Linguistic Geography of Chinese Dialects by Use of a Newly Developed Computer System "PHD"

中国語方言の言語地理学的研究

－新システムによる「漢語方言地図集」の作成－

Linguistic geography of Chinese Dialects by Use of a Newly Developed Computer System "PHD"

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研究の概要

An Outline of the Project

平成17年3月
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The map symbols currently equipped in the map production software *Wonderland* are based on the network-open-published file, "Basic Symbols" (Adobe Illustrator format), which has been developed at the National Institute for Japanese Language and contains the symbols appearing on the volumes *Grammar Atlas of Japanese Dialects* (1989-2002). Our sincerely thanks are due to Professor Takuichiro Onishi (NIJL) who permitted us to use this file and gave us helpful advises on its usage.

Reference:

大西拓一郎「言語地図作成の電算化—『方言文法全国地図』第５集を例に—」『日本語学』2002 年 9 月号.

Errata

p.1, l.4 Iwata 1995 → Iwata 1995b

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p. 12 **Fig. 1 The Dataflow of the PHD System**~~**2.2 WEB Interface**~~

2.2 WEB Interface

p.30, l.13 **[地图 4]**要用来说明“膝盖”和“膝头”二两种系统的分布情况。

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平成 16 年度の研究会活動

第 1 回研究会

7 月 25 日　金沢大学ゲストハウス レセプションルーム

太田斎　「太田科研の総括－個別的変化の諸相－」

橋本貴子「コオロギとキリギリス」

加納巧 「オタマジャクシとガマガエル」

石汝傑* 「江淮方言和吴语的边界调查研究」

7 月 26 日　金沢大学図書館 AV 教室/金沢大学文学部会議室

斉藤成也** 「古代DNAを用いた中国歴史時代の人間の移動の推定」

遠藤光暁 「世代差に反映した言語変化について」

林　智　「PHD システムの概要」

研究打合せ: 作業分担等に関する討議

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第 2 回研究会

12 月 4 日　　金沢大学文学部会議室

張維佳*　「方言研究与方言视图的数字化」

岩田礼、林智　「汉语方言地理学数据库简介」

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曹志耘**　「汉语方言地图集研究计划简介」

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研究打合せ: 今後の研究の進め方について

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Linguistic Geography of Chinese Dialects by Use of a Newly Developed Computer System "PHD"
- History, aim and some controversial issues -

Ray Iwata

1. History

This project is inherited from a previous project entitled "Project on Han Dialects" (hereafter "PHD"), which started in 1989 and continued for three fiscal years (1989-1991). The results of this original and early research appeared in Iwata ed. (1992), including the first volume of our dialect atlas "Atlas of the Chinese Dialects" (refer to Iwata 1995 for a brief introduction). Since then, three projects were organized successively during the past decade and put into practice by many researchers including specialists in extra-linguistic fields, such as genetics, archaeology, agriculture, popular literature and cultural-natural geography:

1. Dialect and Local Culture in China, 1993-1995 fiscal years, directed by *Shoji Hirata*.
2. Linguistic Geography and Cultural-Natural Geography in China, 1997-1999 fiscal years, directed by *Mitsuaki Endo*.
3. Historical studies of Han dialects integrating both philological and fieldwork data, 2001-2003 fiscal years, directed by *Itsuku Ota*.

The *Hirata* and *Endo* projects were attempts at investigating the co-relation or the interaction between linguistic and extra-linguistic evidence. The latter also proceeded from the philological and linguistic studies, seen in the dialect dictionary "Fangyan"(方言) compiled by Yang Xiong (揚雄) two thousand years ago. The *Ota* project focused on linguistic evidence and endeavored to study the history of each word (the names of insects and plants) with reference to extra-linguistic background.

In each of the three projects cited above, one volume of a linguistic atlas was published (Iwata ed. 1995, 1998; Ota ed. 2004), in addition to several volumes of progressive reports.

The early version of our maps, which appeared in Iwata ed. (1992), were hand-made by using stamps acquired from the professional staff at the National Institute for Japanese Language (NIJL), while approximately half of the maps in Iwata ed. (1995) were complied by a MS DOS-based computer map drawing system, EGL (Editor for Geographical Linguistics), which was designed by Kikuo Maekawa at NIJL. The maps in Iwata ed. (1998) and Ota ed. (2004) were from a Window-based map drawing system, SEAL (System of Exhibition and Analysis of Linguistic Data), which was designed by Chitsuko Fukushima (Niigata Women's

college) and Yusuke Fukushima (Nagaoka University of Technology). Refer to http://www.nicol.ac.jp/~fukusima/, where both Japanese and English versions of the software SEAL are available with detailed manuals.

The data storing and converting systems utilized in the past four projects owed much to the effort of our colleagues, Susumu Sato, Takashi Matsue, Takako Hashimoto and the late Professor Nobuhisa Tsuji.

2. Aim

Based on the four previous projects, the present project endeavors to establish a newly developed computer system, which we call "PHD". It covers all necessary tools for geographical studies: data storing, map drawing, map exhibition and web-site. The techniques and the procedures will appear on the second paper in this volume. The dialect materials we use in this project are mostly the descriptive studies so far published in China while some limited amounts of data are available from our colleagues who carried out their own surveys.

The final target of this project is to realize the idea of the late Father Willem Grootaers on Chinese dialectology (Grootaers 1948, 1994, 2003), which had been put into practice in China as early as the 1940's but eventually failed to find its successors in modern China. After the 1950's, Grootaers's ideas and his proposals were brought into Japan and bore good scientific fruit, the Linguistic Atlas of Japan (LAJ, 1966-1974). In line with this tradition, we will study the Chinese dialects from the following perspectives.

1) To study the history of each word (or each linguistic feature)

The linguistic maps provide us with first-hand knowledge about regional differences, but more importantly they will serve for reconstructing the history of words (Shibata 1969). In this study, researchers should be aware of "the linking up of the words with their objects, i.e., the study of the material and spiritual culture as it is reflected in the vocabulary" (Grootaers 1948, p.3). Being gifted with the largest amounts of written documents accumulated for thousands of years, Chinese linguistics is privileged to enjoy the linkage of words with written records. But what these records tell us is just the tip of an iceberg, and it is our linguistic maps that will tell much more about the true history of Chinese dialects, which maybe more or less different from the image that philological studies determined so far. China has a good tradition of etymological study, as represented by the great philologist in Qing Dynasty, Cheng Yaotian (程瑶田), but there is still a myth among modern Chinese linguists. They seem to believe that the reliable sources for historical reconstruction are only those dialectal forms that have their correspondences in written documents and that others are worthless (Iwata 1995a). This presupposes continuity in the evolution of Chinese, but we will find in our maps much evidence that is contradictory to such a presupposition (Grootaers 1946, p.231).

2) To contribute to a general theory of linguistic change

The name for "dragon fly" was replaced by that for "sorghum (gaoliang)" in the Dunhuang (敦煌) dialect; the name for "fly" was changed to that for "mosquito" in a lot of localities in the southwest China such as in Hu'nan, Guizhou and Sichuan; a body part "knee" is called "monkey head" at some localities in Zhejiang and is called "lid of arm" at some limited localities in northeast Jiangsu. These seemingly weird forms are just the outcomes of occasional happenings in the world of Chinese dialects, and these forms themselves have no relevance in terms of general linguistics. However, what have been at work here must be the same linguistic factors as Gilliéron and his successors discovered in Europe and Japanese linguists discovered in the process of producing LAJ, namely, folk-etymology, homonymic clash/attraction. Grootaers (1948, p.16) said, "To put it paradoxically, the most peculiar point in the study of Chinese dialects, is the necessity of stressing less the peculiarities of the Chinese language, and of applying more the linguistic methods known elsewhere". The readers of the best text book, Dauzat (1922), will know how the unexpected changes were motivated and implemented in French dialects, and how the endangered forms were remedied owing to the unconscious wisdom of speakers. In the meanwhile, although Chinese dialects may have their own peculiarities, our Chinese maps are expected to reveal the universal mechanisms that operate in producing the linguistic changes.

3. Terminology and some controversial issues

It seems that there are disagreements on the usage of some terminology among scholars in Chinese dialectology, and it may be worth referring to them in order to identify the domain of our project and to clarify our fundamental ideas.

1) *Linguistic geography* is a term which has been widely accepted in the field of traditional linguistics. Cao (2004) proposed the term *geographical linguistics*, but he intends to cover more domains than ours in his ambitious project. As mentioned above, our studies will be solely directed to contributing to historical linguistics.

2) The terms *Demarcation* and *classification* had better be discriminated, since classification need not accompany demarcation. It is beyond our scope to delimit the dialect boundaries, rather each isogloss deducible from each map will indicate a sort of boundary separating two or more areas. It should be noted in this connection that the demarcation appearing in the volume "Language Atlas of China" (1987) is in principle based on minimally selected phonological items, such as development of muddy initials and that of entering tone. Our attention should be directed to finding the bundle of isoglosses running close to each other, and based on this, the next step would be to study the origin of the boundary by taking historical and extra-linguistic evidence into account (Grootaers 1945, Zavjalova 1982, Iwata 2000a). Motivated by

Grootaers's studies (Grootaers et al. 1948, 1951) as well as by the *Hirata* project cited above, we are now proceeding to do a tentative survey on some folkloric items such as marriage and funeral ceremonies.

The dialect classification will be one of our possible targets *if* quantitatively enough linguistic data are available from our database. This task should be performed in historical perspective, similar to how it is done in biology and genetics.

3) The term *dialect* as it appears in the literature is employed in various senses. In conventional usage, it frequently refers to such dialect groups as Mandarin, Gan, Xiang, Wu, Hakka, Yue and Min, though scholars have failed to show reliable evidence in proving the existence of such dialect groups except for Min. In linguistic geography, it mainly refers to the language that is spoken at the lowest administrative unit: local village or town, where a unified speech community is supposed to be maintained and the traditional local dialect has been preserved (Iwata 2002). But in the present project, the dialect materials available are mostly those of county seats (xiancheng 县城), and the dialects spoken there are more or less influenced by the mixed urban population. This is an inevitable contradiction in this project, but the materials at our hands will hopefully be good enough for our exploring the long history of the words. Cao Zhiyun (曹志耘) and his colleagues, in accordance with the survey by Grootaers and his students (Grootaers 1958), made a good choice of carrying out their surveys in local villages instead of county seats (Cao 2004). Their surveys are of the greatest importance since the traditional local dialects which have been preserved everywhere in China until now are very likely to disappear or to be deformed sooner or later.

4) *Socio-linguistics* is beyond the scope of this particular project, but it opens up into further research. Firstly, the local center of each county is a good laboratory where researchers may have an easy access to socio-linguistic phenomena (e.g., Iwata 1983, Su et al. 1985). Secondly, even the language in a local small village is not necessarily uniform and there exist idiolectal differences among the speakers in terms of such factors as age, sex and career. In this respect, Japanese dialectologists have an advantage in research method, which they call "glottogram" (not that utilized in speech physiology!), and recently I heard that some of our colleagues, Mitsuaki Endo and others, would apply this method in surveying Chinese dialects.

5) The term *language contact* is self-evident in linguistic geography, which presupposes the transmission of linguistic features through the daily contact of the people living in neighboring localities. *A word could travel from one place to another.* For example, in case of the kinship term "ye 爷", it is assumed to have originated somewhere in the eastern Central Plain (中原) and later to have been transmitted to as far as Fujian, presumably via the Jianghuai (江淮) area (Iwata 2000b). There could be two ways for each word to travel: one is to walk slowly and continuously from village to village; another is to be conveyed by immigrants or traders from

one place to another, skipping the intermediate large areas. As a matter of fact, the former is a more frequent manner of linguistic diffusion even in China, where massive migration frequently occurred throughout its long history. A crucial problem is that Chinese dialectology has underestimated or even has ignored this particular evidence. Instead, scholars have overestimated the factor *migration* or even have considered it as a sole contributing factor to the formation of the present dialect distribution (Iwata 1995b, pp.222). This is apparently a fragile assumption. Suppose that a lexical form "A" distributes in a certain area in the north and the identical form emerges somewhere in the south, with the intermediate large area covered by the other form "B" (so called "ABA" distribution). Logically, there are at least three assumptions for accounting for this distribution:

(1) Southern "A" was the result of immigrants' or traders' introducing the word(s) directly from the northern area, or vice versa, without introducing it into the immediate zone.

(2) The form "A" once formed a geographically continuous distribution from north to south by a gradual spreading, but later it was replaced by the form "B" in the intermediate areas.

(3) The words of northern and southern "A" are due to the accidental innovation in each area.

The migration theory merely points to one of these three possibilities, and we are not qualified to accept the assumption (1) unless a detailed study on migration history proves it true. Moreover, even in the case that sufficient data are available for confirming the origin of the population, the influence of language contact introduced by immigration should not be overestimated, because the usual result is for the immigrants to conform to the original dialect (Grootaers 1945, pp.420-421).

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Introduction to the PHD System

Tomo Hayashi*

1. Overview

1.1 What is the "PHD System"?

The *PHD System* is an integrated environment for our project entitled "Project on Han Dialects (PHD)". It provides the most useful and the latest technology-based software environment for the geographical research of Chinese dialects.

The PHD System is composed of one server ("PHD Server") with various software running on both it and the clients' personal computers.

