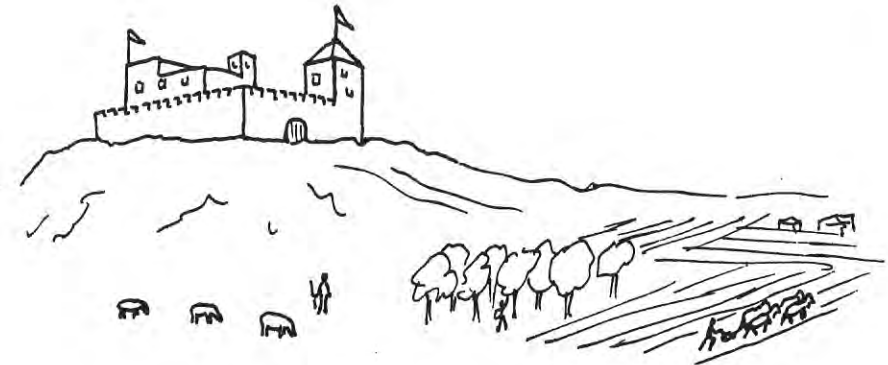


been replaced by the Celtic speech of Ireland. One can visualize the Picts as a small ethnic group, under pressure from the Anglo-Saxons and Vikings, voluntarily merging their cultural identity with the only significant rivals to these Germanic threats.

The Lapps would have lost significant ground to northward-expanding Scandinavians, but the line drawn here is no more than an educated guess.



CHAPTER EIGHT -- FINAL ADJUSTMENT

The last significant step in the development of the linguistic geography of Europe consisted of a number of changes in locations of language boundaries. This did not involve the separating out, or elimination of, any major language. The greater part of this adjustment resulted from the development of a new pattern of farming that stemmed from a particular source area, and which again increased the peasant population base. Another part of this adjustment was the continuing Slavic advance to the east that has not yet run its course. There should be few surprises here, though the economic basis of these movements is rarely noted in most history books.



3-Field System

By 800 A.D. the Germanic advance to the west on the continent had ended, and language boundaries there had begun to stabilize. The area between the



Rhine and Seine Rivers was still in a state of flux, with German dominant in the eastern part and French dominant in the west. Within this area the first indications of a new agricultural revolution were then beginning to appear. This new development is known to Western scholars as the Feudal system.

In practical terms this new procedure was an integration of several important items. Mold-board plows had reached this Frankish area by 800 A.D. and were part of the complex. The change to the 3-field system of crop rotation is first reported from here at about 800 A.D. (Gille 1969, Pounds 1973, White 1962). This involves the sequence of fallow, winter crop, spring crop, etc. At any one time there would be a roughly equal division of the fields into these three uses. Compared with the previous 2-field system, grain production increased by 50% on a given area. It also has the advantage of dividing the plowing into two halves at different times of the year, thus distributing the seasonal work load on draft animals.

The horse collar replaced the neck yoke also at about 800 A.D. This enabled horses to pull four or five times harder without choking, and thus equalling the pulling power of oxen. Since horses can plow half-again faster, and for a few more hours per day, they now become the major draft animal. Much of the increased grain crop was normally in the form of oats, and horses become more economical even when counting their feed requirements.

A new form of tree-felling axe was introduced in the following century (Duby 1954:363, cited by White 1962:41). This is correlated with a major episode of deforestation throughout Europe that lasted until 1300 A.D. By that time virtually all usable agricultural land had been cleared in western Europe, but the process was much slower to the east. These new farm lands alone would have led to at least a doubling of food production.

Beans became a significant part of the food crop at this time (White 1962:76). These are a major source of protein in the human diet and are an effective substitute for much, though not all, of the need for animal protein.

With all of the above factors, overall food production in western Europe increased by at least four times between 800 and 1100 A.D. The corresponding increase in human population would also tend to create outward pressure from the major source area of these innovations. The Feudal system of social organization developed during this time and is credited with being a major factor in subsequent human movements. Increased use of horses in agriculture also made them more available to the military. The stirrup, which allows the soldier to swing a sword from horseback without falling off, was introduced to the West in the 8th Century. Thus western Europe greatly augmented its military power, as well as its population, at this general time.

German Reflux

The core of these new developments was mostly in the Frankish area that straddled the French-German language line. Its major weight appears to have been slightly to the French side, as indicated by a modest rolling back of the German-speaking frontier. This ranged from no change at all around Switzerland to as much as 100 km in some places to the north of there. The upper Moselle valley was the largest area lost by the Germans from their earlier holdings (Fig. 27).



For three centuries the Medieval economy was developing at its source and spreading to the east through the German-speaking area. Then between 1100 and 1300 A.D. the German frontier rolled eastward about 300 km, from the Elbe to well east of the Oder-Nisse line. In central Germany the western Carpathian Mountains were a significant barrier, and they were passed by an average of only 50 km.

After 1300 A.D. (1330 according to some writers) the eastward move continued in an altered form for at least another

century. During this time the German settlers were mainly townspeople--workers in various skilled trades who set up colonies, or added to them, ever farther to the east. Some farmers continued to move, but the advance of the language frontier was mainly in the form of Germanizing the resident

