (1965), which was characterized by an advanced age at marriage and a high proportion of non-marrying people. Another was the widespread use of abortion, infanticide and contraception (Wrigley 1969, Trexler 1973, Spengler 1968). Given these conditions, scholars have indicated two reasons to explain the persecution of witches. Firstly, witch persecutions can be explained as the result of misogynistic resentment and hostility towards a new, independent and threatening type of woman that arose in the wake of a demographic catastrophe (Bainton 1971, pp. 9-14, Kelso 1956). In this case the group wielding power are men. Secondly, and in a more sinister mode, the persecutions can be explained as the result of the attempts by the ruling classes and estates to enforce the reproduction of the labor pool. In this case the power is rooted in the class basis of society.

»We assume that these five centuries (1300 - 1800) were dominated by an enforced reproduction of human beings initiated by the clergy and nobility to replenish their stock of labor for the sake of regaining a sufficient source of income. We further assume that this was done through a far-reaching elimination of birth control, most dramatically expressed by the witch hunts of Modern Times...« (Heinsohn and Steiger 1982, p.203).

Heinsohn and Steiger go on to argue that witch hunts achieved this objective in two ways. The public burnings of women »clearly showed every woman and little girl the dangers associated with witchcraft, in effect with birth control.« (p. 208), whilst the targeting of midwives helped to eradicate the knowledge and technologies of abortion and contraception.

Boundary maintenance/social transformation theses focus on the processes of differentiation, transformation and rationalization in society. According to these interpretations, witches were persecuted as a means by which the identity and influence of both social institutions (new and old) and also the boundaries of the rapidly changing societal community as a whole could be established. (2) Some scholars, such as Trevor-Roper (1967) and Ben-David (1971), have argued that the persecution of witches was an antinomian counter to the emerging rationality of a pre-scientific revolution. More recent work in this tradition has combined their insights with feminist analyses of the relationships between nature, culture and gender;

»Because the oppression of nature was the basis of modernity, the witch phenomenon played the role in Europe that it played nowhere else. It was part of the modernizing process of occidental rationalization. The cost of »progress was paid with the bodies and souls of female witches.« (Honneger 1979, p.798).

In contrast to these perspectives, but still within the same paradigm, others have seen the witch persecutions as the product of conservative, rather than progressive, ideas and institutions. For example, Williams (1959) suggests that the witch hunts were an attempt by the church to re-establish a legitimacy and ideological hegemony which was threatened by the differentiation of knowledge into secular and ecclesiastical spheres. He argues that witches were set up by the church as an opponent »whom it could divinely hate« in order that both its failing authority and the harmonious medieval world view could be re-established. More recently, Ben-Yehuda (1985) has expanded on these insights in order to suggest that the movement against witches was motivated at the level of the societal community;

»The expansion of horizons, more flexible social conditions, the Reformation, the beginnings of the scientific revolution, Renaissance art and humanism were all results of the disappearance of traditional norms and social moral boundaries. The creation of greater cultural diversity and freedom gave rise to a new, infinitely more differentiated society than that of the Middle Ages. The witch craze was a negative reaction to this emerging culture in the sense that its purpose was to counteract and prevent change and to re-establish traditional social-moral boundaries and religious authority.« (Ben-Yehuda 1985, p.57)

Perhaps because of intuitive appeal of the two sets of hypotheses, they have never been tested. Most studies point only to circumstantial textual and historical evidence. Although statistical analyses have been conducted on witch data, they have been limited to the analysis of specific case studies and histo-

ries, such as Midelfort's (1972) study of witch hunting in south-western Germany, and MacFarlane's (1970) analysis of a minor witch craze in Essex. This is unfortunate, for by means of a rigorous comparative statistical method that deploys a large data set, perhaps the merits of the major competing hypotheses can be decided. This paper, modest as it is, represents an initial step in this direction.

Data and Hypotheses

In order to test the hypotheses it was decided to investigate witch persecution using both cross sectional and longitudinal data of witch trials in Europe for the period 1300 - 1500. These two centuries were chosen for several reasons. Firstly, the complicating effect of the wars of religion on patterns of witch persecutions in the 16th and 17th century would make testing of the demographic and transformation hypotheses very difficult. In concentrating study on the period preceding the Reformation, exogenous variables concerned with religious differences could be ignored. Secondly, this period contains data from before and after the Black Death. It is thus the most appropriate locus for a comparative examination of the impact of demographic variables on witch persecution. Thirdly, the period of these two centuries straddles the divide between medieval and early-modern social formations. Hence it is the ideal period in which to examine the impact of social transformation on witch persecution. (3)

Data

Data concerning all 514 known witch trials, deaths and investigations for the period 1300 - 1500 was taken from the appendix to Kieckhefer (1976). Along with some exogenous variables derived from other sources, Kieckhefer's data were coded by trial according to the following system. (4)

- (1) Year of Trial.
- (2) Country of Trial. In the interests of the comparability of the data, events were coded into 10 countries/areas corresponding to modern nation states; Germany, Great Britain, France, Italy, Low Countries, Austria, Switzerland, Iberia, Czechoslovakia, Poland.
- (3) City or Area of Trial.
- (4) Population of city, if known, in 1300. This variable, and the next two, was taken from Chandler and Fox (1974). Unfortunately, though understandably, they provide estimates of the urban population only for cities of over 18 000.
- (5) Population of city, if known, in 1400.