The main purpose of the PHD System is the following:

a) Accumulation of linguistic data

For the database, we accumulate and digitalize valuable information on Chinese dialect research, including linguistic data.

The linguistic data is defined in our system as the digitalized language information, including lexicon, phonetics and syntax, which are specified with reference to localities and data sources.

The linguistic data are arranged and input into the database item by item, e.g., 'sun', 'moon'. Digitalized data can be retrieved for producing the linguistic maps by using the client application or the WEB service application. The data can also be cross-searched across different items.

b) Production of digital dialect maps

The most important function of the PHD System is to produce digital linguistic maps. Using the client application, our colleagues can create, edit, browse, publish, and present digital linguistic maps according to their individual purposes. Moreover, the released maps are immediately registered onto the map database, so that we can utilize these maps in producing new maps. Also, we can refer to plural maps that can be compared with each other. Also, the released maps are automatically published on website.

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c) Publication of digital and paper maps

One of the most useful functions of our system is a digital publication. *Publication* here not only refers to paper publication, but also means that the dynamically-generated digital 2D/3D map image or GIS (Geographical Information System), which can be obtained through networking with users' (and guests') PC and by using a client application or a common internet browser.

We also will provide colleagues with the CMS (Contents Management Service) to manage written documents. This service is related with the map publishing module, by which, in the future, we will be able to automatically construct a more advanced and more useful website without any labor.

d) Sharing research information/data through network

The PHD System is designed on the assumption that almost all research products can be processed through the network from the very beginning. It means that all research information, including resource data, linguistic data, digital maps, and written documents are shared by researchers or some guests. All information and data will be updated successively, so that users can utilize the newest data at all times. Digital maps browsed on the client application or the website are created dynamically, and if the linguistic data are modified, dynamic digital maps are changed according to the newer linguistic data.

1.2 Features

1.2.1 XML-based System

XML (eXtensible Markup Language) is one of the most popular and simple file formats, and XML is currently in the process of becoming a global standard file-format. XML is able to describe user-defined meta-information, to transform other file-formats by using XSLT (XML Stylesheet Language Transformations), and to perform interprocess-communication between multi platform applications by using SOAP (Simple Object Access Protocol). These mechanisms and technologies provide a lot of technical advantages in our processing the Chinese linguistic data accumulated in the system.

The most important reason for our adopting the XML format is to resolve quickly and smartly the way it corresponds to the complex procedure of data processing. In addition, the data in our system must be able to be transformed to other data formats (e.g., HTML/PDF), to be described in the Unicode string data, and to be read and written in many development languages (e.g., C++/JAVA/PHP/ActionScript). Using XML is the best solution for these purposes.

Almost all of the data in the PHD system, including resource data, linguistic data, map data, documents, system information and WEB pages, are described by XML, and they can be interchanged between the server and the client application in the XML format required (the XSLT

parser transforms it).

1.2.2 Construction of Database

In our previous projects on Chinese dialects, the linguistic data have been accumulated in text format or in Microsoft Excel format. In the present system, these data are divided and input into several databases. By this regularization and optimization, we can ensure the safety of synchronization of linguistic data. All databases operate individually, so that each database can be used independently. Since the databases are not SQL but XML-based, they can reasonably describe such data as locality variations and the lexical data, which have a multi-tiered structure.

1.2.3 MVC Architecture

The MVC Architecture is one of the most powerful architectures in software development. It suggests that we can develop a useful application by separating it into three parts: the model, the view, and the controller.

The PHD System is also implemented in compliance with this architecture. Namely, the data in MapXML is described only by logically binding rules in the process of map production, and no application-dependant data are needed. As a result, the linguistic map in the PHD System can be easily transplanted into other platforms. In addition, these data do not control the map view, so that it is free from how the clients draw the linguistic map. This will make it possible for the client software, such as the map production tool, the drawing script in the WEB site, the paper publication tool and the 3D Visualization software, in order to facilitate drawing various maps in different situations and different operating systems.

1.3 Software Environment of the PHD System

The operating system of the PHD Server is Linux (Fedora Core). A number of server applications used by the system are installed in this server, e.g., Apache HTTP Server, Jakarta TOMCAT, JAVA, PHP (HyPertext Processor).

All data management client applications for the PHD research members are Unicode-based Microsoft Windows application written by C++. They are MSXML(Microsoft XML parser), WinHTTP 5.1 (the latest version of Microsoft HTTP communication component), Microsoft GDI+ (a set of new APIs of Microsoft Graphic Device Interface) and Microsoft DirectX (a set of low-level APIs for high-performance multimedia applications). Users should download and install these additional components from the Microsoft WEB-Site.

The access to the PHD Website from an internet browser is possible from any platform, but it is necessary to install Macromedia Flash Player to browse the dynamic contents that use Macromedia Flash in the PHD website.

2. Architecture of the PHD System

2.1 Dataflow

Description of basic dataflow in the PHD System

2.1.1 Modifying linguistic data

First, the linguistic data are input by colleagues. The linguistic data manager *Roots* does this task. The users access the PHD Server and receive the linguistic data, adding, modifying and deleting the data by using this software. The new or modified records are sent to the server and are updated immediately once the "Save" button is clicked.

2.1.2 Modifying map data

The next step is to produce the digital map. The map drawing tool *Wonderland* serves this purpose.

To create the new digital map, users are requested to choose one or more sets of linguistic data, then, the client application requests the server to send the linguistic data.

To modify the existing digital maps, users are required to choose a set of access-permitted digital map data, which are, then, sent by the server.

After modifying the digital map data, users send the renewed map data to the server.

2.1.3 Visualizing digital map

Finally, the application *Tamayura* or *RISE* serves for visualizing digital maps. Users are required to choose any one of the digital map data (Map Binding Rule XML or Static Map XML), which are sent by the server. Then, the client application draws the digital map based on the received map data.

Users can also browse map images on their websites. In the meanwhile, the visualization script draws the map inside the server and sends the rasterised image to the browser.

Throughout these processes, the security module in the PHD server refers to the information in the user account management service and the meta-information about access permission specified by an author as described in the digital map. It also controls the permission of digital maps. To put it concretely, when a particular client requests the index of digital maps existing on the map database, the PHD server sends back the index of access-permitted digital maps. In this way, an author can control the permission and privacy of their own maps.

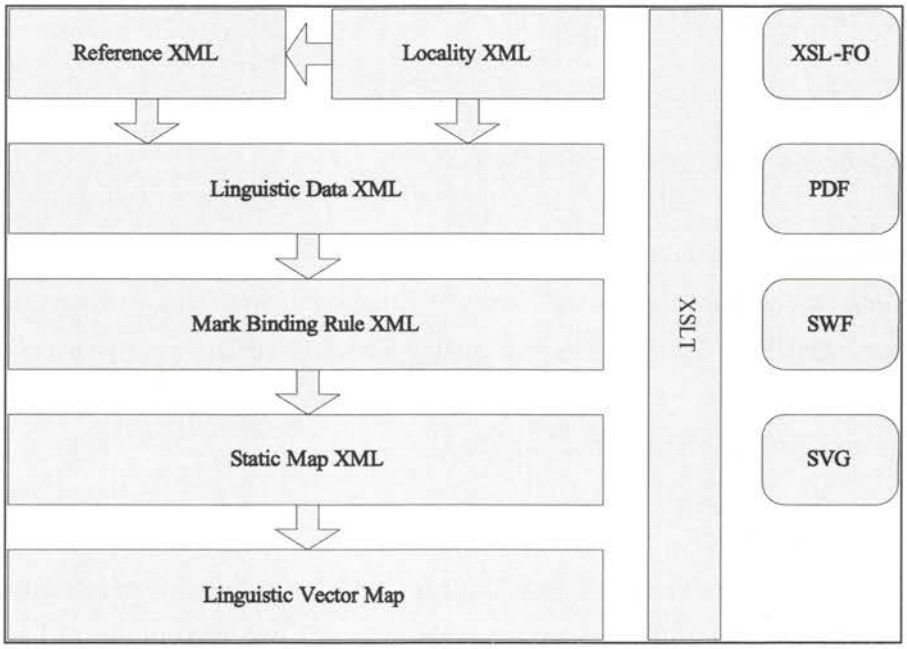

Fig. 1 The Dataflow of the PHD System2.2 WEB Interface

All Data inputs/outputs through the network are processed by way of the WEB interface module. This module works as a front-end server, and all client applications as well as some server scripts retrieve the data to this module.

2.3 Database

Substances of the databases in the PHD Server are numerous raw XML data and access modules. It is implemented as a back-end server, and generally the front-end server requests data as occasion demands.

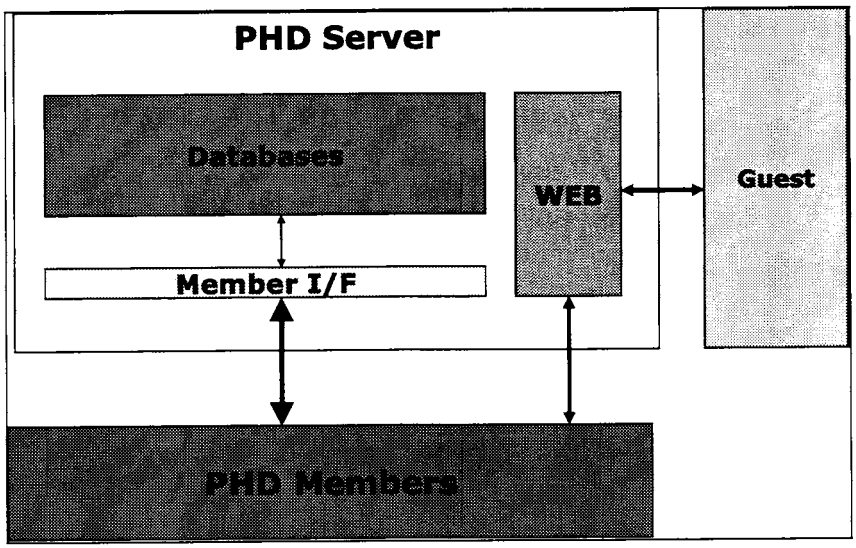

Fig. 2 WEB Interface and Database

2.4 Linguistic Data Specification

The linguistic data in the PHD System is a sort of raw XML data. Schema of this XML has two sections as the child of root elements. The first section is a meta-information node that includes the name of the map, the unique ID of the author, creation date, etc. The second section is the records of linguistic data. These nodes have a set of reference pointers corresponding to the Reference Database record, the Locality Database record and the linguistic data-set containing the information on lexical, phonetic and syntactic features.

The following text is a sample of the second section of the linguistic data "knee".

```
- <Record>
    <Reference>002320</Reference>
    <Locality>X0010700</Locality>
    <Modifier>Yantian</Modifier>
-   <DataSet>
      <Artic>Ⅳ Ⅱ Ⅲ</Artic>
      <IPA>kɤ tiŋ kɐr</IPA>
      <Hanzi>圪顶盖儿</Hanzi>
    </DataSet>
-   <DataSet>
      <Artic>Ⅳ Q Ⅲ</Artic>
      <IPA>kɤ liŋ kɐr</IPA>
      <Hanzi>圪灵盖儿</Hanzi>
    </DataSet>
  </Record>
- <Record>
    <Reference>001458</Reference>
    <Locality>X0018101</Locality>
  <Modifier>Yantian</Modifier>
- <DataSet>
  <Artic> Ⅰ a Q Ⅲ</Artic>
  <IPA>kɤ lə par</IPA>
```

Fig. 3 The second section of the linguistic data "knee"

2.5 Map Data Specification

There are two kinds of map data formats in the PHD System: one is "Map Binding Rule XML" and the other is "Static Map XML".

"Map Binding Rule XML" is described by using logical rules for creating the maps. It has some group nodes which relate to each other. The group node has its parents and some filters.

Group and Filter classes inherit the same basic class. This class has the input/output pins as well as the various procedures for processing linguistic data. This class is similar to the filters in *Microsoft DirectShow*.

The ancestor of Group class is either the Linguistic Data XML or the other Group class. When a Group class receives the linguistic data from the ancestor, they are sent to the first child filter. Then, all filters process linguistic data. Once the outputs from the last filter are sent to parent Group class, the outputted linguistic data of this Group class are determined. Group class can also have mark information, by which the symbol (stamp) for each Group class is specified on the digital map.

Filter classes set in Group class are various. For example, Regex (REGular Expression) Filter class uses a kind of matching rule of strings for filtering the linguistic data. Suppose that the expression input by the user is the Chinese character "鸽子" ('pigeon'), only the data of the string including "鸽子" are sent to the next filter, but those not including "鸽子" will not be sent.