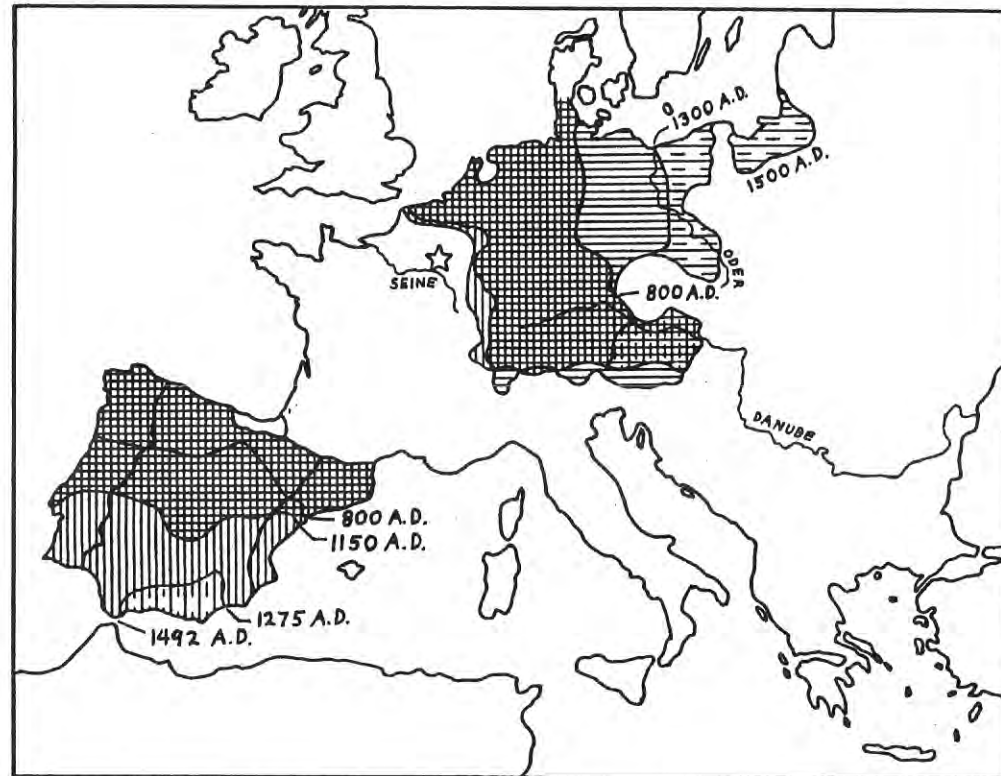


Fig. 27. Effects of the Feudal system. The impact of this new economy was most conspicuous in Germany and Iberia. The star marks its general source in "Frankish" lands. German lost some ground to French (lines perpendicular to the Feudal advance) and gained considerably in two stages to the east (lines parallel to the advance). Mixed markings in Austria illustrate the uncertainty about when Germans fully occupied it. Re-Latinizing of Iberia probably began without the Feudal system, but its rapid advance after 1150 A.D. certainly reflects this influence.

Slavic peoples. This second form of eastward Germanic movement automatically followed the easiest channels of transportation and communication, and these emphasized water travel. During the next century the Germanizing wave progressed another 400 km along the Baltic coast into East Prussia, and 200 km up the Oder River into Silesia.

It should be noted that the 200 km German advance downstream along the Danube exactly fits this pattern and distance. History says it was accomplished by 1100 A.D., but I suspect this was little more than a military occupation. The real Germanization of Austria was probably accomplished after the year 1100.

The geographical pattern of this last German advance can be described as consisting of three thrusts, one along each of the three major waterways (Fig. 27). A 200-km move was made along each river course, and 400 km along the more easily navigated coast. The intervening areas of Bohemia and Polish Posen were only marginally intruded upon.

More advanced outposts also existed, but soon after 1400 A.D. they failed to continue Germanizing the countryside. Instead, the local people were increasingly adopting enough of the Feudal system and its technology to increase their own productivity and population, and thus to hold their ground against further encroachment.

The first advance of German settlers moved the frontier 300 km in 200 years, or 1.5 km per year. The Germanization process then moved it another 200 to 400 km in 100 years, or an average of 3 km per year--twice as fast. Improvements in the means of transportation and communication would then allow further eastward movement of these agricultural skills at an accelerating rate. The 3-field system is reported in Russia at 1500 A.D. This requires another advance of 600 km in that century to reach even the closest Russian frontier by this date. Thus the advance rate was doubled again to become 6 km per year. With no further acceleration these new farming techniques could easily spread over the rest of European Russia in the next three centuries.

Iberia

The process of Latinizing had earlier overlain a substratum of many languages in Iberia. Three of these in the north are of particular interest here. Celts had occupied a 200-km square in the north-west, Basques held the 500-km strip across the top center, and Ligurian was in a triangle of just over 200 km to a side in the north-east. Three distinct dialects of Latin emerged--Galician (or Gallegan), Castilian, and Catalanian, in that order. These eventually became distinct languages.

Early in the 8th Century most of Iberia was conquered by Arabs out of North Africa. Their hold was longest (700 years) and strongest toward the south, and was no more than transitory on any part of the 200-km-deep northern fringe.

Christian reconquest from the Moors progressed slowly until about 1150 A.D., at which time half the peninsula was under their control (Fig. 27). During the next three and a half centuries their expansion rate was twice as fast. There is no obvious ecological basis for the early part of this Christian expansion, but the later and major part coincides with the German expansion to the east. An obvious presumption would be that the 3-field system, horse collars, stirrups, and the rest of the Feudal economy had taken hold in northern Iberia at this time. This then added greatly to the population and military strength of this northern faction.

The reconquest was completed in 1492. It unrolled from the three northern language areas in a generally southward direction. Although the rest of Iberia had been largely Arabized, the more numerous northerners should have easily imposed their languages as they moved to the south. Political boundaries between the various Christian kingdoms varied almost randomly during this conquest, giving no indication of the linguistic divisions.



It is a natural presumption that military manpower, political administrators, and the many new settlers would all tend to move generally southward from their three northern sources.

The Galician corner would naturally progress straight to the south, paralleling the Atlantic coast, and maintaining an average breadth of 200 km. This advance runs out abruptly at the mouth of the Guadiana River in southern Iberia. Except for its originating corner, this strip becomes modern Portugal.

The central and largest section of Castilian is the basis for modern Spanish. Only in this area do we still have a living survival of the original pre-Roman language--Basque. The southward advance of Castilian covered the major part of the peninsula.

The Catalanian corner would unroll down the eastern side of Iberia, but this coast angles strongly to the south-west. Moving straight south they would pinch out against the coast with almost no progress; paralleling the coast at 200 km they would cut unnaturally into the Castilian area. The obvious compromise is a gradually narrowing coastal strip that reaches slightly more than halfway down the peninsula.

These three languages automatically come to occupy their exact modern portions of Iberia. No historical events need be called upon to account for these distributions.

Other Places

The Feudal farming complex would have entered England as it was being developed, and only shortly after the mold-board plow arrived. The Germanic language frontier in the British Isles should have made some advances corresponding to those on the continent. English did gradually prevail over the local Celtic languages, but for no obvious reason this was both slower and later than the German advance to



the east. Celtic resistance may have been stronger than Slavic, and the English pool of resources was smaller than the German. By the year 1500 A.D. only modest progress had been made. With the rise of the modern industrial age Celtic has faded rapidly.

Scandinavians progressed up their major peninsula with the increasing population pressure from the southern areas. The Feudal farming complex probably was not so much a factor in opening up new lands as was the use of new crops and strains that could tolerate the climate. Again, progress was slow to 1500 A.D., but faster with industrialization.

In southeastern Europe the modern language boundaries look like they were reached, for the most part, by the end of the previous stage at 1100 A.D. The southern Slavs, Turks, and Romanians had consolidated most of their gains, and the Greeks had pushed their ethnic frontier back up the Balkan Peninsula. Still, there were a few changes of uncertain date that could be postulated for the period of 1100 to 1500 A.D.

