

21. KREMER, A.: Die Kölner Altstadt und ihre Geschäftsviertel in jüngerer Entwicklung. In: Köln und die Rheinlande. Festschrift zum 33. Deutschen Geographentag in Köln 1961. Wiesbaden 1961
22. KREUZER, G.: Beiträge zur Geographie einer City in Augsburg. In: Mitt. Geogr. Ges. München 51, 1966
23. LEHMANN, H.: Frankfurt am Main. In: Die Erde 6, 1954
24. MAYR, A.: Ahlen in Westfalen. Siedlung und Bevölkerung einer industriellen Mittelstadt mit besonderer Berücksichtigung der innerstädtischen Gliederung. Bochumer Geogr. Arb. Heft 3, 1968
25. MEINEL, H.: Das Problem der City. Ein Beitrag zur Frage des Formen- und Strukturwandels der Großstadt. Dargestellt am Beispiel süddeutscher Städte. Diss. Würzburg 1954
26. MÜLLER, W. H.: Die städtebauliche Eingliederung der zentralen Dienste des tertiären Erwerbssektors. Diss. Braunschweig 1966
27. MURPHY, R. E., VANCE, J. E.: Delimiting the CBD. In: Economic Geography 30, 1954
28. —, —: A Comparative Study of Nine Central Business Districts. In: Economic Geography 30, 1954
29. —, —, EPSTEIN, B. J.: Internal Structure of the CBD. In: Economic Geography 31, 1955
30. NIEMEIER, G.: Binnenpendler 1961 in der Stadt Braunschweig, Karte und statistische Aufschlüsselung. Manuskript im Stadtplanungsamt Braunschweig
31. NORBORG, K. (Hrsg.): Proceedings of the IGU Symposium in Urban Geography Lund 1960. Lund 1961 (Bes. Teile III und IV; darin: KANT, E.: Zur Frage der inneren Gliederung der Stadt, insbesondere der Abgrenzung des Stadtkerns mit Hilfe der bevölkerungskartographischen Methoden)
32. SACHAROW, A. D.: Wie ich mir die Zukunft vorstelle. In: Die Zeit 1968. Nach einem Artikel in der New York Times. (Angaben über die Sozialstruktur der Sowjetunion und der USA)
33. SCHULTZE, J. H. (Hrsg.): Zum Problem der Weltstadt. Festschrift zum 32. Deutschen Geographentag in Berlin 1959. Berlin 1959. Darin Beiträge von: Schultze, J. H. (Einführung), Pfannschmidt, M. (Berlin), George, P. (Paris), Baldacci, O. (Rom), William-Olsson, W. (Stockholm), Talbot, W. J. (Kapstadt), Mayer, H. M. (Chicago), Kiuchi, S. (Tokio), Kar, N. R. (Calcutta), Czajka, W. (Buenos Aires)
34. SCHWARZ, G.: Allgemeine Siedlungsgeographie. Berlin 1966 (3. Auflage)
35. SCOTT, P.: Some Functional Aspects of Cape Town. In: Economic Geography 30, 1954
36. —: The Australian CBD. In: Economic Geography 35, 1959
37. SMITH, P. J.: Calgary: A Study in Urban Pattern. In: Economic Geography 38, 1962
38. SOMBART, W.: Der moderne Kapitalismus. Leipzig 1902
39. STEINMÜLLER, G.: Der Münchner Stadtkern. In: Mitt. Geogr. Ges. München 43, 1958
40. STÖBER, G.: Das Standortgefüge der Großstadtmitteln. Diss. Basel. Frankfurt 1964
41. SUND, T., ISACHSEN, F.: Bosteder og arbeidssteder i Oslo. Oslo 1942
42. WARD, D.: The Industrial Revolution and the Emergence of Boston's Central Business District. In: Economic Geography 42, 1966
43. WILLIAM-OLSSON, W.: Stockholm. Structure and Development. In: Intern. Geogr. Congr. „Norden“ 1960. Uppsala 1960
44. ZIMMERMANN, F. (Hrsg.): Raumplanungsgutachten Südostniedersachsen. Braunschweig 1962—65. Darin: Teil Ic: Thematische Karten; Teil IIb: Gesamtkonzeption; Teil IIc: Mackensen: Struktur, Entwicklung und Verteilung der Bevölkerung; Niemeier: Die großen Städte im Planungsraum Südostnieders.; Wilhelm: Die Umlandbeziehungen der Kreisstädte und kreisfreien Städte Südostnieders. im Konsumbereich; Jelpke: Flächennutzung; Mecke: Verkehr und Planung im klassifizierten Straßennetz; Habekost: Die großen Städte im Individualverkehr des Planungsraums; Lagershausen: Schienenverkehr und öffentlicher Nahverkehr.
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THE STUDY OF GREEK RURAL SETTLEMENTS: A REVIEW OF THE LITERATURE

With 2 figures and 3 tables

J. M. WAGSTAFF

Zusammenfassung: Eine Literaturübersicht zum Thema: Die ländliche Siedlung in Griechenland

Vorwiegend griechische Dörfer wurden in etwa 36 Veröffentlichungen in englischer, französischer und deutscher Sprache in den letzten 80 Jahren (bis August 1968) untersucht. Siedlungstypen sind auf nationaler Ebene zuerst von CVIJC eingehend beschrieben worden. Seine Klassifikation wurde 40 Jahre später von BEUERMANN verfeinert, der auch einige Siedlungstypen untersuchte, die sich erst seit Anfang dieses Jahrhunderts entwickelt haben. Die Erkennung und Klassifizierung von Siedlungstypen sind in regionalen Untersuchungen zu finden, deren Hauptanliegen jedoch die

Unterscheidung räumlicher Gefüge und ihr Verhältnis zur naturräumlichen Umwelt ist. PHILIPPSON ist der erste Vertreter dieses Forschungsbereiches, doch auch OGLVIE, CREUTZBURG und KOSSACK haben ähnliche Arbeit geleistet. Neuzeitliche, detaillierte Untersuchungen über soziale und wirtschaftliche Wandlungen haben zur Ergänzung solcher klassischen Studien beigetragen. Niederländische Wissenschaftler sind hier besonders aktiv. Der ausgezeichnete Beitrag BURGELS dürfte für zukünftige Arbeiten ein Musterbeispiel sein. In den letzten Jahren war auch die Siedlungsmorphologie Gegenstand einiger Untersuchungen, besonders vom architektonischen Standpunkt aus. Einige Aufmerk-

samkeit wurde auch historischen Themen gewidmet, insbesondere der Wüstung (ANTONIADES-BIBICOU) und der Wiederbesiedlung des Flachlandes (PAPENHAUSEN, SCHULTZE, BEUERMANN). Bis heute sind die meisten Untersuchungen mehr beschreibender als analytischer Art gewesen. Eingehendere Analysen sind notwendig, um wesentliche Fortschritte zu erzielen. Dabei wäre auf bisher ziemlich vernachlässigte Themen wie z. B. Siedlungslage, morphologische Entwicklung und Veränderungen im Standortbild zu achten.

Rural settlements in Greece have aroused sporadic interest amongst geographers since the closing decades of the nineteenth century. About 29 studies, in which rural settlements featured prominently, had been published by August, 1968. To these may be added a further 7, geographical in character, but made by scholars from other disciplines. A total of about 36 studies is perhaps sufficiently large for the field to be surveyed. Achievement may thus be publicised and some indication given of topics on which future effort might profitably be concentrated.