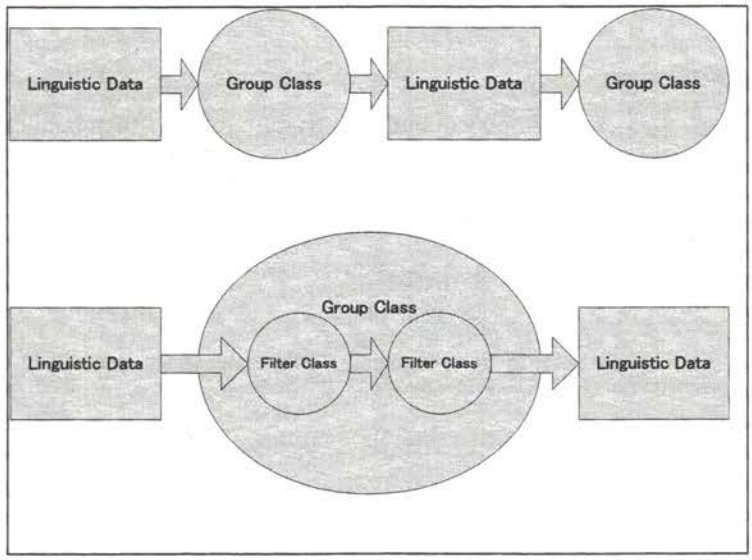

Fig. 4 Procedure of the Group Class

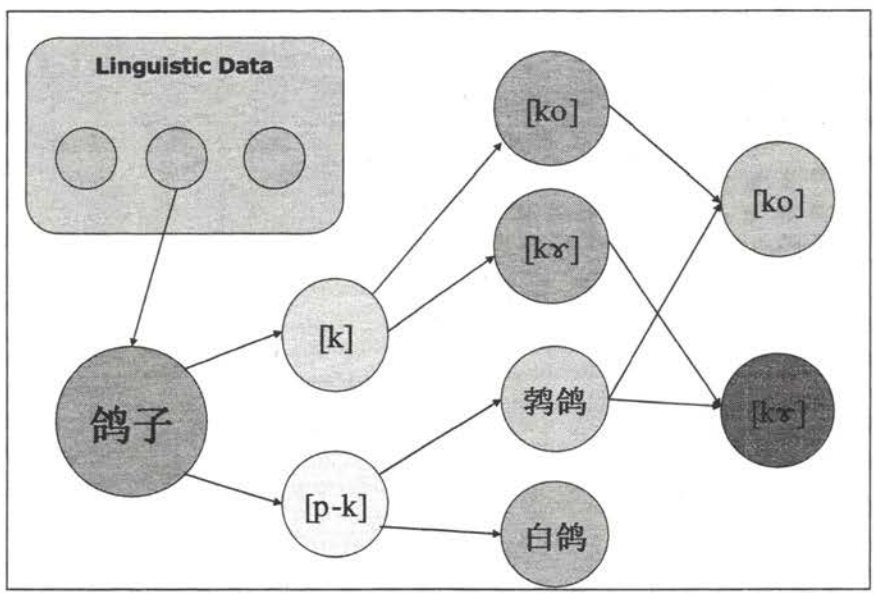

Fig. 5 Inheritance of the Group Class

Static Map XML does not have any logical structure inside it. It only contains the locality information and the mark information concerning the shape, color, and size of the stamp. Therefore, one can quickly draw the map by using this format and the file-size is very small. Also, it is very easy to exchange with another file for publication purposes. This format is used in the final stage of drawing maps on the client application as well as for publication purposes.

The following text is a sample of Map Binding Rule XML.

```
- <Group>
  <Name>鴿子</Name>
    <GUID>{8E7F0E6F-B017-47F3-9C31-F152DD846BF0}</GUID>
    <ParentGUID>{5B03FB0C-F51E-478C-BC61-43E85BD27ECC}</ParentGUID>
    <MarkNumber>-1</MarkNumber>
    <MarkColor>0</MarkColor>
    <MarkSize>1.000000</MarkSize>
-   <Filter>
        <Name>正規表現フィルタ</Name>
        <Regex>鴿子</Regex>
        <Number>0</Number>
  </Filter>
 </Group>
 </Groups>
```

Fig. 6 A sample of Map Binding Rule XML

3. Introduction to the PHD Server

The PHD Server is the infrastructure of the PHD System. It also serves as the information center which releases many web contents such as digital maps, internal reports for PHD members, and public information for outside guests.

All responses received by clients are sent from Apache HTTP Server or Tomcat.

3.1 Databases

There are a lot of databases in the PHD Server. These databases are working as the back-end server, and many server modules and client applications can have access to them through the local communication module or the network socket.

The followings are representative and important databases, besides those for running such a system as User Account Database.

3.1.1 Resource Database

The Resource Database contains any fundamental data which can be referred to by other data or modules in our system.

In addition to the system database that contains the data used for processing basic functions, we have two important resource databases. One is the Reference Database, and another is the Locality Database.

The Reference Database stocks the data source information. Each record in this database contains in its description the information on data source (bibliography) and a list of pointers to each locality. As the first step, we built this database on the basis of some tabbed text format lists created by us in the past. These string data were optimized and transformed through the reference data parser to multi-tagged XML format texts, which are described in the Unicode string. Now users can browse, add and modify the data in the Reference Database through network.

The Locality Database contains geographic information of China. This database is composed of some child databases that have hierarchical structure. Each record in these child databases stocks various useful data, which are constructed on basis of open-published database downloaded from several geographic research organizations in China as well as in the United States. These GIS data describe administrative hierarchy(省级,地级,县级,乡镇级), variants of name, longitude and latitude for each locality, and contains multi-layered vector maps, DEM(Digital Elevation Model), satellite pictures, etc.

3.1.2 Linguistic Database

The Linguistic Database contains linguistic data. Currently, it comprises about 200 linguistic items. These data are managed by using "ROOTS" (Linguistic Data Manager), and referred from "Wonderland" (Digital Map Production Tool). In addition, some server modules use this database. For example, if the map drawing module of Content Management Service generates static map, the module requests the necessary linguistic data, then the database send it back to the module.

3.1.3 Map Database

The Map Database contains digital maps created by PHD members.

These maps are stocked as the Map Binding Rule XML in this database, and when a client requests the Static Map XML of a particular digital map, the transformation module of the interface ingenerates the Static Map XML from the Map Binding Rule XML and send it back to the client.

3.1.4 Document Database

The Document Database is a kind of document repository. Any author can upload related documents onto this database, and the Content Management Service of our server automatically publishes it in website. The database can import the documents in several formats (e.g., Text/XML/Microsoft Word Document), and can transform them to XHTML and PDF.

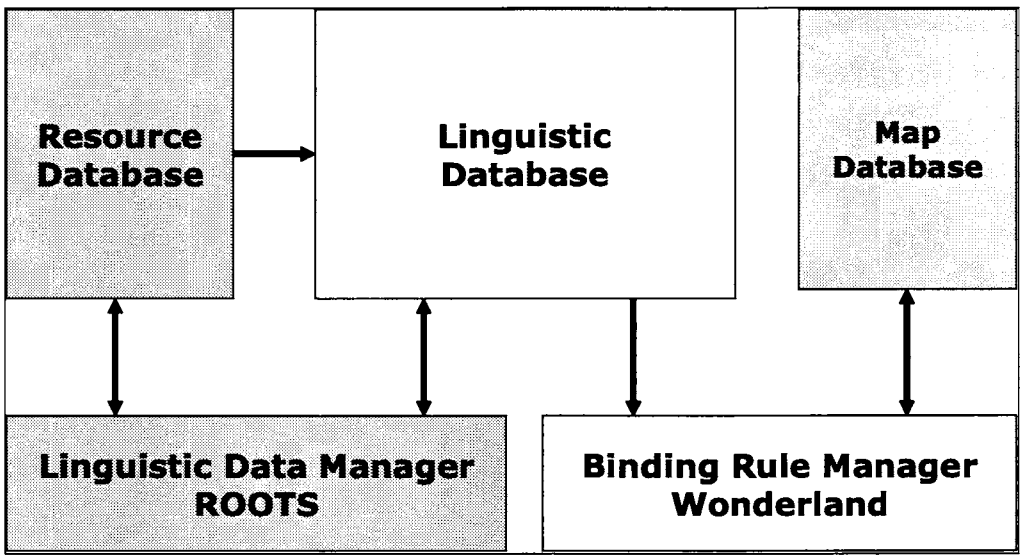

Fig. 7 Databases and Client Applications

3.2 Network Service

The PHD Server provides us with many network services. But "Network Service" here does not mean general network services. Instead, it means the services provided for general HTTP clients,

such as internet browser (e.g., Microsoft Internet Explorer) on our website.

One of the most important network services is Digital Map Publishing Service. This service generates web pages and rasterised digital maps dynamically, and any guest can search and browse it. It is a part of Contents Management Service (CMS).

Also, there is a very useful service called Web Database Service. This service provides us with the interface for searching and browsing any databases from the internet browser.

3.3 Contents Management Service

Contents Management Service (CMS) is one of most important publishing functions in our project. In the past, to publish means to print papers, but now releasing web-pages and databases becomes important. This service provides us with the dynamic-generate function of web-pages which are generated from our databases, resources, documents, and user feedbacks.

A fundamental generation method of this service is transformation of XML documents. All data in our project can be read in XML format, and the generation module transforms XML by using XSLT (XML Stylesheet Language Transformation) or by using any other original parsers. In case CMS generates XHTML (one kind of XML), the module uses XSLT only. In case the service generates PDF, it first transforms the data to XSL-FO (XSL-Formatting Objects), which, then, is transformed to PDF. In case the service generates the rasterised digital map, it transforms the logical map XML to the static map XML, which then is rasterised by the drawing module.

Of course, these processes automatically proceed, so that it is not necessary for the authors to consider how to do web publishing.

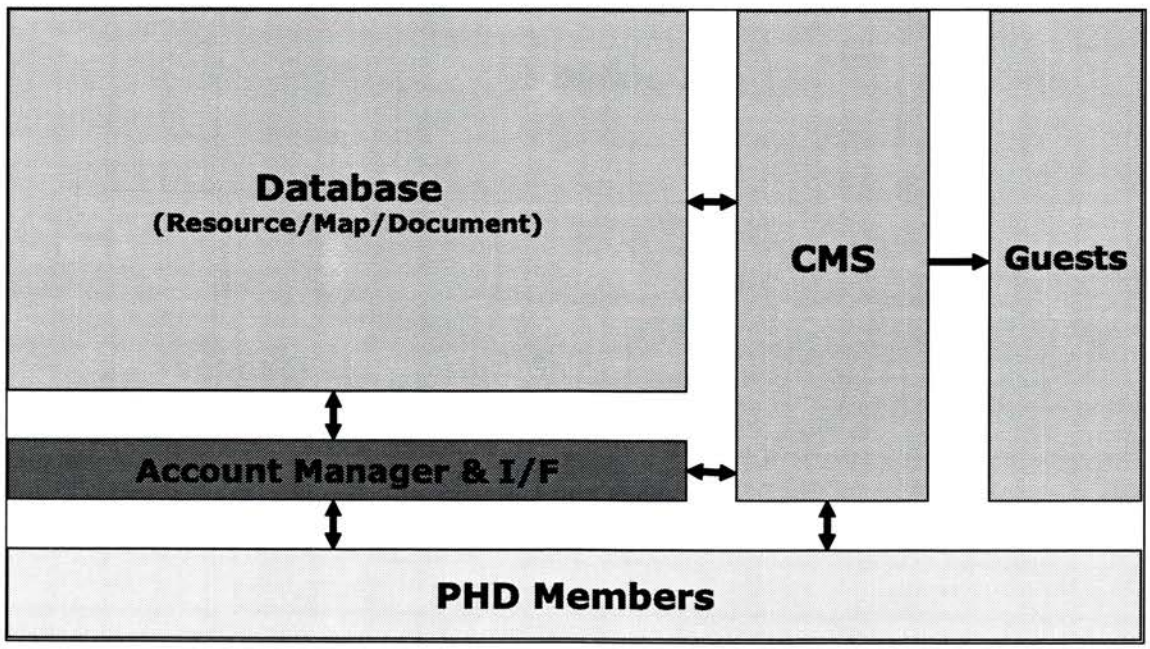

Fig. 8 Network Services (including CMS)

4. Client Applications

In this project, we are going to develop several client applications running on the members' and the guests' personal computers. These applications can be downloaded from our website. Only the PHD members can use them, with the exception of the visualization application.

4.1 ROOTS: Linguistic Data Manager

ROOTS is a client application that manages linguistic data in the PHD server.

ROOTS can add, modify, and remove linguistic data in the PHD Server through the network.

ROOTS has some particular functions for editing linguistic data. The auto filtering function allows users to search records more easily and quickly. The IPA input tool allows users to effectively input the IPA fonts defined in the latest Unicode. Also, users can customize the input-pad by themselves.