- (6) Population of city, if known, in 1500.
- (7) Number and gender of persons accused.
- (8) Number and gender of persons killed.
- (9) Number and gender of persons given other punishment.
- (10) Number and gender of persons acquitted.
- (11) Type of crime. This was coded as a binary variable. Crimes involving the characteristics associated with attempting to control reproduction (hereafter reproduction magic«), and those which did not. Characteristics associated with reproduction magic include, love magic, manipulation of affections, infliction of impotence, any mention of children, any mention of mid wives.
- (12) Whether the court was ecclesiastical or secular.

Comments on the Data, »Hypotheses« and Methodology

It is the norm in historical enquiries involving large data sets to evaluate contending theories through the construction of complex »econometric« models. Although others have good reasons for thinking otherwise, I feel strongly that - because of the unreliable nature of the data - such procedures are not appropriate here: complex edifices require firm, not shaky foundations. There is no way of knowing exactly how regional, national and urban/rural differences influenced the recording of witch trials, and the preservation of the documents in which they were set down. Moreover, it is not clear how systematic witch scholars have been in uncovering these documents. It is uncertain how thorough and systematic Kieckhefer himself was in his analysis of the secondary literature from which he compiled his definitive catalogue. (5) A final problem is that there is a selection bias in the data in that there is no material on cities and countries which did *not* experience witch trials.

In view of the considerations discussed above, is research into the data worthwhile? My answer is yes. Firstly, scholarly analysis of witch activity is at rudimentary stage. Analysis of even the poorest data can hopefully contribute to the scholarly discourse. Of course that analysis will be flawed, vulnerable to attack and capable of making only provisional conclusions. Yet if a careful analysis with modest claims is the best that can be done, then it is unquestionably better that it should be done than that it should not. A second consideration is that although there is a selection bias in the data, there is still a possibility for an internal analysis of the data with an orientation towards descriptive rather than causal aims. I hope to show that such an analysis can reveal a good deal about witchcraft and its relationship to demographic variables in the period 1300 to 1500.

Considering the caveats expressed above, it is clearly inappropriate to formulate rigorous hypotheses that can be tested. After all, what kind of a scienti-

fic refutation can emerge from such flawed data? Therefore in the section below I suggest some empirical associations that one might predict in the data on the basis of the two theories outlined above. During the analysis of the data I shall comment when appropriate on the extent to which it seems to support or cast doubt on the two bodies of theory.

If the demographic/gender hypothesis is correct, one will expect that the greater the failure of cities and countries to recover pre-Black Death population levels, the greater the level and intensity of witch persecution. In other words this theory predicts the activity in precisely those areas that are stagnating demographically. Moreover, according to these theories one anticipates that reproduction magic« will increase over time as the demographic crisis of the 15th century became apparent to the ruling classes, or else exerted its force on unconscious social mechanisms. Also, one can anticipate increased levels of persecution of women in the 15th century as opposed to the 14th.

The boundary maintenance/social transition hypothesis predicts greater levels of witchcraft activity in those areas that are undergoing the most rapid economic and social changes. According to this hypothesis, one would expect to find witch persecutions to be more intense in cities than in rural areas, and more intense in large than small cities, for such cities would be advancing most rapidly towards post-feudal society. (6) Additionally one would expect to find correlations between the intensity of persecution and rapidly growing cities and urbanizing areas. One would expect to find no significant changes over time in the amount of reproduction magic« as a proportion of all magic. Finally, according to one branch of this theory, one would anticipate witchcraft where new rationalistic social institutions (operationalized here as universities!) are to be found, and a close association between such institutions and the incidence of secular rather than ecclesiastical trials. However, the other (backlash) branch of the theory predicts an increase in ecclesiastical trials. Hopefully the trial data should enable us to see whether witch trials were the product of emerging secular forces, or the result of a church backlash against these forces.

Method

In the light of the various data problems discussed above, it was decided to keep the analysis as simple as possible. Cross-tabulations, simple correlations and percentages seemed to be the best way to get a feel for the data without the dangers associated with building complex statistical models.

The data was analyzed in two stages. Firstly, analysis was conducted for the data set as a whole using a series of cross-tabulations aimed at probing key hypotheses. Problems investigated in this phase included the impact of city size, changes in city population on witch trials, the relative importance and severity of secular and ecclesiastical trials and the distribution of reproduction

magic». Of vital importance in this phase was an attempt to get at trends in the data by comparing selected characteristics across time periods. The second phase of the analysis consisted of exploring differences in the pattern of witch trials between countries. The aim of this part of the analysis was to highlight the distinctive features and patterns of each country in order to provide insights that may be of use to specialist scholars for future research. Because of the small number of cases for each country, the comparison of country-specific time periods was not possible using cross tabulations.