Rigorous criticism, though theoretically desirable, seems out of place in such a survey. Some of the studies have not been produced by avowed geographers so that it would be unwise to evaluate them from a purely geographical standpoint, even if complete agreement existed on the nature and aims of settlement geography¹). The studies also cover a period in which disciplines touching on settlement have improved their methods and refined their theory, as well as to some extent changing the foci of their attention.

Three groups of studies may be recognised for review purposes. The first consists of attempts to provide a national survey and the second of regional descriptions. The third group is less well defined. It includes studies of both individual settlements and settlement categories recognised on the basis of form or origin. Each group contains work in English, French and German but not Greek. The few studies in this language known by the author to touch on rural settlement are principally concerned with domestic architecture²).

National Surveys

Surveys of the whole country have been mainly interested in the recognition and classification of settlement types. Although preceded by a simple impressionistic classification³), the first substantial survey was made by the Serbian geographer, CVIJIĆ, in his wide-ranging study of the human geography of the Balkans, *La Peninsule Balkanique*⁴).

¹) STONE, K. H., *The Development of a Focus for the Geography of Settlement*, *Economic Geography*, 41 (1965), 346—55; JORDAN, T. G., *On the Nature of Settlement Geography*, *Professional Geographer*, 18 (1966), 26—28.

²) For example, ΔΑΜΠΙΑΚΙΣ, Α. καὶ ΜΠΟΥΡΑΣ, Χ., *Τὰ Μεσαιωνικὰ Χωριά τῆς Χίτου*, in ΜΙΧΕΛΗΣ, Π. Α., (Ed.), *Τὸ Ἑλληνικὸ Λαϊκὸ Σπίτι* (Athens 1960).

³) RODD, R., *The Customs and Lore of Modern Greece* (London 1892), 55—81.

⁴) CVIJIĆ, J., *La Peninsule Balkanique: Géographie humaine* (Paris 1918), 215—24.

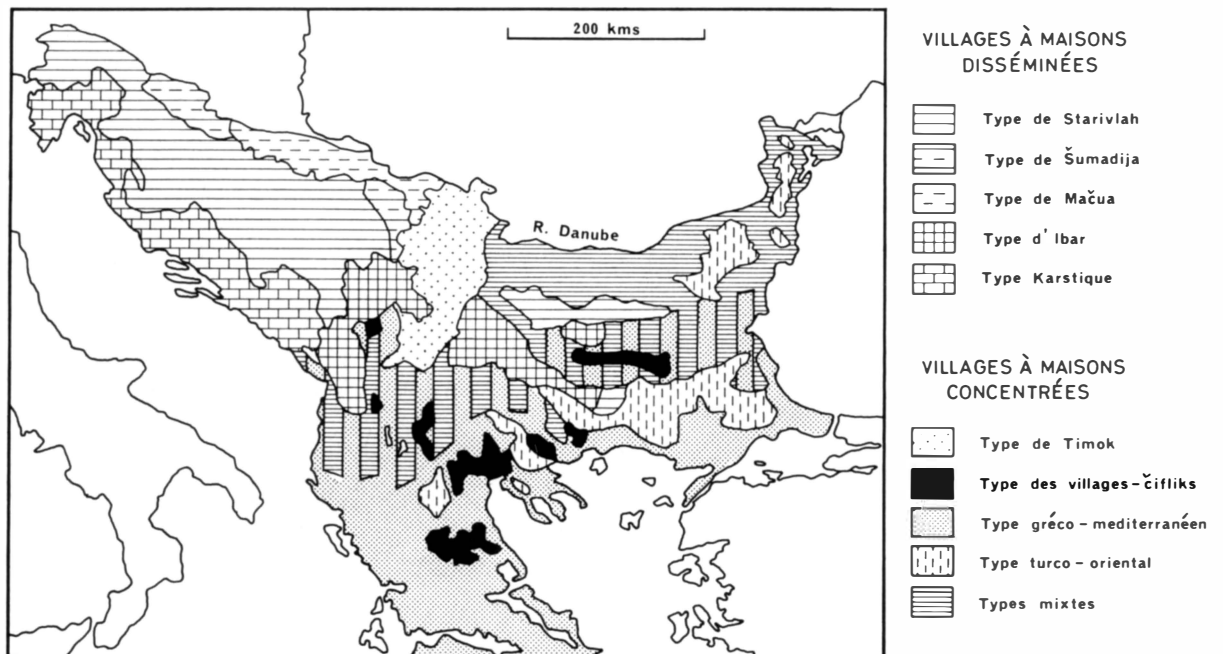


Fig. 1: Settlement Types in the Balkans According to CVIJIĆ

CVIJIC was chiefly concerned with permanent settlements, though in an earlier section he dealt with forms of pastoral life. His distribution map shows that five types of permanent settlements could be recognised within the present boundaries of mainland Greece (Fig. 1). Three were composed of *maisons agglomérées* and two of *maisons disséminées*. Agglomerations were taken to be characteristic of the whole country away from the frontiers but the most widespread type was what CVIJIC called *le type gréco-méditerranéen* from its associations with a particular ethnic group and a distinctive way of life. It was very compacted and consisted of stone or mud-brick houses arranged along streets, often paved, leading to a central square. Where islands of Turkish population occurred, as in Thrace and Macedonia, *le type turco-orientale* was recognised by its distinctive population and characteristic house. The third type of agglomeration, *le type des villages čifliks*, was found principally in the great plains of Macedonia and Thessaly where it was associated with estates worked on a share-cropping basis. In some cases, according to CVIJIC, the čiflik village consisted of a square or squares around which were grouped the 'miserable hovels' of the čifčijes (share-croppers). Other examples were surrounded by a wall, usually of mud-brick, pierced by a single gate.

Dispersed settlements were recognised mainly along the northern frontiers of Greece, in districts where ethnic groups were very mixed. Since he was writing from a Serbian point of view, CVIJIC derived his terminology from core areas in his own country. One form of dispersion, which his map shows to have been widespread, was composed typically of several hamlets in which houses were scattered haphazardly a kilometre or more from each other. Each hamlet in turn was separated from its neighbour by a distance of 2 or 3 kilometres. The whole assemblage, though drawn out over some 7 or 8 kilometres, had a single name. This type of settlement was classified as *le type de Stari Vlah*, after a district in Serbia where it was particularly characteristic. The second type of dispersion was called *le type d'Ibar*, from its frequency in a river basin of that name in south-west Serbia. It too was composed of hamlets, the houses of each occupying a particular hill or group of hills. Although each belonged to a distinct clan, the whole group formed a single administrative unit with one headman.

Classification was thus based on the general appearance of settlements, but account was taken of ethnic associations and, in the case of čiflik settlements, of a particular form of economic organisation. CVIJIC recognised that these associations could be explained in terms of cultural history, about which he wrote extensively in other sections of his book. Subsequent

work, notably by BEUERMANN, has suggested that for all this the classification may have been a simplification of a far more complex situation, at least as far as Greece is concerned. It is, however, difficult to judge what the real situation was fifty years ago, when the field work was done. The settlement picture was undoubtedly modified by events consequent upon the Balkan Wars and the two World Wars.