The Turkish penetration of Caucasian territory is first shown for this time. Also shown is a Caucasian bulge to the north, as well as an Iranian intrusion.

In eastern Europe the Slavic expansion was continuing throughout this period. Details of this advance up to 1500 A.D. and beyond appear in the previous section. This Slavic move was basically a continuation of the mold-board plow phenomenon, and the Feudal farming system merely added a new impetus.

Language Map

At this date of 1500 A.D. the linguistic map of Europe has reached its modern condition in almost all respects. (See Fig. 28 and compare with Fig. 1.) The central area was already modern by the date of 1330 A.D., just before the "Black Death" struck. Only around the periphery have

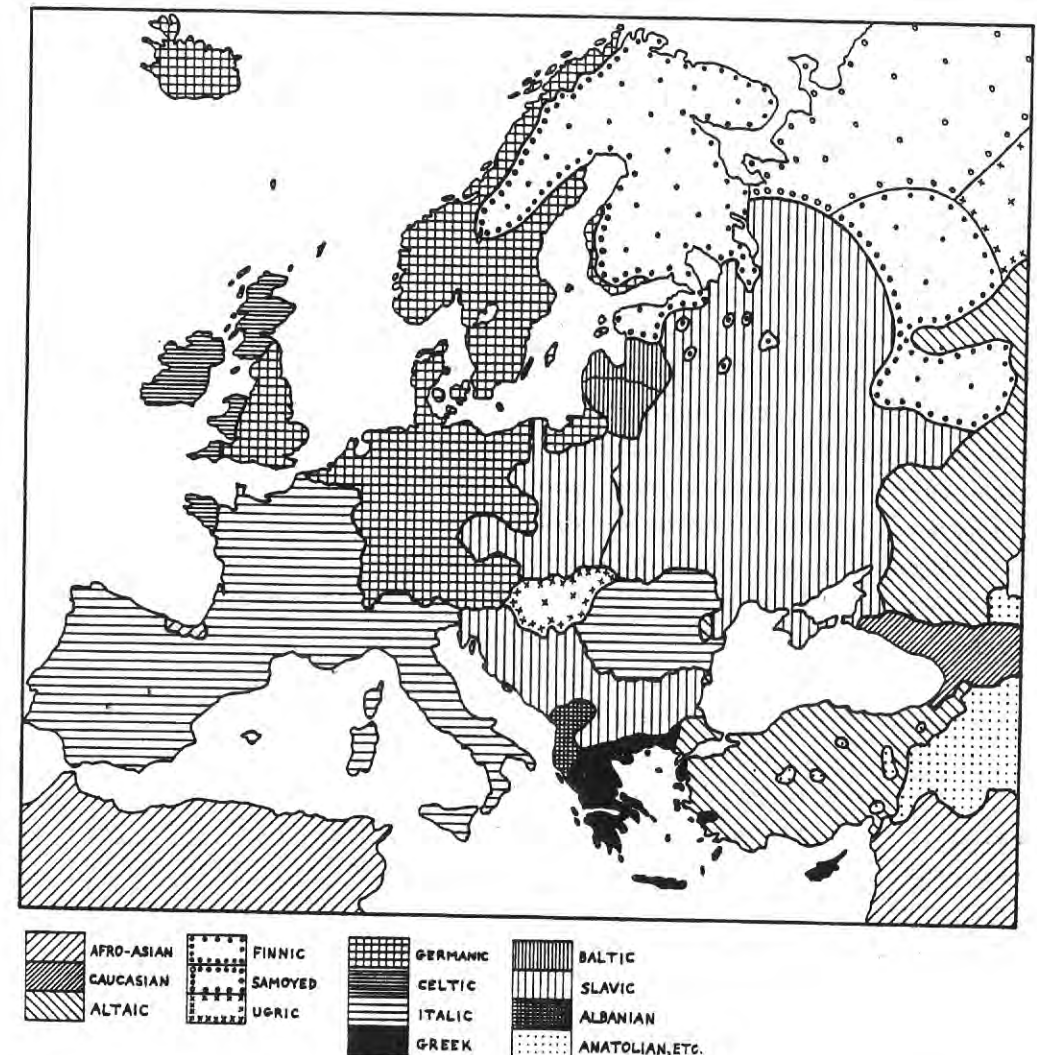


Fig. 28. Language map in 1500 A.D. The major changes are re-Latinizing of Iberia, eastward advance of the Germans, and continuing eastward movement of the Slavic frontier in Russia. The last Turkish progress is shown, along with a presumed Caucasian shift to the north. A recent Persian intrusion in the east is not distinguished here from the Anatolian language group. Scandinavian penetration to the north has been increased gradually and arbitrarily in this and other maps.

there been any further changes in the last four centuries. And these changes are merely continuations of trends that had already been in operation for some time.

Germanic, Italic, and Slavic languages dominated Europe. The only other Indo-European language groups were Greek, Albanian, Baltic, and Celtic. These last four all occupied relatively small areas in 1500 A.D., and Celtic was rapidly retreating. "Anatolian" is used for all Indo-Europeans in Asia.

Of the non-Indo-European families, Uralic was and still is the most impressive in terms of numbers and area. Hungarians, Estonians, and Finns were distinct nationalities, if not modern states. Farther to the north and east, other Uralic speakers were thinly distributed over mostly nonagricultural lands. These were in the process of being Russianized.

Altaics were the next most impressive, with modest Turkic holdings in the Balkans that expand greatly into Anatolia. Turkic territory in the Pontic Steppes was still considerable in 1500 A.D., but was being gradually overrun by Slavic farmers. The final Turkic line there would soon stabilize as good farming land faded into semideserts.

The territory of Caucasian speakers has always been rather small. Turkish and other groups were encroaching on them from the Asian side. On the European side the Caucasians probably held their maximum area as of 1500 A.D. In later centuries the Russian advance would reduce them somewhat.

Basque is the only other non-Indo-European language. Its area of use has probably not been significantly reduced since 1500 A.D., but most of its speakers are now also bilingual in either Spanish or French. They are the only members of the presumed Afro-Asian family on the continent.

The changes that occur after this time are restricted to the Germanic and Slavic areas. English had not yet replaced Celtic in Cornwall, Scotland, and most of Ireland and Wales. Scandinavians were expanding to the north at the expense of the Lapps, and this has continued up to the present time.