Results

According to the data set, between 1300 and 1500 there were 514 known witch trials distributed among 10 different (modern) countries and 205 different cities or regions. A plot of the mean number of trials per decade revealed that there appeared to be a take off point in the number of trials per decade after 1420. A quick tally showed that the mean number of trials per decade for Europe as a whole rose from 10.1 before 1419 to 50.25 after that date. In order to make sure that this apparent explosion in the number of trials was not simply an artefact of better record keeping or research, a test was made to control for the quality of the data. The proportion of persons of known gender to the total number accused was calculated for the periods before and after 1420 (see Table 1).

Table 1 strongly suggests that it is more likely that trials were under-reported in the post-1420 period than in the pre-1420 period, and permits the conjecture that perhaps the actual rise of European witchcraft at the end of the Middle Ages was in fact more dramatic than has been previously suspected. (7) It therefore seems quite likely that 1420 indeed represents the start of the pattern witch persecutions of the early-modern period. Building on this supposition it was decided to use this point to divide the data into two time periods and to examine the differences in the data before and after this point. Hopefully, such a procedure would allow the different patterns of witch persecutions in the medieval and early-modern periods to be distinguished.

It appears that the trials became more severe over time, with an increase in the number of persons killed per trial (see Table 2). The increase in severity cannot be attributed to an increase in the number of persons accused per trial (Table 3). This finding confirms the speculation of both theories that the persecutions became more severe over time. An important discovery was that given a trial females were more likely to be persecuted in the later period (see Table 4) than in the earlier one.

This finding provides strong support for the feminist assertion that witchcraft was not perceived as a gendered activity in the medieval period, and that the image that we have of the witch as a woman would not necessarily have been shared in the Middle Ages. As the data shows, before 1420 more men than

women were accused of witchcraft. It also lends support to speculation of scholars that the proximate cause for the targeting of women may well was not constant over time, but rather emerged in the early-15th century. Table 5 looks at the relationship between gender, time period and mode of punishment. It examines all those cases in which we know both the punishment and also the gender of the purported witch. (8) The figures relating to the number of cases confirm that women were far more likely to be targeted as witches in the 15th century than in the 14th. However, the picture is perhaps not so bleak as feminist theory suggests. Whilst, in the period before 1420 women on trial appear to have slightly stronger odds than men of being killed or receiving a severe punishment, in the period after 1420 the gender gap evens out and the odds of a severe punishment increase for both sexes. This finding suggests that whatever the mechanism was that increased a woman's odds of being brought to trial after 1420, it was not apparently successful in prejudicing her chances in the trial itself. Misogyny, for example, may have led some people to denounce women as witches but was apparently not an important factor in the 15th century witch trial *per se*.

Taking the period as a whole, there was no significant difference in the severity of ecclesiastical courts over secular courts (see Table 6). In the second period trials were more severe than in the first period in both secular and ecclesiastical courts (see Table 7). This observation prevents us from making a judgement in favor of either the »rational institutions« or »church backlash« variations of the social transformation thesis. Rather it suggests that both may be correct. Similarly, in terms of the demographic/gender model and the social transformation models it suggests that both the church and the land owners were active in persecuting witches. There was, however, a small increase in the proportion of secular to ecclesiastical trials (see Table 8).

Although, as I mentioned earlier, an external analysis of the data is dangerous, it is still interesting to note here that there is a great increase in the relative number of secular trials in the second period, although this was not statistically significant. Whereas the ecclesiastical trials increase 176%, secular trials increase 289%. This is suggestive evidence in favor of the fact that rational institutions and secular lords were increasingly the dynamic force behind witch persecutions. However, it is not clear how much significance we can attribute to this result in the light of the data problems discussed above.

An analysis of the type of magic by period provided strong evidence against the demographic/gender model. As Table 9 shows, although there was an increase in the number of cases of reproduction magic«, the proportion of reproduction magic« to all other magic actually declined. This suggests that women were not targeted for population control reasons and is probably the most important finding of this paper.

So far we have discussed changing patterns and inter-relations of gender, type of court and severity of trial. What about demographic variables? Table 10

shows that trials were most likely to be severe in very large cities and in rural areas and cities below 18 000. Once again, although it is dangerous to compare absolute numbers, it would appear that witch persecution was for the most part a rural and small town phenomenon, with only 28% of the trials occurring in cities of over 18 000. It is quite possible that the true proportion is in fact less than this, as one would expect less information to be recorded and preserved in rural areas. Unfortunately, without information on the comparative accuracy of urban/rural trial data it is impossible to standardize the relative rates of trials per unit of population. The high kill rate in the largest cities is suggestive of the social transformation hypothesis, for it is in such cities that rationalization was most advanced during this period. However, this finding is apparently contradicted by the high kill rate in »rural« areas. It may well be the case that there are two distinctive causal mechanisms at work: rationalization may be driving witch persecution in cities, whilst in rural areas demographic explanations may be appropriate.