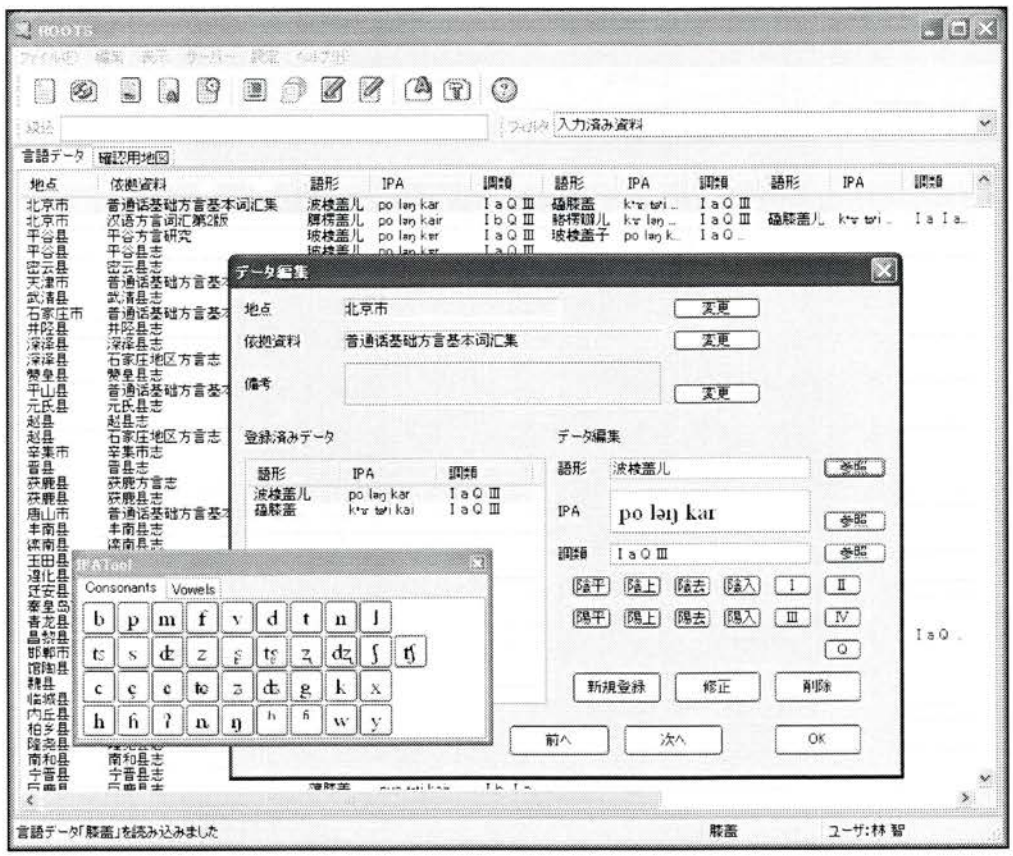

Fig. 9 A screen-shot of "ROOTS"

4.2 Wonderland: Map Production Software

Wonderland is a client application that produces digital linguistic (and other) maps.

Users can create and modify various digital maps on the PHD Server or on the local hard-disk. The substance of the digital map is a simple XML format described by several group definition rules as well as by the mark binding rules that determine the logical structure of the map.

Wonderland has also the simplest visualization and printing function.

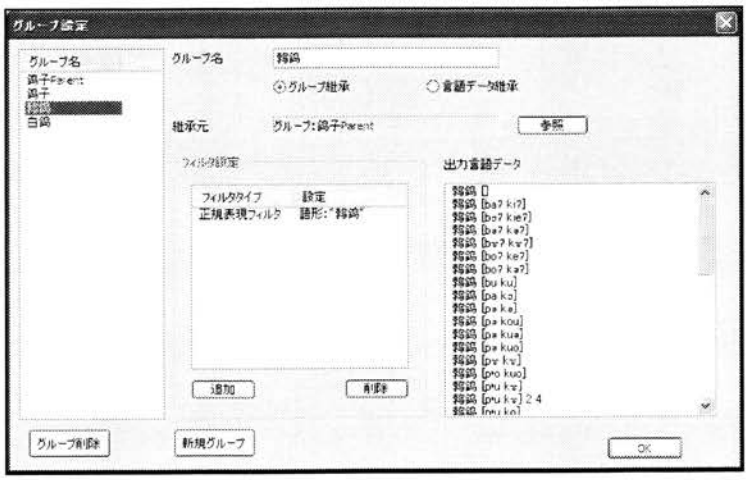

Fig. 10 Group Class dialog box of "Wonderland"

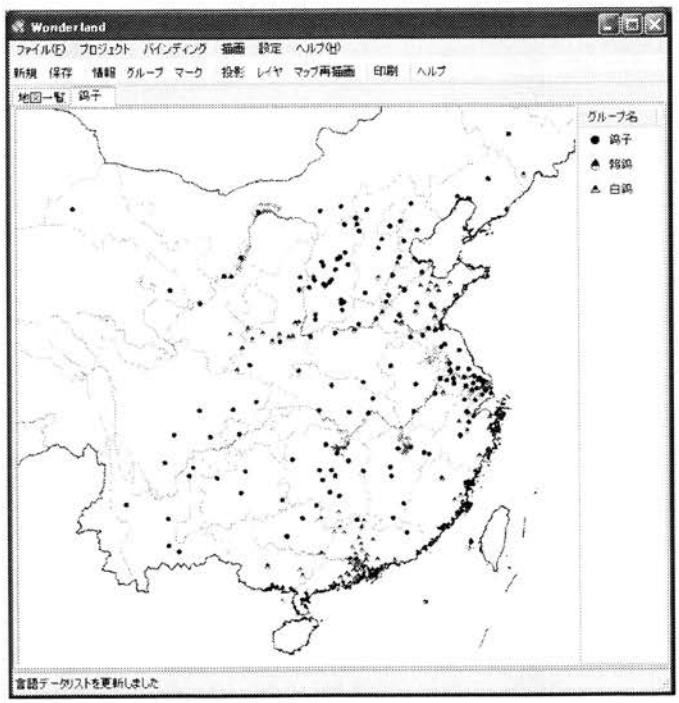

Fig. 11 The result of the map drawing module of "Wonderland"

4.3 Tamayura: 2D Map Visualization Software

Tamayura can visualize the 2-Dimensions vector map from the logical map or the static map. By using Wonderland, users can produce the logical map and send it to the Map Database in the PHD Server. The logical map in the PHD Server can be transformed to the static digital map. Tamayura can download these network static maps or read local static maps, which then are drawn and printed out.

The visualization modules of Tamayura have the most powerful drawing functions. It can draw various series of 2-Dimensions maps. Users can control its projection settings. Also they can select appeared layers, and modify supplementary items such as explanatory notes.

The following image is a sample output result of the basic drawing module used by "Tamayura". Since this module was developed for the drawing tests which were carried out in spring 2004, only administrative layers and hydrographic layers appear on this image.

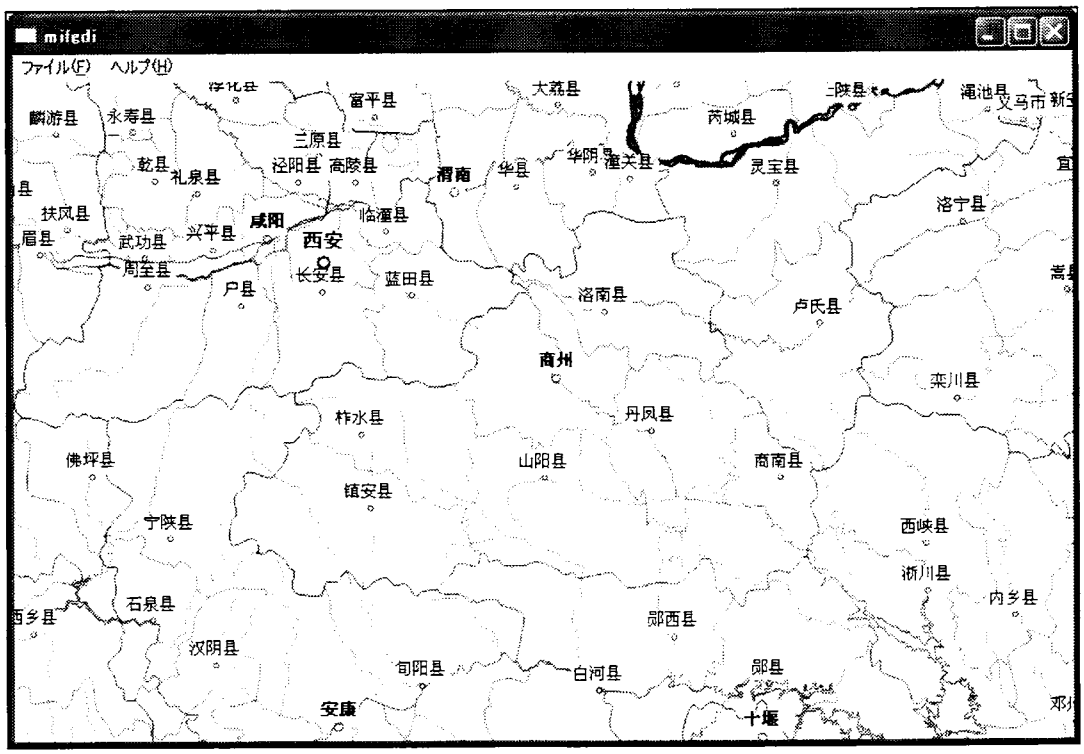

Fig. 12 A sample output result of the basic drawing module

4.4 RISE: 3D Map Visualization Software

RISE is a map visualization software which function is similar to Tamayura. But this application is specialized as the 3-Dimensions visualization of the digital map. This application draws maps by using DirectX and DEM.

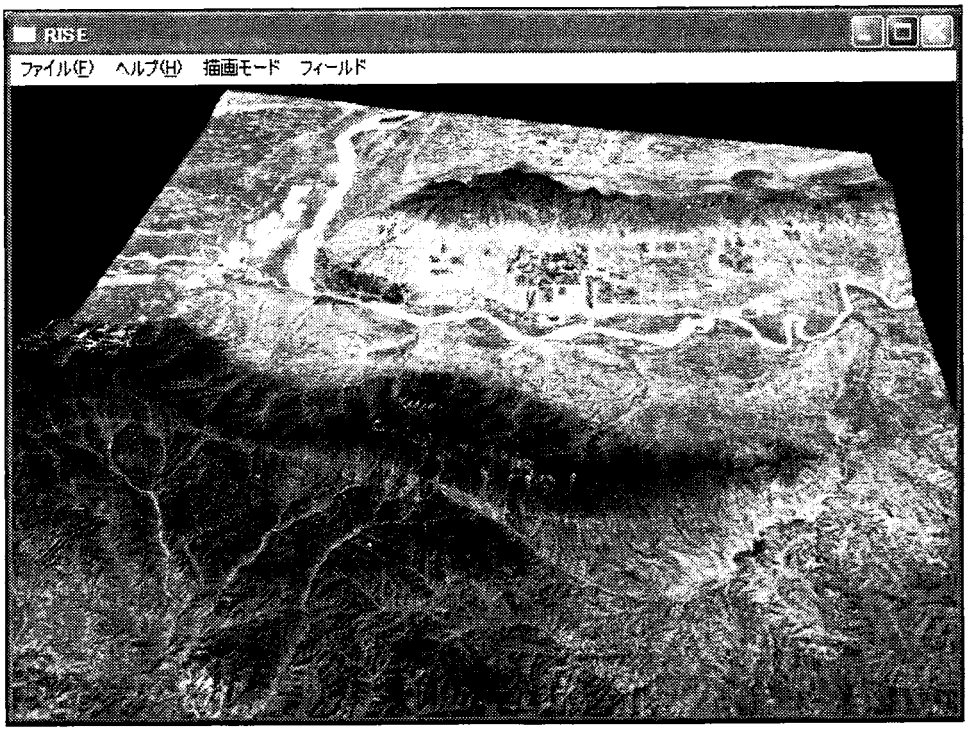

Fig. 13 The output result of the layer drawing module of "RISE"

方言地图的解释及其意义：以〈膝盖〉的方言地图为例

岩田　礼

0. 前言

本文试图构拟汉语〈膝盖〉一词的历史演变。主要的根据是方言地图，有必要时才根据文献资料补充论点。我们认为，文献记载只能偶尔露出常用词历史演变的若干片断，而详细的方言地图能提供全面的资料，用以构拟出十分详细的变化过程。

有些词汇项目，词形种类不很多，一张地图就能够表示出全面的分布情况，如“下雨”、“眼睛”、“走”等。象〈膝盖〉这种词汇，词形种类上百，不好用一张地图表示出全面的情况。我们常用的办法是着重某一个词素或语言特征。本文则以六张地图说明问题。

本文的内容一定程度已在三篇拙作中(岩田 1986,Iwata1995,岩田 2000)讨论过。近几年来，我们信息库中有关〈膝盖〉的资料大量增加，目前已经积累了大约 1,100 个方言点的资料(其中大约 30%仍缺少音标)。本文在这种基础上重新考察〈膝盖〉一词的历史。

1. “膝”的语音形式

首先假设，汉语方言〈膝盖〉(knee)义的最古老的形式是单音节的“膝”。这是一种凭常识的假设，严格地说，还缺乏一点科学根据。首先，在我们的地图上不出现单音节的“膝”。但这个事实好解释：最古老的形式是单音节的“膝”，而它后来由其它形式(如，“膝头”、“膝盖”)代替。第二，有些汉语方言有可能在历史上从来没用过词根的“膝”。这个问题，待下文进行讨论。

“膝”的中古音值为*siĕt，上古音也基本相同。在现代汉语中，有很多方言点“膝”的读音不符合语音变化的规律。首先是声母。请看**[地图 1]**。“膝”字是心母字，擦音的[s],[ɕ],[ɬ]合乎语音变化的规律而塞擦音的[tɕʰ],[tsʰ],[tɕ],[ts]都不合乎规律。从地图可以看出，擦音和塞擦音的分布都遍及全国。为何产生了这种现象？有两种可能:

1) “膝”字在早期的汉语方言中就有擦音(*s)和塞擦音(*tsʰ)两种系统并存(或者说，曾存在声母读塞擦音的强势方言)，而文献记录只保存下来擦音系统的字音。
2) “膝”字在早期的汉语方言中只有声母为擦音的一读*siĕt 而这个词素却与某一个词素 X 发生了同音冲突，以致声母变读为塞擦音。

