An International Annotated Bibliography of Climate Classifications

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Acknowledgements

My interest in climatic classification began in a climatology class I took, in 1969 at Columbia University, with John Oliver. The idea for this project began in a course with John F. Griffiths at Texas A&M University in 1981. To them I owe inspiration for the finished product.

Thanks, also, to the researchers and writers in the field of climatology, and to the many librarians (at many libraries) who assisted me. Special thanks was given to Helmut Landsberg, who provided me with an unpublished study by A. Schulze.

Finally, several people assisted with the translations. Jean-Marc Sems, at the University of Southern Mississippi, and Pat Prieto, formerly of Hunter Library, Western Carolina University did much of the translating of Romance languages. Hiddy Morgan, and Nan Watkins, both at Hunter Library, assisted with many of the German sources. Lia Kushnir aided with Russian and Japanese items. To all of them I owe thanks. Naturally, any errors with these translations are mine. I also take responsibility for all omissions, and suggest that if you do not find your favorite classification or classifier, please notify me. My email address is *strauss@email.wcu.edu*.

Introduction

This work contains more than just classifications. There are also "regionalizations" (studies of specific places), studies of mountain climatic gradients, bioclimatic indices, physical-geographical regionalizations (uniquely Russian) and "indices" which are studies of measures of climatic elements. So long as they contain classifications, even of a single place, and can be used in studies comparing different places, they are pertinent to the broad area of climatic classification.

In the literature, both terms *climate classification* and *climatic classification* are used, almost interchangeably. When searching library literature, the correct term to use, according to the Library of Congress Subject Headings (LCSH) is *climatic classification*.

I created a citation format that differs from standard style manuals. This is used throughout the bibliography. I did this because many styles omit essential information, necessary for researchers who are looking for a particular work. I felt it was essential to include issue number with volume, wherever possible. When one is requesting an article via Interlibrary Loan, this is important. In addition, I determined that, for most researchers, "more is better" especially when there are conflicting citations for the same article. My purpose was to assist later researchers find this information. I give full names, where possible, so initials can be inferred from them (NOT the reverse). In some cases this was not possible. If two places cite slight variations of the "same" work, I listed both citations, unless I was able to verify a correct one. When titles were translated or transliterated, I gave the language used in the work.

There is also the problem of journal titles changing names. This can be a significant change: Indian Journal of Meteorology and Geophysics became Mausam, or a simple one of one word. This problem may be compounded when authors give poor citations. In the hope of minimizing this problem, I have included a table of journals with alternate titles, as well as a list of foreign journals with their English equivalent.

Then there is the problem of works mentioned in articles, but omitted from the author's list of references. Sometimes these works can be found elsewhere, but that is not always the case. A few of these works appeared to be interesting, but all I had was the author's name. I have listed these at the end of the bibliography, along with some more current references. If anyone can provide further information on these references, I would appreciate this and add it to any future editions.

Since climatic classification is a "finite" area of study, unlike climate change (where thousands of citations are produced each year), I was able to determine that I could include much of the world's literature in this field. I chose to make the scope international because, at the present time, with electronic communications, I felt a need to introduce distant researchers to each other's works. Today there is no valid reason for limiting a scientific bibliography to researchers in one nation only.

Although some articles were included that were not "pure" classification, they were included because of their importance to researchers in the field of climatic classification.

I omitted most studies on "the climate of [place]" since many of these are descriptive, rather than being classifications. In the cases where it could be determined that a classification was present, these citations were included.

These sources were compiled and collected from many places. There may be errors which will occur for several reasons:

(a) The original source might have been listed incorrectly.
(b) There might have been a transcription error from writer to journal.

(c) This writer might also have made transcription errors.

I have re-checked these, where possible, to eliminate as many of the errors as possible. However, where ambiguities exist (e.g., 2 different volume numbers, or different page ranges), and where I was unable to confirm the correct information, I included both volumes or different page ranges.

Since many classifications are built on data, I have provided a chapter on data sources. This section should be particularly useful for librarians engaged in collection development.

An index can be a forgiving tool, if used properly. I have tried to add cross references and "see" references, where needed. In addition, there are cases in which a particular article could have been placed in more than one section. By indexing particular words from that article, I hope I have enabled researchers to find it. Authors treated as subjects have been listed in the subject index.

The key to the citation style used:
For Books:
Last Name, First Name, Middle (or Initial). Year. Book title [translation]. City of publication: Publisher, number of pages. Number of references. Geographical region of study. Notes about the work.

For Journals:
Last Name, First Name, Middle (or Initial). Year. "Article title," [translation]. Journal Title Volume (Number): pages. Number of references. Geographical region of study. Notes about the work.

Not all of these elements will be present in each citation. Question marks are used for undetermined volume numbers or page ranges. If some certainty exists, then I show that with parentheses: 69-(77). If no references were present in a work, I included that information.

In many cases, the style followed current library practices. For example, where the publisher or place of publication was not known, I used *Sl* and *sn*. In English titles, unless a place name is used, all words in titles, after the first word, are lower case.

Abbreviations were used sparingly. Journal titles are given in full form. But certain repeating abbreviations are standard and useful.

These abbreviations are:

WMO	World Meteorological Organization
Univ.	University
Dept.	Department
S.l.	Sine loco, without place [of publication]

s.n.	Sine nomine, without name [publisher unknown]
ed.	edited by or edition, depending on context.
	all Months
U.S.	United States
°C	degrees Celsius
°F	degrees Fahrenheit
mm	millimeters (of precipitation)
C. Ag. M.	Commission for Agricultural Meteorology
et al.	et alii and others. Used only where it appeared in a citation.
ref.	References
pp.	Pages (as in 5 pp. ref. Or 5 pages of references)

Some journal name changes:

Agricultural Meteorology became Agricultural & Forest Meteorology = [AM: 1964-1984; A&FM: 1984-].

Archiv für Meteorologie, Geophysik und Bioklimatologie, Series B became Archives for Meteorology, Geophysics and Bioclimatology.

Indian Journal of Meteorology and Geophysics became Mausam.

Journal of Applied Meteorology became Journal of Climate and Applied Meteorology.

Petermann's Geographische Mitteilungen became Petermann's Mitteilungen from 1931-1937, then changed back again.

Verhandlungen des Deutschen Geographentages became Verhandlungen und Wissenschaftliche Abhandlungen (v.22-26 [1927-1936]) and then changed to Tagungsbericht und Wissenschaftliche Abhandlungen (v.28- [1952 -]).

Zeitschrift der österreichischen Gesellschaft für Meteorologie became Meteorologische Zeitschrift [Zeitschrift... from 1866-1885; MZ from 1886 on].

Some journal titles with translation:

Chirigaku Hyoron [Geographical Review of Japan]; from v. 57 on, title is in English.
Doklady Instituta Geografii Sibiri i Dal'nego Vostoka [Reports of the Institute of Geography of Siberia and the Far East]
Trudy, Glavnaya Geofizicheskaya Observatoriya [Transactions, Main Geophysical Observatory]
Geografiya i Prirodnyye Resursy [Geographical and Natural Resources]

Izvestiya Akademii Nauk, SSSR, Seriya Geograficheskaya [Proceedings of the USSR Academy of Sciences, Geographical Series (Moscow)]
Izvestiya Vsesoyuznogo Geograficheskogo Obshchestva [Bulletin of the All-Union Geographical Society (Leningrad)]
Meteorologiya i gidrologiya [Meteorology and Hydrology]
Sibisrskiy Geograficheskiy Sbornik [Siberian Geographical Collection]
Trudy, Gidrometeorologicheskiy, Nauchno-Issledovatel'skiy Tsentr SSSR [Transactions, Hydrometeorological Scientific Research Center of the USSR]
Trudy, Glavnaya Geofizicheskaya Observatoriya [Transactions, Main Geophysical Observatory]
Trudy, Nauchno-Issledovatel'skogo Instituta Aeroklimatologii [Transactions, Scientific Research Institute of Aeroclimatology]
Trudy, Tsentral'naya Aerologicheskaya Observatoriya [Transactions, Central Aerological Observatory]
Trudy, Tsentral'nyy Institut Prognozov [Transactions, Central Forecasting Institute] became: Trudy, Gidrometeorologicheskiy, ... in 1966.
Vestnik Leningradskogo Universiteta. Geologiya-Geografiya [Leningrad University bimonthly. Geology-Geography]
Vestnik Moskovskogo, Universiteta, geografiya [New Geographical Bimonthly of Moscow University]
Voprosy geografii [literally Questions in Geography, but translated as Problems in Geography]

Classification of classifications

In consultation with Professors John Griffiths and John Oliver, I constructed the following "classification of classifications." The final decisions were mine, so that any researchers having disagreements with this table need contact only this researcher.

The groups I have used are:

1. General -- Theory -- History

2. Weather elements (temperature, precipitation, etc.)
    A. Köppen classifications
    B. Other (non-Köppen, as well as elements)

3. Derived indices
    A. Thornthwaite classifications
    B. Other indices (aridity, wind chill, etc.)
    C. Vegetation/Ecological/Phenological/Agricultural
    D. Human comfort/Recreational
    E. Other (topoclimates)

4. Genetic
    A. Air mass/Genetic/Synoptic
    B. Weather classifications/Meteorological
    C. Solar radiation
    D. Other genetic

5. Statistically driven
    A. Cluster analysis/Principal components analysis/Factor analysis
    B. Other statistical analyses
    C. Mapping (and Map pattern analysis)
    D. Complex climatology

6. Climatic change and seasons

7. Others
    A. Comparing 2 or more classifications from different groups
    B. Miscellaneous: regional studies, boundary studies, references that don't fit elsewhere
    C. Physical-geographical regionalization
    D. Morphoclimatic/Mountain classifications

8. Climatic data sources

A scientific bibliography will, by the nature of science, be out of date when it is published. But it will, perhaps, be easier for a researcher to find newer sources than to try to find some of the older ones, included here.

Introduction to Climatic Classification

The purpose of classification is to group items together according to their similarities. Because objects (places) have different measurable qualities, they can be classified in different ways. One chooses a classification based on need and purpose. All classifications are "human created," not discoverable in any natural system. Abler, Adams and Gould, in Spatial organization: the geographers view of the world, stated that "Because it helps us form hypotheses and guides further investigations, classification is the first big step taken in most sciences" (p. 158). [Hemel Hempstead: Prentice Hall, 1971.]

In climate, one purpose of climatic classification is to group together places with similar climatic characteristics. However, this has depended on need and availability of data sources. Classifications have been based on climatic elements such as temperature and precipitation,

which are measurable, on differences in tree species (used to reflect different climates), in indices, derived from climatic data, and in statistical or other criteria.

The first recorded attempt to classify climate was that of Parmenides, ca. 500 B.C. He suggested five general zones: a torrid zone between the Tropics of Cancer and Capricorn, temperate zones from these Tropics to the Polar circles, and frigid zones from there to the poles. This classification was based solely on latitude and is known as a solar climatic classification. Interestingly, this classification can still be found in use today (see reference #375, though attributed to Ptolemy). Other Greek classifications are recorded, and in fact, the English word climate comes from the Greek *klimata*, meaning the slope of the sun's rays. Early Greeks, such as Herodotus and Aristotle, wrote descriptions of weather events and climate. In the eleventh century B.C., the Chinese in the Chou dynasty kept detailed records of precipitation, temperature [subjective?] and storms. It is possible that all agrarian societies that had writing kept some record of flood, rain, sun and heat.

Weather instruments were first developed in the sixteenth century. Early thermometers used different liquids, such as wine or linseed oil, but the present mercury-in-glass was adopted by Daniel Fahrenheit in 1724. The earliest recorded measurements of precipitation were made by Castelli in Italy in 1639. The barometer was developed by Toricelli in 1643. In contrast, the first sunshine recorder was developed by Campbell in 1838. By the middle of the eighteenth century, written records of climatic phenomena were being kept by Thomas Jefferson in Virginia and Dr. J.F. Gauthier in Montreal, among others. Blodget listed precipitation records for Charleston, South Carolina for the period 1738-1754, and noted that “from 1738 to the present time [1857] the continuity of record may be maintained either at Charleston, Cambridge or Philadelphia.” Many of these early records had been lost, even by Blodget's time. Temperature records were first recorded at Cambridge, Massachusetts in 1732, and have been continuous since 1780. New York City has had a continuous record since 1821, and Natchez, Mississippi had temperature observations taken as early as 1799. De Bilt, Netherlands, has had a continuous record since 1706. Blodget lamented that in his time, little use was made of these published records. In 1790, a German meteorological society established 39 weather stations in several countries, including four stations in North America.

Alexander von Humboldt is credited with one of the first modern classifications. Based on data from his expedition to South America, in 1799-1804, he was able to establish climatic belts in the Andes. Von Humboldt introduced the concept of the isotherm (lines of equal values of temperature) and in 1817, he mapped these isotherms across the Northern Hemisphere. In 1842, both Samuel Forry and J.R. Hind developed classifications in the United States. Forry mapped isotherms, while Hind based his classification on different classes both of temperature and precipitation. This was the first attempt to combine two or more elements in one classification. Climatic classifications grew after this period, and many related climate to vegetation, which was considered a physical manifestation of climate. Along with the numerical data, a major source of climatic information during the nineteenth century was from first-person accounts by explorers. In the late nineteenth and early twentieth centuries, the primary classification technique was

based on climate and vegetation. In recent decades, more emphasis has been placed both on statistical analyses and relating climate zones to human comfort.

Errors

Finally, there are bound to be errors and inconsistencies in this bibliography itself. If you find translation errors, citation errors or other oddities, please email me, and I'll try to correct them and re-post a corrected bibliography.
There is at least one numbering error, where one article is referenced as two. I should have changed the entry of one of them to a blank entry, but have not had time to find it. If you do, feel free to send me the two numbers. (Think of it as a treasure hunt.)
There will be inconsitencies in the indexes, as well. The two indexes had been suggested by a publisher, so there are both author and subject indexes.
NB: all numbers refer to entry numbers, not to page number.
Also, newer entries follow number 2247.

Chapter One

This chapter contains works of a general or theoretical nature. Some works, dealing with more than one of the main divisions below, have been included here.

1. Acosta, Father José de. 16th century. *Natural and Moral History of the Indies*. Sevilla. Noted by A. Linés Escardó on p. 197 in chapter 5 "The Climate of the Iberian Peninsula". (*World Survey of Climatology*; v. 5). Zonal.

2. Alisov, Boris Pavlovich, I.A. Berlin and V.M. Mikheev. 1954. *Klimaty zemnogo shara* [Climates of the World]. Leningrad: Gidrometeoizdat. references. on pp. 318-320. Global. (see Rubinshtein: *Course in Climatology*; v. 3).

3. Alisov, Boris Pavlovich, O.A. Drozdov and Evgeniia Samoilovna Rubinshtein. 1952. *Obshchaia klimatologiia; metody klimatologicheskoi obrabotki nabliudenii* [General Climatology: Methods of Climatic Analysis of Observations]. Leningrad: Gidrometeoizdat. references. on pp. 478-482. This was also volumes 1 and 2 of Rubinshtein: *Course in Climatology*.

4. Arakawa, H., ed. 1969. *Climates of Northern and Eastern Asia*. Amsterdam; New York: Elsevier, 248 pp. (*World Survey of Climatology*; v. 8).

5. Armand, D.L. 1965. "The Logic of geographic classifications and regionalization schemes," *Soviet Geography: Review & Translation* 6(9): 20-38. 34 references. Theoretical article dealing with climate, among other schemes. Originally published in 1964, pp. 33-53 in *Razvitiye i preobrazovaniye geograficheskoy sredy*. Moscow: Nauka.

6. Armand, D.L. 1970. "The Objective and the subjective in natural regionalization," [Russian]. *Izvestiya Akademii Nauk, SSSR, Seriya Geograficheskaya*, No. 1: 115-129.

7. Balling, Robert C., Jr. 1984. "Classification in climatology," pp. 81-108 in Gary L. Gaile and Cort J. Wilmott, eds. *Spatial Statistics and Models*. Dordrecht, Boston: D. Reidel. 130 references. Discussion of modern classification techniques.

8. Barrett, Eric C. 1970. "Rethinking climatology," pp. 154-205 in C. Board, R.J. Chorley, P. Haggett, and D.R. Stoddart, eds. *Progress in Geography*, vol. 2. London: Edward Arnold. Suggests we rethink climatic classification completely "from philosophical first principles."

9. Barry, Roger G., and Richard J. Chorley. 1982. *Atmosphere, Weather and Climate*, 4th ed. London and New York: Methuen &Co. 407 pp. Discuss four types of classifications: generic (Köppen, Thornthwaite), energy and moisture budget (Thornthwaite's second, Budyko, Terjung & Louie), genetic (Hettner, Alisov, Flohn, Strahler), and human comfort (Buettner, Olgyay, Terjung).

10. Baumgartner, A., G. Enders, M. Kirchner and H. Mayer. 1982. "Global climatology" pp. 125-177 in E.J. Plate, ed. *Engineering Meteorology*. Published by Elsevier. 61 references.

11. Blanutsa, B.I. 1984. "A system of methods for the automatic classification of geographical objects: some ways of assessing the quality of classification," [Russian]. *Izvestiya Akademii Nauk, SSSR, Seriya Geograficheskaya*, no. 3: 91-(99).

12. Blüthgen, Joachim, and Wolfgang Weischet. 1980. *Allgemeine Klimageographie* [General climate-geography], 3rd ed. Berlin; New York: Walter de Gruyter, 887 pp., 3 folded maps. 115 references. Global. Chapter 6 (pp. 649-694), "Klassifikation der Klimate" [Classification of climate] discusses approximately 17 different classification schemes. References for chapter 6 on pp. 857-860.

13. Böer, W., and O. Fritsche. 1959. "Über Grunsätze der Klimaeinleitung für technische Zwecke," [About principles of climate classification for technical purposes]. *Elektrotechnische Zeitschrift-A* 80(2): 40-43.

14. Borgel, Gregory E. 1969. *The nature and types of climatic classification: an overview*. Thesis (M.A.)--University of California, Los Angeles (Dept. of Geography). 315 references. 169 classifications, classified. The only known thesis devoted entirely to a classification of climatic classifications.

15. Borisov, Anatoliy A. 1955. "O printsipakh klimaticheskogo raîonirovaniia," [Russian. The principles of climatic regionalization (zoning)]. *Vsesoiuznoe Geograficheskoe Obshchestvo SSSR, Leningrad, Isvestiia* 87(3): 279-284. 3 references. USSR. [Also listed as published in *Izvestiya Vsesoyuznogo Gidromet obs.*]

16. Brooks, C.E.P. [Charles Ernest Pelham]. 1948. "Classification of climates," *Meteorological Magazine* 77: 97-101.

17. Bucknell, J. 1952. *Some methods of classifying climates*. Thesis (M.Sc.)--Univ. of Reading.

18. Burchard, H., and G. Hoffmann. 1958. "Beitrag zur Klima-Klassifizierung Technischer Geräte," [A contribution to the technical climate classification apparatus]. *Elektrotechnische Zeitschrift, Ausgabe A*, 79: 315-321.

19. Cantú, V. and P. Narducci. 1973. *Bibliographia Climatologica Italiana* [Climatological bibliography of Italy]. Rome: CNR-IFA, Str. 22, 24 pp.

20. Carter, Douglas B. 1966a. "Characteristics of climatic classification," pp. 305-308 (chapter 1) in D.B. Carter and J.R. Mather, "Climatic classification for environmental biology," [see below].

21. Carter, Douglas B. 1966b. "Modern climatic classification: competition or climatic," pp. 309-325 (chapter 2) in D.B. Carter and J.R. Mather, "Climatic classification for environmental biology," [see below].

22. Carter, Douglas B. 1966c. "Recent progress in classification of climates," pp. 326-340 (chapter 3) in D.B. Carter and J.R. Mather, "Climatic classification for environmental biology." [see below]

23. Chatterjee, Sujan Bandhaba. 1966. "Progress in climatology in India," *Tokyo Journal of Climatology* 3(1): 30-36. Many references. A review of Indian works on climatic classification.

24. *Climatic Classification: a Consultants' Meeting*. see entry under ICRISAT, this section.

25. Crowe, Percy R. 1965. "The Geographer and the atmosphere," *Transactions of the Institute of British Geographers* 36: 1-19.

26. Ditmar, A.B., and G.A. Chernova. 1967. "The idea of latitudinal natural zonality in antiquity and its reflection in the geography of the early Middle Ages," [Russian] *Izvestiya Akademii Nauk, SSSR, Seriya Geograficheskaya*, No. 4: 127-134.

27. Dokuchayev, V.V. 1948. *Ucheniye o zonakh prirody* [The theory [or 'knowledge'] of natural zones]. Moscow: Geografgy.

28. Dokuchayev, V.V. 1951. "Concerning the doctrine of the zones of nature," [Russian] *Sochineniya*, v.6 [Collected works]. Moscow; Leningrad: Academy of Sciences, USSR. Has also been translated as: "On the theory of natural zones."

29. Eriksen, Wolfgang, ed. 1985. *Klimageographie* [Climatic geography]. Darmstadt: Wissenschaftliche Buchgesselschaft, 452 pp. This book includes reprints of articles by Terjung, Thornthwaite, Lautensach, Penck, Flohn, Köppen, Troll, Lauer and Frankenberg (see individuals).

30. Fairbridge, Rhodes W., ed. *The Encyclopedia of Atmospheric Sciences and Astrogeology*. New York: Reinhold, 1200 pp. See especially articles by Gentilli, on continentality and Wilson, on climatic classification.

31. Flohn, Hermann. 1971. *Arbeiten zur Allgemeinen Klimatologie* (Omnibus Volume) [Works on general climatology]. Darmstadt: Wissenschaftliche Buchgesselschaft.

32. Flohn, Hermann. (no date). "Probleme der Geophysikalisch-Vergleichenden Klimatologie seit Alexander von Humboldt," [Problems of geophysical-comparative climatology since Alexander von Humboldt]. *Berichte des Deutschen Wetterdienstes* 8(59).

33. Frankenberg, Peter. 1987. "Stand der geographischen Klimaforschung," [The state of geographical climate research] *Geographische Rundschau* 39(5): 244-252.

34. Fukui, Eiichiro. 1966b. "General review of the development of climatology in Japan," *Tokyo Journal of Climatology* 3(1): 1-4. [Reprinted from "Japanese Geography 1966--its recent trends," *Association of Japanese Geographers* (Aug. 1966): 48-51.] 10 references, plus journals. A general, historical article on Japanese classifications. Fukui mentions two schools: (1) Kira and Kawakita (1945) with the vegetation-thermal/humidity indices, and (2) the dynamical classification of Nagao (1961) and Suzuki (1962). Nagao used air-mass mixing and transformation, while Suzuki considered the polar front, winter precipitation, and heavy rainfall.

35. Gaussen, Henri. 1954. "Théories et Classification des Climats et Microclimats," [Theories and classification of climates and microclimates]. *Rapp. Comm. VIII Congrès International de Botanique Paris*, Sect. 7 et 3: 125-130.

36. Geiger, Rudolf. 1929. "Die Vier Stufen der Klimatologie," [The four degrees of climatology]. *Meteorologische Zeitschrift* 46: 7-10. 8 references. Macroclimatology is one of the four, and includes classification.

37. Gentilli, Joseph. 1958. *A geography of climate*, 2nd ed. Perth: University of Western Australia Press, 172 pp. 104 references. One of the best discussions of many classifications by type (to 1958).

38. Gentilli, Joseph. 1971. *Climates of Australia and New Zealand*. Amsterdam; New York: Elsevier, 405 pp. (*World Survey of Climatology*; v. 8). See especially pp. 176-188. 136 references follow chapter 6, "The main climatological elements" (pp. 119-188), and especially pp. 176-181, "Climatic regions," with maps of Australian air mass frequency and one of hydric efficiency. 22 regions.

39. Gerenchuk, K.I. and S.I. Kukurudza. 1977. "The theoretical basis for classifying natural complexes," [Russian] *Izvestiya Vsesoyuznogo Geograficheskogo Obshchestva* [Bulletin of the All-Union Geographical Society (Leningrad)], No. 6: 531-537.

40. Griffiths, John F. 1972b. *Climates of Africa*. Amsterdam; New York: Elsevier, 604 pp. (*World Survey of Climatology*; v. 10). Many references. Most chapters have a section on climatic zones or regions. See especially chapter 1, "General Introduction," pp. 12-16. Griffiths presents his own classification. There is a Köppen classification map on p. 13, one for Thornthwaite on p. 14, and one for "basic zonation" on p. 15. See also the other chapters in this volume.

41. Griffiths, John F. 1983. "Climatic classification," *International Journal of Environmental Studies* 20(2): 115-125. 24 references. A brief, historical survey. Griffiths notes the limitations of Köppen and Thornthwaite.

42. Guseva, I.N. 1961. "Climatic maps in national atlases," *Soviet Geography: Review & Translation* 2(5): 49-55. 20 references. Argues for climatic regions to be shown in all climatic atlases. Originally published in *Vestnik Moskovskogo, Universiteta, geografiya* [New Geographical Bimonthly of Moscow University], No. 6(1960): 26-32.