The eastern Slavs--Ukrainians and Russians--were still

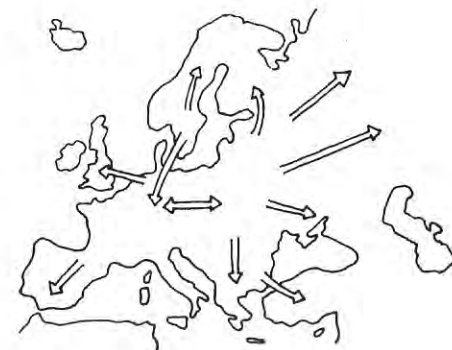
expanding their agricultural holdings with the mold-board plow, and this would continue for some time. Uralics to the north and Altaics to the south were losing ground to this advance. Still further Russian incursions would continue into northern Russia and Siberia in modern times. These incursions, like those by the English and Scandinavians, gained impetus from modern industrial developments.

Recent Racial Changes

The maps of racial distribution that were developed in an earlier chapter represent the situation after the initial Neolithic occupation and up through as late as 500 B.C. Since that time only a few significant changes are indicated. These are summarized as a small item in this chapter, and with the maps in Figs. 29 and 30. These agree well with known distributions of "genetic" and "classical" traits in modern populations.

The first notable racial movement since the Neolithic should have been the expansion of militant horsemen out of the Pontic Steppes in the 5th to 3rd Millennia B.C. This action has been recognized in a few metric changes in some skeletal remains from eastern Europe. This "Kurganization" tapers off swiftly to the west and does not reach central Germany at all (Schwidetzky 1980). Skeletal remains from Greece have been studied in detail for evidence of this same phenomenon. Xirotiris (1980) finds there has been no significant immigration into the Aegean area since the early Neolithic. Present evidence suggests there were no population movements in this time and place that seriously affected gene frequencies over large areas.

Scandinavians, with their presumed 27% Anatolian genes, shifted to the south and entered the German river basins where the residents were an average of 42% Anatolian. My calculations



suggest that the intruders ultimately constitute 41.5% of the resultant mix, so the shift in Anatolian gene frequency in Germany would be about two-fifths of the way from the local Celtic percentages toward the Swedish. This change is introduced into Germany while maintaining a comparable south-north cline as before. (Compare this area in Figs. 14 and 29.)

The Celtic diaspora probably had too little effect on their locations of settlement in most cases to call for changes in the map. The Slavic intrusion from the east into German lands was probably about matched by the German reflux in the opposite direction shortly thereafter. The Germanic (Saxon) intrusion into Great Britain would not have greatly affected the map, because the frequencies in both locations were so similar at that time.

Most of Iberia was initially Asiatic/African except for a small mixture with Mesolithic Europeans. Its northeastern corner was strongly European from the beginning, and there was some Celtic intrusion into the north-west and elsewhere. The Feudal spread would add many more Europeans to the northern fringe, but they were still a small minority. The Christian conquest from the north would raise the European genetic component somewhat higher throughout the peninsula.

The slavic expansion increased local populations at the source area, then these moved radially from there to some degree. Beyond a radius of 400 km there should be some significant shifts in Anatolian isogenes. Among settled agriculturalists about half of the people, and their genes, should have been derived from populations about 400 km closer to the source. This means shifting all isogenes at least 200 km radially outward for as far as the mold-board plow spread. Where native populations were thinner, the shift would be greater. I suggest an isogene shift of 400 km for the Baltic-Finnic area, and one of 600 km for the other Uralics. For the Pontic Steppes the farmers' advance over the herders should have carried their genes at a retention rate of about .81 per 200 km to be consistent with their advance rate. This is all shown in Fig. 29.

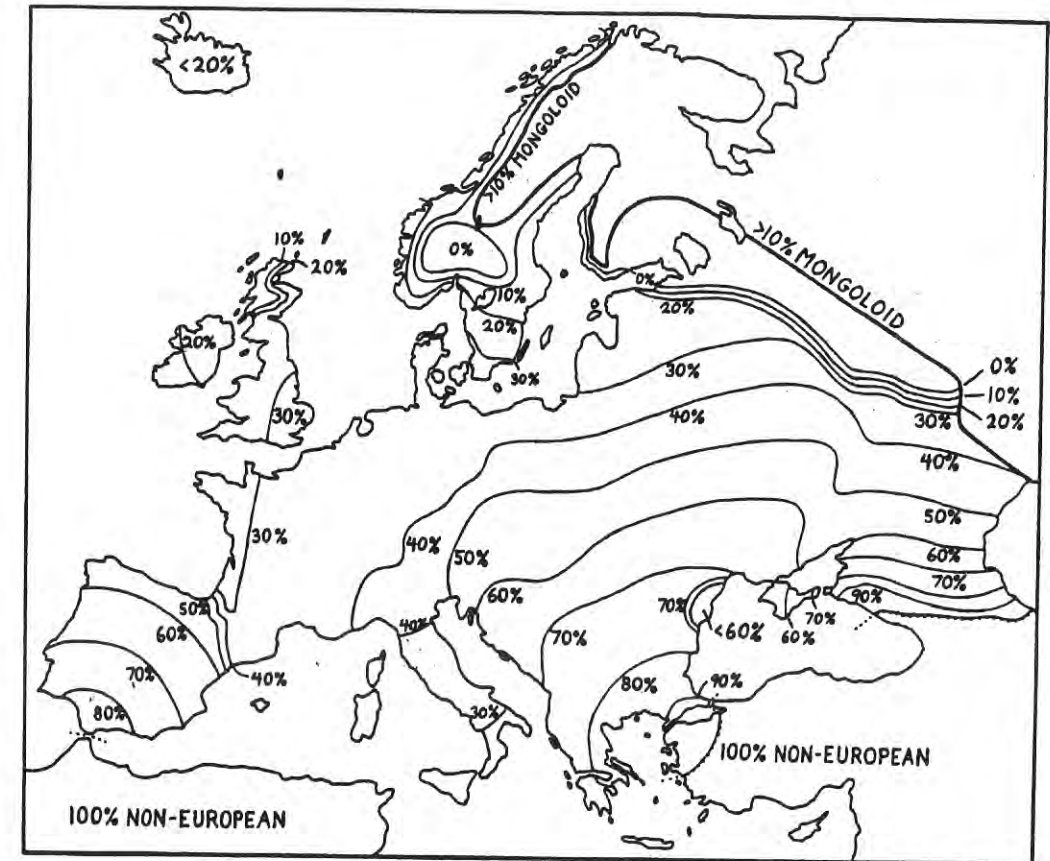


Fig. 29. Non-European genes, recent distribution. The approximate contributions of Anatolian and African genes in Europe are shown at 10% intervals. This map may be compared with Fig. 14, which gives the distribution at the time of the original Neolithic settlement. These changes are the logical expectations that follow from the population movements indicated throughout this reconstruction. The greatest shift is of Anatolian genes to the north and north-east with the Slavic expansion. Non-European genes back-off in Anatolia and Iberia, and there are also some adjustments in the Germanic area. As with Fig. 14, there is no attempt to include extra Anatolian genes along the Mediterranean that were brought in by later Boat People. The Caucasoid-Mongoloid line is also shifted to the north and east.