The relationship between »rationalization« and the size of the urban population is further complicated by the information given in Table 11. This shows that there is no consistent correlation between urban size and levels of secular court activity. Indeed, secular trials are more prevalent in towns and rural areas than in cities of over 30 000. Most interesting of all is the extremely high proportion of secular trials in cities of 15-30 000. Perhaps it is here, and not in the largest cities, that a nascent bourgeoisie was emerging. Yet if this is indeed the case, it would seem that the forces of rationalization tended to ameliorate the effects of the witch persecution, for it should be remembered that in these towns the mean number of deaths per trial was only .34 (see Table 8).

This characteristic seems to be linked to the highly aberrant sex-ratio for trials in cities of 15-29 thousand (see Table 12). It seems on the basis of these tables that one may conjecture that in small cities there was a greater degree of targeting of women, and that this was in some way associated with higher than normal levels of secular prosecution. Unfortunately, due to the small number of cases for the differing city sizes, this result must be considered provisional.

According to both the demographic/gender and the social transformation hypotheses, changes in city population should be associated with changes in levels of witch persecution. For the former model, a decrease in population should lead to an increase in anti-witch activity. For the latter, a thriving city with an expanding population is more likely to undergo rapid social transformation and hence to have an increase in witch trials. This problem was investigated by means of a simple bivariate ordinary least squares regression of the number of witches killed in a trial on the growth in city population in a given time period. The results are given in Table 13 and reflect poorly on both theories as they show that there is no significant relationship. Two other potential relationships are also explored in Table 13. There is no significant relationship between city expansion and the proportion of secular trials - a result

which questions the assumption that expanding cities were necessarily seedbeds of rationalism. (9) Changes in the population of the cities did, however, have a significant impact on the proportion of female trial victims. In the period before 1420 the growth of a city by a thousand people led to a 6 percentage point decline in the number of female witches accused. In the period after 1420 city growth was positively associated with the proportion of female victims - with a 4 percentage point increase in the number of female witches accused per thousand new inhabitants. This result would appear to support the demographic/gender hypothesis. It suggests that social change did not produce uniform patterns of female persecution but rather was mediated by some other variable (eg. emergent misogyny) which made women increasingly likely to become targets.

National Variations

So far I have discussed Europe-wide patterns in various aspects of witch hunting. In this section I wish to discuss the differences between the various countries in the patterns of witch hunting. In order to have statistically significant results, I restrict my discussion to those countries where there are more than 20 trials in the 200 year period. First I shall detail a few cross sectional differences between the countries, and secondly I shall examine the pattern of development in each country.

The first factor examined was the comparative severity of the trials, measured in terms of the mean number of persons killed per trial (Table 14). The results show a considerable variation in the severity of the trials. Britain is an outlier, with a very moderate (permissive?) attitude towards witches. Switzerland is clearly far more aggressive in its punishment of witches. The other cases are fairly close to the group mean. The possibility that this result had arisen from different numbers of persons being involved in each trial was ruled out by an analysis of the mean number of persons per trial by country (Table 15).

The type of court also varied considerably by country. Table 16 shows that in Switzerland and Germany secular trials were far more common than in France, Britain and Italy. This result suggests that these two countries shared a common causal dynamic that was not present in the rest of Europe.

A final crucial difference was the sex ratio of the witches. This is shown in Table 17. It is notable that there is considerable variation in the probability of a woman being accused of being a witch given a trial. Once again Britain stands out as a case with a very different pattern of witch prosecution compared to the rest of Europe, whilst Germany and Switzerland are again both over the grand mean.

The findings presented earlier in the paper regarding changes in the nature of trials between the two periods (see Tables 2, 4, 8) allow for the construction of

two ideal types relating to »medieval« and »early-modern« patterns of witch trial. The characteristics of these two ideal types are presented in Table 18. These ideal types can be used to illuminate the differing patterns of witch trial by country which were identified in the discussion above of Tables 14, 15, 16 and 17. Table 19 makes a tentative effort to link the ideal type prevalent in each country with two other variables - universities and urban density. (10) Urban density was calculated by dividing the total population in a country/region (data from Russell 1958) by the population residing in towns of over 18 000 in 1300 and 1500 (data from Chandler and Fox 1974). This definition was chosen due to the lack of systematic and reliable data on smaller sized towns. One unfortunate consequence was that Switzerland, with its numerous small canton towns - could not be modeled. The figure for the percentage change in the number of universities in 1300 and 1500 was derived from Rashdall (1895). The table shows that in every case except that of England, urban density grew between 1300 and 1500. In part this was due to the fall in the total population occasioned by the Black Death, in part by rural-urban migration, and in part by the increasing prosperity of urban centers which permitted them to support larger populations than in medieval times. This increase in urban density seems to correlate quite nicely with the increase in witch trials - though the small number of cases makes this observation merely an informed speculation. The possible correlation between urban density and witch persecution can be taken to support either theory. However, Occam's razor dictates that the social transformation thesis is preferable in this case - the urbanization process bringing about economic, political and cultural change on a massive scale. Still, the demographic/gender thesis can also account for the association. It could be argued that where urban expansion is the result of a flight of rural serfs to the cities, witch trials will arise in the hinterlands as the landlords attempt to compensate for the diminishing labor force. This hypothesis is in accord with the findings of Table 10 that trials were most severe in rural areas. A detailed historical study of the comparative dynamics of medieval urbanization will have to be conducted before the relative merits of the two theories can be decided upon. The relationship between universities and trials in Table 19 also appears to be very strong, and is suggestive of a connection between emerging societal rationalization and witch persecution. Once again a regression analysis might be necessary in order to determine the strength of the relationship - however, as I pointed out earlier it is not clear if a regression analysis is warranted on data as poor as this. All in all Table 19 provides consistent, if tentative, evidence of a broad and general correspondence between social transformation and the mode of witch persecution. Once again I must concede that finer grained data, and detailed historical research will be necessary in order for the posited relationships to be substantiated. (11)