43. Hann, Julius von. 1883. *Handbuch der Klimatologie* [Handbook of Climatology]. Stuttgart: J. Engelhorn, 764 pp. The original edition. Many references. Global. Different classifications mentioned and discussed in part 5: "Die Grossen Klimagürtel der Erde," (Great climate zones of the Earth). In the 1911 ed. there was a *Band III. Klimatographie* with a discussion of regional (local) climates. The 1932 edition was the 4th revised edition, by Karl Knoch. Part 1 was tranlated into English by Robert DeCourcey Ward and published in 1903 by Macmillan (New York). It was reprinted in 1979 by AMS Press.

44. Hann, Julius von. 1903. *Handbook of Climatology. Part 1. General Climatology*. New York; London: Macmillan, 437 pp. Translated by Robert De Courcy Ward, from the second revised and enlarged German edition. This volume was reprinted in 1979, by AMS Press, New York. Many references. Historical information on early classifiers, e.g., Dove and Spitaler.

45. Hidore, John J. 1972. *A Geography of the Atmosphere*, 2nd ed. Dubuque, Iowa: Wm. C. Brown, 136 pp. Some references. See pp. 58-69 (Chapter 5), "Classification of climates." Hidore does a unique thing: he superimposes the hypothetical continent over a map of the world. Also discusses Köppen and Thornthwaite. Each classification "is a means of extracting the systematic pattern of climates on the earth's surface" (p. 68).

46. Hidore, John J. and John E. Oliver. 1993. *Climatology: an Atmospheric Science*. New York: Macmillan, 423 pp. References. Various classifications are discussed in chapter 13, "Regionalization of the climatic environment". These are divided into "empiric" and "genetic" systems. Empiric systems are those like Köppen and Thornthwaite; genetic are those like Hidore's 1966 air mass classification. In addition, there is a good, though limited, chronology of the development of 20th century classifications.

47. Huggett, Richard John. 1991. *Climate, Earth Processes and Earth History*. Berlin; New York: Springer-Verlag, 281 pp. Many references. Much material on different classifications, and discussions of "morphoclimatic regions" (landforms and climate) and "life zones" (plants and climate).

48. ICRISAT (International Crops Research Institute for the Semi-Arid Tropics). 1978. "Approaches used in classifying climates -- with special reference to dry climates," *ICRISAT, Agroclimatological Progress Report 2*. Hyderabad, India, 25 pp. 16 references. Semi-arid tropics. Various classifications used, but note especially Köppen, Thornthwaite, Troll, Papadakis, Cocheme and Franquin, Hargreaves, Schreiber.

49. ICRISAT (International Crops Research Institute for the Semi-Arid Tropics). 1980. *Climatic Classification: a Consultant's Meeting*, 14-16 April 1980. Patancheru, Andhra Pradesh, India: ICRISAT, 153 pp. All chapters from this volume are cited in this bibliography.

50. Johnston, R.J. 1968. "Choice in classification: the subjectivity of objective methods," *Annals, Association of American Geographers* 58: 575-589.

51. Jones, Stephen B. 1950. "What does Geography need from Climatology?" *Professional Geographer* 2(4): 41-44. No references. Argues against "boundary value" classifications.

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110. Ward, Robert DeCourcy. 1906b. "The characteristics of the zones. II. the temperate zones," *Journal of Geography* 5: 337-353, 395-405. One reference. Global. World temperate belts discussed.

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113. Ward, Robert DeCourcy. 1906e. "The classification of climates, II," *Bulletin of the American Geographical Society* 38(8): 465-477. 10 references. Reviews classifications.

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Chapter Two, part A

This section contains citations referring to elements (temperature, precipitation, etc.) and specifically to the work of Wladimir Köppen. Comparisons of Köppen and Thornthwaite's work appear in Chapter Seven, part A.

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121. Alcorta Guerrero, Ramón. 1950. "El uso de la sistema climatológico de Koeppen en las escuelas secundarias" [Use of Köppen's climatological scheme in the secondary schools]. *Sociedad Mexicana de Geografiá y Estadística, Boletín* 70 (1/3): 345-354. Favors Köppen and opposes de Martonne and Thornthwaite.

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124. Bailey, Harry P. 1948. "Proposal for a modification of Köppen's definition of the dry climates," *Yearbook, Association of Pacific Coast Geographers* 10: 33-38. 5 references. Dry areas. Köppen.

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131. Blair, Thomas P. 1942. *Climatology: General and Regional*. New York: Prentice-Hall. 484 pp. A "simplified climatic classification" based on Köppen: 5 divisions, based on temperature differences, with 14 types and 6 sub-types based on temperature and precipitation differences, related to vegetation.

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133. Borchert, John R. 1947. "A new map of the climates of China," *Annals, Association of American Geographers* 37(3): 169-176. 12 references. China. Modified Köppen; notes Thornthwaite.

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271. Wilhelmy, Herbert. 1950. "Zur Klimatologie und Bioklimatologie des Alto-Paraná-Gebietes in Südamerika," [On climatology and bioclimatology of the Alto-Parana region in South America]. *Petermann's Geographische Mitteilungen* 94: 130-139. Köppen.

272. Zarur, Jorge. 1943. "Um Comentario Sobre a classificaçâo de Köppen," [A commentary about Köppen's classification]. *Revista Brasileira de Geografia* 5(2): 250-254.

273. Zimmermann, G. 1949. "Die Köppenschen Klimaformeln im Unterricht der Oberklasse," [Köppen's climatic formulas in instruction of the upper grades]. *Geographische Rundschau* 1: 293-298.

274. Zistler, P. 1926. *Die Temperaturverhältnisse der Türkei*. [The temperature relations of Turkey]. Leipzig. Köppen classification of Turkey.

Chapter Two, part B

This section contains citations referring to elements (temperature, precipitation, etc.) and to works **not** using Köppen's classification.

275. Ahmad, K.S. 1951. "Climatic regions of West Pakistan," *Pakistan Geographical Review* 6: 1-35. Compares climates; author's classification based on temperature and precipitation regimes.

276. Alisov, Boris Pavlovich. 1951. "Vklad L'va Semenovicha Berga v klimatologiiu" [Russian. Lev Semenovich Berg's contribution to climatology]. *Voprosy Geografii* No. 24, *Fizicheskaia Geografiia*, pp. 27-31. Summary of Berg's classification system.

277. Angot, Alfred. 1913. "Sur un mode de classification des étés," [A system of classification of summers] *Annuaire de la Société Météorologique de France (Paris)*. 61: 341-345.

278. Angot, Alfred. 1914a. "On a method for classifying winters," *Monthly Weather Review* 42(11): 625. Used temperature sums of less than 0°C.

279. Angot, Alfred. 1914b. "On a method for classifying summers," *Monthly Weather Review* 42(11): 628-629. 2 references. Used temperature sums greater than 25°C and 30°C.

280. Anyadike, Raymond N.C. 1992. "Hydrological regions of West Africa: a preliminary survey based on moisture regimes," *Geografiska Annaler* 74A(4): 375-382. 14 references. 7 regions based on a classification of precipitation.

281. Asai, T. and S. Ootani. 1952. "The division of Japan by the frequency of the flood damages," [Japanese] *Miscellaneous Reports. Research Institute for Natural Resources (Tokyo)* 26: 97-106.

282. Azzi, Girolamo. 1954. "Il concetto di clima assoluto," [The concept of absolute climate]. *Geofisica e Meteorologia* 2(1/2): 3-4. Global. Four natural climate types, based on annual mean precipitation and morning temperatures.

283. Azzi, Girolamo. 1955. "Le concept du climat absolu et la classification des climats," [The concept of absolute climate and climatic classification]. *La Météorologie* No. 38: 161-166. No references. Global. Azzi's own classification: a simple one with four regions. Includes English summary.

284. Barrett, Eric C. (with J.O. Bailey). 1971. *Weather and Climate*. Glasgow: Collins. 96 pp. Global. Pressure and wind classification.

285. Barrow, Christopher J. 1991. *Land Degradation: Development and Breakdown of Terrestrial Environments*. New York: Cambridge University Press, 295 pp. Page 164 shows a map of West African climatic zones, based on precipitation. See World Bank (1985).

286. Bennett, Merrill K. 1960. "A World map of foodcrop climates," *Food Research Institute Studies, Stanford*, v.1(3): 285-295, plus 1 map. 17 references. Foodcrop climates are based on annual precipitation and general temperature, producing 21 regions.

287. Berg, Lev S. 1927. *Foundations of Climatology* [Russian]. Moscow-Leningrad. 11 climatic areas of the world, based on temperature, precipitation and vegetation. [Note: Semenovich (Berg's middle name) has also be listed as either Semyonovich or Semënovich.]

288. Bergeiro, José María. 1946. "La temperatura y lluvia estacional en el Uruguay. Delimitación regional climato-geográfica y normas respectivas," [Temperature and seasonal rain in Uruguay. Demarcation of climato-geographical regions and their respective norms] *Revista Meteorologica (Montevideo)* 5: 264-271.

289. Berkin, N.S. 1971. "Regionalization of Cisbaykalia in terms of moisture and heat supply," [Russian] *Doklady Institut Geografii Sibiri i Dal'nego Vostoka*, No. 32: 33-40.

290. Blanford, H.F. 1884. [Map]. In the article by Gadgil, Yadumani and N.V. Joshi (1993-see) there is a map of Blanford's Indian rainfall regions. It originally appeared in *India Meteorological Memoirs*, published by the Government of India.

291. Blumenstock, David I. 1939. "The humid-arid boundary problem," *Geographical Review* 29(4): 681-682. References. Discusses the title problem; different schemes noted.

292. Böer, W., H. Burchard, G. Hoffmann, G. Kerner and R. Reidat. 1961. "Third draft for Supplement (German Industrial Tentative Standards) to DIN 50 019 (Dated Feb. 1961)," *Zeischrift für Metallkunde* 15: 432-445. Map appearing on page 373 of *World Survey of Climatology*, v. 3 (Reidat article), was based on this article. Used temperature, relative humidity and air pressure. Note that the title of this standard is "Materials, unitized construction elements and equipment tests as well as climatological review on the types of outdoor climates."

293. Böhm, Hans. 1964. "Eine klimakarte der Rheinlande," [A climatic map of the Rhineland]. *Erdkunde* 18: 202-206. 17 references. Rhineland [Germany]. Provinces and sub-provinces formed from a combination of temperature and precipitation.

294. Brooks, Charles F. 1948. "The climatic record: its content, limitations, and geographic value," *Annals, Association of American Geographers* 38(3): 153-168. 31 references. Contains some simple classifications using temperatures, and involving means, extremes and frequencies, to illustrate geographical use of climatic data.

295. Budyko, M.I. 1955a. "The climatic conditions of moisture supply on the continents," [Russian] *Izvestiya Akademii Nauk, SSSR, Seriya Geograficheskaya*, Nos. 1, 2.

296. Budyko, M.I. 1955b. "The climatic conditions of moisture on the continents," [Russian] *Izvestiya Akademii Nauk, SSSR, Seriya Geograficheskaya*, Nos. 2, 4.

297. Candolle, Alphonse de. 1855. *Géographie botanique raisonée ou exposition des faits principaux et des lois concernant la distribution géographique des plants de l'èpoque actuelle, I-II61* [Analytical plant geography, or an explanation of the principal events and precepts concerning the geographic distribution of plants to the present era, I-II61]. Genève, 1366 pp.

298. Candolle, Alphonse de. 1874a. "Constitution dans le règne végétal de groupes physiologiques applicables à la Géographie ancienne et moderne," [Constitution of physiological groups within the vegetal realm [plant kingdom] applicable to plant geography, [both] ancient and modern]. *Bibliothèque Universelle. Archives des Sciences Physiques et Naturelles* 50: 5-42. This article was a basis for Köppen's use of vegetation in classification.

299. Candolle, Alphonse de. 1874b. "Géographie botanique raisonée," [Analytical plant geography]. *Archives des Sciences de la Bibl. Univ. de Genéve*. Originally published in 1855, this early classification listed six plant-climate types, based on temperature and humidity.

300. Candolle, Alphonse de. 1875. "Les Groupes Physiologiques dans le Régne Végétal," [Physiological groups within the vegetal realm (plant kingdom)]. *Revue Scientifique*, Ser. 2, 16: 364-372. With the 1874 article, a basis for Köppen's use of vegetation in classification.

301. Chavanne, J. 1902. "Die Temperatur und Regenverhältnisse Argentiniens," [The temperature and precipitation conditions of Argentina]. *Veröffentlichungen der Deutschen Akademischen Vereinigung zu Buenos Aires* 1. Band, 7. Heft. Nine temperature and precipitation regions in Argentina.

302. Chen, Cheng-hsiang. 1957b. "The climatic regions of China," [Chinese. Summary in English]. *Meteorological Bulletin* (Taipei), 3(3): 1-9. Temperature, precipitation and humidity; divides China into 14 climatic provinces.

303. Chen, Cheng-hsiang and Tsung-hui Huang. 1956. *The Climatic Classification and Moisture Belts in Taiwan* [Chinese. Table of contents and summary in English]. Taipei: Fu-min Geographical Institute of Economic Development (Taipei), Research Report, No. 67, 28 pp.

304. Chickering, J.W., Jr. 1884-1885. "Thermal belts," *American Meteorological Journal* 1: 213-218. Also published in *Bulletin. Philosophical Society of Washington* [D.C.], March 1883.

305. Chukreyev, V.K. 1961. "An attempt to delimit climatic regions on the basis of the march of precipitation," *Soviet Geography: Review and Translation* 2(9): 20-32. 11 references. March of precipitation used to create climatic regions for small areas. Originally published in *Izvestiya Vsesoyuznogo Geograficheskogo Obshchestva* [Bulletin of the All-Union Geographical Society (Leningrad)], No.3 (1961): 224-231. [Note: has also been translated as: " An attempt at a climatic regionalization [based] on the march of preciptitation.]

306. Coronas, J. 1920. *The Climate and Weather of the Philippines, 1903 to 1918*. Manila: Bureau of Printing, 195 pp. Four types of climate, based on precipitation characteristics and seasons (since temperature differences are small in the Philippines).

307. Court, Arnold. 1967. "Climate classification and plant geography in 1842," *Weather* 22: 276-288. 8 references, plus Hinds' bibliography. Article is about R.B. Hinds and his 16 regions, and mentions that it was the first modern classification.

308. Credner, W. 1937. "Hinterindien," [The far side of India], pp. 327-451 in F. Klute,ed. *Handbuch der Geographischen Wissenschaft*. Temperature and precipitation classification.

309. Creutzburg, Nikolaus. 1950. "Klima, Klimatypen und Klimakarten," [Climate, climate types and climatic charts]. *Petermann's Geographische Mitteilungen* 94(2): 57-69. 72 references. Global. Discussion of climatic classification, based on (a) relation of climate to vegetation, (b) relation of climate to thermal considerations, and (c) relation of climate to aridity considerations. Own classification. Tropic, subtropic, temperate, cold and highland types of climate, based on moisture classes and length of wet season. Hidore and Oliver mention his terms: isohygromen and tag-isochione meaning, respectively, lines of equal duration of humid months, and lines of equal daily snow cover duration.

310. Crowe, Percy R. 1936. "The rainfall regime of the western plains," *Geographical Review* 26(7-July): 463-484. 6 major regions in the great plains of the United States and Canada.

311. Crowe, Percy R. 1951. "Rainfall regime in the south-eastern United States," pp. 71-90 in L.D. Stamp & S.W. Wooldridge, eds. *London Essays in Geography*. 7 references. A graphical precipitation classification.

312. Dammann, Walter. 1952c. "Zur Festlegung der Klimabereiche," [On the determination of climatic regions]. *Berichte des Deutschen Wetterdienstes in der US-Zone*, No. 38: 137-138. 6 references. Humboldt's definition of climates.

313. Daubenmire, Rexford F. 1938. "Merriam's life zones of North America," *Quarterly Review of Biology* 13: 327-332. 25 references. Merriam described the importance of temperature and humidity for vegetation distribution. This (Merriam) was the first major attempt using climatic data with the North American biota.

314. Davis, William Morris. 1894. *Elementary Meteorology*. Boston: Ginn & Co., 355 pp. Three zones: torrid, temperate (includes highlands) and frigid. Temperature-based.

315. Dieckmann, A. 1929. "Die Differenzen der Mittleren Niederschlagssummen der Monate Mai/Juli minus August/Oktober als Kennzeichnung der Ozeanität und Kontinentalität der Niederschläge in Nord- und Südamerika," [The differences of the mean precipitation totals of May-July minus August-October as they characterize oceanicity and continentality of precipitation in North and South America]. *Zeitschrift für Angewandte Meteorologie* 46: 367-371.

316. Dieckmann, A. 1930. "Ozeanität und Kontinentalität als Begriffe," [Oceanicity and continentality as concepts]. *Zeitschrift für Angewandte Meteorologie* 47: 283-286.

317. Dietrich, B. 1933. "Einleitung (Nord- und Mittelamerika, die Arktis in Natur, Kultur und Wirtschaft)," [Introduction: North and Central America, [and] the Arctic, in nature, culture, and the economy], Pp. 1-55 in F. Klute, ed. *Handbuch der Geographischen Wissenschaft*. Temperature values used to create 13 provinces.

318. Dove, Heinrich Wilhelm. 1846. "Über den Zusammenhang der Temperaturveränderungen der Atmosphäre und der Oberen Erdschichten mit der Entwickelung der Pflanzen," [On the connection between the temperature changes in the atmosphere and the upper soil strata with the development of plants]. *Annalen der Physik und Chemie*, Ser. 2, 68: 224-235.

319. Dove, Heinrich Wilhelm. 1848. "Über Linien gleicher Monatswärme," [On isotherms of the same monthly temperature]. *Abhandlungen. Königlichen Akademie der Wissenschaften in Berlin. Physikalische Klasse*, pp. 197-228.

320. Dove, Heinrich Wilhelm. 1852. *Die Verbreitung der Wärme auf der Oberfläche der Erde erläutert durch Isothermen, thermische Isonamalien und Temperaturkurven* [The diffusion of heat over the surface of the earth illustrated by isotherms, thermal isoanomalies and temperature curves]. Berlin, 2nd edition. [Also translated as "The distribution of temperature over the earth's surface".] Mean temperatures for different bands of latitude.

321. Dove, K. 1888. *Das klima des aussertropischen Südafrika* [The climate of non-tropical South Africa]. Göttingen: Vandenhoek and Ruprecht.

322. Drude, Oscar. 1884. "Die Florenreiche der Erde," [The flowering kingdom of the earth]. *Petermann's Geographische Mitteilungen*, Ergänzungsheft [Supplement] 16, Gotha. Temperature and humidity of the Northern Hemisphere.

323. Drury, Byron. 1857. "On the meteorology of New Zealand," *New Zealand Government Gazette* 5: 178-186. Drury is mentioned by Hargreaves & Maunder (#1713), as is his 1857 map of 8 climate regions in New Zealand.

324. Dryer, C.R.W. [Charles Redway Wilmarth]. 1912. *High School Geography: Physical, Economic and Regional*. Cincinatti; New York: American Book Co., 536 pp. See pp. 328-330 and 358. Reed notes this scheme is similar to Supan's.

325. Dunbar, Gary. 1966. "Thermal belts in North Carolina," *Geographical Review* 56(4): 516-526. References. Thermal belts are zones of different temperatures on mountainsides. Dunbar includes a map of one such region in western North Carolina, and mentions he believed that the originator of the concept of thermal belts was "Silas McDowell of Franklin, North Carolina, in 1858."

326. Easterling, David R. 1989. "Regionalization of thunderstorm rainfall in the contiguous United States," *International Journal of Climatology* 9(6): 567-579. 37 references.

327. Erk, F. 1885. "Über die Darstellung der Stündlichen und Jährlichen Verteilung der Temperatur durch ein einziges (Thermo-Isoplethen-) Diagramm und dessen Verwendung in der Meteorologie," [About the description of the hourly and annual distribution of temperature through a single (thermo-isopleth) diagram, and its use in meteorology]. *Meteorologische Zeitschrift* 2: 281-299.

328. Finkelstein, Peter L. and Lawrence E. Truppi. 1991. "Spatial distribution of precipitation seasonality in the United States," *Journal of Climate* 4(4): 373-385. 33 references. Regions with similar precipitation patterns/distributions by time.

329. Fisher, H.M. 1967. "Cereal yield tests in 1966," *Journal. Department of Agriculture. Western Australia* 8: 372-378. Fisher "divided western Australian arable area into climatically homogeneous regions" (Paterson, et.al., 1978, pp. 349) based on precipitation and temperature.

330. Forry, Samuel. 1842. *The Climate of the United States and its Endemic Influences*. New York: J. and H.G. Langley. [Reprinted in 1978 by AMS Press.] According to Leighly, Forry was the first person to refer to "classification of climates." For the United States, Forry observed 3 zones (north, middle, south) using temperature, latitude and continentality.

331. Forry, Samuel. 1844. "Researches in elucidation of distribution of heat over the globe, especially of the climatic features peculiar to the region of the United States," *American Journal of Science and Arts* 47: 18-50, 221-241.

332. Galliani, G. and F. Filippini. 1985. "Climatic clusters in a small area," *Journal of Climatology* 5(5): 487-501. 16 references. Italy. Temperature and precipitation clustering; useful for plant productivity.

333. Garnier, Benjamin John. 1958b. "Some comments on defining the humid tropics," *University College, Ibadan, Department of Geography, Research Notes*, No. 11: 9-25.

334. Garnier, Benjamin John. 1960. "Delimiting the humid tropics," *International Council of Scientific Unions, Review* 2: 210-218. Tropics. Temperature and precipitation.

335. Garnier, Benjamin John. 1961a. "Mapping the humid tropics: climatic criteria," *Geographical Review* 51: 339-346.

336. Garnier, Benjamin John. 1965. "The problem of delimiting the humid tropics," *Geographical Review* 55(4): 595-596. A review of the problem, citing literature, especially Bultot.

337. Gaussen, Henri. 1955b. "Détermination des climats par la méthode des courbes ombrothermiques," [Definition of climates by the method of ombrothermic curves]. *Comptes Rendus des Séances. Académie des Sciences* 240(6): 642-643. The ombrothermic method (developed with F. Bagnouls) involves drawing 2 curves, mean monthly temperature in ° C and mean monthly precipitation in mm. Each ° C has a scale value corrected to 2 mm of precipitation. Seen as useful in agriculture and forestry.

338. Gaussen, Henri, P. Legris and F. Blasco. 1967. "Bioclimats du Sud-Est Asiatique," [Bioclimates of south-east Asia]. *Institut Français de Pondichéry: Travaux de la Section Scientifique et Technique* 3(4): 1-114. 98 references. Gaussen-Legris classification of south-east Asia (Indochina to Malaysia). Precipitation (total and number of dry months) and temperature (of coldest month).

339. Ghosh, S.K. 1959. "Climatic patterns of India," *Geographical Review of India* 21: 2-4 [Either pp. 2-4 or issue numbers 2,3,4]. Compared vegetation zones and climates. Took precipitation and mean temperatures of hottest and coldest months (temperature of hottest month minus temperature of coolest month), to create 6 climatic types.

340. Greely, A.W. 1893. "Rainfall types of the United States," *National Geographic Magazine* 5: 45-58.

341. Gregory, Stanley. 1953. "A note on the classification of annual rainfall distribution types," *Quarterly Journal of the Royal Meteorological Society* 79: 538-543. 9 references. Great Britain. Classification of rainfall-distribution types uses temporal intensity and a correlation with the frequency of weather types.

342. Gregory, Stanley. 1954a. "Annual rainfall areas of southern England," *Quarterly Journal of the Royal Meteorological Society* 80: 610-618. 7 references. South England. Climatic fluxes and regional differences.

343. Gregory, Stanley. 1956. "Regional variations in the trend of annual rainfall over the British Isles," *Geographical Journal* 122: 346-353. No references. British Isles. Regional variations of precipitation trends are defined for 3 regions.

344. Gregory, Stanley. 1979. "The definition of wet and dry periods for discrete regional units," *Weather* 34: 353-359.

345. Griffiths, John F. 1958a. "Annual rainfall distribution in East Africa," *Nature* 181: 1331.

346. Griffiths, John F. 1958b. "Climatic zones of East Africa," *East African Agricultural Journal* 23(3): 179-185. 2 references. Africa. A classification using precipitation, temperature, and annual precipitation variation.

347. Griffiths, John F. 1962. "The climate of East Africa," pp. 77-87 in E.W. Russell, ed. *The Natural Resources of East Africa*. Nairobi: D.A. Hawkins, 144 pp. No references. Africa. Rainfall regions.

348. Griffiths, John F. 1972a. "Climate," pp. 106-117 (chapter 9) in W.T.W. Morgan, ed. *East Africa: its People and Resources*. Nairobi; New York: Oxford University Press. 12 references. Africa. Rainfall regions.