方言口语词当中的“膝”字，也有韵母或声调不符合语音变化规律的。譬如，长江中游(湖北东部、安徽西部、江西北部以及湖南东部)分布着声母为[s]而韵母不合乎语音变化的规律的。有的报告将它仍写作“膝”而有的写作“色”。

湖北・红安县 sɛ tou (色头)　*县志(《普通话基础方言基本词汇集》写作“膝头”)

湖北・英山县 sɛʔ ku lau ɔr(色骨老儿)　*陈淑梅《湖北英山方言志》

江西・南昌县 sɛt tʰɛu kei tsʅ(色头盖子)　*县志

江西・临川县 set t^hɛ:u(膝头)　　*罗常培《临川音系》

这些词的第一音节，声调均为入声，其词源肯定是“膝”。至于“膝”字的字音，声调都为入声，但其元音都是[i]，如，红安和英山都为[$tɕ^h$i]，南昌县和临川都为[ɕit] 。据《南昌方言词典》，南昌市区叫〈膝盖〉为[k^hiɛt ɕit]，后字正是“膝”字的规则形式。对此现象，可以提出两种解释：

1) “膝”字韵母的主元音为[e]或[ɛ]的是属古老层次的而主元音为[i]的则属新的层次。参看 Sagart (1993)。
2) 这是“膝头”(*siĕt dəu)和“舌头”(*ʑiɛt dəu)发生了类音牵引所致。譬如，在下列方言中，“膝”和“舌”的韵母完全相同了。

湖北・通城县 [seʔ diau kəŋ](色头拱) / [seʔ tiau](舌头)　*刘国斌《通城方言》

江西・奉新县(冯川镇) [sɛt t^hʌu kuit li](口头骨仂) / [sɛt t^hʌu] (舌头)　*刘纶鑫《客赣方言比较研究》

“膝”是阴入字而“舌”是阳入字，奉新还保留这种区别。通城不分阴入和阳入，〈膝盖〉义的[sɛt]和“舌头”义的[sɛt]完全同音，但“头”字却形成了清浊之别(d/t)。除此之外，通城加上了[kəŋ]，奉新加上了[kuit li]两个音节，这也可以看做方言回避同音冲突的措施。

2. 特殊词形：通俗词源

方言的说话者富于创造性，往往创造出令人惊讶的词形。对此有贡献的主要是“通俗词源”(folk-etymology)。从普通语言学的角度讲，一个语言形式和它的所指的关系本来是任意的，也是约定俗成的，但是老百姓总是无意识当中要把形式和它的所指关联起来；象“牛”、“马”、“水”、“风”之类的常用词自古以来根本没受通俗词源的影响，因此一直没发生方言词形的分歧；象“膝盖”、“踝子骨”、“蜻蜓”、“蟋蟀”之类的常用词则与此不同，经常由通俗词源变形，以致产生上百的说法。但是需要指出，通俗词源不一定都是说话者的任意创造而往往是语音本身就含有内在成因。譬如，山西有不少地点“膝盖”变成了“地跪”(参看**[地图 2]**)。这很可能“跪下接地”的形象得来。但是如比较“膝盖”和“地跪”的语音，就可以知道语音在变化的前后没发生太大的变化。

太原市 [kəʔ $tɕ^h$iəʔ kai](圪膝盖) / [kəʔ ti k^huei](圪地跪)　*沈明《太原方言词典》

清徐县 [kəʔ ti k^huai] (圪地跪)　*侯精一、温端政《山西方言调查研究报告》

[地图 1]也表示出若干特殊词形的分布。举例(N 表示前面元音的鼻化成分)：

“娘舅”类：江苏・吴江县(黎里) [nɹiɛN dʑiɯ](娘舅)　*钱乃荣《当代吴语研究》

“猢狲头”类：浙江・义乌市[ɦu sɯɤ dəːn](猢狲头儿)　*方松熹《义乌方言研究》

浙江・淳安县[hɯ sa t^hɯ](猴狲头)　*县志

安徽・歙县[u sʌN t^hiʊ](猢狲头)　*《安徽省志・方言卷》

“猫头”类：浙江・桐庐县 [mɔ de](猫头) *《桐庐方言志》

江西・广丰县 [mɑɔ neiŋ teɯ](猫口头) *秋谷裕幸《吴语江山广丰方言研究》

福建・永泰县[ma li lau](猫利头) *县志

“汤瓶盖”类：浙江・建德县(寿昌)[t^hɑN p^hien kie]汤瓶盖 *曹志云《严州方言研究》

“和尚”类： 四川・乐山市 [ho saŋ ə] (和尚儿)，也叫“和尚头”(标音缺) *赖先刚《乐山方言》

“娘舅”就与称〈舅父〉的形式相同，现无线索可考。其它类在词义上均从〈膝盖〉的形象着想，是无疑的。如，“猢狲头儿”，形似猴头而得名(《义乌方言研究》,p.97)。但是可能还有促进说话者产生这种着想的语音条件。“猢狲头”分布在自新安江流域至东阳江流域的一条线状地区而这一带占多数的说法是“脚膝头”(参看**[地图 5]**)。如，歙县方言，“猢狲头”和“脚膝头”[tɕia siʔ t^hiʊ]都用。假定，“猢狲头”的前身是“脚膝头”。这一带方言的一个特点是儿尾以自成音节的 ŋ̩或-n 韵尾实现(平田昌司等《徽州方言研究》、方松熹〈浙江义乌方言里的“n”化韵〉中国语文 1986-6)。原先可能“膝”字单独也能带儿尾：“膝儿”[siəʔ ŋ̩]>[siən]，而后来习焉不察，这个音节做为“膝”的语音形式固定下来。然后，[siən]的介音[i]或者脱落或者由“头”字的韵尾[u]同化而变带有[u]介音，以致“膝头”的语音接近“狲头”或与此完全同音了(sən dəu 或 suən dəu)。这目前只是一种纸上的思考而已，没有足够的根据。但是通俗词源的产生往往由语音变化诱发，这是探讨词源时必须要考虑的一个因素。至于“猫头”、“和尚”和“汤瓶盖”的成因，有待今后的调查研究。

3. “膝”的脱落

上文讨论了“膝”字读音的各种变异。其实，现代汉语有很多方言根本不用词根的“膝”(下文略称“非膝”系统)。请看**[地图 2]**。粗略地说，词形中保留“膝”的方言主要分布在中国大陆的西部，而东部除了江淮之间重叠分布几种系统的词以外，大部分都是“非膝”系统的分布领域。

北方的东部大部分都是 p-l-k 或 k-l-p 系统的领域。所谓 p-l-k 和 k-l-p 是着重三音节词的声母而归纳出来的词形类别。p-l-k 以“波罗盖”[pə luə kai]为代表，k-l-p 则以“胳拉拜” [kə la pai]为代表。k-l-p 也包括中缀的 l 音节弱化而脱落的次类。如，江苏·赣榆县[kə par](据岩田调查)。北京话有两种系统并存：

[po ləŋ kair](膊楞盖儿) / [kɤ ləŋ panr](胳楞瓣儿) *《汉语方言词汇》第二版

p-l-k 系统的词也分布在宁夏、陕西等西北地区，但是为数不多(对此下文再论及)。

南方的“非膝”系统的词多数也是由三个音节构成的。构词法多数都为“脚 X 头”、“骹 X 头”或“骹头 X”，少数为“脚头 X”或双音节的“骹头”。举例：

江苏・吴江县(盛泽) [tɕiɑʔ mə diəu] (脚馒头) *《当代吴语研究》

福建・建瓯县 [k^hau pu t^he] (骹腹头) *李如龙・潘谓水《建瓯方言词典》

广东・从化县 [kœk t^hɐu ku](脚头鼓) *詹伯慧・张日升《珠江三角洲方言词汇对照》

福建・厦门市 [k^ha t^hau hu](骹头口) *陈章太・李如龙《闽语研究》

广东・澄海县 [k^ha t^hau](骹头) *林伦伦《澄海方言研究》

分布情况，请看**[地图 4]** 和**[地图 5]**。

北方的两种系统，p-l-k 古于 k-l-p：p-l-k 因倒位作用(metathesis)变成了 k-l-p。这种推测，最有力的根据是，k-l-p 的分布集中在山东西部和河北中南部而 p-l-k 有倾向分布在其周围。这是日本语言学者所说的“周圈分布”。假定某一地区原来都是词形 A(p-l-k)的领域，而后来中心地区产生了新的形式 B(k-l-p)，以致词形 A 只保留在周围地区。所谓“中心地区”一般指政治、经济和文化的中心。k-l-p 的领域也包括北京，但是是否北京为 k-l-p 的发源地，不能断言。值得注意的是 k-l-p 在河北南部和山东西部沿着大运河分布。还有自北京走向南方的几条公路。这些很可能在 k-l-p 系统的传播上起过一定的作用。

“周圈分布”不是定律，也允许出现例外。譬如，〈外祖母〉义的“姥姥”在北方的东部有倾向分布在“老娘”的周围(参看 Iwata1995,p.209)。但是我们并不能由此断言，“姥姥”是旧词而“老娘”是新词。因为我们无法说明“姥姥”[lao lao]如何变成了“老娘”[lao niaŋ]；要是如此，“老娘”的“娘”字是从哪儿来的呢？汉语亲属称谓词的发展规律正是相反的，象“伯父”和“叔父”变成了“伯伯”和“叔叔”，这是 Iwata(2000)所说的“词根的脱落”和“修饰成分的词根化”。就这种情况看来，更合理的推测是，首先“老娘”的修饰成分“老”变成了词根，然后按照亲属称谓形成的一般规律“老”字被重叠化了。字写作“姥”，这是其词源(即“老老”)被遗忘的结果。

出现例外的原因主要有两种：一是移民的作用。移民是方言地图解释上的搅乱因素。但是就北方 p-l-k 的分布而言，我们可以排除移民的因素。谁能说山东半岛的 p-l-k 是由河南的移民带来的？这种假说一点科学根据也没有，不值得顾虑。二是相互无关联的创新。“老娘” 变成了“姥姥”，很可能是其一例，因为亲属称谓词修饰成分的词根化在汉语方言中相当普及，隔离很远而没有任何接触的两种方言也会平行产生相同的变化。

也许我们也要考虑 k-l-p>p-l-k 这种变化。在音理上这是完全可能的，个别地点也会发生过这种变化。最后有发言权的是文献记载。p-l-k 系统的词已在明代的文献中出现(岩田1986,《汉语方言大词典》第三卷,p.3666)而 k-l-p 在明清的文献中似乎没出现。

p-l-k 系统的词少数也分布在西南地区，这可能是由明代以后的移民带去的。p-l-k 也分布在珠江三角洲，如

广东・宝安县 [pɔ lɔ kui](波罗盖) *《珠江三角洲方言词汇对照》

这可能不是由北方移民带来的而通过海运从北方直接带去。需要指出，沿海、沿大河的船运交易是促进语言传播的一个重要因素。

岩田(1986)认为，p-l-k 的首字 p-音节来源于“髆”。

《集韵》 髆、髆、胉，骬也，或从尃，亦作胉。匹各切（*pʰɑk)。

《集韵》 骬，膝骨也。丘何切（*kʰɑ)。 /《广韵》骬，膝骨。 苦何切（*kʰɑ)

“髆”是入声字而现代的 p-l-k 大部分都分布在失去入声调的方言点。p-音节，声调最多是阴平，上声次之，少数为阳平或去声；韵母多数为[ə], [ɤ],[o]等央元音，少数为[u]；大致上与“髆”字的中古音对应。但是声母不对应：“髆”是滂母字，读送气的[pʰ]，而现代北方方言的 p-音节都是不送气的[p]。假如说，p-l-k 的首字来源于“髆”，那么方言为何又加上了 l-音节？这里指出两个事实：第一，“波罗”是叠韵词；第二，北方方言富于

构词能力产生嵌 l-词，如“轱辘”[ku lu]、“旮旯[ka la]、“蛤蜊”[kə li]，又如，〈前额〉义的[ie la kai]主要分布在北方的东部，其领域与〈膝盖〉义的 p-l-k/k-l-p 相当重复。《蜾蠃转语记》的研究题目与此有关。作者程瑶田要建立起一个 k-l 系统的词族(word family)，据此也要说明词语的语音和意义辗转变化的过程。程氏的治学精神很值得敬佩，但是他的那种词源学难免导出“一声之转”的谬论。问题在于这种研究法直到现在还继承下来。贺登崧指出，“现代中国的文献语言学的错误不在于依据文献做研究，而在于要在方言中找出和书面汉字相对应的词”(《汉语方言地理学》,p.107)。这一句的后一段也可以改作“要在文献中找出和方言相对应的词”。 我认为，词源学需要建立在方言地理学的基础上。历史语言学者的眼光总是在遥远的古代，其实有很多现象却是近代或现代的产物。将文献记载和方言分布结合起来看，p-l-k 必定产生在唐宋以后的北方东部而 p-l-k 以前存在的应该是“膝盖”(参看下文)。

关于东南沿海地区(吴语和闽语地区)的“非膝”系统的词，今提出两种假说：

1) 吴闽地区的方言在历史上从来没接受过词根的“膝”，而〈膝盖〉一词历来表现为“腿的一部分”，象“腿上的馒头或肚子”(“脚馒头”、“ 骹腹头”)。
2) 吴闽地区的方言曾用过词根的“膝”，但是后来由分析式的词形代替。