CVIJIC's original interest in physical geography was revealed in a brief discussion of site and situation⁵), though without specifically Greek reference. He noted that in mountainous regions of high rainfall, where much of the forest cover still remained and a patriarchal form of life existed, settlements tended to be situated on valley sides at elevations below 1600 metres. In more arid regions, where forest had largely been removed and cultivation was important, settlements were found in the plains and valleys. This situation was also related to what CVIJIC called the *zone of Byzantine civilisation* and which may be said to have covered most of modern Greece. He found that settlement sites (Table 1)

Table 1: Settlement Sites According to CVIJIC

Lowland	
	Lacustrine Terraces
	Cones of Deposition
	Moraines
Mountains	
Non-karst	
	Cones of Deposition
	Fluvial Terraces
	Glacial Terraces
	Moraines
Karst	
	Margins of Poljies, Uvalas and Dolines
	Slopes of Hums

within lowland areas tended to be elevated above their surroundings, whilst in rocky terrain they appeared to be located on areas of fertile soil. CVIJIC did not, however, take these observations further and indicate the extent of the observed preferences or explore the relationships between site and settlement form in any detail. Subsequent general surveys have not added to his remarks on situation, other than to note the importance of water supply. Site has been almost entirely neglected.

CVIJIC's classification of settlement types was embodied in subsequent general geographies of Greece, for example those produced by FELS and MAULL⁶). In these *le type gréco-méditerranéen* was shown to characterise the whole mainland, in-

⁵) Ibid., 207—14.

⁶) FELS, E., *Griechenland*, in GERBING, W. (Ed.), *Das Erdbild der Gegenwart* (Leipzig 1926), vol. 1, 679—700; MAULL, O., *Griechisches Mittelmeergebiet* (Breslau 1922).

cluding the Peloponnese which CVIJIC had not discussed though its northern coast was depicted on his map. Similarly, the authors of the British Naval Intelligence handbook described the typical Greek rural settlement as a 'solitary nucleated village', though they recognised that there were variations in detail between regions, such as the Peloponnese and Macedonia, and between mountains and plains⁷). The same concept of broad uniformity has also been adopted by more recent sociological and anthropological studies⁸).

In 1955 BEUERMANN presented a paper drawing attention to recent changes in the structure of Greek rural settlement⁹). His findings were subsequently expanded into a fully documented discussion of settlement types in Greece¹⁰). This paper contains the most comprehensive classification to date and it may therefore be useful to other workers if it is set out in some detail. However, the presentation used below and in Table 2 is not precisely that followed by BEUERMANN himself.

Table 2: BEUERMANN's Classification of Settlement Types

Temporary Settlements	Permanent Settlements
1. Winter Settlements	1. Clustered Villages
2. Nomad Settlements	Compact Loose
	Malachi Estate
	Colonisation
	2. Street-and-Line Settlements
	3. Hamlets
	4. Isolated Farmsteads
	5. War or Defensive Settlements

Accepting the classic distinction between temporary and permanent settlements, BEUERMANN described two types of temporary settlement found in Greece. The first consisted of the more or less permanently located *kalyvia* (huts) used by pastoralists from fixed villages in the mountains when wintering their animals in the plains. The second type shifted location from year to year. They were temporary settlements of 40—50 *kalyvia* erected by the fully nomadic Aroumi and

⁷) NAVAL INTELLIGENCE DIVISION, *Geographical Handbooks, Greece* (London 1945), especially vol. 2, 40—42.

⁸) For example, FRIEDL, E., *Vasilika: A Village in Modern Greece* (New York 1962); MCNEILL, W. H., *Greece: American Aid in Action, 1947—1956* (New York 1957); SANDERS, I. T., *Rainbow in the Rock: The People of Rural Greece* (Cambridge, Mass. 1962).

⁹) BEUERMANN, A., Strukturwandel ländlicher Siedlungen in Griechenland, *Verhandlungen des Deutschen Geographentages, Hamburg 1955, Tagungsbericht und Wissenschaftliche Abhandlungen* (Wiesbaden 1957), 409—15.

¹⁰) BEUERMANN, A., Typen ländlicher Siedlungen in Griechenland, *Petermanns Geographische Mitteilungen*, 100 (1956), 278—85.

Sarakatsani pastoralists. These groups, whose life is the subject of a recent monograph by CAMPBELL¹¹), have greatly diminished since the Second World War, principally because their traditional winter grazings have been ploughed up. Many of their *kalyvia* have also been transformed into permanent villages.

Permanent settlements were divided into five main types. The most characteristic was the clustered village and several sub-types could be recognised. The most widespread BEUERMANN called *compact clustered villages* (*geschlossene Haufendörfer*). This term took account of the possibility that observed variations in size and physiographic detail might be related to such things as water availability or relief and not simply race, culture or economy as suggested by CVIJIC. In any case, as BEUERMANN pointed out in his first paper, the distinctive *turco-orientale* villages of Macedonia have been almost completely transformed with the replacement of wooden *turco-orientale* houses by stone-built ones in the Greek tradition. They have survived, however, in Thrace where there is still a Muslim population.

A second major sub-type was the loosely clustered village (*lockeres Haufendorf*). In general the type was recognised by its cellular structure. A number of house clusters were separated from each other by considerable distances, as in the Ibar and Stari Vlah settlement types recognised by CVIJIC in frontier areas. BEUERMANN, however, observed that such settlements were found throughout the country.

Transitional between loosely clustered and compact clustered villages was a group which BEUERMANN called *malachi settlements* (from *τό Μαλαχίον* = clan settlement). They were found principally in the Pindhos Mountains and were recognised by the cellular groupings of houses which aerial photographs showed to exist within their built-up areas. BEUERMANN argued that these settlements had developed by the coalescence of originally separate house clusters, each of which was associated with a particular clan. However, he did not offer any evidence to support his hypothesis.

Two other sub-types of clustered village were recognised by the regularity of their ground plans. One was classified as the *estate village*. Like CVIJIC's *čiflik* village, this was distinguished by a quadrilateral ground plan and a large central square, the sides of which had originally been lined with small, mud-brick cottages roofed with thatch. The hovels have been replaced by substantial stone houses, names have changed, but characteristically large squares still survive. BEUERMANN realised, though, that all villages

¹¹) CAMPBELL, J. K., *Honour, Family and Patronage: A Study of Institutions and Moral Values in a Greek Mountain Community* (Oxford 1964). Earlier works are cited in the bibliography.

once connected with estates did not have this distinctive form. It was confined to the northern provinces where the regulatory power of landlords was possibly greatest and where large estates survived beyond the end of Turkish rule. The other sub-type, the colonisation village, was also found principally in the north. It developed between 1923 and 1930 as an emergency measure to house refugees, mainly from Asia Minor, and was associated with the reclamation of swampy plains and valleys formerly divided between large estates and used as winter grazing by nomads. The type was characterised by a rigid grid-iron plan and a central square (see below).

Settlement types recognised as less widespread than clustered villages were street-and-line settlements, hamlets, isolated farmsteads and war or defensive settlements. Street-and-line settlements were identified by the arrangement of 25 to 30 houses along a road. Most of them had originated during the war years 1941—50, when people from destroyed and insecure villages settled along main roads in the hope of security and food. Crystallisation points were formed by wayside chapels and khania (inns) with the result that the patrons of the one and the owners of the other frequently gave their names to the new settlements. BEUERMANN rightly noted, however, that similar linear settlements had developed along the coast road between Patras and Corinth in the northern Peloponnese. This was a response to the local boom in viticulture during the 1880s and 1890s.

Weiler (hamlet) was a term about which BEUERMANN expressed reservations. It had originally been coined, he said, in southern Germany where its use implied a secondary settlement of medieval date. To apply the term in Greece to either 'a small clustered village' or 'a small settlement with several houses or farms' was therefore misleading, though BEUERMANN thought it might justifiably be used to describe lowland settlements in a transitional state between permanent and seasonal occupation. In the literature, however, the term had most frequently been applied to clan settlements associated with semi-nomadism. These settlements were described by BEUERMANN in his first paper. They consisted of a number of houses set in their own walled compounds but united by a high boundary wall. The type was found over wide areas of the northern mountains but their number has greatly declined over the last fifty or sixty years.