349. Griffiths, John F. 1976. *Applied Climatology. An Introduction*, 2nd ed. Oxford: Oxford University Press. 136 pp. 4 references on classification. A new "simple" classification, based on mean temperature, and seasonal/monthly precipitation.

350. Hadlow, L. 1952. *Climate, Vegetation and Man*. London: University of London Press. Five temperature belts and a continental-marine subdivision.

351. Harrison Church, R.J. 1961. *West Africa*. Longmans. West African climate zones based upon seasonal precipitation.

352. Hartshorne, Richard. 1938. "Six standard seasons of the year," *Annals, Association of American Geographers* 28(3): 165-178. 8 references. Divisions of the year by temperature. Global classification by seasonal cycles (11 cycles), and hot/warm combinbations.

353. Hastings, J.R. and R.M. Turner. 1965. "Seasonal precipitation regimes in Baja California, Mexico," *Geografiska Annaler* 47: 204-223.

354. Henderson-Sellers, A. 1980. "The spatial and temporal variation of rainfall intensity in South Africa," *Die Suid-Afrikaanse Geograaf/The South African Geographer* 8(2): 109-112. 9 references. South Africa. Storm rainfall follows patterns of climatic regimes.

355. Henze, H. 1929. "Ozeanität und Kontinentalität bei den Sommerlichen Niederschlägen Norddeutschlands," [Oceanity and continentality in the case of the summertime precipitation of north Germany]. *Meteorologische Zeitschrift* 46: 129-137. 2 references. The specific location is from 50-55° N and 6-22° E.

356. Herbertson, A.J. 1905. "The major natural regions: an essay on systematic geography," *Geographical Journal* 25: 300-312. No references. Climate and vegetation configurations, using Köppen-like criteria of temperature and precipitation.

357. Herbertson, A.J. 1910. "Notes on the teaching of climate. I. Thermal regions," *The Geographical Teacher* 5(5): 241-251. No references. Global. Temperature belts and thermal regions of the world.

358. Herbertson, A.J. 1912. "The thermal regions of the globe," *Geographical Journal* 40: 518-532. Global. A thermal (temperature) classification with 10 main global regions.

359. Hinds, Richard Brinsley. 1842. "The physical agents of temperature, humidity, light, and soil, considered as developing climate, and in connexion [sic] with geographic botany," *Annals and Magazine of Natural History* 9: 169-189, 311-333, 415-416, 469-475. First global classification. Annual temperature, wetness and temperature range. Refers to Dove.

360. Hobbs, J.E. 1971. "Rainfall regimes of north-eastern New South Wales," *Australian Meteorological Magazine* 19: 91-116.

361. Holm, Karl-Friedrich. 1953. "Die Thermische Kontinentalität in Europa während der 'Normalperiode' 1901-1930 und ihre Schwankung," [The thermal continentality in Europe and its fluctuation during the "normal period" of 1901-1930] *Petermann's Geographische Mitteilungen* 97: 26-30.

362. Horn, Lyle H., Reid A. Bryson and W.P. Lowry. 1957. *An Objective Precipitation Climatology of the United States*. Madison, Wisc.: Department of Meteorology, Science Report No. 6, 43 (34?) pp.

363. Howe, George F. 1925. "The summer and winter weather of selected cities in North America," *Monthly Weather Review* 53(10): 427-430. One reference. Produced 13 types or combinations from 4 temperature, 2 precipitation, and 2 wind variables. Similarity to Herbertson's classes possible.

364. Howe, George M., Lawrence J. Reed, John T. Ball, George E. Fisher and Gordon B. Lassow. 1968. *Classification of World Desert Areas*. Natick, Mass.: U.S. Army, Natick Laboratories, Technical Report 69-38-ES, Series ES-44, 104 pp. 192 references. Use "rain day" classes of aridity, producing 4 climates and 6 subtypes.

365. Huculak, W. 1973. "Some more on the thermic continentality of Poland's climate," [Polish]. *Przeglad Geograficzny* 45: 1.

366. Humboldt, Alexander von. 1817. "Des lignes isothermes et de la distribution de la chaleur sur le globe," [On the isothermic lines and the distribution of heat over the earth]. *Mémoires de Phys. et de Chimie de la soc. d' Arceuil* 3: 462-602.

367. Humboldt, Alexander von. 1827. *Über die Hauptursachen der Temperaturverschiedenheit auf dem Erdkörper*. [About the chief cause of temperature differences on the earth]. Berlin. Global.

368. Ivanov, Nikolay Nikolayevich. 1959. "Posaya kontinental'nosti zemnogo shara," [Zones (Belts) of continentality of the earth]. *Izvestiya Vsesoyuznogo Geograficheskogo Obshchestva* [Bulletin of the All-Union Geographical Society (Leningrad)], (91) No. 5: 410-423. Also translated as "The earth's continentality belts" and "Zones of continentality on the globe."

369. Jackson, S.P. 1951. "Climates of southern Africa," *South African Geographical Journal* 33: 1-21. Uses precipitation, temperature and humidity.

370. Janicot, Serge. 1992. "Spatiotemporal variability of West African rainfall. Part I: regionalizations and typings," *Journal of Climate* 5(5): 489-497. 28 references. "Type classifications" of rainfall. [Note: "Part II: Associated surface and airmass characteristics" appeared in the same issue, pp. 499-511. It had 29 references.]

371. Janowiak, J.E., C.F. Ropelewski and M.S. Halpert. 1986. "The precipitation anomaly classification: a method for monitoring regional precipitation deficiency and excess on a global scale," *Journal of Climate and Applied Meteorology* 25: 565-574.

372. Jefferson, Mark. 1916. "Aridity and humidity maps of the United States," *Geographical Review* 1: 203-208. 3 references. Arid and humid zones.

373. Jefferson, Mark. 1938. "Standard seasons," *Annals, Association of American Geographers* 28(1): 1-12. One reference. United States. Temperature criteria associated with seasons, which could be used for classifications.

374. Jeffree, Edward P. 1960. "A climatic pattern between latitudes 40° and 70° N. and its probable influence on biological distributions," *Proceedings of the Linnean Society, London* 171(1): 89-121. 55 references. Global. Used vegetation to describe simple and different climate zones, with January and July temperatures, latitude and winter precipitation.

375. Kals, W.S. 1990. *Stars and Planets: the Sierra Club Guide to Sky Watching and Direction Finding*. San Francisco: Sierra Club Books, 244 pp. An astronomy book, but on pp. 111-114 the classification of Ptolemy is used: torrid, temperate and frigid zones. In 1990!

376. Kal'yanov, K.S. 1972. "A wind erosion regionalization of the USSR and an analysis of wind regime by regions," [Russian] *Vestnik Moskovskogo, Universiteta, geografiya* [New Geographical Bimonthly of Moscow University], No. 4: 61-68.

377. Karapiperis, L.N. 1954. "Über eine Klassifizierung der Etesien auf Grund der herrschenden isobarischen Zustände," [On the classification of the Etesians on the basis of the governing isobaric conditions] *Meteorologische Rundschau* 7: 6-9.

378. Kawamura, Takeshi. 1964. "Regional division of Hokkaido in regard to monthly total precipitation ratio to normals," *Tokyo Journal of Climatology* 1(2): 7-8. [Originally published in Japanese in *Journal of Meteorological Research (Japan)* 14(1962): 725-729.] Regions in Hokkaido due to "variability of monthly precipitation."

379. Kaygorodov, A.I. [also spelled Kaigorodov]. 1955. *Yestestvennaya zonal'naya klassifikatsiya klimatov zemnogo shara* [A natural zonal classification of the climates of the earth (world climates)]. Moscow: Akademiia Nauk, SSSR, [Academy of Sciences], 119 pp. [At head of title page: Institut Geografii [and] Institut Sotsialisticheskogo Sel'skogo Khoziaistva]. Global. Own classification, analogous to Köppen's.

380. Keller, R. 1947. "Die Temperaturjahreszeiten Europas," [The seasonal temperatures of Europe]. *Erdkunde* 1: 190-200. 12 references. A classification based on "temperature seasons".

381. Kendall, Henry Madison. 1935. "Notes on climatic boundaries in the eastern United States," *Geographical Review* 25(1): 117-124. References.

382. Kendeigh, S.C. 1932. "A study of Merriam's temperature laws," *Wilson Bulletin* 44: 129-143.

383. Kenworthy, Joan M. 1966. "Temperature conditions in the tropical highland climates of east Africa," *East Africa Geographical Review* 4: 1-11. 19 references. Temperature divisions of the area.

384. Kenworthy, Joan M. 1968. "Classification of tropical highland climates," pp. 5-10 in *Proceedings of the Symposium on Tropical Climates and their Classification*. Held in the India Meteorological Dept., Poona, Nov. 26-29, 1968. Calcutta: National Committee for Geography, 1972. 35 references. Temperature and precipitation. Local rates of change of temperature with altitude, and importance of diurnal characteristics. Vegetation basis is also important.

385. Kerner, F. von. 1905. "Thermoisodromen. Versuch einer Kartographischen Darstellung des Jährlichen Ganges der Lufttemperatur," [Thermoisodromes. An attempt at a cartographic representation of the annual range of air temperature]. *Abhandlungen. Geographische Gesellschaft (Vienna)* 6(3). [May be vol. 4, according to another reference. Publication also listed as *Kaiserlich-Königliche Geographische Gesellschaft in Wien. Mitteilungen*.]

386. Kondrat'yev, Kirill Ya., G.I. Mosolova and O.V. Tezikova. 1985. "The relationship between the latitudinal temperature gradient and moisture in the USSR and Europe," [Russian] *Vestnik Leningradskogo Universiteta (Geologiya-Geografiya)* [Leningrad University vestnik. Geology-Geography], no. 28.

387. Larkin, Thomas J. and George W. Bomar. 1983. *Climatic Atlas of Texas*. Austin, TX: Texas Dept. of Water Resources [LP-192], 151 pp. On page 2 is a map with 6 climatic regions in Texas. It appears to be based on temperature and precipitation.

388. Lauer, Wilhelm. 1959. "Klimatische und Pflanzengeographische Grundzüge Zentralamerikas," [Climatic and plant geographic features characteristic of Central America]. *Erdkunde* 13: 344-354. Precipitation and temperature.

389. Lauer, Wilhelm. 1960b. "Probleme der Vegetationsgliederung auf der Mittelamerikanischen Landbrücke," [Problems of vegetation classification on the Central American land bridge]. *Verhandlungen des Deutschen Geographentages* 32: 123-132. Precipitation and temperature.

390. Lauer, Wilhelm and Eckart Stiehl. 1973. "Hygrothermische Klimatypen in Raum Puebla-Tlaxcala (Mexico)," [Hygrothermic types of climate in the Puebla-Tlaxcala region (Mexico)]. *Erdkunde* 27(3): 230-234. 11 references. Mexico. Hygrothermic classification of climate: humid period (duration), mean annual precipitation, vertical belts of temperature, and number of freeze and thaw days. Also, vegetation associated with climate.

391. Lee, Douglas H.K. 1957. *Tropical Climates and Economic Development in the Tropics*. New York: Harper's. See especially pp. 11-27. This shows the origin of V.P. Subrahmanyam and K. Sivaramakrishnaiah's classification using temperature and humidity for the warmest and coolest months.

392. Leroux, M. 1983. *Le Climat de l'Afrique Tropicale* [Climates of tropical Africa]. Paris: Champion-Slatkine, 2 v. [V. 2 is an atlas.] Map of climates of West Africa based on "6 ranges of humidity, 7 of temperature, and 7 of rainfall" (p. 123 in Hayward). This results in three coastal zones.

393. Lesko, R. 1971. "The thermal continentalism of Poland's climate," [Polish]. *Czasopismo Geograficzne* [Geographical Journal] 42:3. Continentality.

394. Livathinos, A.N. 1931. "Zur Klassifikation der Klimate," [To the classification of climate]. *Gerlands Beiträge zur Geophysik* 32 (Köppen-Band I): 95-99. 3 references. Northern and eastern hemisphere (ca. 20° E). Very complex mix of temperature, precipitation, cloud and relative humidity characteristics. From weather map code.

395. Livingston, Burton Edward. 1913. "Climatic areas of the U.S. as related to plant growth," *Proceedings, American Philosophical Society* 52: 257-275. United States. His own method of isoline divisions from maps of two "isoclimatic lines". He used (a) temperature and precipitation, (b) temperature and evaporation, and (c) temperature and lines representing precipitation minus evaporation indices.

396. Livingston, Burton Edward and Grace Johnson Livingston. 1913. "Temperature coefficients in plant geography and climatology," *Botanical Gazette* 56(5): 349-375. [Another source gives v. 61.] 28 references. United States. Compares temperature sums and temperature efficiency sums. Based on application of modified Van't Hoff law (rise in thermal efficiency occurs per 18° C rise in temperature).

397. Lu, C. 1965. "A study on the wet and dry periods and regionalization of China according to aridity," [Chinese]. *Acta Geographica Sinica* 31: 15-24.

398. McCune, Shannon Boyd-Bailey. 1941. "Climatic regions of Korea and their economy," *Geographical Review* 31: 95-99. 10 climatic regions based on winter temperatures, similar to Köppen.

399. McCune, Shannon Boyd-Bailey. 1945a. *Climatic Regions: Central West Korea*. [Chicago]: s.n., 30 pp. Drawn from a portion of [the author's] thesis, *The Climatic Regions of Korea*. [This and the following five brochures were taken from the author's thesis and put out by Korean Research Associates.]

400. McCune, Shannon Boyd-Bailey. 1945b. *Climatic Regions: Delineation*. [Chicago]: Korean Research Associates, 19 pp.

401. McCune, Shannon Boyd-Bailey. 1945c. *Climatic Regions: South Eastern Littoral* [Korea]. [Chicago]: Korean Research Associates, 24 pp.

402. McCune, Shannon Boyd-Bailey. 1945d. *Climatic Regions: South Korea*. [Chicago]: Korean Research Associates, 23 pp.

403. McCune, Shannon Boyd-Bailey. 1945e. *Climatic Regions: Southern Littoral* [Korea]. [Chicago]: Korean Research Associates, 16 pp.

404. McCune, Shannon Boyd-Bailey. 1945f. *Climatic Regions: Southern West Korea*. [Chicago]: Korean Research Associates, 21 pp.

405. McDougall, Eric. 1925. "The moisture belts of North America," *Ecology* 6(4): 325-332. 9 references. The effects of temperature and evaporation on vegetation.

406. McGee, O.S. 1977. "The determination of rainfall seasons in South Africa using Markham's technique," *Die Suid-Afrikaanse Geograaf/The South Arfican Geographer* 5(5): 390-396. 11 references. Five seasonal rainfall zones in South Africa.

407. McGee, O.S. and Cheryl A. Williamson. 1978. "The progress of rainfall seasons in South Africa," *Die Suid-Afrikaanse Geograaf/The South Arfican Geographer* 6(1): 53-56. 3 references. Four seasonal rainfall zones in South Africa.

408. Martins, Charles. 1847. "Régions Climatoriales de la France," [Climatic regions of France] pp. 215-280 in *Patria: La France Ancienne et Moderne*. Paris: J.-J. Dubochet, Lechevalier et Cie. Divided France into 5 climatic regions, based on temperature.

409. Martonne, Emmanuel de. 1909. *Traité de Géographie Physique* [Treatise on Physical Geography]. Paris, 910 pp. See especially pp. 206-225. [Third ed., in 1920, 922 p.; 4th ed., 1925, 469 p.; 7th ed., in 1948 (Paris: Librarie Armand Colin)]. Used temperature and precipitation.

410. Maxwell, J.B. 1981. "Climatic regions of the Canadian Arctic Islands," *Arctic* 34(3): 225-240. Many references. Canada. Five regions based on elements (temperature, precipitation, etc.) and meteorological phenomena: IFR (Instrument Flight Rules) conditions, temperature inversion frequency, etc.

411. Meher-Homji, V.M. 1968b. "Bioclimates of the Indian subcontinent," p. 81 (summary only) in *Proceedings of the Symposium on Tropical Climates and Their Classification*. 1972. Held in the India Meteorological Department, Poona, Nov. 26-29, 1968. Calcutta: National Committee for Geography. 1972. Seasonal aspects of precipitation are important as well as temperature of coldest month.

412. Meher-Homji, V.M. 1974a. "The climate of Cuddalore: a bioclimatic analysis," *Geographical Review of India* 36(1): 1-22. 9 references. Inida. Own classification, precipitation important.

413. Meher-Homji, V.M. 1974b. "Variability and the concept of a probable climatic year in bioclimatology with reference to the Indian sub-continent," *Archiv für Meteorologie, Geophysik und Bioklimatologie, Series B* 22: 149-167. 14 references. Inida. Four "bioclimatic factors": number of rainy days, number of dry months, precipitation, precipitation regime.

414. Merriam, C.H. 1894. "Laws of temperature control of the geographic distribution of terrestrial animals and plants," *National Geographic Magazine* 6: 229-238.

415. Merriam, C.H. 1899. "Zone temperatures," *Science* (N.S.) 9: 116.

416. Milewski, A.V. 1979. "A climatic basis for the study of convergence of vegetation structure in mediterranean Australia and southern Africa," *Journal of Biogeography* 6: 293-299. 31 references. Climatic zones based on winter season precipitation, average annual temperature, for UNESCO-FAO (1963) regions (see).

417. Miller, A. Austin. 1952. "The importance of 43°F (6°C) in the classification of temperate climates and in the definition of major geographical regions," *Proceedings, International Geographical Union, 8th General Assembly*, Washington, pp. 276-280. [Also listed as *Proceedings, International Geographical Congress*, 17th, Washington, D.C., Aug. 8-15, 1952, pp. 32-36]. Number of months greater than 6° C.

418. Moreau, R.E. 1938. "Climatic classification from the standpoint of East African biology," *Journal of Ecology* 26(2): 467-496. 118 references (an excellent collection). Review of various classifications. Köppen and three others. He used precipitation and evaporation, precipitation and temperature, and months with a "defined climatic ratio" of dry months per year.

419. Mühry, Adolph. 1858. "Klimatologische Untersuchungen oder Grundzüge der Klimatologie," [Climatological investigations or characteristic features of climatology]. Pp. 135-159 (Chapter 6) in *Das Klima von Deutschland*. Leipzig; Heidelberg: C.F. Winter'sche Verlagsbuchhandlung. Germany. Four climatic regions, using a summer and a winter isotherm.

420. Mühry, Adolph. 1860b. "Die Geographische Vertheilung des Regens auf der Erde," [The geographic distribution of rainfall over the earth]. *Petermann's Geographische Mitteilungen* 6: 1-9. No references. Global. Rainfall correlation regions as belts. Five in the torrid zone, two in each temperate zone, one in each frigid zone.

421. Mühry, Adolph. 1862. *Klimatographische Uebersicht der Erde* [Climatographic review (survey) of the earth]. Leipzig; Heidelberg: C.F. Winter'sche Verlagsbuchhandlung, pp. 741-744, especially. Seasonal precipitation map. Leighly believed this and his 1865 map were the first maps of climate regions.

422. Mühry, Adolph. 1865. *Supplement zur Klimatologischen Übersicht der Erde* [Supplement to the climatoglogical survey of the earth]. Leipzig; Heidelberg: C.F. Winter'sche Verlagsbuchhandlung.

423. Neumann, L. 1909. "Allgemeines und Mitteleuropa," [General information and central Europe]. In v. 1 of A. Scobel, ed. *Geographisches Handbuch; Allgemeine Erdkunde, Länderkunde, und Wirtschaftsgeographie*. Leipzig: Bielefield. Temperature and precipitation.

424. Nimer, Edmon. 1979. *Climatologia do Brasil* [Climatology of Brazil]. Rio de Janeiro: Supren, 421 pp. Classification of Brazil based on precipitation and number of dry months.

425. Nuttonson, M.Y. 1958. *The Physical Environment and Agriculture of Australia with Special Reference to its Winter Rainfall Regions and to Climatic and Latitudinal Areas Analogous to Israel*. Washington, D.C.: American Institute of Crop Ecology.

426. Okolowicz, Wincenty. 1968. "Climatic classification and regionalization," *Geographia Polonica* 14: 119-131. No references. Poland and India. Temperature, precipitation and sun.

427. Olivier, Jana. 1984. *Delimitation and analysis of homogeneous rainfall regions in the south-eastern Transvaal*. Thesis (M.Sc.)--Rand Afrikaans University, Johannesburg.

428. Otorepec, S. 1983. "Termicka Klasifikacija klime Jugoslavijé," [Thermal classification of the climate in Yugoslavia]. *Archiv. za Poljoprivredne Nauke* 44(155): 361-370.

429. Paffen, Karlheinz. 1966. "Die Täglichen Temperaturschwankungen als Geographisches Klimacharacteristikum," [Daily variations of temperature as characteristic of the geography of climates]. *Erdkunde* 20: 252-265. 42 references. Coastal climate types.

430. Paffen, Karlheinz. 1967. "Das Verhältnis der Tages -- zur Jahreszeitlichen Temperaturschwankung," [The relationship of diurnal to annual temperature variations]. *Erdkunde* 21(2): 94-111. 21 references. Global. Map of climates based on diurnal/annual temperature variations.

431. Pakštas, K. 1926. *Le Climat de la Lituanie* [The climate of Lithuania]. Klaipeda: Ministère de l'Agriculture. Temperature and precipitation.

432. Papadakis, Juan. 1961a. *Climatic Tables for the World*. Buenos Aires: J. Papadakis, 175 pp. No references. Global."Ten great groups" based on temperature and moisture, and their subdivisions.

433. Papadakis, Juan. 1961b. *Crop Ecology in West Africa*. FAO, UN Pub. MR/16439/1, v. 2. Climatic regions of Nigeria, based on temperature and precipitation.

434. Parkins, A.E. 1926. "The temperature region map," *Annals, Association of American Geographers* 16(3): 151-165. One reference. Global. Nine temperature regions of the world. Parkins favored more classification maps for teaching.

435. Philipson, Alfred. 1920, 1933. *Grundzüge der Allgemeinen Geographie*, v. 1 (1920), v. 2 (1933). [Characteristic features of general geography]. Leipzig. Temperature zones (gürtel) after Creutzberg. According to Hidore and Oliver, there were 5 zones with 21 climatic types. They also state he used temperature and precipitation.

436. Qion, J. and L. Lin. 1965. "A preliminary study on the wet and dry climatic regionalization of China," [Chinese]. *Acta Geographica Sinica* 31: 1-14.

437. Ravenstein, E.G. 1900. "The geographic distribution of relative humidity," *Report, British Association for the Advancement of Science*, pp. 817-818.

438. Reinhartová, J. 1960. "Climatic regions on the globe with regard to the absolute humidity of the air," *Meteorologické Zprávy* 13(3-4): 74-76. Global. Extreme temperature and absolute humidity.

439. Rey, J. 1955. *Carte Pluviométrique du Liban avec aperçu sur les Facteurs du Climat* [Precipitation map of Lebanon with an overview of climatic factors]. Combier, de Martonne mentioned.

440. Rice, Peter Bruce. 1988. *Interdiurnal temperature variability over the conterminous United States and Canada*. Thesis (M.S.)--Texas A&M University, 59 leaves. References. Climatic classification of North America.

441. Ringleb, F. 1947. "Die Thermische Kontinentalität im Klima West- und Nordwestdeutschlands," [Thermic continentality in the climate of West- and North West Germany]. *Meteorologische Rundschau* 1: 87-95.

442. Ringleb, F. 1948. "Die Hygrische Kontinentalität im Klima West- und Nordwestdeutschlands," [Hygric continentality in the climate of West- and North West Germany]. *Meteorologische Rundschau* 1: 276-282.

443. Rosenan, N. 1957. "Special problems in arid zone climatology," *WMO CC I-II/S.P. 1.* Washington, D.C., January 1957, 8 pp. No references. Global and arid zones. Four climates: humid tropics, arid zone, temperate zone, cold zone.

444. Russell, J.S. 1982. "Selection of homoclimates based on comparisons with single stations and using monthly rainfall and temperature data," *Agricultural Meteorology* 26: 179-194.

445. Russell, R.J. 1926. "Climates of California," *University of California, Publications in Geography* 2(4): 73-84. 11 references.

446. Russell, R.J. 1931. "Dry climates of the United States. I. Climatic map," *University of California, Publications in Geography* 5(1): 1-41. 12 references. Desert California.

447. Russell, R.J. 1932. "Dry climates of the United States. II. Frequency of dry and desert years, 1901-1920," *University of California, Publications in Geography* 5(5): 245-274. 4 references. Russell classifies stations annually, and whether they are humid, steppe or desert.

448. Sabbagh, Michael E. and Reid A. Bryson. 1962. "Aspects of the precipitation climatology of Canada investigated by the method of harmonic analysis," *Annals, Association of American Geographers* 52: 426-440. 34 references. Precipitation regimes and transition zones. Also reprinted on pp. 250-265 in Brian J.L. Berry and Duane F. Marble, eds. *Spatial Analysis, A Reader in Statistical Geography*. Englewood Cliffs, NJ: Prentice-Hall, 1968.