这个问题待下文第 5 节进行考察。

4. 盖/头：南北对立及北方形式的南下

[地图 3]是着重两种词素“盖”和“头”绘制的。以词素为单位的这种地图往往反映出很简单的分布模式。从地图可以看出，“盖”多数分布在淮河-汉水以北的北方地区而“头”多数分布在长江以南的南方地区。江淮之间或长江流域是两种势力角逐的地区，有的方言点用“盖”而有的用“头”，也有两种都用的方言点。南北对立的这种情形是从不少词汇及语音条目的地图上看得出来的，也就是说，这反映着汉语方言地理分布的基本格局(岩田 2000)。

这里有一个问题，即“盖”和“头”到底哪一个更古老？只看**[地图 3]**不能推断。有两个旁证间接证明“头”古于“盖”。第一，在文献上，“膝头”的出现年代早于“膝盖”(岩田 1986)。第二，表现出南北对立的词汇项目，总的倾向是南方的形式比北方的还古老。譬如，用以称〈祖父〉、〈外祖父〉的两种词根，“爷”分布在北方而“公”分布在南方(岩田 1995)。“公”是旧词而做为〈祖父〉义的词根“爷”是新的。“爷”早在六朝以前在北方东部诞生，原来是用为称〈父亲〉而后来转用为指称〈祖父〉和〈外祖父〉，在北方终于代替了“公”。北方的“爷”除了个别方言点以外已不保留〈父亲〉的原义，但江西、福建西北部等地分布着保留原义的“爷”。此乃为北方起源的“爷”经过江淮地区传播到这些地区的结果(Iwata, 2000) 。

从这种观点看，**[地图 3]**有一个值得注意的现象，即复合形式“头盖”的存在及其分布领域。先举例:

安徽・铜陵市 [sɨ rəu kæ](膝头盖) *《安徽省志・方言卷》

江西・全南县(城相) [tɕʰit tʰɛu kɔi](膝头盖) *《客赣方言比较研究》

“头盖”的分布以安徽省的铜陵为起点往南竟到达广东省的珠江三角洲。我认为，这暗示着北方的“盖”越过长江，继而经过江西传播到广东的一条路线。这些方言原来用的是“头”而后来北方或江淮地区传来了带“盖”的形式。这两种形式互为竞争，但因势力平衡而不分胜败。此时方言采取了一种折中法，即拿新来的“盖”放在土著词形“膝头”的后面。这种折中法是并不罕见的。譬如，安徽南部至浙江西部的那一带分布着“脚膝头”、或“脚膝骸(头)”。参看**[地图 5]**。这是“脚+X+头”和“膝头”(或其它带“膝”的词)接触而产生的一种混淆形式，待下文第 5 节讨论。

“头盖”和“脚膝”是简单的 A+B，但也有(A+B)/2 式的折中法，即拿 A、B 两种词形的一部分来构成混淆形式。譬如，江苏北部东海县的方言管“膝盖”叫做“磕拜子”[kʰɐʔ pɛ tsʅ](苏晓青《东海方言研究》)。这是 p-l-k 系统的“胳拜”[kə par]在方言的交接地区与“磕头子”[kʰɐʔ tʰəɯ tsʅ]冲突的结果(岩田、苏 1999,p.249)。

[地图 4]用来要说明“膝盖”和“膝头”二两种系统的分布情况。

首先指出，“膝盖”系统多数分布在山西以西的北方西部并且多数都是“磕膝盖”或“圪膝盖”，如，

山西・户县 [kʰɯ tɕʰɿ kæ](磕膝盖) *孙立新《户县方言研究》

北京也用“磕膝盖”。关于“磕膝盖”的形成，待下文讨论。至于单个的“膝盖”，它在华北地区的分布比较零散，但却在长江流域还保持着一定的势力。值得注意的是，“膝头盖”的分布在湖北和江西的交接地区与“膝盖”毗连。据此可以推测：

1) 在历史上的某一个时期，淮河以北都是“膝盖”的领域。后来由于新兴的两种词形(东部的 p-l-k 和西部的“磕膝盖”)扩大了势力，单个的“膝盖”随之缩小了势力。

2) “膝盖”却在淮河以南的地区扩大了势力。它先到达长江流域，继而也传播到江西、湖南，而最后竟到达了广东。但是在这些地区，“膝盖”也遇到了旧词“膝头”的抵抗，以致形成了折中形式的“膝头盖”。

“膝头盖”的分布现在比较零散，但也不妨推测，这个词形的分布领域过去更广大而后来末字的“盖”受了土著方言构词法的影响，竟变成了后缀的 k-音节。

湖南・浏阳县 [tɕʰi tʰiau ku](膝头古) *夏剑钦《浏阳方言研究》

江西・萍乡市 [tsʰi tʰœ ku](膝头牯) *魏刚强《萍乡方言词典》

广东・斗门县 [sɐp hɐu kuɔ](膝头哥) *《珠江三角洲方言词汇对照》

江西和湖南的方言，后缀较发达，〈膝盖〉的后缀还有 n-或 l-起音的(主要是“脑”)。

江西・宁都县 [tɕʰit tʰɛu nau] (膝头脑) *《客赣方言比较研究》

湖南・宜章县 [sei tei nau](膝头脑) *沈若云《宜章土话研究》

江西・宜丰县 [sæʔ lɑu kʏn](膝脑公) *《客赣方言比较研究》

请注意，这种构词法的实质就与“鸡婆”(母鸡)、“虱婆”(虱子)等词相同(岩田 2000,p.21)。单个的“膝头”一定程度还保留着其势力，尤其是江西东南部至广东东部的客家地区。

值得注意的是，“膝头”少数也出现在长江中游(参看上文第一节湖北·红安县和江西·临川县的例子)。这些说明，长江流域及南方的西部原来都是“膝头”的领域。

南方的东部，由于吴闽的“非膝”势力死守阵地，“膝头”和“膝盖”都无法进入了。从**[地图 4]**可以看出，长江以南非官话系统的方言表现出三种势力鼎立的格局(Iwata1995,p.205-206):

(一) 东部的“脚X头”和“骹X头”

(二) 西部的“膝头X”(包括“膝头盖”)

(三) 客家地区的“膝头”

这是比较笼统的概括而需要加两个注解：第一，单个的“膝头”也分布在广东中部至广西的粤语区，与“膝头X”重叠分布；第二，闽南方言多数都为“骹头X”，在构词法上却与西部方言一致。如，

广东·海丰县 [k^{h}a t^{h}au u](骹头口) *罗志海《海丰方言词典》

5. 骻：吴语的构词法

上一节指出，吴闽方言除了闽南语以外都取“词根+X+头”式的构词法。词根多数都是“脚”或“骹”，是指“腿”(leg)，而少数是“膝”。参看**[地图 4]**。“X”在江苏南部多数是“馒”，在福建是“腹”、“肚”、“骨”、“子”等。后两个音节的组合，象“馒头”、“腹头”、“骨头”等，都是通俗词源所致。

浙江的情况值得仔细探讨。X在浙江多数是以[k^{h}]开头的音节(下文称做“k^{h}音节”)，但在浙江西部至安徽南部的地区则出现“脚膝头”或将k^{h}音节后置于“脚膝”的。

浙江·萧山县[tɕia k^{h}o dio] (脚髁头)/[tɕia ɕi k^{h}o dio](脚膝髁头) *大西博子《萧山方言研究》

安徽·黟县 [tɕi:u sa t^{h}aɯ](脚膝头) *平田昌司等《徽州方言研究》

浙江·浦江县 [cyo sə k^{h}ən] (脚膝髁儿) *县志

k^{h}音节，上面两种资料均写作“髁”，钱乃荣《当代吴语研究》作“窠”，而曹志耘《金华方言》和汤珍珠等《宁波方言词典》都作“骻”。我则同意曹、汤两位的看法，认为k^{h}音节的词源是“骻”。今再引用《集韵》和《广韵》的记载:

《集韵》 骻：膝骨也。丘何切 (*k^{h}ɑ)。 /《广韵》骻： 膝骨。 苦何切 (*k^{h}ɑ)

k^{h}音节为阴平，声韵母也都与“骻”的中古音对应。在词义上，“脚骻头”等于“脚膝头”，也就是说，“骻头”就是“膝头”。

k^{h}音节的分布表示在**[地图 5]**上。可以看出，“脚骻头”分布在浙江的沿海地区而“脚膝头”分布在内陆与“膝头”毗连的地区。对此，本文提出一种假设。

1) 吴语区以及安徽南部的徽语区早期有两种系统重叠分布。一是“膝头”，二是“骹X头”。前者是从外地传来的，而后者是土著形式，也可能反映吴闽共同的基层方言特有的一种构词法。“腿”义的“骹”，现在的分布限于福建省及若干浙江南部的方言点，但是据丁邦新(1988)的考证，“骹”字也出现在南朝的口语中。据此可以推测，南北朝时期的吴语，有可能〈膝盖〉叫做“骹+X+头”。

2) 这两种系统的词(“膝头”和“骸X头”)互为接触，以致产生了“膝X头”。

3) 第二时期，从外地传来了“骱头”。这个词逐渐扩大了势力，致使“膝头”几乎都消灭，但“膝X头”还存在。此时方言采取了一种折中法，即按照土著方言的构词方式将“骱”放在“膝X头”的X的位置上。现代杭州方言正使用这种词形：

[ɕiəʔ kʰo dei](膝窠头) *鲍士杰《杭州方言词典》

4) 但是“膝骱头”这种词，形式与词义没有任何必然的关联，也就是说，语言符号的任意性较强，故方言以〈腿〉义的“脚”代替了“膝”，以便明确其词义。

5) 安徽南部及浙江西部的“脚膝头”，其前身很可能是“脚骱头”，与现代浙江东部的方言相同。这就是说，在第三时期，安徽南部及浙江的大部分方言都是“脚骱头”的领域。但安徽南部及浙江西部是一种方言的交接地区，难免受到北部及西部“膝”方言的影响，故最终也接受了“膝”，以此代替了“骱”。请注意，这实际上是同义代替。

有人会主张，“骱”可能是浙江土产的词根。唐代惠琳《一切经音义》卷三十七：“江南呼髀上骨接腰者曰‘骱’”(引自《汉语方言大词典》,p.6835)，虽然其词义为大腿骨，但是也可以认为是词义转移所致。但是我则倾向主张，“骱”原来是北方的俗语而后来传播到长江流域，继而也遍及现在的浙江省。这种推测的根据是北部吴语若干方言〈踝子骨〉义的词形：

上海市 [tɕiAʔ kʰu kuəʔ](脚骷骨) *许宝华・汤珍珠《上海市区方言志》

这个词的第二音节[kʰu](阴平)在音韵上则与“骱”字对应，可能因词义转移而指〈踝子骨〉了，或者说，北部吴语曾有过时期“骱”字兼指〈膝盖〉和〈踝子骨〉。在北方，由于新兴的“髁”(即p-l-k的词源)急速地扩大了势力，“骱”随之缩小了领域，甚至被淘汰，而它却在吴语区保留着。江苏南部的北部吴语实际上也用“膝馒头”，如，江苏・苏州市：

[tɕiɒʔ mø dʏ](脚馒头)/[siɪʔ mø dəu](膝馒头) *《汉语方言词汇》第二版

从文献资料看，“膝馒头”已出现在明末的《山歌》里而“脚馒头”的出现年代较之很晚(石汝杰、宫田一郎2005)。我则认为，“膝馒头”的前身也是“膝骱头”。

6. 长江方言

我曾在岩田(1995)、Iwata(2000)等论文中强调指出长江方言及“长江型”分布的重要性。所谓“长江方言”指的是以江苏东北部为起点沿着长江一直延伸到云南的方言群。譬如，指称〈祖父〉的“爹”及指称〈叔父〉的“爷”都分布在长江流域并且形成一条带形的分布。这些都反映着长江流域曾发生过的创新。

[地图 5]和**[地图 6]**反映了“长江型”分布的两种变异。从**[地图 5]**可以看出，前缀的[kʰə(ʔ)](磕)自江苏东北部一直延伸到云南，但与一般的“长江型”分布不同，分布领域往北也延伸到陕西和甘肃。类似分布也见于其它特征的分布中。如，〈祖母〉义的“婆”(参看岩田等1995,pp.87-88)。又如，“鸡公”、“鸡婆”之类的构词法一定程度也出现在西北地

区(吉池 1999,32-34)。这些都反映着西北方言的保守性。据此也不妨推测，前缀的[kʰə(ʔ)](磕)不是创新而是古老特征的遗留。

[kʰə(ʔ)]个别也出现在浙江等东南方方言中。如比较下面二例，我们就能了解第一个例子中的[kʰə(ʔ)]是从“骸”变来的。

浙江・衢州市 [kʰəʔ məʔ sʅ təɪ](口末事头) *《当代吴语研究》

浙江・常山县 [kʰɔ moʔ du](骸木头) *曹志耘等《吴语处衢方言研究》

有人据此会认为，前缀的[kʰə(ʔ)]则与“骸”有同源关系。但是[kʰə(ʔ)]必定来源于入声，而“骸”是平声字，本文认为没有同源关系。衢州之例可能是当地局部的变化所致。