The racial map of Caucasoids vs Mongoloids, as far as Europe is concerned, is also plotted for recent times by these same procedures. This is figured only for the year 1500 A.D. to avoid recent Russian expansions which have drastically reduced the Mongoloid element. The problem here is that urban and rural contrasts become great, and cannot effectively be combined in a single map. (Compare Figs. 15 and 30.) Again, this agrees well with modern racial distributions, but this is not entirely surprising because the rates of mixture were at least partly calculated to achieve this result. That the geographic pattern fits is perhaps more significant.

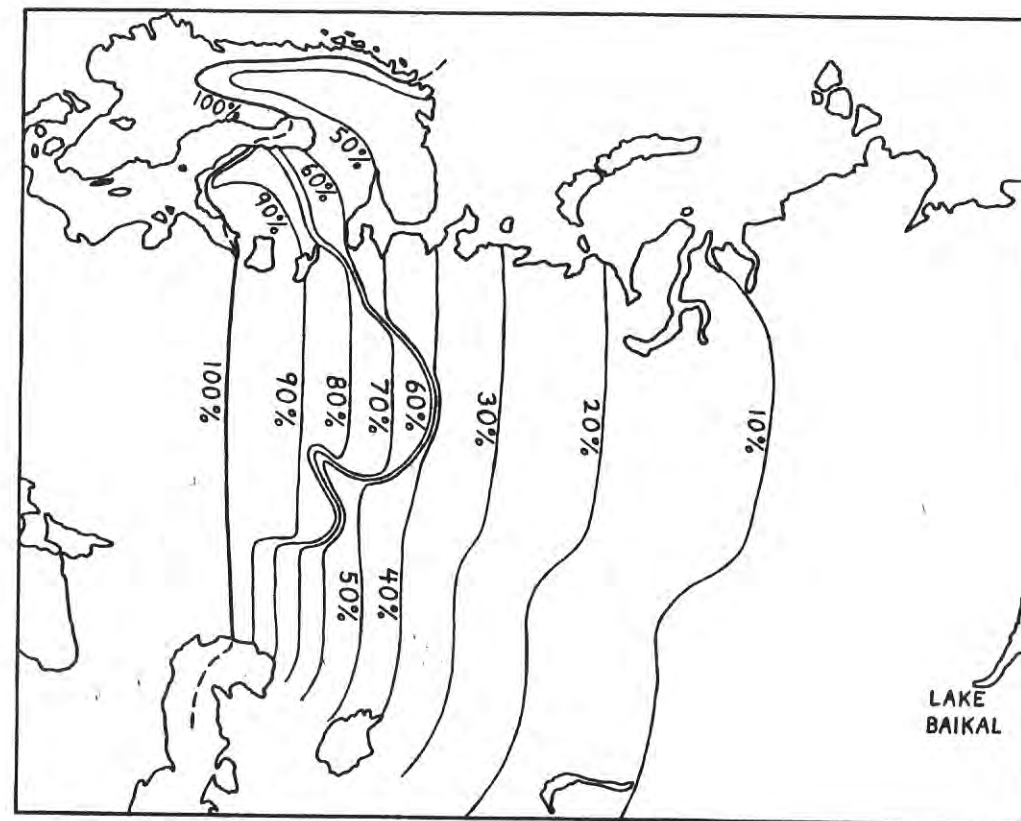
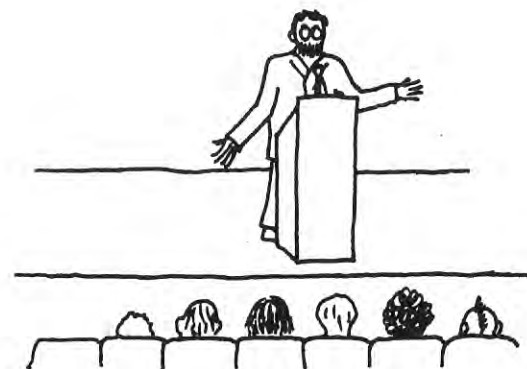


Fig. 30. Caucasoid genes in Asia, recent distribution. The Caucasoid component is given in 10% intervals, beginning with the heavy line of 100% in the west. This map may be compared with Fig. 15, which gives the distribution at the time of original Neolithic settlement. The major contrasts result from Caucasoid intrusions with farming in northern Russia and Scandinavia. These changes, like the earlier map, are based on reconstructed ethnic movements, and are not compared here with actual racial data in detail.



CHAPTER NINE -- CONCLUSIONS

The entire story of the development of European language geography, as just reviewed, turns out to be rather simple in its broad outline. It consists of just five major steps--the initial Neolithic occupation, the Germanic move, the Roman Empire, the Slavic expansion, and the Feudal adjustment. Three of these are based primarily on technological changes, one on a climatic fluctuation, and one on a spread of social factors. There may well have been other important events, but no more need to be added to account for the known linguistic distributions, past and present. The rates of movement of the human populations involved are brought down to just one basic pattern with a few regular quantitative variations. This is also certainly oversimplified, but again no significant differences from this are needed to account for the present language map. (The Slavic shift to the west after World War II is so well known that its inclusion seemed superfluous.)

All of the changes recounted here are rational, natural, and regular--in a word, predictable. To some readers this may also appear to be mechanical, and thus neglecting the "human element." It is true that a consistent theme of this reconstruction is that it does not take into account any conscious decisions of the people involved, nor any chance events--no "historical" factors

at all. Quite simply, it was not found necessary to introduce any such explanations to account for the big picture. In terms of finer details not covered here, these historical factors no doubt would come increasingly into play. That level of detail was not encountered in this study.

An interesting aspect of this investigation is the close parallel between its basic philosophy and that used in purely linguistic reconstructions. In both cases a set of universally applicable rules is devised to describe the known phenomena, and all variations on these are also formulated into rules which admit of no exceptions. There is no inherent reason to connect these two very different kinds of linguistic reconstructions; the rigorous application of rules is part of science in general.