449. Sachi Devi, Suryadevara. 1987. *Thermal Continentality of India: A Climatic Study*. New Delhi: Inter-Indian Publics., 128 p.

450. Sanders, Ellen Mary. 1920. "Climatic zones of Japan and Formosa," *Monthly Weather Review* 48: 404-408. 9 references. Temperature, precipitation, and number of storms.

451. Sands, R.D. 1959. *A Study in the Regional Climatology of Mexico With Precipitation as the Correlative Factor*. Thesis (Ph. D.)--Clark University, Worcester, Mass., 134 p.

452. Sasakura, K. 1950. "Climatic provinces of Japan based on the annual change of relative cloudiness," [Japanese]. *Bulletin. Faculty of Education, Shizuoka University* 1: 106-112.

453. Schmidt, F.H. and J.H.A. Ferguson. 1951. "Rainfall types based on wet and dry period ratios for Indonesia," *Verhandelingen. Djawatan Meteorol. dan Geofis, Djakarta*, 42: 77 pp. Developed Q system, based on dry and wet months. Q = (1.5a)/(12-1.5a) where a=0 to 8 in Indonesia (it varies with the region). Eight regions exist for Indonesia.

454. Schmidt, R.D. 1950. "Klimabereiche in Mitteleuropa," [Climate regions in central Europe]. *Geographisches Taschenbuch* (ed. Meynen): 160-161. [Published in Stuttgart.] Temperature and altitude.

455. Schmuck, A. 1957. "The thermal regions of the Wroclaw Administrative County," *Czasopismo Geograficzne* [Geographical journal] 28: 273-285. Silesia. Temperature limit and duration.

456. Schultz, A. 1937. "Russisch-Turkistan," [Russian Turkestan], pp. 211-244 in F. Klute, ed. *Handbuch der Geographischen Wissenschaft*. Potsdam: Wildpark. A temperature and precipitation classification of Turkestan.

457. Schultz, A. 1950. "Der Erdteil Asien," [The Asian continent]. In W. Evers, ed. *Kleine Länderkunden, Unser Wissen von der Erde*. Stuttgart. Asia. Temperature, precipitation, wind and vegetation.

458. Sekiguti, Takeshi. 1949b. "Distribution of rainy days in Japan and new climatic divisions depending upon them," *Geographical Review of Japan* 21: 361-367.

459. Sekiguti, Takeshi. 1952. "Some problems of climate classification: a new classification of climates of Japan," *International Geographical Congress, 17th, Washington, Aug. 8-15, 1952. Proceedings*: pp. 41-46. [Also listed as being in *International Geophysical Union, 17th Congress, Washington. Proceedings 8th General Assembly*: pp. 285-290. One reference. Japan. 27 climatic districts; temperature and precipitation characteristics.

460. Sekiguti, Takeshi. 1964. "Secular change patterns of Japanese rainfall," *Geographical Review of Japan* 37: 217-225.

461. Sekiguti, Takeshi. 1965a. "Snow-winter and frost-winter climates in Japan," *Japan Progress in Climatology* 2(Nov. 1965): 15-17. [Originally published in *Geographical Review of Japan* 26(1953): 110-121.] No references. Classification of snow and frost regions of Japan.

462. Sekiguti, Takeshi. 1986a. "Wind systems of the world," pp. 32-44 in K. Takahashi, ed. *World-Wide Weather*. Rotterdam: A.A. Balkema, 252 pp. No references. Sekiguti has a map of "climatic zones of the world based on the wind system." 13 regions.

463. Shitara, Hiroshi. 1970. "On winter-days and ice-days in Japan," *Japanese Progress in Climatology* 7(Nov. 1970): 85-99. 5 references. Japan. Classification based on ice and winter days. Three regions with 2 or 3 subtypes each. [Reprinted from *Science Reports of the Tohoku University, Seventh Series (Geography)*, No. 19(1969): 1-15.]

464. Skaggs, Richard H. 1969. "Analysis and regionalization of the diurnal distribution of tornadoes in the United States," *Monthly Weather Review* 97(2): 103-115. 21 references. United States. Regions of diurnal tornado distribution patterns.

465. Supan, Alexander Georg. 1879. "Die Temperaturzonen der Erde," [The temperature zones of the earth]. *Petermann's Geographische Mitteilungen* 25(9): 349-358. 2 references. Global.

466. Supan, Alexander Georg. 1887. "Die Mittlere Dauer der Haupt-Wärmeperioden in Europe," [The average duration of the main warm periods in Europe]. *Petermann's Geographische Mitteilungen* 33: 165-172. Lines of equal duration of frost (0° C), warm (10° C) and hot (20° C) periods.

467. Suzuki, S. 1948. "Climatic provinces of Japan from the viewpoint of humidity distribution," [Japanese]. *Tenki to Kiko* 14: 312-313.

468. Taylor, Griffith. 1920b. *Australian Meteorology: a Text-Book Including Sections on Aviation and Climatology*. Oxford: Clarendon Press, 312 pp. References. Maps of "economic rainfall regions," and of rainfalls effects on crops. In addition, climographs showing climate types based on the intersection of lines of relative humidity and wet bulb temperatures.

469. Thorbecke, F. 1910. "Das ozeanisch-subtropische Klima und die Gebiete der Etesian und Winterregen," [The oceanic-subtropical climate and the territories of the Etesians and the winter rains]. *Geographische Zeitschrift* 16: 261-272 and 318-327.

470. Troll, Carl. [Sometimes Karl]. 1930. "Die Tropischen Andenländer (Bolivien, Peru, Ecuador, Columbien und Venezuela)," [The tropical lands of the Andes (Bolivia, Peru, Ecuador, Colombia and Venezuela)], pp. 309-461 (v. 1) in Fritz Klute, ed. *Handbuch der geographischen Wissenschaften*. Potsdam: Akademische Verlagsgesellschaft, 12 v. Precipitation, fogs and rainy season.

471. Troll, Carl. 1943. "Thermische Klimatypen der Erde," [Thermic climate types of the earth]. *Petermann's Geographische Mitteilungen* 89(3/4): 81-89. 38 references.

472. Trube, L.L. 1969. "A system of characterizing winter and summer in terms of temperature," [Russian]. *Geografiya v Shkole*, No. 6: 29-?

473. Ukert, Friedrich August. 1816. *Geographie der Griechen und Römer von den frühesten zeiten bis auf Ptolemäus*, v. 1, pt. 2. [Geography of Greece and Rome from the earliest times up to Ptolemy]. Weimar: Geographisches Institut, 6 v. Page 187 is on Ptolemy's climates.

474. Van Royen, W. 1927b. "Outline of the article on The climate regions of North America," *Monthly Weather Review* 55: 410-412.

475. Visher, Stephen S. 1942. "Regionalization of the United States on a precipitation basis," *Annals, Association of American Geographers* 32: 355-370.

476. Visher, Stephen S. 1945. "Climatic maps of geologic interest," *Bulletin. Geological Society of America* 56: 713-736. 16 references. United States. Different regionalizations based on climatic elements.

477. Wace, Nigel. 1990. "World thermal climates and the concepts of seasonality and continentality in climate classification," *Erdkunde* 44(4): 237-259.

478. Wahlenberg, Georg. 1813. *De Vegetatione et climate in Helvetia Septentrionali Inter Flumina Rhenum et Arolam* [On the vegetation and climate in northern Switzerland between the Rhine and Aare rivers]. Zurich. Wahlenberg concluded that plant distribution was related to temperature. Possibly a basis for Köppen's work.

479. Ward, Robert DeCourcy. 1914. "A note on the classification of climates," *Bulletin of the American Geographical Society* 46: 108-116. Primarily a review of Herbertson's classification.

480. Winkler, Julie A. 1985. "Regionalization of the diurnal distribution of summertime heavy precipitation," *Preprints, Sixth Conference of Hydrometeorology, American Meteorological Society*, pp. 9-16. Boston: AMS.

481. Woeikoff, A. 1887. *Die Klimate der Erde* [The climate of the Earth]. Jena. Part I, p. 327, combines Greek classification and winds.

482. World Bank. 1985. *Desertification in the Sahelian and Sudanian Zones of West Africa*. World Bank, 60 pp. Map of climatic zones, based on precipitation. See Barrow, 1991.

483. Yoshino, Masatoshi M. 1969a. "Climatic division of Kantô District, Japan," *Japanese Progress in Climatology* 6(Nov. 1969): 87-90. No references. Temperature, precipitation and wind, and subsets of conditions (13 subsets). Subsets of numbers of days with drizzle and air flow patterns for January and August. [Reprinted from *Annals. Tohoku Geographical Association* 19(1967): 165-171.]

484. Yoshino, Masatoshi M. 1969b. "Climatic division of Chugoku and Shikoku Districts, Japan," *Japanese Progress in Climatology* 6(Nov. 1969): 91-92. Temperature and precipitation. Up to 35 subareas. Same as 1969a, though no mention of wind. [Reprinted from *Geographical Sciences* No. 10 (1968): 1-8.]

485. Yoshino, Masatoshi M. 1980. "The climatic regions of Japan," *Erdkunde* 34(2): 81-87. 40 references. Japan. Temperature and precipitation, but also some extremes (of means) used.

486. Yoshino, Masatoshi M. and Masaru Chiba. 1984. "Regional division of China by precipitation and its annual variation type," [Japanese with English abstract]. *Geographical Review of Japan, Ser. A*, 57(8): 583-590.

487. Zhakov, S.I. 1975. "Precipitation belts of the world," [Russian]. *Geografiya v Shkole*, No. 5: 23-27.

488. Zubenok, L.I., N.A. Yefimova and V.V. Mukhenberg. 1958. "Materials for the climatic regionalization of the USSR," *Trudy Glavnoi Geofizicheskoi Observatorii*, No. 76. Leningrad, Gidrometeoizdat. [Also published as *Transactions of the A.I. Voeikov Main Geophysical Observatory, No. 76* by the American Meteorological Society, Boston, in November 1961, pp. 151-171. Translated as "Data applicable to the division of the Soviet Union into climatic regions." 16 references. USSR. Temperature and aridity.

489. Zuylen, G.F.A. van. 1959. "De Ruimtelijke Verdeling. van het Macroclimaat," [The spatial distribution of the macroclimate]. *Tijdschrift der Koninklijk Nederlansche Aardrijkskundig Genootschap* 76: 352-362. Global. Partly genetic (temperature, pressure and wind), and partly "effective."

Chapter Three, part A

Chapter three contains works on derived indices. Part A deals with the classifications of C.W. Thornthwaite. Studies comparing Thornthwaite with Köppen are in chapter 7, part A.

490. Antezana, Pardo O. 1958. "Climas de Bolivia, según el sistema de Thornthwaite," [Climates of Bolivia, according to Thornthwaite's system]. *Revista. Facultad de Agronomia. Universidad Nacional de La Plata* 34: 161-191.

491. Arléry, R. 1953. "Quelques Remarques á propos de l'application des conceptions de C.W. Thornthwaite á une classification des climats de la France," [Some remarks about the application of C.W. Thornthwaite's concepts to a classification of the climates of France]. *Mémoires et Travaux de la Sociéte Hydrotechnique de France*. V. II: 123-126. France. Thornthwaite. [Also in *La Houille Blanche* 8(B): 713-716.]

492. Arléry, R., M. Garnier and R. Langlois. 1954. "Application des méthodes de Thornthwaite á l'esquisse d'une description agronomique des climats de la France," [Application of the Thornthwaite method to an outline of an agronomic description of the climates of France]. *La Météorologie*, ser. 4, no. 36 [35?]: 345-367. 16 references. France. Thornthwaite.

493. Ayoade, J.O. 1972. "A re-examination of Thornthwaite's moisture index and climatic classification," *Quarterly Meteorological Magazine* 2: 190-194.

494. Basile, R.M. and S.W. Corbin. 1969. "A graphical method for determining Thornthwaite's climate classifications," *Annals, Association of American Geographers* 59: 561-572. 12 references. Used graphs and nomograms.

495. Beadle, N.C.W. 1952. "The misuse of climate as an indicator of vegetation and soils," *Ecology* 32(2): 343-345. 4 references. Beadle is critical of Blumenstock and Thornthwaite. Using their classifications, one will err in mapping the vegetation of New South Wales. He is against the use of climate to indicate vegetation and soils. Says only field observation is valid.

496. Beenhouwer, O. 1953. "Palynology and the Thornthwaite climatic classification," *Ecology* 34(4): 803-804. 3 references. Relates tree species to climatic types. Prefers a simple system to Thornthwaite.

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Chapter Three, part B

Chapter three contains works on derived indices. Part B deals with other indices, such as wind chill, aridity, etc.

589. Ahmad, M.S. 1958. *Précipiation, évapotranspiration et aridité en Pakistan Occidental: essai d'interprétation geographique*. [Precipitation, evapotranspiration, and aridity in West Pakistan: an essay of geographic interpretation] Univ. Rennes, Faculté des Lettres & Sciences Humaines, Laboratoire de Climatologie, Tavaux. 91 pp. Prefers Penman's method to that of Thornthwaite to measure aridity.

590. Alfimov, A.V. 1988. "The use of some climatic indices in microclimatic studies (the example of the upper Kolyma basin)," *Geografiya i Prirodnyye Resursy* [Geographical and Natural Resources], no. 3.

591. American Geographical Society of New York. 1948. "Moisture regions in the United States; Average annual thermal efficiency; Seasonal variation of effective moisture; Summer concentration of thermal efficiency," *Geographical Review* 38(1): 4 maps.

592. Ångström, Anders. 1936. "A coefficient of humidity of general applicability," *Geografiska Annaler* 18: 245-254. 5 references. North West Europe and Greenland. Moisture index.

593. Anyadike, Raymond N.C. 1987a. "The Linacre evaporation formula tested and compared to others in various climates over West Africa," *Agricultural and Forest Meteorology* 39: 111-119.

594. Aubreville, A. 1949. *Climats, Forêts et Désertification de L'Afrique Tropicale* [Climates, forests and desertification of tropical Africa]. Paris: Societe D'Editions Geographiques, Maritimes, et Coloniales, 351 pp. 59 references. Africa. All classification systems are reviewed here, but Aubreville presents a bioclimatic classification. He uses temperature, precipitation, evaporation, cloudiness and de Martonne's index of aridity.

595. Bagnouls, F. and Henri Gaussen. 1953. "Saison seche et régime xerothermique," [Dry season and xerothermic regime]. *Documents pour les Cartes des Production Vegetates, Sér. Généralités*. Toulouse. Vol. 3, Part 1: 193-239. [Also seen: art. 8, p.47.]

596. Bailey, Harry P. 1958. "A simple moisture index based upon a primary law of evaporation," *Geografiska Annaler* 40(3-4): 196-215. 16 references. Classification based on moisture.

597. Bailey, Harry P. 1960. "A method of determining the warmth and temperateness of climate," *Geografiska Annaler* 42: 1-16. 17 references. Evaluation of different methods and indices.

598. Bailey, Harry P. 1964. "Toward a unified concept of the temperate climate," *Geographical Review* 54: 516-545. 38 references. Global and U.S. An index of temperateness computed from average annual temperature, range of temperature and standard deviation of temperature.

599. Bailey, Harry P. 1979. "Semi-arid climates: their definition and distribution," pp. 73-97 in A.E. Hall, G.H. Cannel and H.W. Lawton, eds. *Agriculture in Semi-Arid Environments*. Berlin; New York: Springer-Verlag, 340 pp. 38 references. Bailey compared his method with Thornthwaite's for dry climates. Map of dry climates of the world.

600. Belyayev, A.V. 1977. "The complex relationships within the water balance of the principal geographical zones of the earth," [Russian] *Izvestiya Akademii Nauk, SSSR, Seriya Geograficheskaya*, No. 1: 38-50. Global.

601. Belyayev, A.V. 1978. "A technique for compiling maps of water-balance elements on the basis of zonal relationships," [Russian] *Izvestiya Akademii Nauk, SSSR, Seriya Geograficheskaya*, No. 4: 105-117.

602. Belyayev, A.V. 1980. "A comparative assessment of water-budget maps constructed by different techniques," [Russian] *Izvestiya Akademii Nauk, SSSR, Seriya Geograficheskaya*, no. 3: 103-(110).

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609. Brusberg, Mark D., Thomas L. Puterbaugh and George J. Huffman. 1987. "The use of Penman's potential evaporation formula in classifying North American Sukhovei events," pp. 166-167 in *18th Conference, Agricultural and Forest Meteorology, and 8th Conference, Biometeorology and Aerobiology*. Boston: American Meteorological Society. 6 references. Sukhovei classification.

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615. Carton, P. 1935. "Nouvelle Classification des Climates. Application à l'Indochine," [A new climate classification applied to Indochina]. *Communication à la Commission Internationale de Méteorologie Agricole à l'occassion de sa reúnion de 1935*. Hanoi.

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Chapter Three, part C

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Chapter Three, part D

Chapter three contains works on derived indices. Part D deals with human comfort zones, comfort indices and recreational classifications.

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1169. Auliciems, Andris and Jetse D. Kalma. 1979. "A climatic classification of human thermal stress in Australia," *Journal of Applied Meteorology* 18(5): 616-626. 43 references. Australia. Human energy balance and thermal stress.

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1195. De Freitas, Christopher R. 1985. "Assessment of human bioclimate based on thermal response," *International Journal of Biometeorology* 29(2): 97-119. 64 references. Australia. Index of heat effect on people, useful for recreational studies.

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1197. Demina, D.M., I.S. Kandror and Ye. M. Ratner. 1972. "The thermal state of man as the basis for a physiological evaluation of local climate and for a sanitary climatic regionalization," [Russian] *Voprosy Geografii*, No. 89: 64-72.

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1230. *Meteorológica del Perú*. 2(2): 11-34. Human effects: stimulating, depressing, comfort climates, racial climates, psychological climates. [Year unknown].

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1232. Mieczkowski, Z. 1985. "The tourism climate index: a method of evaluating world climates for tourism," *The Canadian Geographer* 29(3): 220-233. 52 references. Global. Tourism classification, based on weather variables of temperature, relative humidity, sunshine, wind, precipitation.

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1234. Nikiforov, L.G. and G.A. Toropov. 1977. "Climatic zonality of shoreline types of the world ocean," [Russian] *Vestnik Moskovskogo, Universiteta, geografiya* [New Geographical Bimonthly of Moscow University], No. 3: 43-50. May pertain to recreational (beach) classifications.

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1239. Primault, B. 1980. "Le Degré de Stimulation: un Indice de Classification pour les Stations de Cures Climatiques," [The degree of stimulation: an index of classification for climatic spa stations]. *Archiv für Meteorologie, Geophysik und Bioklimatologie, Series B* 28(3): 207-216. 10 references. Health climates.

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1245. Terjung, Werner H. 1966b. "Physiological climates of the conterminous United States; a bioclimatological classification based on man," *Annals, Association of American Geographers* 56(1): 141-179. 72 references. United States. Man and temperature, wind chill, and solar radiation.

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1247. Terjung, Werner H. 1967a. "Annual physioclimatic stresses and regimes in the United States," *Geographical Review* 57(2): 225-240. 9 references. United States. Annual physiological climate stress regimes and cumulated stress. [Also published in 1973, pp. 119-128 (chapter 11) in Geoffrey R. McBoyle, ed. *Climate in Review*. Boston: Houghton Mifflin. See.]

1248. Terjung, Werner H. 1967b. "The geographical application of some selected physioclimatic indices to Africa," *International Journal of Biometeorology* 11(1): 5-19. 31 references. Africa. Analysis of 4 classifications (indices): effective temperature, relative stress, 4-hour sweat rate, and still air temperature.

1249. Terjung, Werner H. 1967c. "Physiological climates of California," *Yearbook, Association of Pacific Coast Geographers* 28: 55-73. 5 references. Classification of the physiological climates of California.

1250. Terjung, Werner H. 1968a. "Bi-monthly physiological climates and annual stresses and regimes of Africa," *Geografiska Annaler*, Series A, 50: 173-192. 28 references. Africa. Monthly physiological climates and annual cumulative stress, as well as an annual "physio-climatic" regime.

1251. Terjung, Werner H. 1968b. "Some thoughts on recreation geography in Alaska from a physioclimatic viewpoint," *The California Geographer* 9: 27-39.

1252. Terjung, Werner H. 1968c. "World patterns of the distribution of the monthly comfort index," *International Journal of Biometeorology* 12(2): 119-151. 18 references. Global. Comfort index as a factor in classification, by month.

1253. Thom, E.C. 1959. "The discomfort index," *Weatherwise* 12(2): 57-60. One reference. United States. Summer discomfort index, based on cooling degree days. Maps of discomfort index values for the U.S.

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1256. Zamyshlyayeva, I.A. and S.V. Reshetnikov. 1988. "An experiment in the classification of recreational environments in Hungary," [Russian]. *Vestnik Moskovskogo, Universiteta, geografiya* [New Geographical Bimonthly of Moscow University], No. 6: 69-73.

1257. Zaninović, K. 1986. "The assessment of thermal comfort and bioclimate in various regions," *XIX Conference on Alpine Meteorology, Sept. 1-5, 1986, Tagungsbericht*, pp. 372-376.

1258. Zaninović, K. 1992. "Limits of warm and cold bioclimatic stress in different climatic regions," *Theoretical and Applied Climatology* 45(1): 65-70. 22 references. Yugoslavia. Based on temperature, wind speed and humidity.

Chapter Three, part E

Chapter three contains works on derived indices. Part E contains those classifications that contain indices, but do not fit the other four divisions.

1259. *Agricultural Meteorology*. 1972. "Proceedings of the WMO Seminar on Agricultural Meteorology, with special reference to tropical areas of Regions III and IV. (Barbados, November 1970)." Geneva: WMO, 357 pp. Many references after individual articles.

1260. Anapol'skaya, L. Ye. 1964. [Mentioned by Kolyago. Possibly in *Trudy Glavn. geofiz. observ. im. A.I. Voyekova*, No. 161. (See Kolyago, 1970: "A climatic regionalization of western Siberia and Kazakhstan for the construction industry." (p. 39).]

1261. Burkhanov, V.F. 1966. *Teknika dlya Severa* [Machines for the North]. Moscow. USSR. Cross-country transport and climatic regions.

1262. Burkhanov, V.F. 1970. "Criteria for determining an engineering-geographic boundary of the north of the USSR," *Soviet Geography: Review & Translation* 11(1): 24-37. No references, although mention is made of the following: a study by L.L. Breyfus (1928) using the July isotherm of +10° C as the southern boundary of the "North"; and a study by B.P. Alisov, L.S. Berg and N.N. Zubov which defined "Arctic" as having ice and snow all year on sea and land (at sea level). This intriguing paper is a climate-machine classification of the northern regions of the USSR. The author develops an index of "climatic harshness" which relates to machinery. Factors include blizzards, light, plus geomorphic factors, and economic factors. Map of the USSR with 4 regions and 9 sectors. [Originally published in *Vestnik Moskovskogo Universiteta, geografiya*, No. 5 (1967): 82-90.]

1263. Geiger, Rudolf. 1969. "Topoclimates," pp. 105-138 in H. Flohn, ed. *General Climatology 2*. Amsterdam: Elsevier, 266 pp. (*World Survey of Climatology*; v. 2). 64 references.

1264. Geslin, H. 1947. *La caractérisation des climats locaux* [Characterization of local climates]. Compte Rendu du Congrès de Pédologie, 9-20 (5), 84 p.

1265. Howe, G. Melvyn. 1960. "Homoclimes within the British Commonwealth," *Indian Journal of Meteorology and Geophysics* 11: 223.

1266. Kolyago, V.A. 1970. "A classification and regionalization of the harsh, cold climate of Siberia and the Far East in relation to problems of cold resistance of machines," *Soviet Geography: Review & Translation* 11(1): 38-47. 22 references. Four subtypes of harshness: (1) number of days with mean daily temperature less than -15° C, (2) number of days with mean daily temperature less than -30° C, (3) mean absolute annual temperature minimum, and (4) mean January temperature. A climate-machine classification, where cold harshness is related to the cold resistance of structural steel. [Reprint from *Doklady Instituta Geografii Sibiri i Dal'nego Vostoka* [Reports of the Institute of Geography of Siberia and the Far East], No. 19(1968): 28-36.

1267. Krishnan, A. and K.A. Shankaranarayan. 1964. "Climatic classification of the arid zone of Rajasthan," pp. 380-387 in *Proceedings, Symposium of the Problems of Arid Zones of India*. Jodhpur: Central Arid Zone Research Institute.

1268. Livathinos, A.N. 1936. "Sur l'amplitude annuelle de la température et sur le degré thermique de continentalisme des regions de la Gréce," [French, with Greek summary. On the annual range of temperature and on the thermic degree of continentality of regions of Greece] *Praktika de l'Académie d'Athènes*, 11: 340-350. Continentality of Macedonia.