山西及其邻接地区是不送气的前缀[kəʔ]，是入声，可能与送气的[kʰə(ʔ)]同源(请注意，北京及河北省的石家庄、承德等地也用[kʰə(ʔ)])，但也可能较早时期就分化。**[地图 5]**也表示了 k-l-p 系统的分布。可以看出，其领域与[kəʔ]的领域距离不远，据此也不妨推测，p-l-k 变为 k-l-p 的时候，晋语的前缀[kəʔ]也会有所影响。

[地图 6]表示出一种典型的长江型分布，但是中下游的分布错综复杂，这是两种系统的词重叠分布的缘故。哪两种？一种是“磕膝头”或“膝头”而另一种是 p-l-k 的后裔。如上所说，除此之外还有单个的“膝盖”。

旧词是“膝头”或“磕膝头”。上文推测，长江流域原来是“膝头”的领域，可能早期就可带前缀的[kʰəʔ]。但后来北方传来了带“盖”的形式。先来的是“膝盖”，如上文讨论；而后有 p-l-k 系统的词开始向南传播。从**[地图 6]**可以看出，p-l-k 也出现在江苏和安徽的若干地点:

江苏・扬州市 [po lo kɛ tsɛ] (波罗盖子) *《江苏省志・方言志》

安徽・巢湖市 [pʊ nʊ kɛ tsʅ](波罗盖子) *巢湖方言词汇(一) 《方言》1998-2

从地图可以看出，p-l-k 经过陕西和湖北的省界地域也传播到西北地区。

陕西・太白县 [pɑu lɑu kæ] (包老盖) *县志

但是 p-l-k 在长江流域的传播过程中也遭到了旧词“(磕)膝头”的强烈抵抗，不仅没得到胜利，反而却面临了自己要消灭的危机，因此要企图妥协。妥协的方法是要把词形的一部分献给“(磕)膝头”，从而形成混淆形式(请注意，长江方言多数不分声母的[l]和[n])：

安徽・郎溪县 [tʰɪ tɕiə po lo](腿节波罗) *县志 按: “节”即“膝”

四川・达县 [kʰɛ ɕi po nu](腿膝波罗) *《普通话基础方言基本词汇集》

湖北・钟祥县 [kʰə tɕʰi pau no rɭ](磕膝包骡子) *赵元任《钟祥方言记》

河南・光山县 [kʰɛ tɕʰi par](客膝包) *县志

安徽・铜陵市[sɨ rəu po tsʅ](膝头钵子) *《安徽省志・方言卷》

可见，p-l 或 p 音节都后置于“膝”或“膝头”。需要指出，自安徽至四川的长江沿岸都取相同的构词法。这不是偶然所致而必定有某种原因致使长江流域产生了共同的现象。表示出类似分布类型的有〈外祖母〉、〈外祖父〉义的“ka 婆”、“ka 公”或“ka ka”(Iwata 1995, p.209)。岩田(2000,p.22-23)将这种分布类型叫做“楚型分布”。这与典型的长江型略不相同，其领域不包括江苏省。

p-l-k 在西北地区甚至也传播到甘肃北部、青海和新疆而在那里致使前缀的[kʰə]变成[pə]了。在语音上这只不过是一个声母的替换。

新疆・乌鲁木齐市 [pɤ ɕi kair](波膝盖) *周磊《新疆方言词典》

以上推论 p-l-k 的扩散及变形的过程，其实旧词的“磕膝头”在有些地区也发生了变化。这主要由于通俗词源所致(参看岩田、苏晓青,p.249)。

江苏・涟水县 [kʰəʔ tʰəu tsʅ](磕头子) *《普通话基础方言基本词汇集》

安徽・颍上县 [kʰɤ lɔ tʰɤo tsʅ(磕老头子) *《安徽省志・方言卷》

7. 语言传播的方式

方言词传播的一般方式是“徒步”式，即一个词通过居民的日常交际从一个村庄传播到邻村。当然，这种传播速度缓慢。众所周知，在中国历史上屡次发生过人口的大规模流动，由此也会发生方言词的“飞机”式的移动，即方言词由甲地飞到乙地。但是“徒步”式仍是最普遍的传播方式。一个重要的事实是，即使有移民的存在，“经过两三代后，新移入者的方言无疑与周围的方言完全同化”(贺登崧 2003,p.64)。历来，汉语方言研究的一个特殊的特点是，学者过于注重移民的因素而忽略“徒步”式的传播。如有一个词隔离千里分布在两个地方，有些学者就轻易地把它归于移民之功。但是如上文第 2 节指出，移民最多是方言分布形成上的诸种因素之一。

上文第 4 节说，“头盖”的分布暗示着北方的“盖”越过长江，继而经过江西传播到广东的一条路线。但是这不等于说这一条路是北方移民南迁的要道，更不能说此乃是客家的祖先南迁的路线。这里也要指出，本文的地图只表现出〈膝盖〉一个词的历史。客家话可能在某些特征上保守而在其它特征上可能却创新。但是如将各种语言特征结合起来看，我们会发现方言特征传播的主要路线，这个问题我在岩田(2000)和 Iwata(2000)上讨论过，兹不赘述。

大河和大海都是贸易交易及资流动的媒介，因此，也会做为语言传播的媒介起作用。上文第 3 节推测，广东的 p-l-k 可能是通过海运从北方直接带来的。上一节讨论了长江方言的一些特征。这一条大河很可能在 p-l-k 的传播上起过重大的作用。如有大河，人们想要度过；如有高山，人们想要越过。因此，渡口和山口都是语言传播上的枢纽(贺登崧 2003,p.72-73)。希望我们的方言地图也能够阐明与语言的传播密不开的诸种因素。

8. 总结：膝盖一词的历史演变

1) 最古老的形式为“膝”。
2) 华北地区早期产生了“膝头”。在早期的南方方言中可能存在分析式的词，即“词根+X+头”。
3) “膝头”开始扩散，而扩散的过程中也形成了带前缀的形式：“[kʰə]/ [kə]膝头”。这种形式如今还在长江流域及山西以西的华北地区保留着。
4) “膝头”越过长江进入了华南地区的西部(赣、湘、粤)。单个的“膝头”现在还保留

在客家语及粤语等南方方言中，个别也保留在长江流域。

5) “膝头”也进入了东南沿海地区，但遭到了土著形式“骸+X+头”的顽固抵抗，势力平衡而不分胜败，最终形成了折中形式的“膝+X+头”，以此停战。

6) 后来华北地区产生了“膝盖”。这个新词也开始向南扩散，而在华南西部地区的传播的过程中产生了混淆形式的“膝头盖”，也按照土著方言的构词方式变成了带后缀的形式“膝头+[k-]”。

7) 在某一时期，华北地区产生了“骷头”。这个词后来经过江淮地区进入了吴地。但是其命运与“膝头”无二致，也遭到了“膝+X+头”的抵抗，以致形成“膝骷头”，接着也变成了“脚骷头”。

8) 在华北东部地区，唐宋以后又有一种新词开始流行，即 p-l-k。这个词后来传播到长江流域，但在那里和旧词的“膝头”或“磕膝头”冲突，以致产生了混淆形式的“([k^hə])膝+p-l/p”。p-l-k 在山东西部至河北南部的地区因倒位现象变成了 k-l-p。

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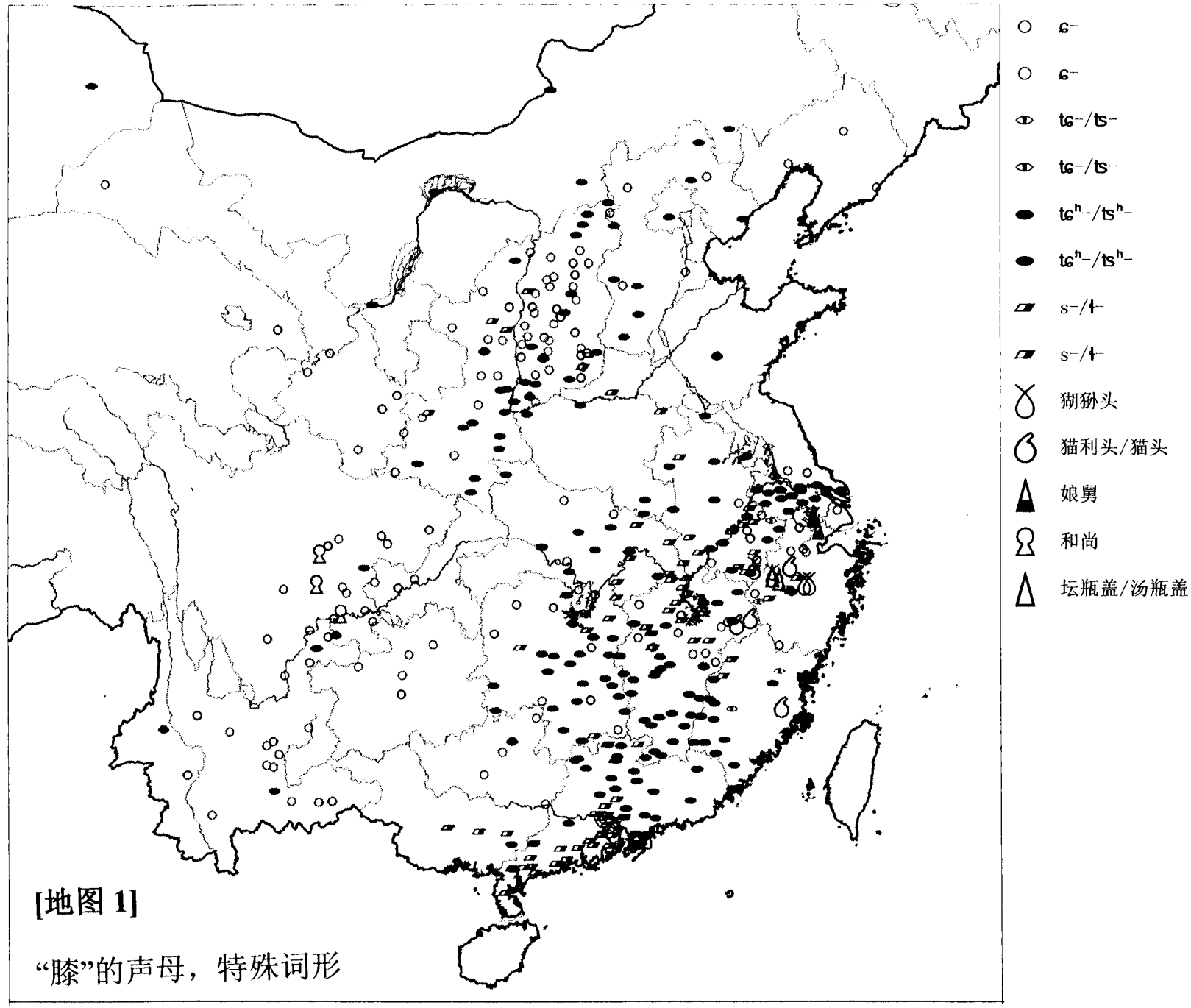
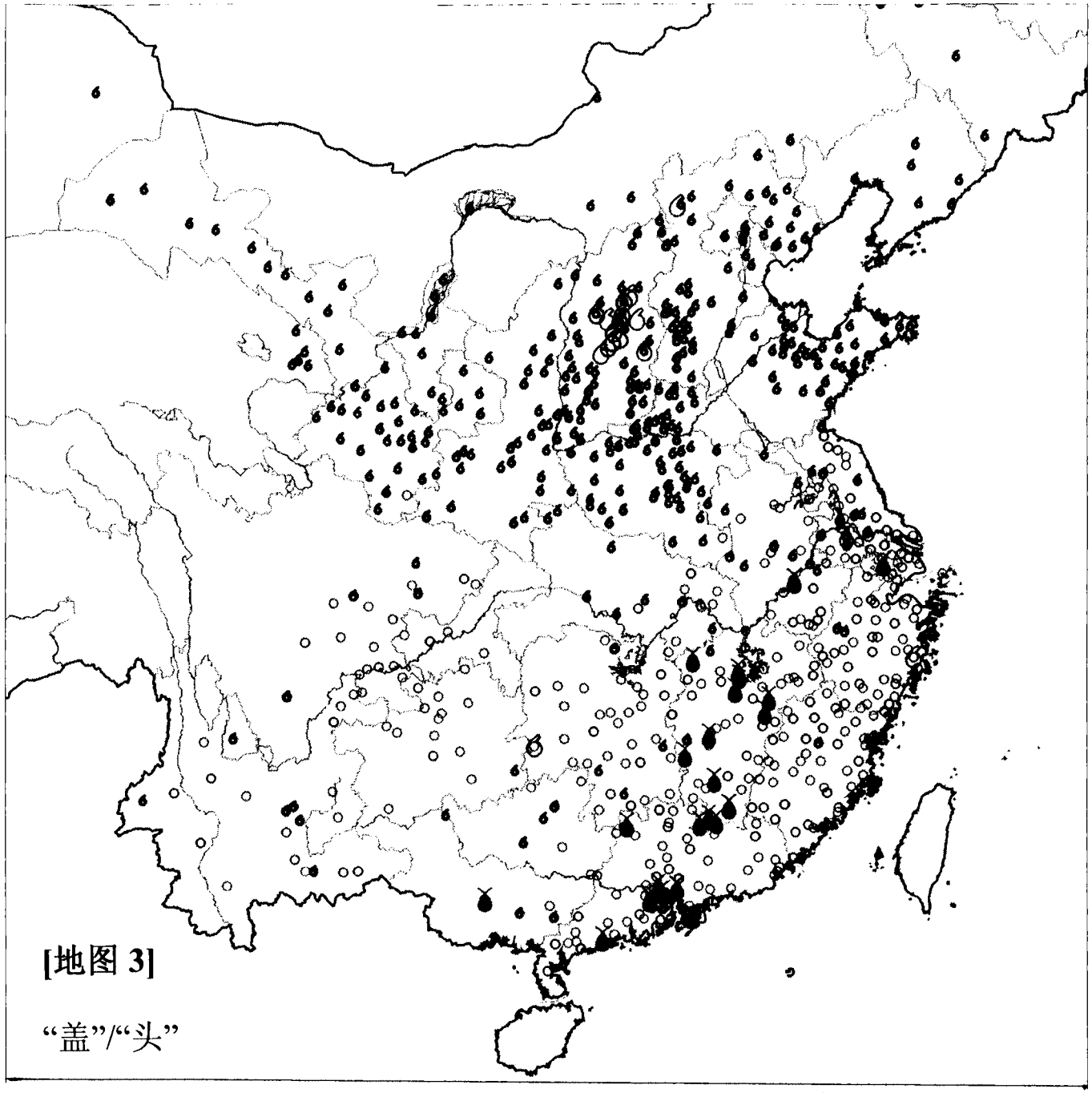