Concluding Discussion

A Summary of Characteristics of Witch Persecution 1300-1500

(i) Europe

There was a dramatic increase in the number of trials throughout Europe after 1420. The mean number of trials per decade for the period 1300 -1420 is around 10, whilst for the period 1420 to 1500 it is around 50 - a 500% increase. Analysis of the data revealed that the former period was characterized by a different pattern of witch persecution from the latter. It is useful to consider these patterns in terms of the system of ideal types already laid out in Table 18. In the period from 1300 - 1419 we find what I call a »medieval« pattern of witchcraft. There was a tendency towards less severe trials: given a trial there was only a 40% chance of someone accused in that trial being executed. Men were as likely as women to be accused of being a witch. Reproduction magic was of moderate importance, being an issue in 17% of all trials. In contrast, the pattern of witchcraft after 1420 showed a movement towards more severe trials, with a 65% chance of a death given a trial, significantly more women than men accused of witchcraft, and a drop in the amount of reproduction related magic. There may also have been a shift towards a greater proportion of secular trials, though the evidence for this is not conclusive.

For the period 1300-1500 considered as a whole, it appears that ecclesiastical courts were slightly more severe than secular courts, though 71% of proceedings were in secular courts. The demographic factor of city size seemed to have a significant impact on a number of variables. The probability of a given trial resulting in at least one execution was highest in cities below 18 000 population and in those above 50 000 population. Small cities had well above average amounts of secular trials and also a greater proportion of female witches than large cities. For Europe as a whole in the period 1300-1500, the urban population grew around 100%. One consequence of this growth was an trend towards the disproportionate persecution of women.

(ii) Countries

There are 84 trials in the data for Germany, comprising 16% of the total data set. Assuming that the data is accurate this works out at 7.6 trials per million people (based on 1340 population). German trials were of moderate severity, with 53% of trials having at least one killing. A very high proportion of trials were secular in Germany, 89%, and a very high proportion of the accused were female, with a .79 probability of a female being the accused in any given trial. Table 18 shows a clear increase in the number of trials in Germany after 1420. This appears to be closely correlated with the growth of German universities after 1360. An extremely high 175% increase in urban density over the 200

year period also corresponds with the increase in witch persecutions, which grew by 140% from 4.9 per decade mean before 1420 to a 12 per decade from 1420 to 1500. Taken all together a plausible explanation for the growth of witch hunting in Germany may well focus upon secular/social transformation issues, rather than on religious/demographic issues.

If the data is accurate, it is fair to say that Britain had little witchcraft, with only 45 trials in the two hundred year period. However, when its small population is taken into account, it becomes apparent that Britain had rates of witchcraft higher than in Germany. These 45 trials, when standardized to the population of Germany in 1300 indicate that had Britain the population of Germany it would have had 93 trials. The take-off in the number of trials in Britain after 1420 was as severe as in other part of Europe, the number increasing some 200%. British trials were very mild, with only .28 persons killed per trial. This low figure is all the more surprising when it is considered that half of these trials were ecclesiastical. Further evidence that Britain had a uniquely »medieval« pattern of witch persecution is that most of the accused were males. Another anomalous aspect of British witchcraft is the inverse correlation of trial density with urban density, urban density decreasing from an already low 1.5% to 1.1% between 1300 and 1500.. England gained no new universities between 1300 and 1500, although three very small universities did emerge in Scotland. Putting these facts together, one is left with the image of a country lagging behind the rest of Europe, with little social change. If this is indeed the case, counterfactual logic allows the conjecture that in Britain we see the pattern of witch persecution that may have arisen in the rest of Europe had the demographic impact of the Black Death been the only causal factor. This pattern would have consisted of higher trial rates per decade (such as actually came about), but with »medieval« ideal-type characteristics. A final point of interest is that if my speculation is correct, then the non-gendered nature of witchcraft in Britain questions the alleged association between demographic factors and the gendered nature of witchcraft accusations.