The amount of speculation that has been indulged in here is actually remarkably small, especially as compared with other reconstructions of the same subject. After settling on the basic principles involved, the task here became one of finding where, when, and how people would have moved, but not of discussing where they could have moved. Each of these moves had to be shown to follow directly from the geographical situation. None of them could be postulated just to fit with the reported historical, linguistic, or archeological data. In many cases definitive evidence is lacking for what has been claimed here. The future studies and discoveries that might test these claims are mentioned throughout the text, where pertinent.

Major Innovations

A number of conclusions are reached in this study that contrast sharply with present commonly held opinions about the prehistory of European languages. There are ten such contrasts that are worth recounting here in some detail. The first four of these should prove to be the more



important and surprising to most students of this subject.

1. That the Indo-European languages originated in the Near East and were spread by the first farmers at an early date. There is ample evidence that Neolithic farming spread over most of Europe since 7000 B.C. from a Near Eastern source by way of Anatolia. It is equally clear that this economy was brought by an incoming wave of settlers who greatly outnumbered the native foragers at all points of contact. It necessarily follows that the language of these immigrants prevailed over that of the previous residents in all cases. There was a limited entry area, at the Dardanelles, for those whose descendants eventually overran the majority of the continent. This means that most of early Neolithic Europe must have constituted a single linguistic unit. At no time in subsequent European history is there any evidence of another human wave of advance that had anywhere near such overwhelming numbers, or that spread itself over so great a territory. Even with no information beyond this, the most obvious conclusion would be to relate this Neolithic invasion to the major language family of Europe today. That all of the geographical details and subdivisions fit with this picture, as well as the distributions of other nearby families, only serves to strengthen this interpretation.

The timing of this event, as compared with the supposed time of origin of the Indo-European languages, is the major point of contention. If the Indo-European dispersal could be put back substantially in time, then the source and the mechanism for its spread would follow automatically. The speed of linguistic change has been roughly estimated in some Indo-European languages where documentation extends back to well over 2000 years ago. (Linear B to modern Greek has the longest, though poorly known, history of 3400 years.) By assuming a constant rate of change, and extrapolating back beyond these documents, a beginning time for Indo-European divergence has generally been put at about 3500 B.C. Many Indo-Europeanists now push this back another 900 years to make an archeological connection with the Kurgans as the

presumed source. The fact that the Neolithic spread began much earlier, at 8000 B.C., may pose no problem for several reasons.

First, the dialect mesh was most likely intact up to about 2000 BC and maybe even much later, while full-speed drift would commence only after it broke up. Differentiation among its connected dialects until then may have been considerable, but was probably much less than what occurs in freely drifting languages.

Second, it is quite possible that language change was a much slower phenomenon in early times than it has been more recently. Most known cultural changes follow this pattern. I see no inherent reason why language diversification should also have followed an accelerating growth curve, but perhaps it has.

The third reason is that increased communication between different languages tends to provide innovations for further changes. Such contacts certainly increased in later times with the development of civilizations. This is mainly a supporting argument for the acceleration idea given above.

Finally there is my own observation that small speech communities appear to drift more slowly than large ones, all else being equal. This is easily shown with the languages at hand--Baltic is most like proto-Indo-European, Icelandic is the most conservative Scandinavian language, Rhaeto-Romanche is the most like Latin, and even Quebecan resembles an early form of French. Slavic is also close to the original Indo-European, while its population explosion is a very recent phenomenon. Similar examples are found in other language families, including some California Indians (Krantz 1977). The general rule is that among sister languages, these with the larger populations change the fastest. This is not generally recognized, I suspect, simply because most linguists have not arranged their data to look at this possibility.

A combination of some or all of these factors could easily put the Indo-European origin time back to 10,000 years ago, rather than the 5500 (or 6400) that has been commonly supposed.

Another major problem with this thesis is that proto-Indo-European vocabulary indicates a mainly pastoral economy

others disagree
(Goodenough 1970). Common words for "plow" and "to plow" as well as words for the major cereal grains are found in the European language branches, but cannot be matched with corresponding words in Anatolian or Indo-Iranian (Cowgill 1970). At first glance this would indicate that the original Indo-European speakers were pastoralists, but not farmers. A second look, however, suggests that this common European terminology may be significant. It shows that the original Indo-European speakers who spread over Europe must have been both farmers and herdsman--exactly the basic Neolithic economy as postulated for them here. If they were herders only, then one is at a loss to account for their common farming terminology. On the other hand, my reconstruction is at a loss to explain why this same farming terminology is not found in the Asian branches. Clearly this is an impasse, with basic vocabulary capable of being used to argue both ways. *

The regular occurrence of horse and cattle words in all Indo-European branches could be explained by their being broadly intruded into the pastoral terminology before the language break-up had progressed very far. On the other hand, the idea of a similarly late intrusion of farming terminology into the European half of the family would presuppose they were not farmers up to that time. *no horse is divergent!*

Benveniste (1969) shows that Indo-European societies all include a division between priests, warriors, and farmers, but that the etymology for these classes does not correspond in the various branches. This also suggests a broadly intrusive social structure at some later date. Likewise, words for kingship, slaves, sacred, sacrifice, and legal terminology do not go back to common roots; whereas terms for order, moderation, and control are comparable. Again, this all seems to point more to peasants than to warriors at the beginning.

In addition, Goodenough (1970:262) pointed out that if one follows the Indo-European connection with Caucasian (Lehman 1952:112) to its logical conclusion, this implies that its spread "...could go back to the Neolithic colonization of Europe."

2. That Anatolia was mostly Indo-European speaking as far back as 7000 B.C. This conclusion greatly simplifies all of our prehistoric reconstructions for that area by removing the need to look elsewhere for the origins of some known peoples of early history. The supposed migration of Hittites through Caucasian territory (however that might have been accomplished) is not needed in order to explain their remote similarities; they actually had been neighbors since 7500 B.C. in their present locations. Even the Mitanni, of presumed Indo-European (no) affiliation, are first located exactly where this language family is shown to bulge down into the Afro-Asian area in the initial dispersal.

It is often assumed that southern Anatolia could not be the Indo-European homeland because its natural flora and fauna does not correspond well with the terminology of the protolanguage, as derived from its most widely distributed words. This does not necessarily follow if such words were distributed only as widely as are the natural items they refer to. Thus the original Indo-European would not be expected to include words for things that did not exist in its homeland, but such words would develop where and when the items were encountered and spread from there. While Indo-European natural vocabulary does not support an Anatolian source, I fail to see that it clearly excludes this source either.