Isolated farmsteads (Einzelsiedlungen) were recognised as a comparatively new element in the landscape. They had begun to appear in the lowlands during the second half of the nineteenth century when brigandage had been stamped out, techniques of deep drilling developed and communications improved. An associated development, not described by BEUERMANN,

was the growth of settlements along the once empty coasts of the Dodecanese Islands¹²).

Wehrsiedlungen (war or defensive settlements) were BEUERMANN's last type. They were characterised by towers, now much decayed, and found only in the Máni. BEUERMANN did not mention, though, that most Maniat settlements today could easily be put into his other categories on the basis of their general layout, affected in detail though that is by the location of the towers. He also rather curiously excluded from this category the walled villages of the Cyclades and Chios, despite their apparently defensive origin.

Comparison of the studies made by CVIJIC and BEUERMANN reveals the development of three new types of settlement during the intervening forty years. Colonisation villages and most street-and-line settlements resulted from major upheavals caused by war. Isolated farmsteads were a gradual development in response to socio-economic and political changes which may not have been clear in the landscape at the beginning of the century, especially in northern Greece. In addition, BEUERMANN's papers drew attention to the effects of emigration. Numbers of village houses were standing empty in the 1950s and the total desertion of some mountain villages was predicted. The 1961 census suggests that this is now widespread and its reality is confirmed by personal observation¹³).

BEUERMANN's work has other merits apart from indicating developments since the beginning of the century. It clarified the use of hamlet, though this is perhaps of more importance in German than English or French. Special categories were developed to cover forms of settlement between dispersion and agglomeration. Above all, BEUERMANN's classification simplified settlement data sufficiently to clear the way for other geographers to initiate detailed studies of the origin and development of particular types. BEUERMANN himself promised a full study on these lines but it does not seem to have materialised. Other geographers do not appear to have used the classification as a starting point for new research. One reason may be that any classification tends to be regarded as in some sense an objective description of reality instead of a necessary first stage in research.

Standing apart from the classificatory concerns of the studies already reviewed is one by an historian. It dealt with deserted villages¹⁴). In the first section

¹²) NAVAL INTELLIGENCE DIVISION, *Geographical Handbooks, Dodecanese* (2nd Ed., London 1943); KASPERSON, R. E., *The Dodecanese: Diversity and Unity in Island Politics* (Department of Geography, University of Chicago, Research Paper No. 108, 1966).

¹³) WAGSTAFF, J. M., *Rural Migration in Greece, Geography*, 53 (1968), 175—79, especially Fig. 3, Uninhabited Settlements, 1961.

¹⁴) ANTONIADIS-BIBICOU, H., *Villages désertés en Grèce — Un Bilan provisoire*, in: *Ecole Pratique des Hautes Etudes —*

Miss ANTONIADIS-BIBICOU used an extremely wide variety of evidence (archives, chronicles, maps, place names, travel narratives and tradition) to discover, both by period and region, the number of villages abandoned between the beginning of the eleventh and the middle of the nineteenth century. A total of 2,049 was advanced and the fourteenth and early nineteenth centuries suggested as the periods of greatest abandonment. The author then proceeded to outline the reasons for desertion. Much attention was given to general socio-economic changes, such as the growth of large estates and tax farming, but little attempt was made to show how such changes worked in detail in particular regions or on specific villages.

Two additional criticisms may be made. The first is that Turkish material was totally neglected, particularly the registers of land and population made periodically from the conquest (completed on the mainland c. 1500) until the seventeenth century. A large number of documents is, of course, involved. For example, 24 registers covering the Peloponnese are now in the *Başvekalet Arşivi* in Istanbul and others are held by the survey and land office at Ankara¹⁵). They are not adequately catalogued and their interpretation is far from easy, but they should be used by future workers in the field¹⁶). Secondly, Miss ANTONIADIS-BIBICOU did not recognise that, in dealing with desertion on such a large scale, she might have wrongly classified some settlements. For example, not only were a number of the Peloponnesian villages destroyed in the War of Independence (1821—29) reoccupied soon afterwards but, over the centuries, many settlements have changed their names and thus apparently disappeared from the record. Name-changing has increased since 1909 when the Commission for Greek Place Names began work eradicating non-Greek names from the map, sometimes to the great frustration of settlement geographers interested in historical development.

Regional Studies

Regional studies have chiefly been concerned with describing patterns of settlement and explaining them largely in terms of relief and geology. The trend was perhaps set by PHILIPPSON in two regional monographs¹⁷), of which that on the Peloponnese will be

VIe Section, Centre de Recherches Historiques, Les Hommes et la Terre, XI, *Villages Désertés et Histoire Economique XIe—XVIIIe Siècles* (Paris 1965), 343—417.

¹⁵) Article on *Daftar-i Khākāni* in LEWIS, B., PELLAT, C. and SCHACHT, J., (Eds.), *The Encyclopedia of Islam*, new edition, vol. 2 (Leiden and London 1965), 81—83.

¹⁶) SHAW, S. J., *Archival Sources for Ottoman History: The Archives of Turkey*, *Journal of the American Oriental Society*, 80 (1960), 1—12.

¹⁷) PHILIPPSON, A., a. *Der Peloponnes* (Berlin 1892), especially 580—96; b. *Thessalien und Epirus* (Berlin 1897).

considered here. In the Peloponnese PHILIPPSON recognised the existence of two types of temporary settlement. One was used by nomads and semi-nomads practising inverse-transhumance. The other was used by cultivators when working distant parts of their village land. Pastoral settlements were beginning to disappear in the 1880s, when the field work was done, and temporary cultivation settlements were gradually being transformed into permanent villages. Isolated farmsteads and hamlets were uncommon, except in the Máni and the Argolis peninsula. However, a class of isolated houses did exist more widely. These were the *khanias*, establishments set some distance from main roads or beaches and combining the functions of inn and general store. Another type of isolated settlement was formed by the numerous monasteries, many of which were ruined or almost deserted even then.

The predominant form of settlement was the nucleated village. The focus of every village was said to be its square around which were found general stores, coffee houses and a church. In the largest settlements the square formed the core of a well-developed *bazar*, the existence of which made distinction between town and village particularly difficult. Variations in settlement size were seen to exist from region to region. PHILIPPSON attributed these to the relative frequency of springs. Where they were rare, as in the eastern and central Peloponnese, population was forced to concentrate around them and large nucleations were the result. Conversely, a pattern of small nucleations in the west was said to be related to an abundance of springs, though in the Máni, where springs are almost totally absent, a similar pattern was attributed to dependence upon cisterns. PHILIPPSON also argued that springs were the main siting factor for settlements, basing his case on the apparent frequency of spring-line locations. Unlike some of his successors, he was not rigidly deterministic over the role of water supply for he drew attention to an observed preference for unencumbered, open sites on mountain slopes. He believed such sites were chosen to avoid the fever of valley bottoms and the storms of mountains crests, whilst securing the benefits of bracing airs, extensive visibility and easy defence.

PHILIPPSON's study is clearly an historical document and the situation has changed so much in the present century that his conclusions would be difficult to verify, though some attempt has been made at updating them in his monumental work on Greek landscape¹⁸).