France, with 166 trials in the data set, is the single greatest contributor of trials. When standardized to the population of Germany, it still would have produced 121 trials, (assuming the reporting is accurate). The take off in France was even more severe than in Germany, with a 200% increase from a mean of 5 trials per decade for the period before 1420, to 15 after that date, this was matched by a 69% increase in urban density and a 200% increase in the number of universities. Given these factors one would expect that France would share the internal trial characteristics of Germany - that it would have the early-modern pattern. However, this is not the case. Like England, France seems to have had a broadly »medieval« type of witch persecution pattern - with some 46% of trials involving ecclesiastical prosecution and only 56% of the accused being female. On the other hand there was a comparatively high kill ratio of .64 persons killed per trial. Perhaps this strange mixture of characteristics can be

explained by the fact that although considerable social change occurred in France, it was not as severe as in Germany. In 1300 France had an urban density of 3.2% and one university for every 3 million people. By 1500 it had an urban density of 5.5% and one university for every million people. In contrast Germany expanded much more quickly during this period. In 1300 it had no universities and an urban density of around 2%. Yet by 1500 it had caught up with France in urban density, with 5.4% of the population urban, (a 180% increase in urban population), and had nearly two universities for every million people. These factors suggest that Germany experienced a much more rapid and severe social transformation than France during the two hundred year period. If this is indeed the case, then it is understandable that in France some aspects of the »medieval« pattern of witch persecution remained.

Italy has 42 trials in the data set. When standardized to the population of Germany (1340) this figure rises to only 48.63. There is little reason to doubt the fact that Italian witch persecution rates were indeed very low. As the most highly urbanized and literate region of Europe, one would expect better record keeping than in the other areas of Europe where an under-count may well be more severe. However, the take-off after 1420 was comparatively as severe as in the rest of Europe, with a 200% increase from the mean number of trials per decade before 1420 to the mean for 1420-1500. Italian trials correspond to the »medieval« model in that they have only moderate kill rates, and around 50% ecclesiastical trials. However, Italy is second only to Germany in the gendered nature of its witch persecutions, with an average of .70 probability of a woman being in a given trial. This may well be related to the fact that reproduction magic« was of far greater importance in Italy than in the other countries, making up some 30% of all Italian trials. On the indices of »modernity« Italy scores more highly than the rest of Europe, and was without doubt highly urbanized and cosmopolitan. Yet in terms of social transformation, it did not change as rapidly as Germany. The urban density rose from around 8% to around 18% (a 144% increase), whilst the university density rose from 1.2 per million to 3.4 per million. Whilst these are significant changes they are overshadowed by Germany's rapid rationalization and urbanization described above. In sum the case of Italy seems to confirm then argument that was made with regard to France that moderate social change led to a hybrid witchcraft form. It also seems to suggest that it is not the amount of »development« that was crucial but rather the pace of development. This observation seems to confirm the boundary maintenance type of explanation of witchcraft.

It is unfortunate that no urban population data exists for Switzerland. Not only would it be a vital extra case but it would also prove a vital test for the theory in that it shares the »early-modern« persecution pattern with Germany as well as the centrality of the subsequent Reformation. Evidence showing a rapid social change in Switzerland could help to confirm my exploratory analysis. Clearly future analyses of witch activity in Europe must attempt (by primary

research) to uncover some demographic variables for Switzerland. The importance of Switzerland is all the greater when it is realized that it may well constitute a paradigm case of »early-modern« witchcraft, with a massive explosion in the number of trials after 1420, an extremely large trial density of 1 439 when standardized to the population of Germany, exceptionally severe trials, and a high proportion of secular courts. The only »medieval« feature is a fairly equitable sex-ratio for the accused, a factor which may be related to its proximity to Italian influences.

2 Final Comments

The results of this paper fall somewhere between classification as significant findings and as significant non-findings. Among the significant findings are that substantial differences exist between the patterns of witchcraft persecution before and after 1420, that differing regions have patterns of witchcraft, and that these patterns are also shaped by demographic factors. These demographic factors relate to the interplay of urban and rural society within the social formation: urban size, urban density and urban growth all have repercussions on the characteristics of witchcraft hunting. One of the most important recommendations of this paper is that future research pays more attention to the role of urbanization processes in defining witch persecution. The significant non-findings of this paper relate to the relative merits of the two theories. The message is ambivalent. Both the demographic/gender and the social transformation hypotheses were successful in predicting certain relationships. On the other hand, both had doubt cast upon them by other findings and neither emerged as a strong explanatory hypothesis. What can we conclude from this ? One lesson is that attempts to apply either of the theories universally and simplistically without attention to real-world social dynamics in concrete historical situations are probably misguided. Clearly, the causal relationships in the 14th and 15th centuries are every bit as complex as they are in today's world. A second lesson is that more data, and more information about the quality of the data is necessary for future work to discriminate more carefully the goodness of fit between theory and reality. A final lesson is that the recent progress made in theorization of witch persecution has done less to dispel the fog of mystery around the subject than the spells of the theoreticians would have us believe - the European witch craze remains a tantalizing enigma that has still to be fully decoded.