3. That the Altatic language family spread from the Kuban rather than the Altai Mountain area. The only available impetus that would account for Altaic expansion would be their animal husbandry, initially based on sheep and goats. The most obvious source of this economy is the Near East. Putting the exact location of proto-Altaic just east of the Sea of Azov is not well substantiated, but it could not have been far from there. The timing of this origin at 7500 B.C. ought not to generate much controversy, especially if a long-persisting dialect mesh is allowed for in the early stages.

There will be disagreement with my identification of

Kurgans, and especially Scythians, with the Altaic family of languages. Ecology and geography argue for a single ethnic group having spread pastoralism over the entire Eurasian Steppes, and there is no evident opening for even a partial replacement until the time of the Slavic heavy-plow farmers.

No mechanism has ever been suggested whereby Indo-European speech could have entered the steppe area at some early date, let alone spread out over most of its neighbors, and then be replaced by Altaic. Some Iranian names among the later Scythian rulers are no indication that this was the language of the population. A conquest from the outside, or even imitation of names from a higher civilization nearby, could easily account for this meager linguistic evidence. The fact that the Mongol conquest in the 13th Century A.D. left only a few small language enclaves would certainly argue for ethnic stability of even this region.

4. That the Uralic language family stemmed from the Mesolithic inhabitants of the Hungarian Plain. According to most authorities Uralic originated in the Ural Mountain area and spread out from there, including a final intrusion into Hungary in the 9th Century A.D. This is most improbable because there is no accounting for how such a pastoral adaptation could have arisen in this starting location. Yet if the adaptation moved into the area from outside, it should have been brought by people whose linguistic affiliations lay elsewhere. On the other hand, it is certainly possible that some relatively primitive nomads from the Urals could have intruded themselves into the heart of Eastern Europe, but no good reason for such a move has been offered. It is especially difficult to explain how they could have ethnically replaced an entrenched peasantry that probably outnumbered them by more than ten to one.

The only resolution to these problems is to postulate Hungary as the origin place for the Uralics, and having them spread to the north and east from there. As reconstructed here, they would automatically have separated themselves into the three major subdivisions that are now located in the northern regions.

It also follows here that the easternmost of these subdivisions would automatically have the closest affinity with the Hungarian source.

Archeological evidence of a presumed early Uralic population in the Ural Mountain area fits just as well with the new interpretation offered here as it does with the traditional view. It is a simple consideration of who had the capacity to move in which direction, at what time, and against which population, that should decide the issue. The only problem that remains is the linguistic time depth that is apparently involved. Since this appears to be a common problem throughout this reconstruction, and the only one of note, the principle of Occam's Razor would argue that we should make a general correction in just this one aspect.

5. That the Basques are a remnant of an early Afro-Asian occupation of Iberia. This view should raise little objection except from those few who want to make Basque the oldest language in Europe. The only realistic alternative to the farmers out of northern Africa would be to make them descendants of the Aegean Sea Shepherds. In recent times the Basques have been mainly farmers. Their fame as sheep herders could arise from a farming base just as easily as their farming could have been added to pastoralism. It is their geographic situation, rather than any strong evidence of linguistic affiliation, that points to Afro-Asian connections. The Sea Shepherds ethnically disappeared from their coastal occupations, and there is nothing to indicate why they might have continued just here to become Basques. On the other hand, the Afro-Asian expansion should have stopped exactly along the present Basque boundary in France.

6. That the Germanic-speaking fringe of southwestern Finland dates back to the arrival of the first Neolithic farmers out of Sweden. Traditionally, this intrusion is put sometime in the Middle Ages during the period of Swedish military expansion. One problem with this view is that nowhere else along the trans-

Baltic coast did other Swedish speech communities survive where they should equally be expected. A more positive argument is that this is the exact strip of coast, with the correct depth of penetration, that would have been occupied from a Swedish source at 3050 B.C. according to the present reconstruction. Its linguistic unity with Sweden could have been maintained since then by regular shipping contacts.

7. That Breton has been the local Celtic language of Brittany since the earliest Neolithic. History would have this as an intrusion from western Britain during the 5th to 9th Centuries. The improbability of such a linguistic replacement, without a known mechanism, should be evident. The difficult terrain of Brittany is physically similar to those areas of Celtic hold-outs in western Britain. A similar continuity of speech is only to be expected. The especially close relation between Breton and Cornish is a problem that does not fit well with my reconstruction.

8. Deriving the German language directly from Sweden is not an original suggestion. That they initially occupied exactly the drainage basins of the two major western German rivers is highly specific here. It was not just the historical estimates of their early boundaries that suggested this mapping. The Germanic move out of Scandinavia was the only major population shift that had neither overwhelming numbers nor higher civilization to account for its success. It was therefore necessary to examine the exact geographical circumstances to see if there might be some kind of satisfactory explanation. These turned out to be unique, at least on this scale, and a river-basin pattern of occupation showed how this move was accomplished.

9. That the pattern and timing of the Roman Empire was inevitable, at least in rough outline. This should raise little objection, but it will be insisted by many that it was a historical circumstance that Rome was its center. I'm inclined

to think that if all the details were known, the triumph of that one Italic town might well prove to have been inevitable as well. It was, after all, located right on the meeting line of Etruscan and Greek civilizations, and it could profit maximally from both.

Lacking such knowledge, we can speculate on the results if a competing site had been successful. It is my contention that if Carthage had won the Punic wars it would have formed the same empire for all practical purposes. This would no doubt have had essentially the same linguistic result, except that it would have been Phoenician instead of Latin that dominated the western Mediterranean.

10. That the modern Turks entered Anatolia from Europe rather than from a central Asian source. The interjection of the Turks, which broke the geographic continuity of the Indo-European languages, may not be a proper part of this study because it occurred outside of Europe. Still, the people who apparently made this move, and the evident mechanism that was used, both originated in eastern Europe. Anatolia also has figured quite prominently in European linguistic affairs ever since the major entry of the Neolithic economy from there 9000 years ago, so its recent fate may be of legitimate interest.

Historical sources give no indication of how this Turkish interjection was accomplished--military conquest being no explanation. An ethnic replacement of this magnitude requires an ecological reason comparable to that which caused the great Slavic expansion. These Turks did not bring in a higher order of civilization, nor were they a massive exodus from some natural disaster. In fact, the mold-board plow did enter an area of Turkic speech on the lower Danube, as reconstructed here, giving these people sole and direct geographical access to Anatolia.

The ten innovative concepts summarized above are only a small fraction of those presented in this study; the list could have been prolonged almost indefinitely. These are selected as being the conclusions that are most at variance with the usual

historic and prehistoric reconstructions. It was never my intention to deliberately seek to disagree with previously held views, but neither did I hesitate to do so when the evidence warranted this.