1269. Maunder, W.J. 1974. "National econoclimatic models," chapter 13 (pp. 237-257) in James Allan Taylor, ed. *Climatic Resources and Economic Activity: A Symposium* (see). New York: Wiley; Newton Abbot [England]: David & Charles, 264 p.

1270. Naveh, Z. and J. Dan. 1973. "The human degradation of Mediterranean landscapes in Israel," pp. 373-390 in Francesco di Castro and Harold A. Mooney, eds. *Mediterranean Type Ecosystems: Origin and Structure*. New York: Springer-Verlag, 405 pp. 48 references.

1271. Paszynski, Janusz. 1963. "A climatological classification of a small area," *Idöjárás* 67(5): 268-273. Microclimatic classification.

1272. Paszynski, Janusz. 1983. "Les Méthodes d'Éstablissement des Cartes Topoclimatiques," [Methods of establishing topoclimatic maps]. *Geographia Polonica* 45: 35-45. 41 references.

1273. Romer, Eugeniusz. 1949. "Regiony klimaticzne Polski," [Polish climatic regions]. *Prace Wroclawskiego Towarzystwa Naukowego. Seria B*, No. 16, 26 pp. Poland. Romer is critical of Köppen and de Martonne, and proposes a system based on climatic gradients and isogradients. Ten regions and 60 areas are produced.

1274. Taylor, Griffith. 1920a. "Agricultural climatology of Australia," *Quarterly Journal of the Royal Meteorological Society* 46(196): 331-355. 7 references. Maps of "economic rainfall regions" based on amount and reliability.

1275. Thrower, Norman J.W. and D.E. Bradbury. 1973. "The physiography of the Mediterranean lands with special emphasis on California and Chile," pp. 37-52 in Francesco di Castro and Harold A. Mooney, eds. *Mediterranean Type Ecosystems: Origin and Structure*. New York: Springer-Verlag, 405 pp. 23 references.

1276. Troll, Carl. 1963. "Seasonal climates of the earth," pp. 19-28 in H.E. Landsberg, H. Lippmann, Kh. Paffen and C. Troll *World Maps of Climatology*, 1st ed. Berlin: Springer-Verlag, 28 pp. This is a bilingual English-German volume, called *Weltkarten zur Klimakunde* in German. Also on the title page is "Edited under the sponsorship of the Heidelberger Akademie der Wissenschaften, by E. Rodenwaldt and H.J. Jusatz. [There also are 2nd and 3rd eds., which were published in New York, also by Springer-Verlag.] Includes colored maps. See the following citation for a later, German, edition. Troll and Paffen classification map.

1277. Troll, Carl. 1964. "Karte der Jahreszeiten-Klimate der Erde," [Map of the seasonal climates of the earth], *Erdkunde* 18: 5-28. 46 references. Global. Thermoisopleth diagrams and Troll-Paffen map.

1278. Union of Soviet Socialist Republics. 1967. *Rukovodyashchiye teknicheskiye materialy. Oborudovaniye elektrotekhnicheskoye, postavlyayemoye v rayony s kholodnym klimatom. Obshchiye teknicheskiye usloviye (OTUEL-Khl)* [Technical instructions for electrical equipment operating in regions with a cold climate...]. Moscow: All-Union Scientific Research Institute of Electrical Engineering. Kolyago article contains a map with a cold-climate zone.

Chapter Four, part A

Chapter four deals with genetic classifications. Part A contains air mass, genetic and synoptic classifications.

1279. Alijani, Bohloul and Jay R. Harman. 1985. "Synoptic climatology of precipitation in Iran," *Annals, Association of American Geographers* 73(3): 404-416. 20 references. Iran. Six climatic regions of Iran, based on similar uplift mechanisms, which are, in turn, based on mean annual precipitation days.

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Chapter Four, part D

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1506. Weedfall, Robert O. 1970. *Applications of Air-Mass Classifications to West Virginia Climatology*. ESSA Technical Memorandum EDSTM 13, 23 pp. 15 references. West Virginia and eastern United States. Classifications of Landsberg, Strahler, and Bryson.

1507. Weedfall, Robert O. and B. Linsky. 1969. "A mesoclimatological classification system for air pollution engineers," *Journal of the Air Pollution Control Association* 19: 511-513.

1508. Wos, Alojzy. 1980. "An outline of a method of distinguishing the climatic seasons," *Geographia Polonica* 43: 49-59. 7 references. Poland. The seasonal structure of climate.

1509. Yaegashi, S. 1951. "A meteorological classification of season," [Japanese. English summary] *Iwate Meteorological Association. The Review* Nov. 1951: 27-29.

Chapter Five, part A

Chapter five deals with statistically driven classifications. Part A contains citations using cluster analysis, factor analysis and principal components analysis.

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1511. Anyadike, Raymond N.C. 1987b. "A multivariate classification and regionalization of West African climates," *Journal of Climatology* 7(2): 157-164. 19 references. West Africa. Cluster analysis: 4 factors, 10 regions.

1512. Atwoki, Kagenda. 1975. "A factor analytic approach for the delimitation of the rainfall regions in Uganda," *East African Geographical Review* No. 13: 9-36.

1513. Austin, M.P. and G.A. Yapp. 1978. "Definitions of rainfall regions of south-eastern Australia by numerical classification methods," *Archiv für Meteorologie, Geophysik und Bioklimatologie, Series B* 26: 121-142. 46 references. Australia. Rainfall regions. Authors used an agglomerative classification and a modified principal components analysis.

1514. Casetti, E. 1964. *Classificatory and Regional Analysis By Discriminant Iterations*. Thesis (Ph. D.)--Northwestern University, 95 leaves. Many references. Author took 70 weather stations in North America and put them in 8 (modified Köppen) groups. Using discriminant analysis (principal components analysis), two dimensions were created which explained 100% of the variance. Also published by Northwestern University, Dept. of Geography, Technical Report 12, ONR Task 389-135, Office of Naval Research, Geography Branch. Contract 1228(26).

1515. Denton, Shirley R. and Burton V. Barnes. 1988. "An ecological climatic classification of Michigan: a quantitative approach," *Forest Science* 34(1): 119-138. 66 references. Michigan. Authors use discriminant analysis and cluster analysis (principal components analysis) to determine 3 regions with 20 districts. Weather variables used are "winter variables," growing season temperature variables, and growing season water balance variables, those "variables important to tree growth and survival." Thornthwaite classification.

1516. Dyer, T.G.J. 1975. "The assignment of rainfall stations into homogeneous groups, an application of principal component analysis," *Quarterly Journal of the Royal Meteorological Society* 101: 1005-1013. 12 references. Use of principal component analysis with precipitation regions of South Africa.

1517. Ehrendorfer, Martin. 1987. "A regionalization of Austria's precipitation climate using principal component analysis," *Journal of Climatology* 7(1): 71-89. 54 references.

1518. Fovell, Robert G. and Mei-Ying C. Fovell. 1993. "Climatic zones of the conterminous United States defined using cluster analysis." *Journal of Climate* 6(11): 2103-2135. 30 references. Cluster analysis of temperature and precipitation data. Applied Köppen classification to clustering data.

1519. Gadgil, Sulochana and R.N. Iyengar. 1980. "Cluster analysis of rainfall stations of the Indian peninsula," *Quarterly Journal of the Royal Meteorological Society* 106: 873-886.

1520. Gadgil, Sulochana and N.V. Joshi. 1980. "Use of principal component analysis in rational classification of climates," pp. 17-26 in *ICRISAT* (see #49).

1521. Gadgil, Sulochana and N.V. Joshi. 1983. "Climatic clusters of the Indian region," *Journal of Climatology* 3(1): 47-64. 24 references. India. Principal component analysis using precipitation, moisture index (precipitation/potential evapotranspiration), and minimum temperature.

1522. Gadgil, Sulochana, Yadumani and N.V. Joshi. 1993. "Coherent rainfall zones of the Indian region," *International Journal of Climatology* 13(5): 547-566. 28 references. India. Used principal component analysis and cluster analysis.

1523. Goosens, Ch. 1985. "Principal component analysis of Mediterranean rainfall," *Journal of Climatology* 5(4): 378-388. 27 references. Mediterranean region. Cluster analysis and principal components analysis of precipitation.

1524. Goosens, Ch. 1986. "Regionalization of the Mediterranean climate," *Theoretical and Applied Climatology* 37(1-2): 74-83. 17 references. Mediterranean region. Cluster analysis and principal components analysis.

1525. Gregory, Stanley. 1975. "On the delimitation of regional patterns of recent climatic fluctuations," *Weather* 30(9): 276-287. 9 references. England. Annual rainfall flux regions, using principal components analysis.

1526. Gregory, Stanley. 1989. "Macro-regional definition and characteristics of Indian summer monsoon rainfall, 1871-1985," *International Journal of Climatology* 9(5): 465-483. 21 references. India. Principal components analysis and classification.

1527. Hannes, Gerald P. and Susan M. Hannes. 1984. "A cluster analysis of Southern California desert climate data," *California Geographer* 24: 39-46. 6 references. Nine variables (6 temperature and 3 precipitation) and 26 stations produced 4 sub-regions.

1528. Hoffmann, Ludwig. 1980. *Möglichkeiten einer Klimaklassifikation mit Hilfe der Zweimaligen Anwendung der Faktorenanalyse* [The feasibility of a climate classification with the help of a repeated application of factor analysis]. (Berichte des Deutschen Wetterdienstes, Nr. 152.) Offenbach am Main: Im Selbstverlag des Deutschen Wetterdienstes, 92 pp. 110 references. Germany. Factor analysis. Used wind, temperature, vapor pressure, and precipitation to determine three spatial components of German climate.

1529. Iakovleva, N.I. and K.A. Gurleva. 1969. "Objective division into regions by expansion in terms of empirical function," [Russian]. *Trudy Glavnoi Geofizicheskoi Observatorii* (Leningrad) 236: 155-164.

1530. Johnston, R.J. 1981. "Regarding the delimitation of regions according to climatic fluctuations," *Archiv für Meteorologie, Geophysik und Bioklimatologie, Series B* 29: 215-228. 20 references. Great Britain. Principal components analysis of rainfall regions.

1531. Jones, H.E. and R.G.H. Bunce. 1985. "A preliminary classification of the climate of Europe from temperature and precipitation records," *Journal of Environmental Management* 20(1): 17-29. 18 references. Used principal components analysis, multivariate statistics to put 1204 European locations into 11 classes.

1532. Jones, P.D. and P.M. Kelly. 1982. "Principal component analysis of the Lamb Catalogue of daily weather types: Part I, annual frequencies," *Journal of Climatology* 2: 147-157.

1533. Kalkstein, Laurence S., Guanri Tan and Jon A. Skindlov. 1987. "An evaluation of three clustering procedures for use in synoptic climatological classification," *Journal of Climate and Applied Meteorology* 26(6): 717-730. 30 references. Cluster analysis.

1534. Kemper, Franz-Josef and Wolfgang Schmiedecken. 1977. "Factoren-analysen zum Klima Mitteleuropas," [Factor analyses of the climate of central Europe]. *Erdkunde* 31(4): 255-272. 25 references. Thermic and hydric continentality of central Europe.

1535. Key, J. and R.G. Crane. 1986. "A comparison of synoptic classification schemes based on 'objective' procedures," *Journal of Climatology* 6: 375-388. 20 references. Arctic. Principal components analysis/cluster analysis classification of air masses.

1536. Kojima, C. 1973. "Detailed climatic classification of Tohoku district by principal component analysis," [Japanese]. *Journal of Agricultural Meteorology* (Tokyo) 29: 165-172. Used temperature, precipitation, snow cover and humidity.

1537. Legates, David R. and Cort J. Willmott. 1983. "A comparative evaluation of principal components-based and information theory methods of precipitation regionalization," *Archiv für Meteorologie, Geophysik und Bioklimatologie, Series B* 32: 381-394. 32 references. Different statistical methods of precipitation regionalization, compared for California.

1538. McBoyle, Geoffrey R. 1971. "Climatic classification of Australia by computer," *Australian Geographical Studies* 9: 1-14. 6 references. Generic, not genetic classification. Used factor analysis and produced 28 regions. [Also published as chapter 10 (pp. 110-118) in G.R. McBoyle, ed. *Climate in Review*. Boston: Houghton-Mifflin, 1973.

1539. McBoyle, Geoffrey R. 1972. "Factor analytic approach to a climatic classification of Europe," *Climatological Bulletin* 12: 1-11. 5 references. Used precipitation and temperature. Climatic elements only. Boundaries dependent on location of most rapid change of climate (steepest gradient).

1540. McBoyle, Geoffrey R. and Dieter Steiner. 1972. "A factor-analytic approach to the 'problem of continentality'," *Geografiska Annaler* 54A: 12-27.

1541. McCutchan, Morris H. 1980. "Use of cluster analysis and discriminant analysis to classify synoptic weather types in Southern California," pp. 310-315 in *Eighth Conference on Weather Forecasting and Analysis*, American Meteorological Society.

1542. McCutchan, Morris H. and Mark J. Schroeder. 1973. "Classification of meteorological patterns in Southern California by discriminant analysis," *Journal of Applied Meteorology* 12: 571-577. 9 references. Five classes of days from May to September.

1543. McDonald, N.S. 1975. "Eigenvector analysis as an aid to airmass recognition," *Archiv für Meteorologie, Geophysik und Bioklimatologie, Series A* 24: 229-244.

1544. Micklin, Philip P. and David G. Dickason. 1981. "The climatic structure of the Soviet Union: a factor analysis approach," *Soviet Geography: Review and Translation* 22(4): 226-239. 15 references. USSR. Factor analysis and 4 factors: aridity-humidity, maritimicity-continentality, atmospheric pellucidity-turbidity, and thermality, which together explain 85% of climatic variation.

1545. Miller, W.S. and A.N. Auclair. 1974. "Factor analytic models of bioclimate for Canadian forest regions," *Canadian Journal of Forest Research* 4(4): 536-548. 28 references. Canada. Although not really a climatic classification, the methods and references are useful.

1546. Morin, G., J.P. Fortin, W. Sochanska, J.P. Lardeau and R. Charbonneau. 1979. "Use of principal component analysis to identify homogeneous precipitation stations for optimal interpolation," *Water Resources Research* 15: 1841-?

1547. Newnham, R.M. 1968. "A classification of climate by principal component analysis and its relationship to tree species distribution," *Forest Science* 14: 254-264. 11 references.

1548. Nicholson, J. and D.G. Bryant. 1972. *Climatic Zones of Insular Newfoundland: a Principal Component Analysis*. Environ. Canada, Canadian Forest Service, Publ. No. 1299, 13 pp.

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1550. Ogallo, L.J. 1989. "The spatial and temporal patterns of the East-African seasonal rainfall derived from principal component analysis," *International Journal of Climatology* 9(2): 145-167. 45 references.

1551. Olaniran, Olajire J. 1986. "On the classification of tropical climates for the study of regional climatology: Nigeria as a case study," *Geografiska Annaler, Ser. A. Physical Geography* 68A(4): 233-244. 14 references. Factor analysis of 24 climate variables, resulting in 3 factors: "airmass residential time, the wind regime, and precipitation characteristics." These 3 factors explained 92% of the variation. For broader work, the author preferred regions with 7 and 14 zones.

1552. Oliver, John E., A.H. Siddiqi and S.N. Goward. 1978. "Spatial patterns of climate and irrigation in Pakistan: a multivariate statistical approach," *Archiv für Meteorologie, Geophysik und Bioklimatologie, Series B* 25: 345-357. 9 references. Cluster analysis and factor analysis using thermal and precipitation variables.

1553. Patterson, J.G., N.A. Goodchild and W.J.R. Boyd. 1978. "Classifying environments for sampling purposes using a principal component analysis of climatic data," *Agricultural Meteorology* 19(4): 349-362. 18 references. Australia. Principal components analysis of soil moisture storage, "vernalization function," growth function, radiation and growing season.

1554. Perry, A.H. 1970. "Filtering climatic anomaly fields using principal component analysis," *Transactions. Institute of British Geographers* 50: 55-72.

1555. Powell, J.M. and D.C. MacIver. 1975a. "Climatic classifications of the Prairie Provinces: a new preliminary classification for the forested area of Alberta," pp. 99-111 in B.M. Barr, ed. *Western Canada Research in Geography: The Lethbridge Papers*. [British Columbia]: B.C. Geogr. Series No. 21, Occassional Papers in Geography, Canadian Association of Geographers, Western Division. 53 references. Canada. Factor analysis used and discussed, to test differences of groups.

1556. Powell, J.M. and D.C. MacIver. 1975b. "A factor analytic climatic classification of the forested areas of the Prairie Provinces," *Proc. 12th Agricultural Meteorology Conference*, Tucson, AZ, April 14-16, 1975. Boston: American Meteorological Society, 10 pp. Canada.

1557. Powell, J.M. and D.C. MacIver. 1977. *A Summer Climate Classification For the Forested Area of the Prairie Provinces Using Factor Analysis*. Infor. Rept. NOR-X-177. Edmonton: Northern Forest Research Centre, Canadian Forestry Service, Fisheries and Environment Canada, 51 pp.

1558. Reddy, S.J. and S.M. Virmani. 1982. "Grouping of climates of India and West Africa using principal component analysis," *ICRISAT FSRP, Agroclimatology Annual Report 1980-1981 (Progress Report 5)*. Patancheru, India: ICRISAT, pp. 21-25.

1559. Rhodes, R.C. 1980. *Application of Cluster Analysis to Aerometric Data*, 1: [Part 1: "Clustering, validation and classification of data"; Part 2: "Investigation and report of cluster analysis."] 2: [M.E. Graves, "Modifications and options applied to Wolfe's NORMIX 360 cluster analysis program".] 3: ["Separation of environmental data into clusters by the NORMIX program."] 4: ["Project summary," "Applications of cluster analysis to aerometric data."] Springfield, VA: National Technical Information Center (NTIS).

1560. Richman, Michael B. 1981. "Obliquely rotated principal components: an improved meteorological map typing technique?" *Journal of Applied Meteorology* 20: 1145-1159. 40 references. Eastern United States. Map typing.

1561. Richman, Michael B. and Peter J. Lamb. 1985. "Climatic pattern analysis of three-day and seven-day summer rainfall in the central United States: some methodological considerations and a regionalization," *Journal of Climate and Applied Meteorology* 24(12): 1325-1343. 75 references. Principal component analysis and eigenvector analysis of rainfall gives 6 regions.

1562. Ronberg, Baruch and Wei-Chyung Wang. 1987. "Climate pattens derived from Chinese proxy precipitation records: an evaluation of the station networks and statistical techniques," *Journal of Climatology* 7: 391-416. 57 references. Principal components analysis and cluster analysis. Map of climatic regions for China.

1563. Russell, J.S. 1978. "Classification of climate and the potential usefulness of pattern analysis techniques in agroclimatological research," Paper presented at the International Agroclimatology Workshop, 22-24 November 1978, ICRISAT, Hyderabad, India. Published in *Proceedings. Agroclimatological Research Needs of the Semi-Arid Tropics*, pp. 47-58.

1564. Walsh, J.E., Michael B. Richman and D.W. Allen. 1982. "Spatial coherence of monthly precipitation in the United States," *Monthly Weather Review* 110: 272-286. 37 references. United States. Precipitation regions produced by factor analysis.

1565. White, Dale A. 1988. *Climate Regionalization: a Comparison of Principal Component Analysis Rotation Schemes*. Thesis (Ph. D.)--Pennsyvania State University.

1566. White, Dale A., Michael B. Richman and Brent M. Yarnal. 1991. "Climate regionalization and rotation of principal components," *International Journal of Climatology* 11(1): 1-25. 45 references. Pennsylvania precipitation regions.

1567. White, E.J. 1981. "Classification of climate in Great Britain," *Journal of Environmental Management* 13(3): 241-260. 32 references. United Kingdom. Cluster analysis.

1568. White, E.J. and A.H. Perry. 1989. "Classification of the climate of England and Wales based on agroclimatic data," *International Journal of Climatology* 9(3): 271-291. 33 references. Principal components analysis, cluster analysis and agroclimate.

1569. Williams, G.D.V. and Joan M. Masterton. 1983. "An application of principal component analysis and an agroclimatic resource index to ecological land classification for Alberta," *Climatological Bulletin* 17(1): 3-28. 35 references. Alberta. Principal components analysis and potential evapotranspiration.

1570. Willmott, Cort J. 1977a. "A component analytic approach to precipitation regionalization in California," *Archiv für Meteorologie, Geophysik und Bioklimatologie, Series B* 24: 269-281. 13 references. California. P-mode principal components analysis and precipitation.

1571. Willmott, Cort J. 1977b. "Toward a new climatic regionalization of the contiguous United States," *Proc. of 2nd. National Solar Radiation Data Workshop*, Huntsville, Ala, Johnson Environmental and Energy Center, University of Alabama, pp. D1-D11.

1572. Willmott, Cort J. 1978. "P-Mode principal components analysis, grouping and precipitation regions in California," *Archiv für Meteorologie, Geophysik und Bioklimatologie, Series B* 26: 277-295. 19 references. California. Precipitation regions. Principal components analysis.

Chapter Five, part B

Chapter five deals with statistically driven classifications. Part B contains works using other multivariate analyses, analyses of variance and various techniques, such as fuzzy sets.

1573. Armand, D.L. 1950. "An attempt at a mathematical analysis of the relationship between vegetation types and climate," [Russian]. *Izvestiya Vsesoyuznogo Geograficheskogo Obshchestva* [Bulletin of the All-Union Geographical Society (Leningrad)], No. 1.

1574. Ayoade, J.O. 1977. "On the use of multivariate techniques in climatic classification and regionalization," *Archiv für Meteorologie, Geophysik und Bioklimatologie, Series B* 24: 257-267. 23 references. Nigeria. Uses sixteen weather variables to produce 4 components accounting for 87% of the variance.

1575. Babenkov, Ye. F. 1961. "A possible method of quantitative characterization of the continentality of climate," [Russian]. *Izvestiya Vsesoyuznogo Geograficheskogo Obshchestva* [Bulletin of the All-Union Geographical Society (Leningrad)], (Jan.-Feb.): 63-(65).

1576. Balling, Robert C., Jr. 1983. "Harmonic analysis of monthly insolation levels in the United States," *Solar Energy* 31(3): 293-298. 46 references. Insolation values for United States.

1577. Bogolepow, M. 1932. "Über die zahlenmässige bestimmung der kontinetalität des klimas in Sibirien," [On the numerical determination of the continentality of climate in Siberia]. *Meteorologische Zeitschrift* 49: 258-261. 6 references. Siberia.

1578. Bull, William B. 1991. *Geomorphic Responses to Climatic Change*. New York: Oxford University Press, 326 pp. Discusses Val Mitchell's (1976) paper (see) on regional climates, and introduces "a simple quantitative classification...." (p. 37).

1579. Christensen, Walter I. 1966. *An Investigation of the Potential of Component Analysis For Weather Classification*. Thesis (Ph. D.)--University of Wisconsin. Factor analysis.

1580. Christensen, Walter I. and Reid A. Bryson. 1966. "An investigation of the potential of component analysis for weather classification," *Monthly Weather Review* 94: 697-709. North central United States. Factor analysis with weather classifications.

1581. Crutcher, Harold Lee. 1955. *Discriminant Climatology*. "Proposal for a dissertation to fulfill in part the requirements for a Doctor of Philosophy degree at New York University." 15 leaves. An objective classification using R.A. Fisher's discriminant function.

1582. Crutcher, Harold Lee. 1960. *Statistical Grouping of Climates and the Statistical Discrimination Among Climatic Groups*. Thesis (Ph. D.)--New York University, 462 pp. References on p. 456.

1583. Davies, Arthur. 1950. "Climatic regions and climatic numbers," *Scottish Geographical Magazine* 66(1): 4-13. 5 references. Mnemonic classification of "climatic numbers."

1584. De Gaetano, Arthur T. and Mark D. Shulman. 1989. "The interpolation of gridded climatic data for use in climatic classification schemes," *National Weather Digest* 14(3): 28-34. 14 references. United States and Canada. Statistical method.

1585. Dyer, T.G.J. 1976. "On the components of time series; the removal of spatial dependence," *Quarterly Journal of the Royal Meteorological Society* 102: 157-165. 12 references. Precipitation regions (see Dyer, 1975) of South Africa.

1586. Eichenlaub, Val A., Norton D. Strommen and David G. Dickason. 1971. "Precipitation probabilities as indices of climatic variation over the eastern United States," *Professional Geographer* 23(4): 301-307. 7 references. Gamma probability function used "to make regional comparisons" (p. 306).

1587. Epperson, David L., Jerry M. Davis, Gerald F. Watson and John F. Monahan. 1989. "Bivariate normal classification of North American air masses using the NORMIX program," *International Journal of Climatology* 9(5): 527-545(?). 17 references. NORMIX cluster program; air mass classification.

1588. Fagbemi, O.J. and F.O. Okulaja. 1971. "Space correlation fields of rainfall and homoclimates of Nigeria," unpublished resarch paper, Dept. of Computer Sciences, Univ. of Lagos. Noted in Ojo, *The Climates of West Africa*. Used only rainfall with correlations, then combined the result with Thornthwaite and Papadakis.