[地图 1]

“膝”的声母，特殊词形

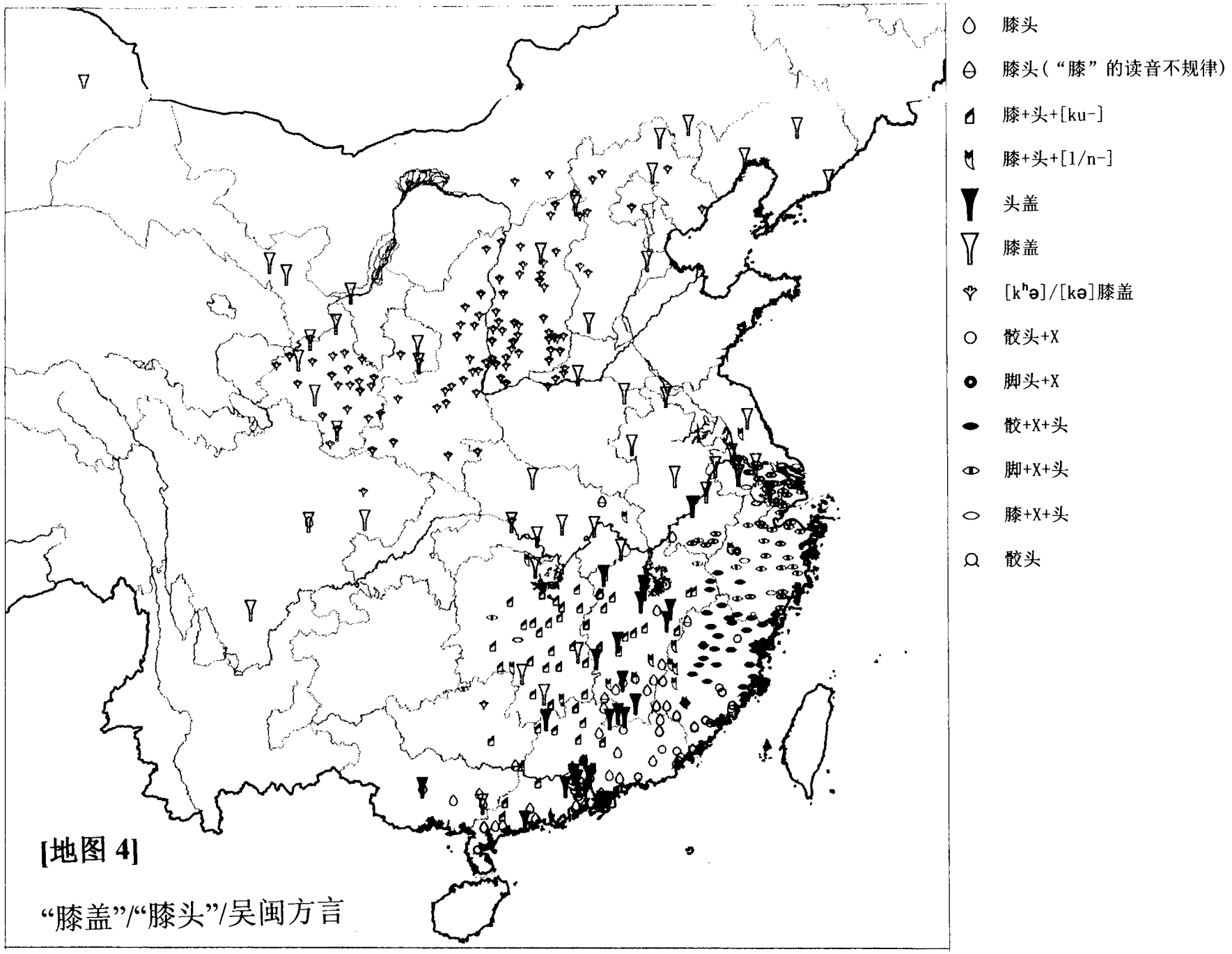
[地图 2]

“非膝”系统的分布



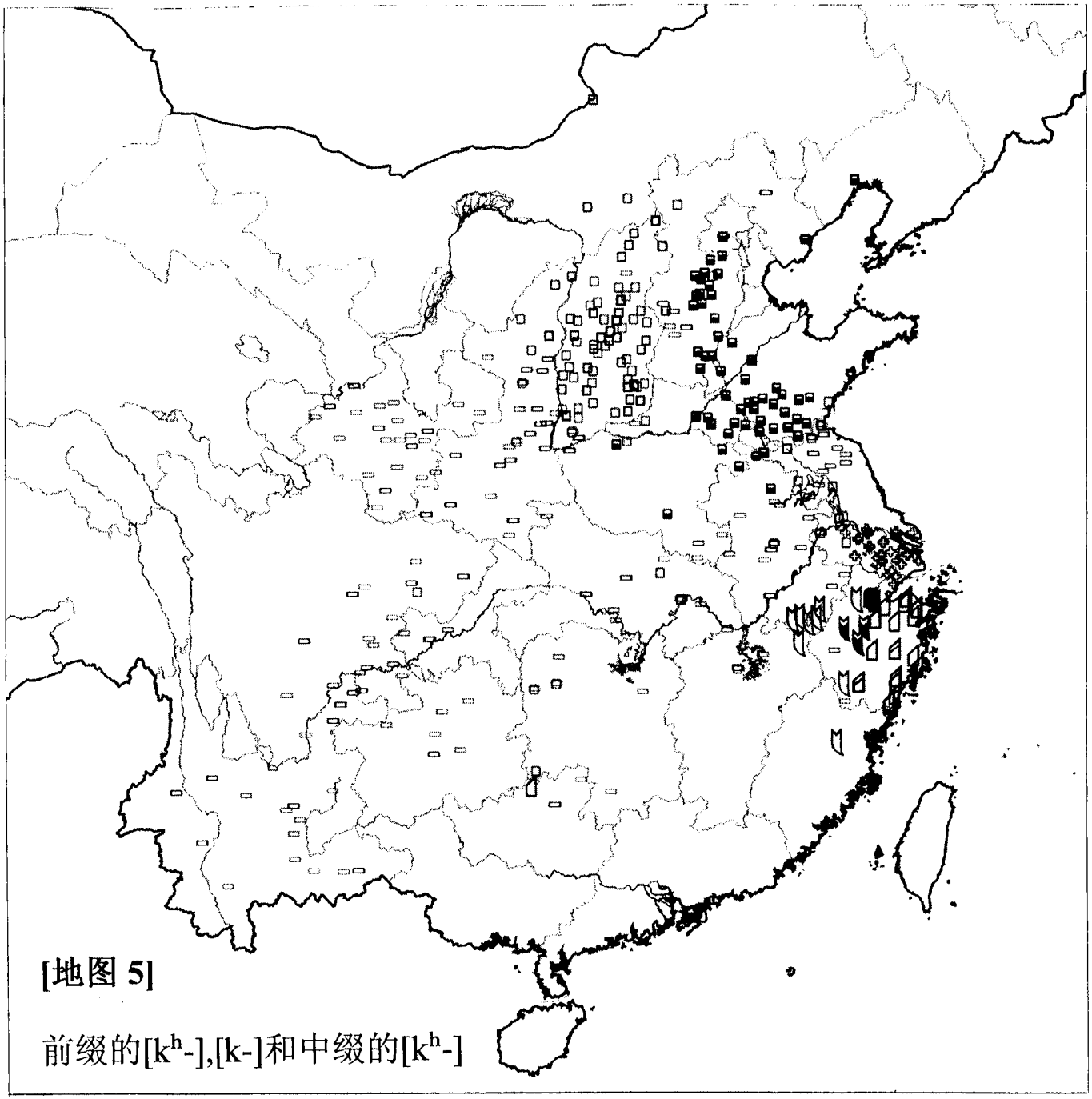
[地图 3]

“盖”/“头”



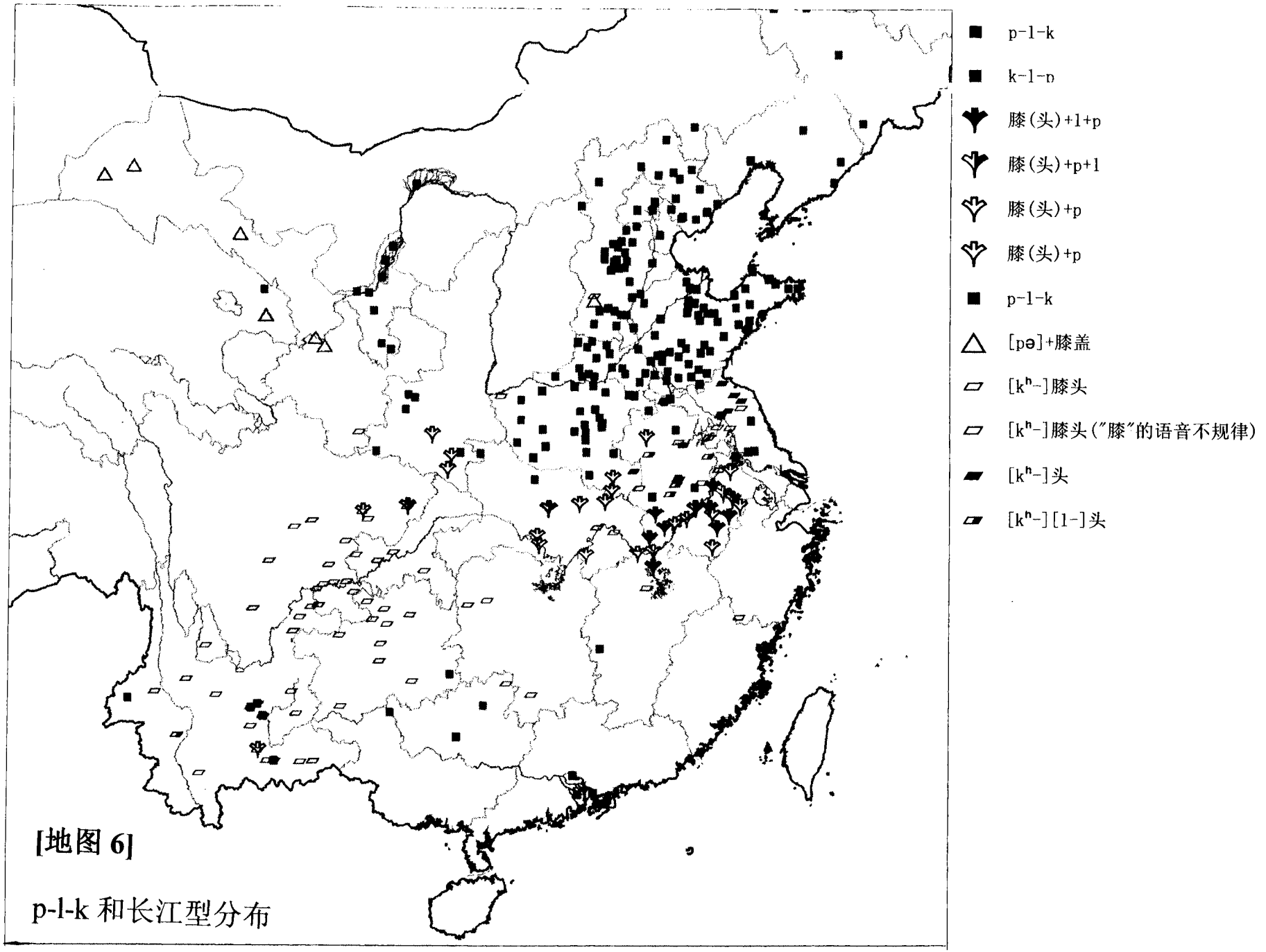
[地图 4]

“膝盖”/“膝头”/吴闽方言



[地图 5]

前缀的[kʰ-],[k-]和中缀的[kʰ-]



[地图 6]

p-l-k 和长江型分布