It might be supposed that the major common theme of these new conclusions is the assigning of greater antiquity to many events than has usually been assumed. I would rather describe the common theme as saying that most people have tended to inhabit their homelands since their differentiation. Only incidentally has this come to indicate longer residence in a number of instances.

Many other reconstructions of Indo-European prehistory have had the various peoples moving rapidly and widely around the map for some time, then somehow arriving at their first recorded locations just before their written history begins. After this they move very little except for a few who's languages did not persist. This contrast between high mobility before history begins, and then relative stability after this, seems much too extreme for people who were agriculturally based throughout. By my interpretation these migrations are substantially reduced in number, and those moves that are retained are spaced out somewhat in their timing. In each instance an ecological reason is given that would appear to make the move inevitable.

A notable aspect of this reconstruction is that the same procedures and rules of movement are applied throughout its development. Prehistoric peasants are assumed to have been just as tied to the land as their historic descendants. If early boundaries are to be moved from place to place, then these must be described in the same terms as for the more recent movements.

It will be noticed that many historically famous migrations are either specifically denied here, or are simply ignored. The waves of ethnic conquest that repeatedly swept over the Eurasian Steppes were, at most, replacements of the ruling groups. Any major change in the Altaic languages of this area would require some mechanism that has yet to be proposed. Likewise, the series of invasions of Hungary had no known method by which they might

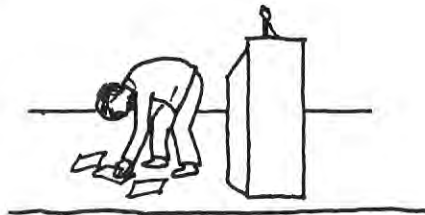
have changed the ethnic identity of the masses of people living there. A whole series of others, like Goths, Vandals, Vikings, etc., are left out entirely because they caused no permanent linguistic changes of significance. If the German army has not affected the French-German speech boundary with three crossings in one recent century, then it is not surprising that earlier and far smaller armies had no lasting linguistic effects either.

Problems Remaining

There are also a few aspects to this reconstruction that are not fully satisfactory to me. Some of these are worth recounting briefly.

1. The Caucasian language origin proposed here is very hypothetical and could use some confirmation or correction. I am particularly uncomfortable about postulating another center of origin for Neolithic farming in the Caucasus Mountain region, and passing over the known stand of natural emmer wheat in northwestern Iran for the source. Yet all considerations of timing and geography argue for this more northerly location.

2. The Aegean Sea Shepherds are treated here mainly in their frontier capacity as Boat People, but they later would facilitate the spread of full Neolithic farming techniques and people along the northern Mediterranean coast. Linguistically, this could mean that Aegean speech was a factor in Ligurian, Etruscan, and various Italian languages. Racially, this means a greater Anatolian component in Italy and southern France than my maps indicate. I have largely ignored this racial factor simply because there was no obvious way to quantify its effects. A correction of some kind is desirable here.



3. What caused the Magyar extension into Transylvania? There is a substantial population of modern Hungarians in the center of Romania for which I find no ecological explanation that is suitably rigorous.

4. If the mold-board plow originated inside Magyar territory, why is all its terminology Slavic in origin? Vocabulary argues for an origin in Slavic lands; ecology would place it on the Slavic-Magyar border; but subsequent geographical considerations fit best with the spread beginning just inside the Hungarian Plain. This reconstruction is based mainly on the geographical interpretation, although it would make relatively little difference which one had been used.

5. The historical impact and repercussions of the Slavic expansion to the west appear to have been somewhat earlier than they were in the south, although their timing ought to have been about the same. Some adjustment might be made to explain this, but it would also affect the solutions to problems 3 and 4 above. Every variation I've tried so far seems to affect these three problems in a slightly contradictory manner.

6. The proposed exodus of Finnic farmers out of Latvia and Estonia, and then across Russia, is an uncomfortably unique phenomenon. There is nothing logically wrong with this aspect of the reconstruction for its time and place, but it would be much better if there were other examples of this kind of move.

7. It is not clear why the Turks should have spread so far with the mold-board plow while the Magyars used it to advance their frontier less than half that distance. It is true that there were some major grasslands for the Turks to move through while the Magyars faced only forested lands to the west of Hungary. Other factors of ecology and demography may have been involved.

This list of remaining problems could also be prolonged, but not very far. In general, the procedures used here have handled all but some relatively trivial discrepancies. I would welcome any new attempts at this kind of reconstruction. Perhaps some of the problems noted above might be handled with new factors or new interpretations. More empirical data relating to some of my assumptions about human movements might strengthen or alter them. Perhaps the entire problem could be redone with some wholly new or greatly altered assumptions.

The overall picture of European linguistic geography is perfectly described and accounted for by the procedure used here. The conclusions reached are given in the form of clear laws, discrete events, and exact mapping--all of which may have been a bit overstated and oversimplified for the sake of clarity. In effect, the stage was set as of 10,000 years ago, the rules were given, and some reasonable innovations were tagged for their introduction at specified times and places. The whole thing was then put in motion and the results were observed through time. While much of the resulting story is not presently testable, some of it is. The fact that this process does fit well with most of known history and archeology, and that it ends up with the modern distributions and relationships--all this argues strongly that it represents the actual series of events.

It would seem unreasonable to discredit the method itself because of disagreement with some of its results. If this were done for the sake of a few details, then the explanation for the major part is lost as well. Either the method works or it does not. It would be peculiar indeed if 90% of European linguistic history followed natural laws, and the remainder were under no such constraint.

This is not to say that the reader must accept every detail of this reconstruction as given, or else reject it all. The method still has room for correction and change. Since the entire reconstruction follows automatically from the facts of geography and my basic assumptions, any error in its conclusions should be found to stem from an error among these assumptions.

In developing this picture I tried out many different sets of assumptions about human movement that were within the range of possible choices. All of the dates given at the 200-km intervals on the migration paths were calculated at least ten separate times. Many other paths were also figured out, several times over, that are not shown on the maps. There is also some leeway in the application of geographical barriers, climates, soils, and vegetation zones; the atlases do not always agree on these. I do not claim to have tried out every possible set of assumptions, but after finding some impossible situations at various extremes it was usually easy to close in on the most likely ones.

Hopefully, the spirit of this approach will be appreciated by critics and supporters alike. Ideally it will be used by those who would alter or redo this reconstruction, or who would attempt a similar reconstruction of another area. The spirit might be restated simply as: There is a reason for everything, it's just a matter of finding it.



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