A more deterministic approach was adopted by OGLIVIE in his study of physiography and settlement

¹⁸) PHILIPPSON, A., *Die Griechischen Landschaften: eine Landeskunde*, 6 vols. (Frankfurt am Main 1950—59).

in southern Macedonia¹⁹). He set out to describe the relief of the region and to indicate human response to it in terms of settlement location. His method was to divide the region into physiographic units and describe each in turn. As a result OGILVIE produced a characteristically fine description of the terrain but offered this description, synthesising settlement location and relief, as explanation for settlement location itself. In effect a series of simple correlations was produced with little analysis of site and location in terms of process. To be fair, however, OGILVIE probably did not have the necessary data to hand since his paper was based on map analysis and rapid field work under war conditions.

The physical emphasis in regional studies was also apparent in a paper by KOSSACK on Epirus²⁰). Using aerial photographs he produced a ten-part classification of settlement types and argued that four of his categories reflected the influence exerted on settlement form by relief (Table 3). KOSSACK's conclusions pro-

Table 3: Types of Rural Settlement in Epirus, According to KOSSACK

Clustered Villages	
Irregular Ground Plans	Regular Ground Plans
On Slopes	Čiflik Villages
On Scree and Terraces	Colonial Villages (Kolonialdörfer)
On Ridges	
In Gaps (Durchragungen)	
With Quarters (Machala)	
Street-and-Line Villages	
Hamlets (Kalyvia)	
Isolated Farmsteads (Einzelsiedlungen)	

vided much of the material for BEUERMANN's nationwide classification but they were not used without criticism. BEUERMANN attacked KOSSACK for ignoring human factors in the evolution of settlement form and for not setting his study in an historical context which would have taken full account of the wide cultural connexions of Epirus. He added that KOSSACK's work on the clustered village simply indicated that the type could be found on any kind of terrain.

More subtle environmental influences were deduc-

¹⁹ OGILVIE, A. G., *Physiography and Settlement in Southern Macedonia*, *Geographical Review*, 11 (1921), 172—97.

²⁰ KOSSACK, H. P., *Epirus: Beiträge zur Kenntnis einer Nordgriechischen Landschaft*, *Geographica Helvetica*, 46 (1949), 78—92.

ed by CREUTZBURG in a paper on Crete²¹). Most settlements were found below the altitudinal limit of the olive (600—700 metres) and, given that the staple crops were olives, vines and wheat, CREUTZBURG argued that the climatic requirements of the olive, the most demanding of the three, set an upper limit to location. In this he apparently ignored the existence of permanent settlements on the large upland plain of Lasithi (c. 900 metres) and their associated olive groves. An apparent preference for spring-line locations also led CREUTZBURG to conclude that water supply was important, whilst the widespread situation of settlements on the edge of areas of cultivated soil caused him to deduce that siting was controlled by a desire to preserve these valuable stretches of land. In a later paper, commenting on the dispersed pattern of settlement characteristic of Mykonos, CREUTZBURG developed a more sophisticated argument²²). His case was that the settlement pattern of the island resulted from a traditional economy in which intensive cultivation was combined with pastoralism. In turn this particular form of economy was a response to an arid climate and a relief composed of hard rocks in which soil was confined to a few shallow depressions. The fault with both accounts is that, as in OGILVIE's article, descriptive correlation was turned into explanation. As still happens with many studies in human geography, no attempt was made to demonstrate the processes whereby forms of economy actually produced patterns of location or settlement form. Detailed historical work is necessary for this but it must be admitted that suitable records are often missing, as Miss ANTONIADIS-BIBICOU made clear in a paper discussed above.

CREUTZBURG's most interesting contribution to Greek settlement study was his recognition that house type had a direct influence on settlement form. It is a fundamental point but it is one which does not seem to have been made before in a Greek context. Only recently has it been explored in detail, despite the considerable attention given to house types by MIGLIORNI in a paper on the Dodecanese Islands²³). According to CREUTZBURG, the typical Cretan house was a honey-comb structure of flat-roofed cells joined on to an original core in response to accommodation pressures. A collection of such houses formed a highly compact settlement which closely followed the con-

²¹ CREUTZBURG, N., *Die ländlichen Siedlungen der Insel Kreta*, in KLUTE, F. (Ed.), *Die ländlichen Siedlungen in verschiedenen Klimazonen* (Breslau 1933), 55—66.

²² CREUTZBURG, N., *Die Mykonischen Inseln, insbesondere ihre Siedlung und Wirtschaft*, *Regio Basiliensis*, 1 (1960), 212—32.

²³ MIGLIORNI, E., *Ricerche antropogeografiche eseguite nelle isole italiane dell'Egeo*, *Viaggi di Studio, Promossi dalla Fondazione Volta*, 4 (Reale Accademia d'Italia, 1938), 5—27.

tours of its site to give the overall appearance of a series of low, irregular steps cut through by narrow, gorge-like streets. Unfortunately, CREUTZBURG did not explore the ways in which houses might actually have interacted to produce the compact form, though this seems necessary to establish the validity of his hypothesis. Similarly, he failed to use his data to explain general morphological development, despite his statement that the typical house was an expression of traditional Cretan society with a history claimed to go back to Minoan times. Moreover, the whole hypothesis may have been incorrectly based. It apparently ignored the existence in western Crete of two-storey houses with pitched roofs. The honey-comb structure is entirely absent so that the general mountain type²⁴) of house may be related to the looser form of clustered settlement characteristic of the region.

Miscellaneous Studies

Many studies of Greek rural settlements are difficult to classify in any consistent way. They are neither national nor wholly regional in scope. A majority are particularly concerned with the socio-economic functions of settlements, but a few are devoted to the more traditional aspects of form and location. Some are concerned to a greater or lesser extent with several aspects.

Three studies have been concerned with economic change in mountain villages — in the Peloponnese²⁵), central Greece²⁶) and Epirus²⁷). They showed how marginal physical environments, together with conservative attitudes, were at least partly responsible for the depopulation of mountain villages which has become so noticeable all over Greece in the last twenty years. A UNESCO development study, however, indicated that change was not uniform in pace nor similar in its detailed effects even within one mountainous region²⁸). Similar conclusions were reached in a comparative study dealing with the suitability for modern economic development of settlements in widely different parts of the Peloponnese²⁹). By contrast,

²⁴) WAGSTAFF, J. M., Traditional Houses in Modern Greece, *Geography*, 50 (1965), 58—64.

²⁵) SIBBLES, P. L., Ano Vlasia: Analyse van een Bergdorp in de Peloponnesos, *Tijdschrift van het Koninklijk Nederlandsch Aardrijkskundig Genootschap*, 77 (1960), 177—200.

²⁶) SIBBLES, P. L. and SCHRIJVERS, A. J., Vryena, Analyse van een Bergdorp in Midden-Griekenland, *Tijdschrift van het Koninklijk Nederlandsch Aardrijkskundig Genootschap*, 79 (1962), 315—32.

²⁷) KAYSER, B., a. Margariti (Epire). L'Echec d'une colonisation spontanée, *Etudes Rurales*, 11 (1963), 65—101; b. Margariti — Village d'Epire (Centre des Sciences Sociales d'Athènes, 1964).

²⁸) MENDRAS, H., *Six Villages d'Epire* (UNESCO Rapports de Missions, No. 11, 1961).

²⁹) VOOYS, A. C., DE, and PIKET, J. J. C., A Geographical Analysis of Two Villages in the Peloponnesos, *Tijdschrift*

COMMON and PRENTICE showed that economic change generally had beneficial results in the typical village of lowland Macedonia³⁰). Conclusions reached in a very detailed study of changing man-land relationships in a village in the Mesara Plain of southern Crete were somewhat different³¹). In this community, structural obstacles to the adoption of modern technology were so considerable that economic change had brought about a good deal of emigration, a response observed in the marginal environments of mountains and smaller islands but not normally associated with lowland areas. The Mesara study is also important on other counts. It attempted to provide an historical perspective with which to view change and made use of a wide variety of sources and data-collecting techniques. These points suggest that the study will prove to be a useful model for similar work elsewhere in Greece.