1589. Gadgil, Sulochana, R. Gowri and Yadumani. 1988. "Coherent rainfall zones: case study for Karnataka," *Proceedings. Indian Academy of Sciences. Earth and Planetary Sciences* 97: 63-79.

1590. Glasspoole, J. 1925. "Relation between annual rainfall over Europe, Oxford, and Glenquoich," *British Rainfall* 65: 254-269. Correlation analysis; 2 British regions of precipitation.

1591. Goldreich, Yair and Adi Raveh. 1993. "COPLOT display technique as an aid to climatic classification," *Geographical Analysis* 25(4): 337. Climate of Israel classified with 14, then 6, variables. They used factor analysis and cluster analysis.

1592. Gorczynski, Wladyslaw. 1934a. "Decimal system of world's climates, with adaptation to Europe," *Compte Rendus de Séances de la Societé des Sciences et des Lettres de Varsovie* 27(class III): 1-12. [Preston E. James reviews this work in *Bulletin of the American Meteorological Society* 17 (1936): 366. It has also been referred to as having been published in *Comptes Rendus du Congrés Géographique Internationale*, Warsaw, 1934].

1593. Gorczynski, Wladyslaw. 1934b. "Sur la Classification des climats avec quelques remarques sur le Système de Köppen," [On the classification of climate, with a few remarks on Köppen's system]. *Compte Rendus du Congres International de Geographie, Varsovie* 2: 252-268. Decimal classification of Europe.

1594. Gorczynski, Wladyslaw. 1942. "Climatic types of California according to the decimal scheme of world climates," *Bulletin of the American Meteorological Society* 23(4): 161-165 and 272-279. No references.

1595. Gorczynski, Wladyslaw. 1945. *Comparison of Climate of the United States and Europe, With Special Attention to Poland and Her Baltic Coast*. New York: Polish Institute of Arts and Sciences in America Series, No. 7, 288 pp. Global. Decimal classification with 10 main types. [Several parts of this publication appeared earlier.]

1596. Gorczynski, Wladyslaw. 1948. "Decimal system of world climates," [Polish]. *Przeglad Meteorologiczny i Hydrologiczny* 1: 30-43.

1597. Gorczynski, Wladyslaw. 1951. "El mejor clima en America del Norte, con alusión especial sobre el de Mejico," [The best climate of North America, with special reference to Mexico]. *Revista Meteorológica* (Montivideo) 10(36,37): 84-88. Gorczynski's own classification, with 5 major groups and 10 types.

1598. Guiot, J. 1983. "Analyse multidimensionelle par la mise en oeuvre d'une climatographie spatio-temporelle," [Multidimensional analysis through the implementation of a spacio-temporal climatology]. *Contribution no. 38: Institut d'Astronomie et de Géophysique*. Université Catholique de Louvain-la-Neuve.

1599. Hess, W. 1981. "Die Programmierung der Klimakennzahlen nach Schreiber," [The programming of climatic code numbers according to Schreiber]. Unveröffentl. [Unpublished]. *Hausarbeit für die Erste Staatsprüfung, Sekundarstufe. II. Ruhr-Universität Bochum* [Homework for the first state exam, Secondary level. II. Ruhr University, Bochum].

1600. Horn, Lyle H. and Reid A. Bryson. 1960. "Harmonic analysis of the annual march of precipitation over the United States," *Annals, Association of American Geographers* 50(2): 157-171. 17 references. Statistical analysis of precipitation climatology.

1601. Jackson, I.J. 1972. "The spatial correlations of fluctuations in rainfall over Tanzania: a preliminary analysis," *Archiv für Meteorologie, Geophysik und Bioklimatologie, Series B* 20: 167-178. 9 references. Classification by correlation and similarity of rainfall.

1602. James, Preston E. 1936. "On climatic classifications," *Bulletin of the American Meteorological Society* 17(12): 366-367. Criticizes Gorczynski's decimal scheme.

1603. Johansson, Osc. V. 1929. "Die Eigenschaften und Typen der Jährlichen Temperaturperiode Besonders in Europa," [The natures and types of annual temperature periods, especially in Europe]. *Mitteilungen des Meteorologischen Institutes der Universität Helsingfors*, No. ?: 11. Gorczynski's continentality index and asymmetry and phase shift of temperature, for continents and oceans.

1604. Keen, Cecil S. and Peter D. Tyson. 1973. "Seasonality of South African rainfall: a note on its regional delimitation using spectral analysis," *Archiv für Meteorologie, Geophysik und Bioklimatologie, Series B* 21: 207-214. 12 references. Regional classification of rainfall regimes.

1605. Kuipers, W.J.A. 1970. "An experiment on numerical classification of scalar fields," *Idöjárás* 74: 296-306. 3 references.

1606. Kupriyanova, T.P. 1971. "The delimitation of statistically homogeneous physical-geographic regions through the use of computers," [Russian]. *Izvestiya Akademii Nauk, SSSR, Seriya Geograficheskaya*, No. 3: 90-(100).

1607. Litynski, Joseph K. 1980. *The Numerical Classification of the World's Climates*. [Geneva]: WMO, 44 pp. World Climate Programme, WCP-PMC-63. [Also published in 1984. Pierrefonds, Quebec: Editions Gamma, 46 p.]

1608. McBratney, A.B. and A.W. Moore. 1985. "Applications of fuzzy sets to climatic classification," *Agricultural and Forest Meteorology* 35: 165-185. 18 references. China, Australia. This may be the first application of fuzzy sets to climatic classification.

1609. Morris, R.A. and F.M. Rubaoa, Jr. 1985. "Classification of Philippine rainfall patterns," *IRRI* [International Rice Research Institute], Research paper Series, v. 109, 19 pp. Mathematical study of agroclimate.

1610. Muñoz Jimenez, Julio. 1980. "Ensayo de clasificacion sintetica de los climas de la España peninsular y Baleares," [Study of synthetic classification of climates of peninsular Spain and the Balearics]. *Estudios Geograficos* 41(160): 267-302. 24 references. Multivariate classification, using Euclidean distance algorithm.

1611. Nicholson, S.E. 1979. "Statistical typing of rainfall anomalies in Sub Saharan Africa," *Erdkunde* 33: 95-103.

1612. Niedringhaus, Thomas E. 1970. *A Climatography of Michigan*. Thesis (Ph. D.)--Michigan State University [1966?], 230 leaves. Climatic classification of Michigan.

1613. Olivier, Jana and P.A.J. van Rensburg. 1985. "Vector analysis as a means of indicating rainfall seasonality in the Transvaal," *Suid-Afrikaanse Geograaf/The South African Geographer* 13(2): 163-169. 14 references. South Africa. Regionalizing seasonality of rainfall. 8 regions in Transvaal.

1614. Prescott, J.A. 1943b. "The value of harmonic analysis in climatic studies," *Australian Journal of Science* 5: 117-119.

1615. Preston-Whyte, R.A. 1974. "Climatic classification of South Africa: a multivariate approach," *South African Geographical Journal* 56: 79-86.

1616. Russell, J.S. and A.W. Moore. 1970. "Detection of homoclimates by numerical analysis with reference to the Brigalow Region (eastern Australia)," *Agricultural Meteorology* 7: 455-479. 25 references.

1617. Russell, J.S. and A.W. Moore. 1976. "Classification of climate by pattern analysis with Australasian and southern African data as an example," *Agricultural Meteorology* 16(1): 45-70. 20 references. Australia. South Africa. Pattern analysis of "large numbers of attributes".

1618. Schelling, Herman von. 1952. *Remarks on the Climate in Alaska*. New London, CT: U.S. Medical Research Laboratory, Rept. No. 198, March 31, 1952, 12 pp. [On cover: v. XI, No. 15.] Alaskan, North American and global climatic regions. The author disregards data and uses mathematical derivations.

1619. Schumann, T.E.W. and W.L. Hofmeyr. 1938. "The partition of a region into rainfall districts: with special reference to South Africa," *Quarterly Journal of the Royal Meteorological Society* 64: 482-488. One reference. Based on seasonal distribution of precipitation, using phase and amplitude.

1620. Steiner, Dieter. 1965. "A multivariate statistical approach to climatic regionalization and classification," *Tijdschrift van het Koninklijk Nederlandsch Aardrijkskundig Genootschap*, 2nd Series, 82(1965): 329-347.

1621. Stellmacher, Rita. 1971. *Einige Methoden der statistischen Analyse, angewandt auf das Problem der Klimaklassifikation* [Some methods of statistical analysis, applied to the problem of climate classification]. Berlin: Akademie-Verlag, 40 pp. (Abhandlungen des Meteorologischen Dienstes der Deutschen Demokratischen Republik), Nr. 99 (Bd. 13): 5-39.

1622. Stone, Roger C. 1989. "Weather types at Brisbane, Queensland: an example of the use of principal components and cluster analysis," *International Journal of Climatology* 9(1): 3-32. 43 references. Australia. Principal components analysis with 27 weather variables and cluster analysis. A microclimatic study.

1623. Tan, Guanri. 1988. "Evaluation of clustering procedures in climatic classification," [Chinese. English summary.] *Acta Meteorologica Sinica* 46(2): 171-186.

1624. Taylor, Griffith. 1916. *Control of Settlement by Temperature*. Australian Commonwealth Bureau of Met. Bull. No. 14. According to Landsberg, Taylor, in this work, was the first to use climographs.

1625. Trefná, Emilie. 1950. "Decimální trídení svetovych podnebí," [Czech. Decimal classification of climates] *Meteorologické Zprávy* 4(5-6): 123-125. Gorczynski's climatic index applied to Czechoslovakia.

1626. Tyson, Peter D. 1971. "Spatial variation of rainfall spectra in South Africa," *Annals, Association of American Geographers* 61: 711-720.

1627. Van Groenewoud, H. 1984. "The climatic regions of New Brunswick: a multivariate analysis of meteorological data," *Canadian Journal of Forest Research* 14(3): 389-394. Canada.

1628. Van Husen, C. 1967. "Klimagliederung in Chile auf der Basis von Häufigskeitsverteilungen der Niederschlagssummen," [Climate classification in Chile on the basis of the frequency distribution of preciptiation sums]. *Albert-Ludwigs-Universität, Geographischen Institute, Freiburg*, 113 p.

1629. White, E.J. and D.R. Lindley. 1976. "The reduction of climatological data for ecological purposes: a preliminary analysis," *Journal of Environmental Management* 4: 161-182.

1630. Yarnal, Brent M. and Dale A. White. 1987. "Subjectivity in a computer-assisted synoptic climatology I: classification results," *Journal of Climatology* 7(2): 119-128. 21 references. United States. Objective methods are subjective.

1631. Yarnal, Brent M., Dale A. White and Daniel J. Leathers. 1988. "Subjectivity in a computer-assisted synoptic climatology II: relationships to surface climate," *Journal of Climatology* 8(3): 227-239. 14 references. Statistical aspects.

1632. Zhensheng, Yao. 1951. "Study of Chinese climate by harmonic analysis of annual temperature variation," *Journal of Geography* 18. Divided China into 3 main types and 5 subregions of climates, based on "harmonic analysis of annual temperature variation".

Chapter Five, part C

Chapter five deals with statistically driven classifications. Part C contains various mapping techniques, and works dealing with map-pattern classifications.

1633. Australian Institute of Agricultural Science. 1947. "Climatic mapping," *Journal. Australian Institute of Agricultural Science* 13: 138-140. No references. Prefer mapping elements to using indices.

1634. Blasing, T.J. 1975. "A comparison of map-pattern correlation and principal components eigenvector methods for analyzing climatic anomaly patterns," *Preprints of 4th Conf. on Probability and Statistics in Atmospheric Sciences*, Tallahassee, Fla., Nov. 18-21. Boston: American Meteorological Society.

1635. Blasing, T.J. 1979. "Map pattern classification at a prescribed level of generality," pp. 118-125 in *Sixth Conference on Probability and Statistics in Atmospheric Science*. Boston: American Meteorological Society.

1636. Borland, J. 1988. "Mapping flaws," *American Nurseryman* 168: 59-66. [Oct. 1, 1988].

1637. Hartranft, F.R., J.S. Restivo and R.C. Sabin. 1970. *Computerized Map Typing Procedures and Their Applications in the Development of Forecasting Aids*. Ent. Air Force Base, Colo.: Tech. Paper 70-72. HQ 14th Weather Wing, 57 pp.

1638. Janhofer, Günter. 1983. *Problemklima Südkalifornien: Klimakartierung der westlichen USA nach dem Verfahren von Schreiber* [The problematic climate of Southern California: climatic mapping of the western United States according to the method of Schreiber]. Paderborn, W.G.: Ferdinand Schöningh, 122 pp. [Has reference to *Bochumer Geographische Arbeiten* 43.]

1639. Kausyla, K. 1972. "An attempt at a microclimatic map classification," [Russian]. *Hidrometeorologiniai Straipaniai* (Vilnius) [v. 5 ?].

1640. Kostyukov, V.V. and S.M. Likhachev. 1987. "The mapping of climatic parameters with the help of the weighted mean method," [Russian]. *Geografiya i Prirodnyye Resursy* [Geographical and Natural Resources], No. 3.

1641. Lavin, Stephen, Jay Hobgood and Paul Kramer. 1986. "Dot-density shading: a technique for mapping continuous climatic data," *Journal of Climate and Applied Meteorology* 25(5): 679-690.

1642. Leighly, John B. 1926. "Graphic Studies in Climatology. I. Graphic Representation of a Classification of Climates," *University of California Publications in Geography* 2(3):55-71. 11 references.

1643. Leighly, John B. 1968. *Graphic Studies in Climatology: I-III*. Berkeley: University of California Press, 3 v. in 2. V. 1 is titled "Graphic representation of a classification of climates." These were originally published (see above) as *University of California Publications in Geography*, v.2, nos. 3 and 13 and v. 6, no.5. They have also been published by Johnson Reprint Co. (New York).

1644. Lund, Iver A. 1963. "Map-pattern classification by statistical methods," *Journal of Applied Meteorology* 2: 56-65. 5 references. Northeast United States. Pressure. Refered to in many classification articles.

1645. McKay, G.A. and M.K. Thomas. 1971. "Mapping of climatological elements," *The Canadian Cartographer* 8: 27-40.

1646. Markham, Charles G. 1970. "Seasonality of precipitation in the United States," *Annals, Association of American Geographers* 60(3): 593-597. No references. Map of seasonality of regional concentration of precipitation. Mean monthly rainfall totals treated as vector quantities. Seasonality index.

1647. Richman, Michael B. 1980. *Map Typing Patterns Associated With Potential Urban Enhanced Precipitation*. Thesis (M.S.)--University of Illinois.

1648. Sabin, R.C. 1974. *Computer Map Typing -- Optimizing the Correlation Coefficient Threshold*. [Colorado Springs, CO]: U.S. Air Force [Ent. Air Force Base?], Twelfth Weather Squadron, Technical Paper, 16 p.

1649. Steinhauser, F. 1956. "Grundsätzliche und kritische Bemerkungen zur Ausarbeitung von Klimakarten," [Fundamental and critical observations on the working out of climate maps]. *Geographischer Jahresbericht aus Österreich* 26: 1-24.

1650. Steinhauser, F. 1967. "Methods of evaluating and drawing climatic maps in mountainous countries," *Archiv für Meteorologie, Geophysik und Bioklimatologie, Series B*, 4, v. 15: 329-358.

1651. Williams, G.D.V., J.S. McKenzie and M.I. Sheppard. 1980. "Mesoscale agroclimatic resource mapping by computer, an example for the Peace River region of Canada," *Agricultural Meteorology* 21: 93-109.

Chapter Five, part D

Chapter five deals with statistically driven classifications. Part D contains references on ***complex climatology***.

1652. But'yeva, I.V., A.A. Gerburt-Geybovich and Yu. N. Shvareva. 1983. "The present status of complex climatology," *Izvestiya Vsesoyuznogo Geograficheskogo Obshchestva* [Bulletin of the All-Union Geographical Society (Leningrad)], No. 3: 241-(247).

1653. Chubukov, L.A. 1949. *Kompleksnaya klimatologiya* [Complex climatology]. Moscow: Akademiia Nauk, SSSR, 94 pp. References on pp. 81-84. Complex climatology was previously developed in studies by Fedorov (1921), Howe (1925), Switzer (1925) and Nichols (1925). There are 31 references to Fedorov.

1654. Chubukov, L.A. 1950. "Klimat," [Climate] chapter 3 (pp. 141-176) in A.A. Grigor'ev, ed. *Kazakhstan; obshchaia fiziko-geograficheskaia kharacteristika* [Kazakstan: general physical-geographical characteristics]. Moscow: Izdat. Akademii Nauk, SSSR. Uses complex climagrams.

1655. Chubukov, L.A., ed. 1963. *Voprosy kompleksnoy klimatologii* [Problems in complex climatology]. Moscow: Academy of Sciences, 207 p.

1656. Fedorov, E.E. 1932. *A Complex Method in Climatology and Its Application to Agriculture*. State of New Jersey: Department of Agriculture Circular No. 207 [see Lydolph, 1959].

1657. Fel'dman, IA.I. and L.A. Chubukov. 1953. "Klimat v pogodakh," [Climate in the weather]. *Priroda* No. 10: 42-48. Fedorov's "complex climatology."

1658. Klyukin, N.K. 1963. [See p. 191 in]: *Voprosy kompleksnoy klimatologii* [Problems in complex climatology]. Moscow.

1659. Lydolph, Paul E. 1959. "Fedorov's complex method in climatology," *Annals, Association of American Geographers* 49(2): 120-144. Many references, especially on "complex climatology." Weather typing (very complex) and climatic classification based on it.

Chapter Six

Chapter six deals with classifications containing references to climatic change, or to classifications at periods in the past.

1660. Balling, Robert C., Jr. 1980. "Classification and regionalization of climatic change," *Great Plains-Rocky Mountain Geographical Journal* 9: 1-8. Classification of climatic change types.

1661. Berg, H. 1940. "Die Kontinentalität Europas und ihre Änderung 1928/37 gegen 1888/97," [The continentality of Europe and its change, 1928-37 compared with 1888-97]. *Annalen der Hydrographie* 68: 124-132.

1662. Borisov, Anatoliy A. 1963. "On climatic boundaries and characteristics within the territory of the USSR in various geological periods," [Russian]. *Izvestiya Vsesoyuznogo Geograficheskogo Obshchestva* [Bulletin of the All-Union Geographical Society (Leningrad)], No. 5: 406-414.

1663. Borisov, Anatoliy A. 1969. "A paleoclimatic regionalization of the territory of the USSR," [Russian]. *Izvestiya Vsesoyuznogo Geograficheskogo Obshchestva* [Bulletin of the All-Union Geographical Society (Leningrad)], No. 5: 441-448.

1664. Borisov, Anatoliy A. 1975. *Klimaty SSSR v proshlom, nastoyashchem i budushchem* [Climates of the USSR in the past, present and future]. Leningrad. Reviewed [Russian] on p. 578 of *IVG Universiteta*, No. 6, by I.Ye. Buchinskiy.

1665. Brown, D.B. and J.R. Brown. 1972. *Climate Classification and the Effect of Climate Upon the Past, Present and Future of Cornwallis Island, N.W.T.* Toronto: University of Toronto, Institute of Environmental Sciences and Engineering, Publication No. EG-5. 15 pp. Canada.

1666. Büdel, Julius. 1949. "Die raumliche und zeitliche Gliederung des Eiszeitklimas," [The spatial and temporal classification of Ice Age climate]. *Die Naturwissenschaften* 4/5: 105-112 and 133-139.

1667. Curry, Leslie. 1962. "Climatic change as a random series," *Annals, Association of American Geographers* 52(1): 21-31. 23 references. Discusses vegetation boundary changes, therefore useful for climatic classification.

1668. Dachille, Frank. 1954. "Effect of type of climate in evolution," *Journal. Alabama Academy of Science* 26: 91. Astronomical: climatic classification and climate change.

1669. Huntington, Ellsworth. 1913. "The shifting of climatic zones as illustrated in Mexico," *Bulletin. American Geographical Society* 45: 1-12, 107-116.

1670. Kikuchi, Ritsu. 1969. "Secular change of winter precipitation in Tohoku District, Japan," [English]. *Japanese Progress in Climatology* 6(Nov.): 84-86. [Reprinted from *Annals of the Tohoku Geographical Association* 20(1968): 215-220.] Five types of "secular change patterns of winter precipitation." Classification of secular change.

1671. Kikuchi, Ritsu. 1970. "Fluctuation of winter precipitation in northern Honshu," [English]. *Japanese Progress in Climatology* 7(Nov.): 66-84. [Reprinted from *Science Reports of the Tohoku University, 7th Series (Geography)* 19(1970): 161-179. 8 references. Secular trends (patterns) mapped. As above, 5 types using winter precipitation.

1672. Klimenko, L.V. 1963. "On secular fluctuations of the continentality of the Moscow climate," [Russian]. *Izvestiya Vsesoyuznogo Geograficheskogo Obshchestva* [Bulletin of the All-Union Geographical Society (Leningrad)], No. 4: 367-368.

1673. Kosminskiy, Vladislav V. 1977. "Climates in the territory of the USSR at the time of maximum glaciation," [Russian]. *Izvestiya Vsesoyuznogo Geograficheskogo Obshchestva* [Bulletin of the All-Union Geographical Society (Leningrad)], No. 3: 259-264.

1674. Kosminskiy, Vladislav V. 1978. "The continentality of climate in the USSR during the Anthropogene," [Russian]. *Izvestiya Vsesoyuznogo Geograficheskogo Obshchestva* [Bulletin of the All-Union Geographical Society (Leningrad)], No. 6: 540-544.

1675. Krishnan, A. 1968c. "Delineation of different climatic zones in Rajasthan and their variability," *Indian Journal of Geography* 3: 33-40. India.

1676. Lauer, Wilhelm and Peter Frankenberg. 1979. "Der Jahresgang der Trockengrenze in Afrika," [The annual cycle of the desert boundary in Africa]. *Erdkunde* 33(4): 249-257.

1677. Lawson, Merlin P., Robert C. Balling, Jr., Albert J. Peters and Donald C. Rundquist. 1981. "Spatial analysis of secular temperature fluctuations," *Journal of Climatology* 1: 325-332. United States. A classification based on climatic change. Temperature, precipitation and principal components analysis (factor analysis).

1678. Markov, K.K. 1969. "Geographical regions and zones and their Quaternary development," pp. 3-5 in H.E. Wright, ed. *Quaternary Geology and Climate*. Washington, D.C.: National Academy of Sciences.

1679. Mikami, T. 1978. "Dynamical climatological studies on the regionality of the climatic fluctuations in the Northern Hemisphere," [Japanese, English summary]. *Geographical Review of Japan* 51: 38-59.

1680. Mitchell, C.W., R. Webster, P.H.T. Beckett and B. Clifford. 1979. "An analysis of terrain classification for long range predictions of conditions in deserts," *Geographical Journal* 145: 72-85.

1681. Panov, D.G. 1964. "Paleotemperature conditions and a paleoclimatic regionalization of Europe in the last glacial epoch," [Russian]. *Izvestiya Vsesoyuznogo Geograficheskogo Obshchestva* [Bulletin of the All-Union Geographical Society (Leningrad)], No. 6: 480-487.

1682. Sakaida, Kiyotaka. 1981. "Zonality of climatic change for August in the Far East," *1980 Japanese Progress in Climatology* (March 1981): 49-62. 7 references. Regional correlations of climate change. Reprinted from *Science Reports of the Tohoku University, 7th Series (Geography)* 30(2): 119-132 [1980].

1683. Suzuki, Hideo. 1962d. "Südgrenze der Periglazialen Erscheinungen in den Niederen Gebieten und Klimaklassifikation der letzten Eiszeit," [Japanese with English summary. Southern limit of the periglacial phenomena in the lower regions and climate classification of the last Ice Age]. *Geographical Review of Japan* 35: 67-76.

1684. Suzuki, Hideo. 1971. "Climatic zone of the Würm glacial age," *Bulletin. Department of Geography, University of Tokyo* 3: 35-46.

1685. Tikhomirov, B.A. 1961. "The changes in biogeographical boundaries in the north of U.S.S.R. as related to climatic fluctuations and activity of man," *Botaniska Notiser* 56: 285-292. USSR.

1686. Tyson, Peter D., T.G.J. Dyer and M.N. Mametse. 1975. "Secular changes in South African rainfall: 1880 to 1972," *Quarterly Journal of the Royal Meteorological Society* 101: 817-833. 47 references. South Africa. Purpose: "to establish the regional gradients of (climatic changes) over South Africa" (p. 830).

1687. Walsh, R.P.D. and D.M. Lawler. 1981. "Rainfall seasonality: description, spatial patterns and change through time," *Weather* 36: 201-208.

1688. Yasamanov, N.A. 1984. "Climatic zonality of continents in the late Cenozoic," [Russian]. *Izvestiya Akademii Nauk SSSR, Seriya Geograficheskaya*, No. 5: 34-[43].