References

- (1) The formulation of rigorous hypotheses that can be used to test theory is the norm in quantitative macro-sociology. Due to the poor quality of my data, I am unable to do this. The intentions of this paper are to provide suggestive results that may help us evaluate the merits of the theories, rather than to confirm or falsify them.
- (2) The most notable example of the boundary maintenance hypothesis is Kai Erikson's imaginative and beautifully written book *Wayward Puritans*, Erikson explains three crime waves (one of which was the infamous witch hunt) in 17th century Salem as attempts by the community to reinforce its collective identity at times when that identity was threatened. An unfortunate aspect of Erikson's thesis is that the links between his theory and his data are established almost anecdotally, and the causal links between identity crisis and social agency are woefully mystical. Although I cite numerous studies here as exemplars of »boundary maintenance« hypothesis, it should be born in mind that they are all careful to identify proximate modes of causation in the concrete historical interests of particular social groups located within the society under transition.
- (3) Of course, the advantages to be gained from a detailed analysis of a specific period of the witch craze are to some extent off set by the problems of generalizability that one must confront. Clearly, the extent to which the findings of this period are generalizable to post-reformation Europe is problematic. Still, even assuming that the causal mechanisms that I identify in this paper are not generalizable to subsequent activity, there is a distinctive merit in the investigation of the period 1300 - 1500 purely as an inquiry into the rise of European witchcraft. Moreover, the activities of this period, in that they set a precedent and historical tradition, must be seen as in some sense causally relevant to the development of subsequent witch persecutions.
- (4) Trials and events involving more than 20 persons were excluded from the data set on theoretical grounds. During the period in question, mass trials and persecutions of witches were often conflated with proceedings against the last remnants of medieval heretical sects such as the Cathars. Although Keickhefer includes these persecutions in his Calendar, diabolism/sorcery was not the chief reason for prosecution of heretics. Rather the events are primarily political/religious, and are of a different qualitative order from the persecution of witches.
- (5) Kieckhefer himself admits that « the contents of archives throughout Europe still need systematic investigation before a full list of ascertainable witch trials can be made«, and goes on to comment that »the following calendar is therefore merely a provisional tool, reflecting the present state of research.« My paper takes heed of his comment. Its findings should not be considered as conclusive but rather as suggestive.

- (6) The close correlation between the growth of towns and the transition from feudalism to capitalism has been remarked by scholars as diverse as Weber, Braudel, Marx, and Adam Smith. It is on the basis of their work that I am able to operationalize levels of social transformation as related to levels of urbanization. It should be noted that demographic considerations are relevant to this part of the paper too. Whereas the demographic/power theory investigates the relationship between demographic change and social processes, in the case of the social transformation theory demographic variables provide the basis for an operationalization of levels of social change.
- (7) The finding does however rest on the assumption of a homology between the internal quality of the data and the reliability of the reporting and recording of trials. Personally I find this assumption reasonable.
- (8) The categories of punishment were defined as follows. Killed = Reference to burning, drowning, burying alive etc.. Other Punishment = imprisonment, fine, banishment, branding. Absolved = acquitted or given penance.
- (9) Because secular trials were coded as a binary variable the estimated effects for the equation were obtained with logistic regression.
- (10) I am not suggesting here that my variables are themselves causal in the traditional Millian sense - they are merely operationalizations of other underlying causal mechanisms. Nor should the scores be taken too seriously. I merely wish to present strongly suggestive evidence that the amount of social change has strong repercussions on the type (as well as quantity) of witchcraft that was dominant in a given country during the period 1300 - 1500. The ideal type classification is made on the basis of the three characteristics used to distinguish the two models, severity of trial, gender, type of court as considered in Tables 14, 16, and 17. The allocation of a given country towards an ideal type is determined by whether that country's score on a given variable is above or below the grand mean as expressed in the Tables. Germany, for example, is considered to be 2/3 early-modern because it scores above the grand mean in terms of secular trials and the gender of the suspects, but below the grand mean in terms of trial severity.
- (11) In an earlier draft of this paper, I reported the results of a pooled cross-sectional time series analysis in which the association of both universities and urban density with the number of trials was significant. After consideration a regression approach was dropped pending the location of more, and improved, data.

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Table 1: Proportion of Persons of Known Gender to Total Numbers Accused.

Period	Known Gender	Total Accused	%Known Gender
1300-1420	194	225	86%
1421-1500	493	640	77%

Independence Demonstrated by Chi-Squared test at 0.01 level.
 Significance levels are reported with this data in order to comply with convention. Some readers may find them useful. However, it should be added that as the data cannot be considered a truly random sample, the utility of the significance levels is doubtful. In most tables the number of cases are given in parentheses beneath the reported scores.

Table 2: Number of Persons Killed per-Trial by Period.

Period	Mean
1300-1420	.4028 (72)
1421-1500	.6549 (226)
Entire pop.	.5940 (298)

Number of cases in parentheses.
 F = 15.0167.
 Significance = .0001.
 Missing cases = 216
 (1300-1420 = 121,
 1421-1500 = 167).

Table 3: Number of Persons Accused per Trial by Period

Period	Mean
1300-1420	1.84 (121)
1421-1500	1.63 (393)
Entire pop.	1.68 (514)

F = 1.92.
 Significance = .1664.
 Missing cases: = 0.

Table 4: # Females Accused
as % of All Ac-
cused

Period	Mean
1300-1420	47% (113)
1421-1500	70% (345)
Entire pop.	.64 (458)

F = 23.8449.

Significance = .0000.

Missing cases = 54.