Morphological development has attracted some attention, despite modern trends in favour of analysing function. Perhaps significantly, though, the attention has been mainly from non-geographers. In the earliest of these studies EDEN dealt with one of the fortified settlements of southern Chios³²). He demonstrated that use of the outer walls of houses as a community defence was only possible if the physical size of the settlement was decided before building began. Equally, access to houses from the interior of the settlement necessitated provision of an open space at the centre, whilst the use of other houses as internal rings of defence forced circulation into streets arranged as concentric loops. The entire structure of the settlement was therefore indicative of planning. EDEN's conclusions almost certainly apply to neighbouring settlements in Chios. This possibility is supported by a recent architectural study³³). Amongst other things, Miss TYRWHITT showed how a high degree of regularity in the villages resulted from the consistent use of a standard-sized barrel vault in houses and covered streets. Similar indications of planning are found in the Cyclades and were described by the classical scholars WACE and DAWKINS³⁴). EDEN believed that the concentric form of Mesta, and

van het Koninklijk Nederlandsch Aardrijkskundig Genootschap, 75 (1958), 30—55.

³⁰) COMMON, R., and PRENTICE, A., Some Observations on the Lowland Macedonia Village, *Tijdschrift voor Economische en Sociale Geografie*, 47 (1956), 223—27.

³¹) BURGEL, G., *Pobia: Etude géographique d'un Village Crétois* (Centre des Sciences Sociales d'Athènes, 1965).

³²) EDEN, W. A., The Plan of Mesta, Chios, *Annual of the British School at Athens*, 145 (1950), 16—20.

³³) TYRWHITT, J., Order out of Chios, *Architectural Review*, 139 (1966), 475—78.

³⁴) WACE, J. B. and DAWKINS, R. M., The Towns and Houses of the Archipelago, *Burlington Magazine*, 26 (1914—15), 99—107.

presumably of similar settlements, was that preferred by town planners before the revolution in planning concepts associated with Hippodamos of Miletus. However, Mesta itself seems to have been built early in the Genoese occupation of Chios (1346—1566), though an ancient tradition may have been followed³⁵).

Apart from providing evidence for planned settlement in Greece, these studies are significant as attempts to relate social needs and domestic architecture to the form of the settlement. The same basic relationships, also mentioned by CREUTZBURG for Crete, have been explored in two other papers, one on the Máni peninsula and the other on Lindos in the island of Rhodes. Both began with a tacit, and perhaps natural assumption that relationships exist between a settlement and the way of life which it contains. They then attempted to discover the nature of the relationships, though causation seemed easier to suggest than to prove. The Máni paper focused on house types as an expression of the peculiar social system which once existed in the region³⁶). It attempted to indicate how the two interacted to produce the characteristic physiognomy of Maniat settlement as well as the regional pattern of the peninsula. A subsequent study broadened the argument to siting³⁷). In their paper on Lindos, three architects sought to explain the village's overall form through the inter-relationships of certain basic needs³⁸). These were identified as the need for protection against attack and earthquake, for warmth and coolness in season, for containing the family, and for allowing internal circulation. All were expressed by the integration of domestic architecture into the general settlement plan.

Both studies may be criticised for their basic assumptions. They may also be regarded as pioneer attempts to reach a deeper understanding of settlements than has hitherto been usual.

Studies of two specific types of settlement have been made by German scholars: kalyvia villages, and settlements established to accommodate refugees from Asia Minor and various Balkan countries in the aftermath of the First World War³⁹). Although many

³⁵) SMITH, A. C., *The Architecture of Chios*, edited by ARGENTI, P. P. (London 1962), 119—20.

³⁶) WAGSTAFF, J. M., House Types as an Index in Settlement Study: A Case Study from Greece, *Transactions and Papers of the Institute of British Geographers*, 37 (1965), 69—75.

³⁷) WAGSTAFF, J. M., Anonymous Settlement Planning in the Mani Peninsula (summary only), *Ekistics*, 22 (1966), 196—98.

³⁸) SMITH, D. LEE, RICH, P., and MORGAN, J., A Study of the Architecture of Lindos, Rhodes (summary only), *Ekistics*, 22 (1966), 182—87.

³⁹) The most recent of many studies of the population exchanges is PENTZPOULOS, D., *The Balkan Exchange of Minorities and its Impact upon Greece* (The Hague 1962).

refugees found homes in former Turkish villages, others were settled in specially designed settlements (subsequently classified as colonisation villages). PAPPENHAUSEN⁴⁰) and SCHULTZE⁴¹) gave straightforward accounts of those established in northern Greece, where a majority were located. PAPPENHAUSEN concluded that 432 settlements were built in New Greece during the 1920s. They could usually be recognised by their names, often those of places in Asia Minor but with the prefix *nea* (new). The urgent task of providing rural housing for a considerable number of people left its mark on settlement form and housing character. In contrast with the confusion of traditional settlements, most of the new ones were laid out on a checker-board or grid-iron plan. The main exception was Nea Chios in the Argolis, described by LEHMANN⁴²), where a fish-bone layout was adopted. In all cases streets intersected at right angles and along them standardised two-roomed houses were set at regular intervals. At the centre a whole block was left for a square and around it a church, school and coffee house were subsequently built. Swamp reclamation and land redistribution were associated developments. They resulted in extremely regular field patterns and compact land holdings.

Kalyvia villages, a much older settlement type, were studied by BEUERMANN in the Peloponnese⁴³). BEUERMANN argued that when people from permanent villages in the plains vacated them, during conditions of insecurity in the medieval period, they were forced to establish themselves in unclaimed mountain country, generally around the 1000 metre contour. A marginal environment forced such communities to adopt a pastoral economy, using upland grazing in summer and the largely empty plains in winter. Accordingly, kalyvia were built for seasonal occupation in the plains or around their margins. During the nineteenth and twentieth centuries many kalyvia villages gradually became permanent in response to increasing internal security and economic development. Some kalyvia

⁴⁰) PAPPENHAUSEN, F., Die Neubesiedlung Griechenlands, *Zeitschrift der Gesellschaft für Erdkunde zu Berlin*, 1933, 34—51.

⁴¹) SCHULTZE, J. H., a. *Neugriechenland. Eine Landeskunde Ostmakedoniens und Westthakiens mit besonderer Berücksichtigung der Geomorphologie, Kolonistensiedlung und Wirtschaftsgeographie* (Gotha 1937); b. Greek Colonisation in Thrace and Macedonia, *Scottish Geographical Magazine*, 53 (1937), 81—89.

⁴²) LEHMANN, H., a. Zur Flüchtlingssiedlung in Griechenland, *Zeitschrift der Gesellschaft für Erdkunde zu Berlin*, 1929, 113—122; b. *Argolis. Landeskunde der Ebene von Argos und ihrer Randgebiete* (German Archaeological Institute, Athens 1937).

⁴³) BEUERMANN, A., Kalyvien-Dörfer im Peloponnes, in: *Ergebnisse und Probleme moderner geographischer Forschung. Hans Mortensen zu seinem 60. Geburtstag* (Bremen 1954), 229—38.

settlements, however, originated during the Second World War when numbers of mountain villages were destroyed.