1689. Yoshino, Masatoshi M. and Razuko Urushibara. 1981. "Regionality of climatic change in East Asia," *Geo Journal* 5(2): 123-132. 25 references.

1690. Yoshino, Masatoshi M. and Osamu Yagisawa. 1990. "Regionality of occurrence frequencies of various climatic types in the Mediterranean and its surrounding region," *Science Reports of the Institute of Geoscience. University of Tsukuba: Section A, geographical sciences* 11: 1-18.

Chapter Seven, part A

Chapter seven contains other classifications; i.e., those that don't fit elsewhere. Part A deals with classifications comparing two or more classifications from other chapters such as Köppen and Thornthwaite.

1691. Angola, Serviço Meteorológico de. 1955. *O clima de Angola* [The Climate of Angola]. Luanda. Serviço Meteorológico de Angola. 53 pp. Köppen and Thornthwaite classifications. Angola. No references.

1692. Bernard, Étienne. 1945. *Le climat écologique de la Cuvette centrale congolaise*. [The ecological climate of the central Congo basin]. Brussels: Publication de l'Institut National pour l'Etude Agronomique du Congo Belge (I.N.E.A.C.). 240 pp. 176 references. Köppen and de Martonne.

1693. Boerman, Willem Everhard. 1949. *Klimaat, klimaattykes, klimaatgebieden, bodemproductie, bevolkung* [Dutch. Climate, climatic types, climatic regions, agriculture and population]. 2nd ed. Gorinchem: Nooduijn's Welneschappelijke Reeks. 258 pp. references. Several classifications, especially Köppen and Huntington's climagram.

1694. Chu, Co-Ching [also Coching]. 1929. "Climatic provinces of China," *Natlional Research Institute, Nanking I, Meteorological Memoirs*. 11 pp. Classified China according to Köppen and de Martonne. Used temperature criteria, and produced 8 main types.

1695. Chu, Co-Ching. 1931. *Climatic Provinces of China*. Academia Sinica, Institute of Meteorology, Memoir No. 1, 11 pp. 18 references. Eight climatic provinces of China. Compared with Köppen and de Martonne.

1696. Clasificación de los climas, La. [Climatic classification]. 1951/1952. *Revista Meteorológia (Montevideo)* 11(39/40): 131-207. Published in the October 1951-January 1952 issue. References. Consists of translations into Spanish from Petterssen's "Meteorology," Köppen's "Climatology," a paper by Walter Knoche, "New presentation of basic facts for agro- and phyto-climatological purposes," and a review of Thornthwaite's classification by Alfonso Contreras Arias. An article by Luis Morandi (not a classification) is appended.

1697. Coggins, Robert S. 1955. "Some geographical applications of climatic indices," *Australian Meteorological Magazine* 11: 75-82. 19 references. Discusses Köppen, Thornthwaite and Prescott.

1698. Doerr, A.H. and S.M. Sutherland. 1964. "Variations in Oklahoma's climate as depicted by the Köppen and early Thornthwaite classifications," *Journal of Geography* 63(2): 60-66. 6 references.

1699. Eagleman, Joe R. 1976. *The Visualization of Climate*. Lexington, Mass.: Lexington Books (D.C. Heath & Co.), 227 pp. 46 references. United States. Several classifications, notably Gaussen, Johansson, Thornthwaite, Terjung, and the author's own. Uses temperature and aridity-humidity regions.

1700. Eredia, F. 1942. *Lezioni di Climatologia* [Lessons of climatology]. Ministerio dell' Aeronautica. Corsi di Perfezionamento Tecnico Professionale per Ufficiali Geofisici. Classification of China according to Co-ching Chu (see); Europe, Brazil, etc. according to Köppen.

1701. Fenton, L. 1949. *Climate of the Lake Victoria Plateau*. Nedlands: Univ. of Western Australia, Geographical Laboratory (Economics Dept.), Research Report No. 6, 15 pp. Thornthwaite and Köppen climate types.

1702. Ferreira, H. Amorim. 1942. "O 'Clima Português' de Martonne e a Classificaçâo de Köppen," [The "Potuguese climate" -- de Martonne and the classification of Köppen]. *Ordem dos Engenheiros, Boletim* (Lisbon) 6(68): 283-288. Portugal. Classifications of Köppen, Thornthwaite and de Martonne.

1703. Flohn, Hermann. 1950. "Neue Anschauungen über die allgemeine Zirkulation der Atmosphäre und ihre klimatische Bedeutung," [New observations about the general circulation of the atmosphere, and its climatic importance]. *Erdkunde* 4: 141-162. Many references. Global. Köppen and Penck, as well as a genetic classification (global wind belts).

1704. Flohn, Hermann. 1957. "Zur Frage der Einteilung der Klimazonen," [The problem of classification of climatic zones]. *Erdkunde* 11(3): 161-175. 50 references. A "classification of classifications" begun by Tor Bergeron (dynamic classification) and B.P. Alisov's air mass classification; mentions E. Neef, E. Kupfer and Thornthwaite.

1705. Fukui, Eiichiro, ed. 1977. *The Climate of Japan*. New York: Elsevier Sci. Pub. Co. ; Tokyo: Kodansha, Ltd., 317 pp. See especially chapter 12 (pp. 225-270), "Climatic division and climatography" by Mitsuhara Mizukoshi (see). 50 references. Used classifications of Köppen, Thornthwaite and his own.

1706. Ganji, M.H. 1954. "A contribution to the climatology of Iran," PhD dissertation, Clark University, Worcester, Mass., 334 pp. Gives several different climatic classifications.

1707. Gates, David M. 1972. *Man and His Environment: Climate*. New York: Harper and Row, 175 pp. No references. A microclimatic classification. Mentions R.B. Hinds (1842), Köppen, Thornthwaite and human classifications.

1708. Gentilli, Joseph. 1946. *Climatic Regions: a Review of Koeppen's [sic] and Thornthwaite's Systems as Applied to Australia*. S.l.: s.n. 17 leaves, 2 folded maps.

1709. Gentilli, Joseph. 1948. "Two climatic systems applied to Australia," *Australian Journal of Science* 11(1): 13-16. 24 references. Australia. Compares Köppen (1932) and Thornthwaite (1931). Prefers Thornthwaite for middle and high latitudes, Köppen for low latitudes. He mentions that Köppen based his system on the tropics, while Thornthwaite based his on the middle latitudes of the United States.

1710. Gentilli, Joseph. 1950. "The measurement of precipitation effectiveness," *Scope* 1(5): 43-48. 41 references. Formulas of Köppen and Gorcynski.

1711. Hare, F. Kenneth. 1951a. "Climatic classification," pp. 111-134 in Laurence Dudley Stamp and Sidney William Wooldridge, eds. *London Essays in Geography: Rodwell Jones Memorial Volume*. London: London School of Economics and Political Science, University of London [Also: London; New York: Longmans, Green and Co., 1951; Cambridge, Mass.: Harvard University Press, 1951. Reprinted in 1969 by Books for Libraries Press, in Freeport, N.Y. Also published as Chapter 9 (pp. 96-109) in Geoffrey R. McBoyle, ed. *Climate in Review*. Boston: Houghton-Mifflin, 1973.] Over 30 references. A critical study of Köppen's (1900) classification, Thornthwaite's 1931 and 1948 classifications, and Gorczynski, as well as of the moisture index and thermal efficiency. Transeau, Lang, and de Martonne also are discussed.

1712. Hare, F. Kenneth. 1951b. "Some climatological problems of the Arctic and sub-Arctic," pp. 952-964 in Thomas F. Malone, ed. *Compendium of Meteorology*. Boston: American Meteorological Society, 1334 pp. 69 references. Discusses the tree-line boundary and the classifications of Supan, Vahl, Köppen and Nordenskjöld.

1713. Hargreaves, R.P. and W.J. Maunder. 1964. "An early classification of New Zealand coastal climates," *Professional Geographer* 16(2): 6-10. 7 references. Compares a present classification (Garnier, 1958a) with an 1857 classification by Byron Drury.

1714. Hashemi, F., G.W. Smith and M.T. Habibian. 1981. "Inadequacy of climatological classification systems in agroclimatic analogue evaluations -- suggested alternatives," *Agricultural Meteorology* 24: 157-173. 24 references. Iran, Japan, Spain, United States. Climatic analogues using Köppen, Thornthwaite, and Trewartha-Köppen.

1715. Hayward, Derek F. and Julius S. Oguntoyinbo. 1987. *The Climatology of West Africa*. London: Hutchinson; Totawa, NJ: Barnes & Noble, 271 pp. Many references. After mentioning some other classifications of West African climates (Köppen, Thornthwaite, Gentilli, Ojo), the authors propose their own, based on rainfall, length of rainy season and temperatures.

1716. Hela, Ilmo. 1952. "Remarks on the climate of southern Florida," *Bulletin of the Marine Science of the Gulf and Caribbean* 2(2): 438-447. Köppen and Conrad's continentality.

1717. Heyer, E. 1963. *Witterung und Klima* [Weather and Climate]. Leipzig. Discusses general classifications, and some specific ones, including Köppen, Koeppe, Penck, Creutzberg, Alisov, Flohn and Kupfer.

1718. Jones, Stephen B. and Rolland Bellaire. 1937. "The classification of Hawaiian climates. A comparison of the Köppen and Thornthwaite systems," *Geographical Review* 27: 112-119. 12 references.

1719. Kawamura, Takeshi. 1971. "Representation of moist and dry climate of monsoon Asia according to climatic indices," pp. 275-285 in M.M. Yoshino, ed. *Water Balance of Monsoon Asia*. Honolulu: University of Hawaii Press. 17 references. South and east Asia. Reviews indices of Lang, de Martonne, Köppen, Reichel, Emberger, Mayer, Prescott, Wang, Gorczynski, Ångström and Kira.

1720. Kazi, S. 1951. "Climatic regions of West Pakistan," *Pakistan Geographical Review* 6(1): 1-35. Used classifications of Blair, Kendrew, Köppen, Miller, Thornthwaite (1931) and Trewartha.

1721. Kimmins, J.P. 1987. *Forest Ecology*. New York: Macmillan; London: Collier Macmillan, 531 pp. Many references. Chapter 16.2 (p. 434-438) is on climatic classification. Discusses Köppen, modified by Trewartha, and based on Money (1972). Also, physiographic (landform) classification, various vegetation classifications, and physiognomic classification (structure and life form). On p. 450, mention is made of the biogeoclimatic classification of Krajina (1965, 1969, 1972).

1722. Landsberg, Helmut E. 1958a. *Physical Climatology*, 2nd ed. DuBois, PA: Gray Printing Co., 446 pp. 15 references. Pages 361-374 are on climatic classification. Mention is made of classifications by Köppen, Thornthwaite, Troll, Gorczynski and Brooks, as well as of a general geographic scheme and Landsberg's "dynamic scheme" (atmospheric types). There are also climate graphs.

1723. Lautensach, Hermann. 1945. *Korea, eine Landeskunde auf Grund eigner Reisen und der Literatur* [Korea. A Landscape Study Based Upon an Individual Journey and the Literature]. Leipzig. Korea. Classifications by Köppen and von Wissmann.

1724. Lefebvre, Th. 1934. "Remarques à propos de la Classification des Climats," [Remarks about the classification of climates]. *Comptes Rendus du Congres International de Géographie, Varsovie* 2: 269-284. 7 references. Discusses Köppen and de Martonne.

1725. Lewek, H. 1932. *Morphologie der Klimazonen* [Morphology of climate zones]. Vienna. Köppen and Penck.

1726. McAlpine, John R. and Gael Keig with R. Falls. 1983. *Climate of Papua New Guinea*. Canberra: Commonwealth Scientific and Industrial Research Organization (CSIRO) in association with Australian National University Press, 200 pp. Chapter nine (pp. 144-165) is titled "Climatic classification." Classifications discussed are the authors' own, Köppen, Thornthwaite, Holdridge, and Terjung. The authors' classification is based on subjective class intervals, using vegetation and heat, evaporation, precipitation and precipitation/evaporation ratio.

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Chapter Seven, part B

Chapter seven contains other classifications; i.e., those that don't fit elsewhere. Part B deals with miscellaneous classifications, such as boundary questions, various regions of the world, maps and atlases and others that do not fit elsewhere.

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Chapter Seven, part C

Chapter seven contains other classifications; i.e., those that don't fit elsewhere. Part C deals with a particulary Russian form of classification, ***physical-geographic regionalization***.

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Chapter Seven, Part D

Chapter seven contains other classifications; i.e., those that don't fit elsewhere. Part D contains mountain classifications (zones of elevation) and morphoclimatic classifications. Mountain zones are included only where they might be applicable to the broader picture of classification.

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2182. Penck, Albrecht. 1910. "Versuch einer Klimaklassifikation auf Physio-Graphischer Grundlage," [An attempt at a classification of climate on a physiographic basis]. *Preussische Akademie der Wissenschaft, Sitzungsberichte der physikalisch-mathematischen Klasse* 12: 236-246. 18 references. Global. Three main types and 6 subregions, based on physiography. [Reprinted in 1913 in *Sitzungsberichte. Preussische Akademie der Wissenschaften* 1st Sem.: 77-97. Also, pp. 183-185 in Wolfgang Eriksen, ed. *Klimageographie*, 1985 (see).]

2183. Penck, Albrecht. 1973, 1910. "An attempt at a classification of climate on a physiographic basis," chapter 2 (pp. 51-60) in Edward Derbyshire, ed. *Climatic Geomorphology*. New York: Barnes & Noble, 296 pp.

2184. Petrov, M.P. 1969. "On a classification of the deserts of the earth," [Russian]. *Izvestiya Vsesoyuznogo Geograficheskogo Obshchestva* [Bulletin of the All-Union Geographical Society (Leningrad)], No. 6: 489-497.

2185. Petrov, M.P. [1969?]. "A new classification of deserts based on climate, geomorphology, soils and landscapes," Paper presented at 21st International Geographical Congress in New Delhi.

2186. Rikhter, G.D. 1964a. "On the latitudinal zonality of natural phenomena," [Russian]. In the collection: *Razvitiye i preobrazovaniy geograficheskoy sredy* [Development and Transformation of the Geographical Environment]. Moscow: Nauka, 1964.

2187. Schneider-Carius, K. 1948. "Klimazonen und Vegetationsgürtel in Tropischen und Subtropischen Gebirgen," [Climate zones and vegetation belts in tropical and subtropical mountains]. *Erdkunde* 2: 303-313. 20 references. Vertical zonation of climate.

2188. Tanner, William F. 1973. "An alternative approach to morphogenetic climates," chapter 11 (pp. 186-192) in E. Derbyshire, ed. *Climatic Geomorphology*. New York: Barnes & Noble, 296 pp. 8 references. Global. Four main climatic types plus sub-types. [Originally published in 1961 in *Southeastern Geologist* 2(4): 251-257.]

2189. Thorbecke, F. 1927. "Morphologie der Klimazonen," [Morphology of climate zones]. *Düsseldorfer Geogr. Vorträge und Erörterungen* (Breslau), 99 pp.

2190. Tricart, J. 1955. "Types de fleuves et systèmes morphoclimatiques en Afrique occidentale," [Types of rivers and morphoclimatic systems in West Africa] *Bulletin. Section de Geographie. Comite des Travaux Historiques et Scientifiques. Ministere de l'Instruction Publique et des Beaux Arts. Ministere de l'Education Nationale* 68: 303-345.

2191. Tricart, J. 1957. "Application du concept de zonalité à la géomorphologie," [Application of the concept of zonality to geomorphology]. *Tijdschrift der Koninklijk Nederlansche Aardrijkskundig Genootschap. Festschrift Jacoba Hol* 74(3): 422-434. Global. Morphoclimatic divisions of the earth.

2192. Tricart, J. 1958. "Division morphoclimatique de Brésil atlantique central," [Morphoclimatic division of central atlantic Brazil]. *Revue de Géomorphologie Dynamique* 9: 1-22.

2193. Tricart, J. and A. Cailleux. 1965. *Introduction à la Géomorphologie Climatique* [Introduction to Climatic Geomorphology]. Paris. Five basic regions and 13 morpho-climatic regions. An article based on chapters 3 and 5, translated by Edward Derbyshire, was published as "Morphoclimatic regions," chapter 14 (pp. 228-268) in Edward Derbyshire, ed. *Climatic Geomorphology*. New York: Barnes & Noble, 1973. It contained 8 references. [Note: another source states that the English version was translated by Conrad J. Kiewiet de Jonge in the Longman's ed.]

2194. Troll, Carl. 1949. "Die Natur der Hochgebirge in den Verschiedenen Klimazonen der Erde," [The nature of high mountains in different climate zones of the earth]. *Mitteilungen. Naturforschende Gesellschaft in Bern* 6: 16 f.

2195. Troll, Carl. 1959. "Dir Tropischen Gebirge: Ihre dreidimensionale klimatische und pflanzengeographische Zonierung," [The tropical mountains: their three-dimensional climatic and plant-geomorphic zonation]. *Bonner Geographische Abhandlungen* 25, 93 pp. [Reprinted in 1969: London; New York.]

2196. Troll, Carl. 1973. "The upper timberlines in different climatic zones," *Arctic and Alpine Research* 5(3; pt.2): A3-A18. 79 references. Differences between humid tropical highlands and other areas.

2197. Vedenskaya, I.E. 1969. "On the morphoclimatic zonality of the territory of the USSR," *Izvestiya Akademii Nauk SSSR, Seriya Geograficheskaya* No. 3: 12-19.

2198. Wilson, Lee. 1968. "Morphogenetic classification," pp. 717-731 in Rhodes W. Fairbridge, ed. *The Encyclopedia of Geomorphology*. New York: Reinhold, 1295 pp. 11 references. Global. Shows "climato-morphologic zones (after Büdel, 1963)." Also, a modified Strahler map of climates.

2199. Wilson, Lee. 1973. "Relationships between geomorphic processes and modern climates as a method in paleoclimatology," chapter 15 (pp. 269-284) in Edward Derbyshire, ed. *Climatic Geomorphology*. New York: Barnes & Noble, 296 pp. 11 references. Global. Köppen-type classification. [Originally published in 1969 as "Les Relations entre les processus Géomorphologiques et le Climat Moderne comme Méthode de Paleoclimatologie," [The relations between geomorphic processes and modern climate as a method of paleoclimatology]. *Revue de géographie physique et de géologie dynamique* 11: 303-314.

2200. Woeikoff, A. 1884. "Flüsse und Landseen als Produkte des Klimas," [Russian. Rivers and inland lakes as products of climate], chapter 8, in *Die Klimate des Erdballes*. St. Petersburg. A German translation (excerpt) appeared in *Zeitschrift der Gesellschaft für Erdkunde, Berlin* 20(1885): 92-110. Nine climate-river types, based on water flow and variations.

2201. Yefremov, Yu. K. 1960a. "Vysotnaja Pojasnost," [Russian. Vertical (Altitudinal) zonality]. V. 1, in A.A. Grigor'ev, ed. *Kratkaia geograficheskaia entsiklopediia*. Moskva: Sovetskaia entsiklopediia, 5 v.

Chapter Eight: Climatic Data Sources

The data sources here are considered significant resources for librarians or for researchers in climatic and environmental sciences. The sources range from those covering the globe (Müller, Rudloff, *HMSO* guides) to countries (Blodgett, Boyer, etc.), states (Bomar), cities (Brazell, Chandler) and others. They provide the raw data on which climatic classifications can be built.

2202. American Association of State Climatologists. One unpublished resource is the network of state climatologists. The federally-funded state climatologist program existed until the early 1970s when the program was abolished. Individual states have continued this service, and many states, in conjunction with universities, began to support state climatologists. The national organization is the American Association of State Climatologists (AASC). At present, there is one person in almost every state. One function is to be a distribution center for federal and local data. Federal data comes from the government in printed or computer generated form. State climatologist's offices are depositories of local news items, state items mailed there, and personal accounts of historical weather events.

2203. Blodget, Lorin. 1857. *Climatology of the United States*. Philadelphia: J.B. Lippincott, 536 p. Includes many tables of temperature and precipitation data from the beginnings of station records, in the 18th century. For example, there is a list of Cambridge/Boston monthly average temperatures from October 1748 to December 1854. [Addendum, Aug. 29, 2007: This source, and many other 19C books, are available online at *google books*.]

2204. Bomar, George W. 1983. *Texas Weather*. Austin: University of Texas Press. This source is descriptive. It is a personal story of the kinds of weather extremes in Texas. The book has a lot of information, good photographs and illustrations, and contains material that would be hard to find elsewhere.

2205. Boyer, Richard and David Savageau. 1989. *Places Rated Almanac*. New York: Prentice Hall, 421 p. (Newer eds. exist.) This is an unusual guide because of its odd, inconsistent rating systems. For example, the climate of Galveston, Texas, ranks 20th, while Houston's is rated 290th. The *Retirement Places Rated* (by Savageau) is more tolerant of hot weather, but both appear to rely more on subjectivity than on any objective criteria.

2206. Brazell, J.H. 1968. *London Weather*. London: Her Majesty's Stationery Office, 249 p. Two of the best current books about the climate of a particular city are both about London. The other one is *The Climate of London* by Chandler (see). Brazell's book is historical. The author discusses "Weather before 1841," "Frost fairs on the Thames," and "London fogs" among other subjects. The emphasis is on the historical, instrumental record. At the back of the book are tables of annual climatic averages, for London stations (Greenwich and Kew), from 1841 to 1964. Temperature, rainfall and sunshine are graphed, by month, for this 120+ year record. An excellent bibliography is included, though not as lengthy as Chandler's.

2207. Chandler, T.J. 1965. *The Climate of London*. London: Hutchinson & Co, 292 pp. This book is filled with tabular data as well as discussions of these data. Individual weather elements are discussed, such as "temperature," "precipitation," "cloud amount," etc. Chandler was an urban climatologist, and his chapter "Consequences of an urban climate" contains an excellent discussion of the terrible smog in December 1952 that resulted in 4000 deaths.

2208. Clayton, Henry Helm. 1929. *World Weather Records*. (Smithsonian Miscellaneous Collections, v. 79.) Washington: The Smithsonian Institution. This series was originally begun by Henry Helm Clayton. It is currently published decadally by the Environmental Data Service, with a lag of about seven years. This is a multi-volume work with tables of ten-year monthly averages of temperature (° C), precipitation (mm), and station air pressure (millibars) for many locations around the world. This source is considered very important by many climatologists and researchers, but for librarians, it is not crucial. The temperature data consist only of the average of the monthly maximum and minimum values.

2209. *Climates of the States*. 1985. Detroit: Gale Research, 2 v. 3rd ed. Also published as a series, "Climates of the States, Climatography of the United States" as no. 60, Parts 1-52 (without any part 50) by U.S. National Oceanic and Atmospheric Administration. It consists of a written description of the climate and topography of each state, and unlike other references, has tables of climatic data for many second order stations, as well as for the major stations. [Incidentally, Washington D.C. is listed under Delaware.]

2210. Conway, H. McKinley and Linda J. Liston. 1974. *The Weather Handbook*, Rev. ed. Atlanta: Conway Research, Inc. This book is subtitled "a summary of weather statistics for selected cities throughout the United States and around the world." It contains information for 575 locations, compared to about 500 in the *Times' World Weather Guide* (see). There are a number of useful maps of hurricane tracks, and weather profiles of United States cities. One problem is that the precipitation normals (called Prec. Nor.) are not adequately explained. Although it appears to be the **number** of days with precipitation, it is actually the monthly total in inches, rounded to the nearest whole inch. This book does contain information which is hard to find elsewhere. The percent of IFR (instrument flight rules) weather is given, and this is useful for pilots. The section dealing with non-U.S. cities is alphabetical by country, regardless of continent and this makes it easy to use. At the back of the book is a map of weather extremes from around the world. There is also an alphabetical index of cities. Good features include (1) the amount of information; (2) the ease with which it can be read; and (3) having maximum and minimum mean monthly temperatures. Weak points include: (1) the fact that it is too simplified for scientists and research workers; (2) there is no indication of the sources of the data, especially important for researchers working with foreign data; and (3) no period of record is given. This would be a better reference for public libraries than for academic libraries.

2211. Corliss, William R. 1983. *Tornados, Dark Days, Anomalous Precipitation, and Related Weather Phenomena*. Glen Arm, MD: The Sourcebook Project, 196 pp. An esoteric, fascinating book. It is subtitled "a catalog of geophysical anomalies." This work catalogs unusual phenomena. Each topic (e.g. "giant snowflakes," "falls of manna") contains a description, background information, data evaluation (for reliability), an anomaly evaluation, possible explanations and similar or related phenomena (cross-referenced). It is indexed by source, subject, first author, place of event and time of event. All events have a four character code locating them in the text. Although this is not a climatic data source, it is related to the data sources and is useful to know about.