Table 5: Relationship Between Gender, Time Period and Victim Outcome

Period	% Women Kill	% Women Puni- shed	% Women No- Pun	% Men Kill	% Men Puni- shed	% Men No- Pun
1300-1420	42% (27)	49% (32)	9% (6)	36% (16)	24% (11)	40% (40)
1421-1500	63% (112)	25% (45)	12% (22)	77% (50)	9% (6)	14% (9)

Independence Demonstrated by Chi-Squared Test at 0.01 level.

Missing Cases = 489.

Table 6: Mean Number of Persons Killed per Trial by Type of Court.

Court	Mean # Killed
Ecclesiastical	.6563 (64)
Secular	.5304 (181)
Entire pop	.5633 (245)

F = 3.058.
Significance = .081.
Missing cases = 269.

Table 7: Mean Number of Persons Killed per Trial by Type of Court and Period.

Period	Court	Mean # Killed
1300-1420	Ecclesiastical	.3529 (17)
1421-1500	Ecclesiastical	.7660 (47)
1300-1420	Secular	.2432 (37)
1421-1500	Secular	.6042 (144)
Entire pop.		.5633 (245)

Missing Cases = 269.

Table 8: Proportion of Secular Trials by Period.

Period	Proportion
1300-1420	.59 (89)
1421-1500	.70 (341)
Entire pop.	.67 (430)

F = 3.609.
Significance = .058.
Missing cases = 84.

Table 9: Reproduction Magic as a Proportion of All Magic.

Period	# Cases Repro -Magic	# Cases All Magic	% Repro -Magic
1300-1419	23	133	17.2
1420-1500	45	400	11.25

Independence of periods significant by Chi-Squared test at 0.01.

Table 10: Relations Between City Size and Number Killed per Trial

Size	Mean # Killed
<18 000	.66 (213)
18-29 999	.34 (23)
30-49 999	.38 (34)
>50 000	.53 (28)
Entire pop	.59 (298)

F = 5.76.

Significance = .0008.

Missing cases = 216.

Table 11: Relationship Between City Size and Mean Number of Secular Trials as a Proportion of All Trials

Size	Mean
<14 999	.66 (329)
15-29 999	.96 (26)
30-49 999	.60 (46)
>50 000	.65 (29)
Entire pop.	.67 (430)

F = 3.65.

Significance = .0126.

Missing cases = 84.

Table 12: Sex Ratio of
Females to All Ac-
cused by City Size.

Size	Mean # Females
>14 999	.65 (349)
15-29 999	.86 (25)
30-49 999	.62 (49)
>50 000	.49 (35)
Entire pop.	.64 (458)

F = 3.21.

Significance = .0227.

Missing cases = 56.

Table 13: Effects of Urban Population Growth in 14th and 15th
Centuries on the Numbers of Witches Killed per Trial, the
Log Odds of a Secular Trial and the Proportion of Female
Witches Accused.

Population Growth Period	Number Witches Killed	Secular Trials	Female Witches
1300-1400	-.99 p=.48	.008 p=.261	-.63 p=.01
1400-1500	1.26 p=.44	-.005 p=.32	.41 p=.04

Table 14: Mean Number of Persons Killed per Trial by Country.

Country	Mean # Killed
Germany	.53 (65)
Britain	.28 (14)
France	.64 (103)
Italy	.56 (25)
Switzerland	.75 (61)
Mean	.6157 (268)

F = 3.52. Significance = .0081.
Missing cases = 246.

Table 15: Mean Number of Persons per Trial by Country.

Country	Mean # Persons
Germany	1.7750 (80)
Britain	1.7950 (44)
France	1.8077 (156)
Italy	1.4500 (40)
Switzerland	1.50 (143)
Mean	1.676 (463)

F = 1.241. Significance = .2927.
Missing cases = 51.

Table 16: Mean Number of Secular Prosecutions per Trial by Country.

Country	Mean # Trials
Germany	.8939 (66)
Britain	.4839 (31)
France	.5447 (123)
Italy	.5143 (35)
Switzerland	.7252 (131)
Mean	.6580 (386)

F = 9.0106. Significance = .0000.
Missing cases = 128.

Table 17: Mean Numbers of Females per Trial by Country.

Country	Mean # Females
Germany	.7993 (71)
Britain	.4042 (40)
France	.5636 (139)
Italy	.7059 (34)
Switzerland	.6654 (129)
Mean	.6322 (413)

F = 6.148. Significance = .0001.
Missing Cases = 101.

Table 18: Two Ideal Types of Witch Persecution 1300-1500

Period	1300-1420	1420-1500
Persecution Type	"Medieval"	"Early-Modern"
Mean Severity	Low	High
Witch Gender	#Males=#Females	#Females>#Males
Court	#Eccle=#Secular	#Secular>#Eccle

Table 19: Relationship between Mode of Witch Persecution and Levels of Social Transformation by Country For Europe 1300-1500.

Country	%Change Uni	%Change UrDens	Sum	Ideal Type
Germany	Infinite	+175	Infinite	2/3 E.M.
Switzerland	.	.	.	2/3 E.M.
France	+200	+69	+249	2/3 Med.
Italy	+58	+143	+210	2/3 Med.
Britain	+150	-27	+123	Medieval