BEUERMANN's paper is important, for it showed plainly that locational patterns have not been static, even in recent times. On the contrary, they have adapted to changing socio-economic conditions — a conclusion which is supported by Miss ANTONIADIS-BIBICOU's work on deserted villages in Greece. Two criticisms, however, may be made. First, little attention was given to the cultivation functions of lowland kalyvia. Secondly, BEUERMANN did not deal adequately with a problem raised by his opinion, possibly derived from PHILIPPSON, that the suffixes *-eïka* and *-itiká* (adjectival forms showing possession or association) indicated a former kalyvia village. The problem is that many settlements with an *-eïka* or *-itiká* termination are found in long settled districts, such as the Máni, where few settlements have been established since independence and where parent settlements, implied by the ending, cannot now be traced. Moreover, in the Máni at least, settlement names with an *-eïka* suffix can be traced back to the seventeenth century. They may possibly have resulted from migration into the region from other parts of the Peloponnese following the Turkish conquest and their parent settlements will be difficult to trace. It seems, though, that BEUERMANN and PHILIPPSON before him, discovered a process of colonisation with a much longer history than they imagined and one which was not necessarily confined to the reoccupation of plain or valley land.

Conclusions

Most studies of Greek rural settlement have been concerned more with description than analysis. Types of settlement have been recognised and their characteristics described. Locational patterns have been distinguished and correlated with elements in the physical environment. Such classic studies have been recently supplemented by detailed investigations of the impact of nation-wide socio-economic changes on particular communities. Settlement form has also been investigated over the last few years, principally by architects. Location and site choice, however, seem to have been generally neglected as fields for detailed work. There is clearly a need for these two aspects to be analysed with due attention to the human as well as the physical factors involved. Morphological development is another subject which requires further study and a start might well be made by investigating settlements falling into the categories of BEUERMANN's classification. The development of the distinctive estate village and of *malachi* stand out as worthwhile topics.

Change has been touched on by several studies and comparison between the classifications made by CVIJIC and BEUERMANN reveals the emergence of new forms of settlement over the intervening forty years. Care-

ful examination, however, has been generally lacking. Mention has been made of the loss of population from mountain villages and the colonisation of plains and coastlands. The reverse process, that of movement into upland areas, does not appear to have been studied, though its existence has long been recognised and was documented in a survey by VACALOPOULOS⁴⁴). Excavation of abandoned villages should be of assistance here, for a precise chronology and reliable estimates of population are rarely available even where the documentation appears relatively good. Purely geographical studies of surviving settlements which resulted from the retreat process are also required. Particular attention might well be given to the hypothesis that insecurity and burdensome taxation were the main reasons for their foundation. Insecurity, for example, is frequently invoked on the basis of analogy with other parts of the Mediterranean but its operation has not been conclusively demonstrated with reference to particular settlements in Greece. Security was clearly important in the design of some Aegean villages but evaluation of its role in site choice has scarcely been attempted, even locally.

Comparison of settlement patterns at different periods is an aspect of historical studies which has been somewhat neglected. A start was made by LEHMANN with a paper on eastern Crete in Minoan times⁴⁵) and the subject has to some extent been taken up by KIRSTEN⁴⁶). Much, however, remains to be done. Archaeologists have provided an abundance of material for the early periods⁴⁷) and the Turkish archives may yield important information for modern times.

A subject not discussed in any of the studies published to date, but touched upon by KAYSER in his *Géographie humaine de la Grèce*⁴⁸), is that of definition. The Greek authorities recognise a hier-

⁴⁴) VACALOPOULOS, A. E., *La Retraite des Populations grecques vers les Régions éloignées et montagneuse pendant la domination turque*, *Balkan Studies*, 4 (1963), 263—76.

⁴⁵) LEHMANN, H., *Die Siedlungsräume Ostkretas im Wandel der Zeiten*, *Geographische Zeitschrift*, 45 (1939), 212—228.

⁴⁶) KIRSTEN, E., *Die griechische Polis als historisch-geographisches Problem des Mittelmeerraumes*, *Colloquium Geographicum*, 5 (1956), 15—25; also contributions (Beiträge zur historischen Landeskunde) to PHILIPPSON, A., *Die Griechischen Landschaften: eine Landeskunde*, 6 vols. (Frankfurt am Main 1950—59).

⁴⁷) For example, SIMPSON, R. HOPE, *A Gazetteer and Atlas of Mycenaean Sites* (Institute of Classical Studies, London 1965); WATERHOUSE, H. and SIMPSON, R. HOPE, *Prehistoric Laconia, Part 1*, *Annual of the British School at Athens*, 55 (1960), 67—108, Part 2, *ibid.*, 56 (1961), 114—178; WRONTEKA, T., *Pour un Atlas archéologique de la Crète minoenne: Sitia I*, *Bulletin de Correspondance Hellénique*, 83 (1959) 523—42.

⁴⁸) KAYSER, B., *Géographie humaine de la Grèce* (Centre des Sciences Sociales d'Athènes, 1964).