2212. Departments of the Air Force, the Army, and the Navy. 1978. *Engineering Weather Data*. S.l.: Departments of the Air Force, the Army, and the Navy, July 1, 1978. [This is also identified as Department of the Air Force Manual AFM 88-29; Department of the Army Technical Manual TM 5-785; and Department of the Navy Manual NAVFAC P-89.] For "weather extremists," this is a book with dry bulb temperatures (normal air temperatures) and wet bulb temperatures which are used to calculate relative humidity. From this book, one can actually discover the hottest, most humid climates in the world, and how frequently the hottest conditions occur (percentage of the time, by month). Engineers use this data when constructing plants requiring cooling, in order to estimate the amount of time the climatic conditions are above certain threshold values. For example, Wilmington, North Carolina exceeds a wet bulb temperature of 81° 1% of the time; Calcutta, India exceeds 83° *10%* of the time.

2213. Environmental Data Service, United States. *Daily Weather Maps; Weekly Series*. Washington: Environmental Data Service. Weekly weather maps, with daily maximum and minimum temperatures, and precipitation, for many U.S. cities. Almost as current as the daily newspaper.

2214. Food and Agriculture Organization of the United Nations. 1984. *Agroclimatological Data for Africa* [Données agroclimatologiques pour L'Afrique]. (FAO Plant Production and Protection Series, No. 22.) Rome: Food and Agriculture Organization of the United Nations, 2 v. Volume 1 contains countries north of the equator. Excellent recent source of data for African stations.

2215. Griffiths, John F. and Janine Bryan. 1987. *The Climates of Texas Counties*. Austin: Natural Fibers Information Center, University of Texas; College Station: Office of the State Climatologist, Texas A&M University, 569 pp. This is a recent update of older data for Texas' 254 counties, but was completely rewritten and re-compiled. One station was selected to represent each county in Texas, and a table of climatic normals produced. A one page description of the county gives seasonal information, population and economic characteristics. A map of Texas with county outlines shows the location for each weather station.

2216. Griffiths, John F. and Robert F. Strauss. 1981. *The Climate of Bryan-College Station, Texas*. College Station, Texas: Office of the State Climatologist, Dept. of Meteorology, Texas A&M University, 4 pp. This is an example of a brief guide, published locally, for a particular region. It lists average and extreme weather elements, gives a textual description of the area's climate, and presents some of the more interesting weather events. A brief station history is also included.

2217. Hacia, H. 1970. *An Annotated Bibliography of Climatic Atlases and Charts of the World*. Silver Spring, MD: Environmental Data Service. A useful reference work.

2218. Hatch, Warren L. 1988. *Selective Guide to Climatic Data Sources*. Washington, D.C.: U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Environmental Satellite, Data, and Information Service, 1 v., various pagings. This is a revised edition of the original publication, compiled by Keith D. Butson and Warren Hatch. "This guide provides information on 215 separate climatological data sets filed in the NCDC archives" (p. iv). It contains many sources that are very specialized. For a researcher in the field, or for a librarian assisting that person, this is an excellent resource.

2219. Howard, Luke. 1818-1820. *The Climate of London*. The first book about a local climate.

2220. Kendrew, Wilfrid G. 1961. *The Climates of the Continents*, 5th ed. Oxford: The Clarendon Press, 608 pp. The classical work. It was originally published in 1922. Kendrew was "Reader in Climatology" at Oxford University, and began his work by describing the elements of weather most important for climate: temperature and precipitation. He also discussed pressure and wind systems and the causes of weather patterns. The major part of his work was a survey, by continent and country, of the world's climates. This book is packed with information available nowhere else, e.g., detailed descriptions of the climate at various places.

2221. Landsberg, Helmut E., Editor-in-Chief. 1969-1984. *World Survey of Climatology*. Amsterdam: Elsevier Publishing Co., 15 vols. Each volume in this series was edited by an expert in that area. Volumes 1-3 cover general climatology, volume 4 is *Climate of the Free Atmosphere*, and volumes 5-15 each deal with a region of the world. These books contain information not available elsewhere, especially for regions with little data. For example, if one needed wind speed for someone going to South Orkney Island, this would be the place to get it. It is much like an updated version of Kendrew's book. There are many maps, tables and graphs included. The bibliographies are excellent.

2222. Ludlum, David M. 1971. *Weather Record Book*. Princeton, N.J.: Weatherwise, Inc., 98 pp. [Weatherwise magazine is currently published by Heldref Publications.] The subtitle, The outstanding events 1871-1970, explains what it is about: extremes occurring over a century. This is useful for settling questions about the hottest, coldest, wettest, etc., for different continents. There is also a table, now dated, of extremes of temperature and rainfall for U.S. cities.

2223. Ludlum, David M. 1982. *The American Weather Book*. Boston: Houghton Mifflin, 296 pp. Many tables and maps are updated from the previous title. In addition, there are many monthly weather facts for the United States.

2224. Meteorological Office. 1956. *Handbook of Meteorological Instruments. Part I, Instruments For Surface Observations*. London: Her Majesty's Stationary Office. One of a class of books useful for someone setting up a weather station.

2225. Meteorological Office. 1958. *Tables of Temperature, Relative Humidity and Precipitation For the World*. London: Her Majesty's Stationary Office, 6 v. This was published in six parts, representing continental areas (Australia and Antarctica combined). It has been revised and/or reprinted several times. The format consists of explanatory notes for each of the weather elements discussed: temperature, relative humidity, precipitation; for latitude, longitude and elevation; and for the period of record. It includes a very comprehensive bibliography and an index. A map shows the locations for all of the stations in each part, and the data tables follow. For each location, the monthly maximum and minimum mean temperatures are given (correctly called "average daily" temperatures, since they are the daily temperatures averaged for each month). Following this is an unusual, and useful, listing of the average of highest and lowest temperature each month. From this table, one can get an idea of how hot or cold it is apt to be in an average month. Then there is a table of "absolute" temperatures, i.e., the record extremes, by month. Relative humidity is given for the coolest and hottest times of day. Unfortunately, these times are not uniform for different places and vary worldwide. Lastly, precipitation (the water content from both rain and snow) is given, in three columns: average monthly amount, maximum amount in 24 hours, and average number of days each month above a threshold value which varies from 0.01" to 0.10". This table can be useful for determining how frequently it rains at a particular place. One example of this is that Miami, Florida averages about 60" of precipitation per year, with 135 days with more than 0.01" of rain while London, England, averages 23" and 164 days (with more than 0.01"). This work is the current classic, and is actually the source for many other works purporting to be more recent. Often referred to as *HMSO*.

2226. Müller, Manfred J. 1982. *Selected Climatic Data For a Global Set of Standard Stations For Vegetation Science*. (Tasks for Vegetation Sciences; 5) The Hague: Dr. W. Junk, 306 pp. This is perhaps the finest collection of climatic data, and includes some special features as well. The book begins with explanations for the data and structure, including why these stations were chosen. Müller, like Rudloff (see), classifies his stations, but with two classifications: one by Köppen and one by Troll and Paffen. Colored maps of each continent are included for both classifications. Computer-generated climate diagrams have been produced for some of the stations. The program for producing these is included as an appendix and the index is alphabetical by station, with page numbers. A superb list of references is included. The tables are the most valuable part of this book. About 1000 stations were selected and were evenly spaced over the earth. The data are in metric units, and include maximum and minimum mean temperatures and their average, extreme temperatures, mean and extreme precipitation, mean duration of sunshine, mean quantity of radiation (in langleys per day), mean potential evaporation, mean wind speed, and mean predominant direction of the wind. Not all of these are available for all stations. The period of record is given with each statistic. In all, there can be 16 different statistics and two classifications for each location. This book is the single best volume for research workers needing reliable climatological data.

2227. National Climatic [Data] Center. 1983. *Climate Normals For the U.S. (Base: 1951-80)*. Detroit: Gale Research, 712 pp. This is a list of tables, by state, of monthly and annual values of temperature (mean maximum, minimum, average), precipitation, and heating and cooling degree days. It includes this information for **5557** weather stations across the United States. The latitude, longitude and elevation of each station are given. As an example, the temperatures for seventy-six stations in North Carolina are given, and the precipitation for 117 locations. This is a useful source for information unavailable elsewhere. The best source for a quick look at the climate of "Anytown, USA".

2228. National Climatic [Data] Center. 1977. *Local Climatological Data. Annual Summaries For 1976*. Asheville, NC: National Climatic Center, 5 v. Formerly in 2 parts, now in five. These volumes contain the tables and descriptions for United States first order stations. They are issued annually, since one table lists the monthly conditions for the prior year. Also referred to as *LCDs*. [See also *Weather of U.S. Cities*, eds. Ruffner and Bair, below.] Each state is listed alphabetically as are individual cities within the state. These cities make up the first-order network of climatological stations, i.e. those with full-time, professional staffing. The information "packet" for each city has a one page descriptive summary of the climate, and a second page with tables of "normal" or average conditions including those of the preceding year. A third page contains average monthly temperature, precipitation and snowfall for the past 40 years, and heating and cooling degree days for the past 20 years. The fourth page contains a complete record of the station history. This includes each location, the number of miles and direction each new station was from the former station, latitude and longitude, who was responsible (person or agency), and any additional remarks. These volumes contain approximately 300 records. Recently, Gale Research (James Ruffner and Frank Bair, editors) has begun to publish these as *Weather of U.S. Cities*. The 3rd edition, in two volumes, was published in 1987. The format has changed slightly due to the records being generated from a computer database. In addition, the Gale version is in hardcover, so it is more durable for libraries.

2229. Oliver, John E. and Rhodes W. Fairbridge, eds. 1987. *The Encyclopedia of Climatology*. New York: Van Nostrand Reinhold. (V. 11 in *Encyclopedia of Earth Sciences*, ed. Rhodes W. Fairbridge). While not a data source, this is a useful adjunct for climatologists and librarians needing information on particular topics. It has no antecedents in the field of climatology. The encyclopedia consists of 216 articles on all aspects of climatology from acid rain to zones, climatic. The articles range from brief paragraphs to many pages. For example, the article on climatic classification is 17 pages long. The longer articles contain extensive bibliographies as well as a highly useful list of cross-references to other topics in the volume. The articles are signed and there is a list of all 132 contributors, their professional affiliation, and, in italics, their contribution. Individual contributions have varied from collaborating on one article to contributing to thirty-nine. The articles range from the contemporary (nuclear winter, carbon dioxide and climate) to more esoteric (koniology, nephanalysis) and from the technical (vorticity, katabatic (gravity) winds) to the practical (crime and climate, health and climate). The authors constitute a "who's who" of climatologists in the world.

2230. Pearce, E.A. and C.G. Smith. 1984. *The Timesbooks' World Weather Guide*. New York: The New York Times, 480 p. This book is subtitled "a city-by-city guide that will enable you to forecast the weather you can expect in any part of the world at any time of the year". It is a very clear book that has introductory chapters explaining temperature scales (Fahrenheit and Celsius), rainfall conversion between inches and millimeters, hours of daylight and includes a selected glossary of meteorological terms, which contains the names of winds. The organization is by continent, but is a little odd: Africa is followed by North *A*merica, rather than North being a proper part of the name. This is a very contrived order. The states of the United States are listed regionally, rather than alphabetically, or by city, and this makes it more difficult to use. The other flaw is that no annual totals are given, just the figures for the twelve months. However, since the purpose of the book is to assist travellers, and not climatological researchers, this is not critical. A lesser fault is that for New York City, for example, the data are for Battery Park and not for Central Park, so that the summer temperatures tend to be artificially lowered. The index is good, with countries in capital letters, and cities in lower case. The layout and data are the best parts of this work. On one side of a page is a textual description of a country; on the other side, tables for different cities in that country. The averages of temperature and precipitation and temperature extremes all are highlighted in red to make reading easier. There is not as much total information as in *The Weather Handbook*, but the presentation makes this book a pleasure to use. Acknowledgement is given to the *HMSO* tables from which all of the data are taken.

2231. Ristow, W.W. 1960. "Cartographic research guide. Weather and climate maps," *Special Libraries Association, Geography and Maps Division, Bulletin*, No. 42. December 1960. Pp. 24-38.

2232. Rudloff, Willy. 1981. *World-Climates: With Tables of Climatic Data and Practical Suggestions*. Stuttgart: Wissenschaftliche Verlagsgessellschaft, 632 pp. Rudloff's book was translated into English by the author. After an introduction to climatology, there is an interesting chapter on bioclimatology which includes discussions on clothing, metabolism and the heat budget. Each country's climate is briefly discussed but the tables of data are the main feature of this work. They are complex enough so that a card is included with the book for interpreting the codes and descriptors. Major differences with other works are that (1) all of the climates are classified, in a modified Köppen classification, (2) a recommendation is made for the kind of clothing to be worn each month, and (3) when necessary, heat stress is given (for uncomfortable locations). Unfortunately, Rudloff only gives monthly average temperatures. The data are in metric units. The index is by the topic in the descriptive text, but the stations are listed alphabetically, without page numbers. Instead there is a six digit numerical code which is confusing. This book is not for the casual browser, but does contain tables for 1474 locations, making it one of the most comprehensive works available.

2233. Ruffner, James A. and Frank E. Bair, eds. 1987. *Weather of U.S. Cities*, 3rd ed. Detroit: Gale Research, 2 v. This publication contains United States city tables from the *Local Climatological Data*, but adds excellent explanations of how to read and understand the tables. The editors mention that "Normal does not refer to 'normalcy' or 'expectation,' but only to actual averages for a particular thirty-year period." The world data are derived from the 1941 *Yearbook of Agriculture* (see below).

2234. Ruffner, James A. and Frank E. Bair. 1984. *The Weather Almanac*, 4th. ed. Detroit: Gale Research. This book includes many articles, tables and photographs. Although sources are credited, there is no indication that the data have been collected and published elsewhere.

2235. Sheehy, Eugene P. 1986. *Guide to Reference Books*, 10th ed. Chicago: American Library Association. Lists books that are useful in a library. One of two standard reference guides that list some climatic data sources (*Walford's Guide to Reference Material* is the other). Neither is particularly up to date nor are they comprehensive. They are useful places to begin.

2236. United States. Department of Agriculture. 1941. *Climate and Man. Yearbook of Agriculture, 1941*. Washington: U.S. Government Printing Office, 1248 pp. This book, though somewhat dated, still has enormous value. There are a number of chapters discussing climate and the farmer and others on the influence of climate on various human activities. The final part, which has been published separately, contains climatic tables and maps for the United States (primarily) and the world.

2237. United States. Navy Department, Hydrographic Office (ed.). 1943. *Weather Summary For Hydrographic Office. Publication No. [varies]. Naval Air Pilot, [region]*. Washington, D.C.: United States Navy Department, Hydrographic Office. During World War II the U.S. Hydrographic Office produced a collection of then-classified volumes containing whatever data were available from the Pacific Islands. Most of these contained only 3-5 years of data: everything that was available at that time. Much of these data have now filtered into the published record, including into the *HMSO* tables. The British version of this wartime data was put out by the "Admiralty, Hydrographic Office" and was called *Pacific Islands Pilot*. It was also available for other parts of the world.

2238. United States. Department of Commerce. Naval Weather Service. 1967-. *U.S. Naval Weather Service World-Wide Airfield Summaries*. [Also called *Worldwide Airfield Summaries*.] They were first published in 1967 and distributed by NTIS, the National Technical Information Service. Currently, they are available, from NCDC, on microfiche. Although these are restricted to airfields, they are very comprehensive. In all, there were 27 parts and volumes, each with approximately 350-450 pages. Each volume included a number of countries, and each country was introduced with a map of the stations. Unfortunately, these locations are numbered with the 5-digit WMO code, and it takes some work to figure them out, using an atlas and the latitude and longitude. The data cover the record for as long a period as is available and this period is given, along with the number of observations. Data include the usual temperature and precipitation averages, many threshold values (e.g., days per month equal to or above 90°, or below 32°, and so on), and much more. In addition, there are a number of tables for pilots, dealing with visibility, number of days with thunderstorms, wind speeds, sky cover and ceilings, and visibility. Each volume or part contains a bibliography of sources. These tend to be in an abbreviated form, but most are from foreign governments. Although these are useful books, they have become prohibitively expensive for individuals, but would be a good investment for an academic library.

2239. United States. *Comparative Climatic Data* is published annually. It is a thin (under 100 pages) pamphlet with a large variety of data. Unfortunately, these data are quite difficult to read due to being "split." That is, tables of maximum temperatures are grouped by city, and several pages later, minimum temperatures are similarly grouped. The quantity of data are remarkable and all are listed by month: temperatures (means and extremes), snowfall, precipitation, degree days (heating and cooling), wind speed (average and maximum), and sunshine, to name only part. The volume is organized into observed data and climatological normals, although the "average wind speed" is listed under the former instead of under the latter.

2240. United States. *Climates of the States* is published by the U.S. Government. This has also been available in commercial, hardcover format from Gale. The new editions, including Gale's, have fairly complete tables of second and third order stations. These stations are run by military (second order) or cooperative (third order) observers. Each state has three (or more) pages of textual description followed by tables for the smaller stations. The first order data follow. This set is more useful than the *LCDs* if one needs data for small cities. That set (LCD) is more useful for detailed city description and data. The best situation for a library would be to have both sets. Both are excellent ready-reference works, as well as being suitable for the scholar. The only negative aspect in these works is that the government recently decided to include **only** airport data. The result was that an 80- or 100-year period of (urban) record was replaced by a much shorter span from a more rural location. An older version of these data, published by the U.S. Department of Agriculture, was the *Climatic Summary of the United States*. It included the record from the establishment of the stations to 1930 (some versions only go to 1920). This publication was issued by state divisions and is sometimes called *Bulletin W*. It is a storehouse of early American climatic records.

2241. United States. *Monthly Climatic Data For the World*. This monthly series presents one of the great missed opportunities in climatic history. The producers of this work have taken the monthly maximum and minimum mean temperatures, and from these calculated and published *only* the average of the two. Otherwise, the publication is superb, with precipitation, station pressure, relative humidity, dew point, upper air temperature and wind, as well as departures from long-term averages. This last is what makes it so valuable to research workers. The information is provided for over 1400 stations world-wide.

2242. Visher, Stephen S. 1954. *Climatic Atlas of the United States*. Cambridge, MA: Harvard University. There are quite a few climatic atlases which have mapped data. The 1941 Yearbook, *Climate and Man* is one. Another good source is Visher's. This work contains 1031 maps and diagrams and includes the sources of the maps. A third source is Walter and Lieth's *Klimadiagramm-Weltatlas* (1960-1967). Two bibliographies of climatic maps and atlases are those by Hacia and Ristow (see).

2243. Walford, A.J. 1980. *Walford's Guide to Reference Material*. 4th ed., v. 1: Science & Technology. London: The Library Association. One of two standard reference guides, the other being Sheehy's (see) that list some climatic data sources. Neither is particularly up to date nor are they comprehensive. However, they are useful places to begin.

2244. *Weather Calendars*. A different sort of local presentation are the weather calendars. These are produced by local communities and individuals (although The Weather Channel produces a national one), and often contain daily average temperatures (both high and low), record maximum and minimum temperatures for each day, and even daily sunrise and sunset listings. In addition, they often give local weather oddities.

2245. WeatherDisc Associates. 1989? *The World WeatherDisc*. Seattle: WeatherDisc Associates. This is a CD-ROM disc containing "seventeen data sets acquired from the archives of the National Climatic Data Center and the National Center for Atmospheric Research." These data include Local Climatological Data, Historical Sunshine Data, Tornado Data, Worldwide Airfield Summaries, and World Monthly Station Surface Climatology, to name but five. Software programs are included to download some of the data, but in the past, the user has had to write programs to access the rest of the data. There is also a *World Climate Disc*, produced by Chadwyck-Healey. More CD-ROM data sets have recently become available.

2246. Wernstedt, Frederick L. 1972. *World Climatic Data*. Lemont, PA: Climatic Data Press, 6 v. This is a classic work which contains at least one glaring error. Wernstedt lists monthly mean temperature (no maxima or minima) and precipitation for *19,000* stations. The sheer number makes this book valuable, but the possible unreliability is a problem. The glaring example is for Pittsburgh. Precipitation figures are grossly high, but may be caused by a misplaced decimal point. The strong points of this volume are its number of stations, number of years of data and list of data sources for each part.

2247. Wynar, Bohdan S., ed. 1988. *American Reference Books Annual 1988*, v. 19. Englewood, Colo.: Libraries Unlimited. Wynar's *American Reference Books Annual* (ARBA) is an excellent source for recent publications in climatology. This book is especially useful in library collection development.

&&&**Newer Classification articles (not indexed)**

Ahmed, Badraddin Yusuf Mohammed. 1997. "Climatic classification of Saudi Arabia: an application of factor-cluster analysis," *GeoJournal* 41(1): 69-84.

Błażejczyk, Krzysztof. 2007. Prof. Błażejczyk has continued copious publication in bioclimatology and topoclimatology. A recent bibliography can be found on his website at: http://globus.igipz.pan.pl/geoekoklimat/szczegoly.htm

Brewer, Michael J. 2001. *Estimating Natural Vegetation from Climatic Data*. Pittsgrove, N.J.: C.W. Thornthwaite Associates, Laboratory of Climatology (1725 Pavin Mill Road, Pittsgrove, N.J. 08318), and Newark, Dela.: University of Delaware, Center for Climatic Research.vii, 93 p. References on pp. 90-93. Author discusses vegetation-based classifications, Köppen's 1930 and 1936 classifications, Thornthwaite's 1931 and 1948 classifications, Lauer's dryness index, Holdridge's Natural Life Classification, Mather & Yoshioka's work on vegetation distributions, and Willmott-Feddema's moisture index.

Burrough, Peter A., John P. Wilson, Pauline F.M. van Gaans, and Andrew J. Hansen. 2001. "Fuzzy k-means classification of topo-climatic data as an aid to forest mapping in the Greater Yellowstone Area, USA," *Landscape Ecology* 16(6): 523-546.

Essenwanger, O.M. 2001. *Classification of Climates*. Amsterdam: Elsevier, 2001. World Survey of Climatology, vol. 1C, General Climatology 1C. Epilogue by H.E. Landsberg.xi, 113 p. 5 pp. refs. History and early development of classifications, then Köppen and non-Köppen systems, Thornthwaite, Genetic, Air Mass, Miscellaneous and Mathematical classifications. An excellent volume.

Feddema, Johannes J. 1994. *Evaluation of Terrestrial Climatic Variability using a Moisture Index*.Vol. 47, no. 1 in Elmer, N.J.: C.W. Thornthwaite Associates, Laboratory of Climatology and Newark, Dela.: University of Delaware, Center for Climatic Research. References, p. 36-41. Discussion of climatic moisture indexes, Thornthwaite modied index and mentions Linsser (1905) and earlier work.

Geodok is a German/English reference source. Searching for *climatic classification* returned 92 hits (Sept. 13, 2007). http://www.geodok.uni-erlangen.de/en/

Li, Danny H.W., and Joseph C. Lam. 2000. "An analysis of climatic parameters and sky condition of classification," *Building and Environment* 36(4): 435-445(6).

Liubarskii, A.N. 1993. "Climatic zoning of Antarctica by automated classification methods," [Russian with English summary.] *Antarktika* 31:25-34. 22 references. Citation located at: http://cold.loc.gov/cgi-bin/starfinder/4047084/session3.txt

Null, Jan. 2003 [earlier?]. *Camelot Climate Index*. WWW resource at http://ggweather.com/camelot.htm The author's idea of an ideal climate. Unique and imaginative.

Oliver, John E. 2002. "Climatic regionalization," pp. 112-129 (chapter 6) in *The Physical Geography of North America*. Oxford, New York: Oxford University Press. References, pp. 127-129.

Rivas-Martinez S, Sanchez-Mata D., and Costa M. (1999) - North American Boreal and Western Temperate Forest. Itinera Geobotanica, 12, pp. 5-16. "A generic world-wide climate classification in five macrobioclimates (tropical, Mediterranean, temperate, boreal and polar) on the basis of bioclimatic indexes" source: http://www.iao.florence.it/training/geomatics/BenSlimane/Marocco21_3_1_2.htm

Sanderson, Marie. 1999. "The classification of climates from Pythagoras to Koeppen [sic]," *Bulletin, AMS* 80(4): 669-673. References. Calls for a new classification scheme.

Smith, G. Louis. (2002). "Surface radiation budget and climatic classification." *Journal of Climate* 15(10): 1175-1188. References. A radiation budget classification.

Vigneau, J.P. 2001. "The "supratropical" zone in the world and in France, an essay on climatic classifications," *Annales de géographie* 110(619): 227-242.

Yao, C.S. 1998. "A loading correlation model for climatic classification in terms of synoptic climatology," *Theoretical and Applied Climatology* [date: Nov. 4, 1998, no vol. or page info.]

A recent (May 2003) search by the author of *Online Geographical Bibliography* (http://geolib.lib.uwm.edu/) turned up quite a few new classification references.

In addition, there seem to be a great number of recent forest and land cover classifications. Another online resource is Infortrieve: http://www.infotrieve.com/search/databases .

I also have a reference, no hard information, to an (article on?) Eiffel Index, by Steadman.

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