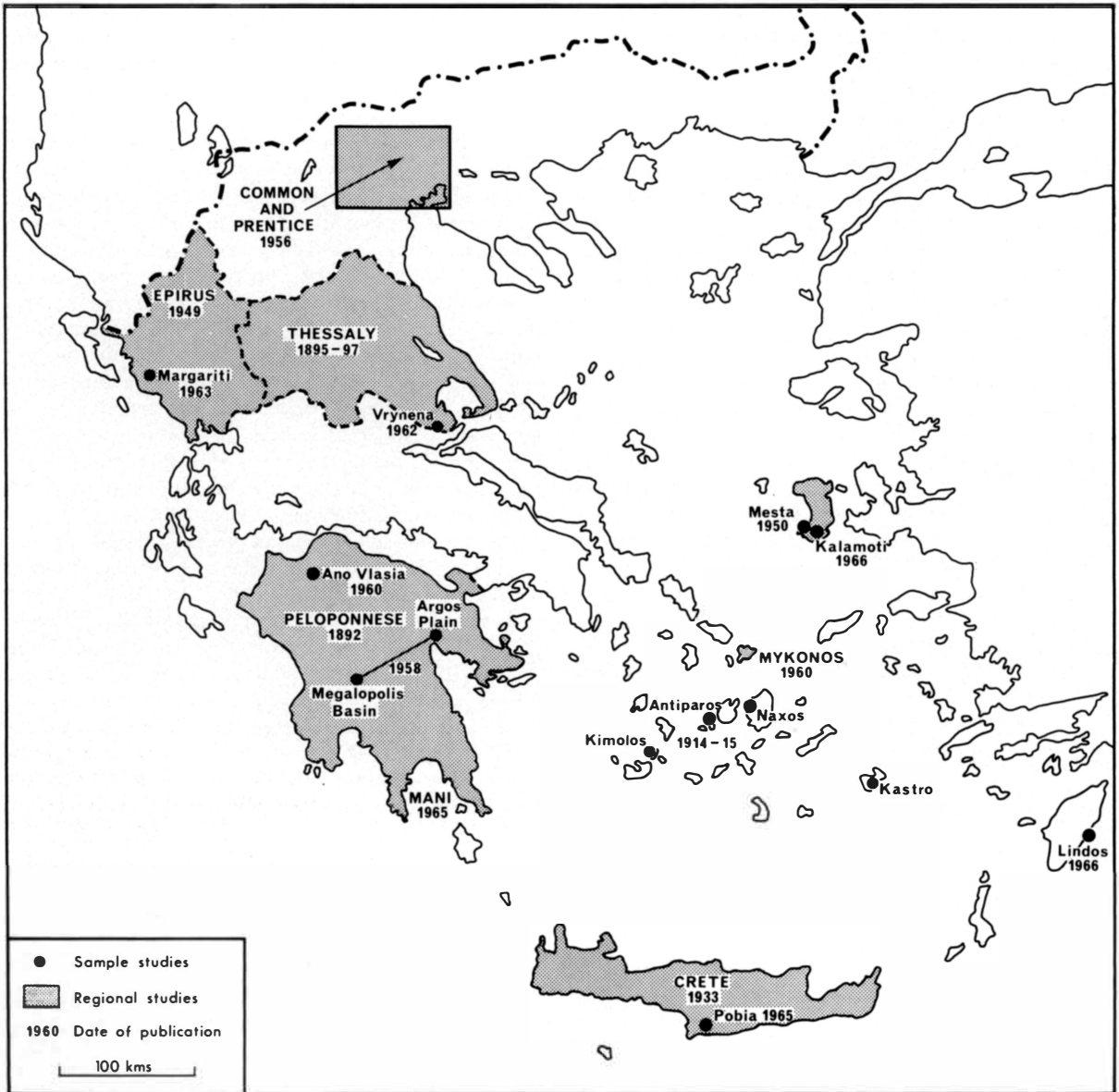


Fig. 2: Distribution of Studies Reviewed

archy of settlements in which only those localities (οικισμοί) with populations of less than 2,000 are considered to be rural⁴⁹). Those with populations between 2,000 and 9,999 are considered semi-urban, a classification which can often be justified by the number of functions found in such communities. These distinctions have applied since the 1961 census, when the concentrated population of the localities was first taken into account. Before 1961, the definition was based 'on the total population of the said locality',

concentrated or dispersed. Clearly, then, the localities do not necessarily reflect the situation revealed by field work or analysis of such topographical maps as are available to the public. A good example is again afforded by the Máni. Some 300 individually named settlements can be counted on the British Staff maps covering the presentday eparchia (administrative units roughly corresponding to English hundreds) of Oítylo and Yíthion⁵⁰). Only slight change seems to have taken place since the Second World War but only

⁴⁹) NATIONAL STATISTICAL SERVICE OF GREECE, *Statistical Yearbook of Greece, 1966* (Athens 1967), 12-14.

⁵⁰) Greece, 1:100,000, Sheets M7 Yíthion and N7 Tainaron, (1st Ed. 1944).

150 localities were recognised by the 1961 census⁵¹). The leading settlement in each of these is the only one shown in the recently published administrative atlas⁵²). Future work must take such discrepancies into account, particularly when analyses of settlement patterns, or even population densities, are attempted.

Finally, as Figure 2 shows, settlement study has not covered the whole country. There are considerable gaps

⁵¹) OFFICE NATIONAL DE STATISTIQUE, *Population de la Grèce au Recensement du 19 mars 1961* (Athens 1962), 121 and 125.

⁵²) NATIONAL STATISTICAL SERVICE OF GREECE, *Atlas of Greece, 1: 200,000* (Athens 1965).

and these need to be filled, especially before any new classification is advanced. It would also be generally helpful if the classes described by BEUERMANN could be mapped. Moreover, some of the studies reviewed were made many years ago. The ground needs to be reworked, if only to discover the detailed changes that have taken place in the interim.

The plea, then, is for more studies and greater depth of analysis. Attention should be given not only to synthesised and ordered description, which remains basic, but also to process. It is important to discover the forces which shaped settlement form, decided site choice, developed regional patterns and brought about change.

DIE KLIMAKLASSIFIKATION VON BUDYKO UND GRIGOR'EV

Mit 5 Abbildungen und 3 Tabellen

ERNST GIESE

Summary: The classification of climate of BUDYKO and GRIGOR'EV

As in the USA there has developed in the USSR in recent times, too, a theoretical physical climatology. This development has been promoted particularly by the research of BUDYKO and GRIGOR'EV on the heat and moisture balance of the earth's surface. Based on this research BUDYKO and GRIGOR'EV have developed a classification of climate, which is remarkable for its exact physically based of delimitation and the use of a new and complex delimitation parameter, the so called radiation index of dryness. According to this classification BUDYKO and GRIGOR'EV have defined the climates of the USSR and constructed a map of the climatic regionalization of the USSR.

Etwa seit Ende der 40er Jahre hat sich in der Sowjetunion (USSR) eine Klimatologie entwickelt, die sich um eine physikalisch vertiefte Betrachtung des Wärme- und Wasserhaushaltes bemüht. Sie versucht dies in zunehmendem Maße durch theoretische Ableitung physikalisch begründbarer, gesetzmäßiger Zusammenhänge thermischer und hydrologischer Parameter, um dann über indirekte Meßmethoden auf die Eigenschaft des Klimas eines Gebietes schließen zu können. FLOHN (1958) sieht in dieser sich auch in den USA abzeichnenden Entwicklung eine neue und grundlegende Stufe der Klimatologie, die er als theoretische Klimatologie bezeichnet.

Wesentlich zu dieser Entwicklung in der USSR haben vor allem die Untersuchungen BUDYKOS über den Wärme- und Wasserhaushalt der Erdoberfläche beigetragen. Auf ihrer Grundlage haben BUDYKO und GRIGOR'EV eine Klimaklassifikation entwickelt, die sich durch Anwendung neuartiger Abgrenzungsparameter und exakter physikalisch begründeter Abgrenzungsmethoden auszeichnet.

Bereits 1948 hat BUDYKO die Grundsätze zu dieser

Klimaklassifikation vorgelegt. Endgültig wurde sie jedoch erst in einer Gemeinschaftsarbeit mit GRIGOR'EV über die Klassifikation der Klimate der USSR (1959) veröffentlicht¹⁾. Mit ihr wurde zugleich eine Karte der klimatischen Bereichsgliederung der USSR vorgelegt, die für den bisher noch nicht erschienenen Klima atlas der Sowjetunion bestimmt war, später dann, von kleinen drucktechnischen Fehlern bereinigt, aber sonst unverändert, in den physisch-geographischen Weltatlas (1964, S. 203) aufgenommen wurde²⁾. An der Erstellung dieser

¹) A. A. GRIGOR'EV, M. I. BUDYKO: Klassifikacija klimatov SSSR. In: *Izv. AN SSSR, ser. geogr.*, Nr. 3, 1959.

Eine englische Übersetzung dieses Aufsatzes findet man in: *Soviet Geography, Review and Translation*, Vol. I, 1960, Nr. 5, S. 3-24.

Leider hat man es auch hier wie im Originaltext unterlassen, den Leser über die Herleitung der verwendeten Formeln sowie über die verschiedenen Meß- und Berechnungsmethoden der angegebenen Konstanten und Variablen zu informieren, so daß ein Verständnis und eine Beurteilung der Klimaklassifikation ohne die Kenntnis vorausgehender Arbeiten BUDYKOS nicht möglich ist. Ebenso muß angemerkt werden, daß in den Arbeiten BUDYKOS im allgemeinen übliche Dimensionsangaben nur in spärlichem Umfang zu finden sind. An dieser Stelle möchte ich Herrn JULIUS WERNER vom geophysikalischen Institut in Münster, der mir bei der Herleitung einiger Formeln und Bestimmung der Dimensionsangaben behilflich war, herzlich danken.

²) Die auf S. 270/271 des russ. Atlases vorliegende Kommentierung der Karte der klimatischen Bereichsgliederung der USSR ist gleichfalls wie der gesamte Text des Atlases ins Englische übersetzt worden (siehe *Soviet Geography, Review and Translation*, Vol. VI, 1965, Nr. 5/6, S. 223, Übersetzung der Zeichenerklärung, S. 317 bis 320, Übersetzung des Kommentars).