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Chinese Writing System

MINIMAL GRAPHIC UNITS

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Preface

It was in the first place methodological reasons that made me study in greater detail the writing system of the Chinese characters. The traditional methods employed in teaching the writing of Chinese characters are essentially of a global nature, more or less based on the mechanical drill of every graphemic unit (naturally, with some elementary introduction into their graphic form, structure and the technique of their writing). The new method that has been tried out in the Chinese and Japanese sections of the Department of Asian and African studies of the Philosophical Faculty of Charles University in Prague, is based on phased steps employed in the process of mastering Chinese characters. Starting from minimal graphic units gradually introduced from the viewpoint of their graphic and combinative features, it proceeds to higher graphic and structural units. The elaboration of this method was naturally conditioned by a preliminary anlysis of both the graphic form and the graphic structure of the basic store of Chinese characters. In the course of this analysis, plenty of problems arose concerning various aspects of the Chinese writing system. It was evident that a more detailed examination on different levels of analysis had to be carried out on the basis of more extensive material. Some of these problems had been touched upon in some of the author's earlier works, e.g. On the Nature of Chinese Characters (in Charles University of Far Eastern Culture, Prague 1968), in the disertation thesis Synchronní charakteristika čínského znakového písma (Synchronous characteristics of the Chinese Characters, 1969, unpublished), Formal Aspects of the Chinese Graphemic System (in New Methods of Analysis in Oriental and African Studies, Studia Orientalia Pragensia, Charles University, Prague 1972), etc. The present work is an attempt at a systematic description of the representative number of Chinese characters.

The purpose of this work is to contribute to a deeper knowledge of the inner system of the Chinese script on the basis of a detailed explication of the relevant features of minimal graphic units. As relevant are considered here not only their graphic-visual but also the combinative features. An allround approach to the characteristics of the minimal graphic units makes it possible to carry out a reasonable classification and specification of their variant forms. There have also been pedagogical reasons: according to our own experience, the description of the graphic-visual and combinative features of the minimal graphic units is one of the prerequisites of working out more effective methods of teaching the Chinese characters.

Prague, January 1976 *J. Vochala*

I. Introduction

1. Levels of analysis

The Chinese writing system is formed by hierarchical graphic units and by operating rules used in the recording of the Chinese language. The basic graphic units of the Chinese writing system are the so-called Chinese characters, i.e. graphic symbols by which the linguistic units of the Chinese language are immediately designated. Of what kind the denoted linguistic units are — is a question of fundamental relevancy for the typological characteristics of the Chinese writing system. In other words — the type of the Chinese writing system should be characterized from the point of the relationships that exist between its graphic symbols and the linguistic units immediately designated by them. The level of analysis, on which the relationships between the Chinese linguistic system and the Chinese writing system are examined, might be termed GRAPHOLINGUISTIC[1]. The approach to the investigation on this level can be synchronous (the subject of the investigation is the above-mentioned writing system at a certain historical level of its development), or diachronous (the investigation concerns its origin and developmet). In the present work the synchronous point will be applied. Graphic symbols as the basic units operating on the grapholinguistic level can be termed GRAPHEMES in terms of general denominations of the graphic representatives of linguistic units; their typological specification will be expressed by the terms LOGOGRAM or MORPHEMOGRAM, i.e. graphic units representing the words or morphemes of the Chinese language. For the purpose of the lingustic units on different levels of analysis, if examined with special regard to their graphic representation, the terms with component "grapho-" can be used, e.g. GRAPHOLEXEME, GRAPHOMORPHEME, GRAPHOSYLLABLE, GRAPHOPHONEME, etc.[2] The graphic variants of the grapheme can be termed ALLOGRAPHS. The examination on the grapholinguistic level further deals with the representation of the linguistic units by graphemes from the viewpoint of their mutual relation, i.e. whether there is one-to-one relation, or a multi-to-one relation and vice versa. Thus different kinds of graphic representations can be distinguished: MONOGRAPHIC (i.e. one linguistic

unit is represented by one grapheme), HOMOGRAPHIC (i.e. several linguistic units are represented by one grapheme), MULTIGRAPHIC (i.e. several graphemes denote different connotations of one linguistic unit) and HETEROGRAPHIC (i.e. the representation of one linguistic unit by several graphemes, which is caused by the lack of an orthographic norm).[3]

As mentioned above, the Chinese writing system consists of graphic units of different ranks, and these graphic units participate, in different ways, in the graphic representation of the given linguistic units. An examination of the graphemes from the viewpoint of the participation of their subordinated graphemic units in the designation of semantic content of linguistic units also belongs to the grapholinguistic level of analysis. From this point of view, different kinds of graphemes can be distinguished. Proceeding from the traditional classification of the Chinese characters, it will be mainly the categories SUGGESTIVE GRAPHEMES and PHONOIDEOGRAMS that will be above all the subject of analysis on this level. In addition, graphemes can be considered from the viewpoint of their motivating character and classified with regard to their motivating reference.[4] According to the complexity of their internal structure, the graphemes can be devided into the following two basic groups: SIMPLE GRAPHEMES and COMPOUND GRAPHEMES. Compound graphemes are composed of graphic constituents referring to linguistic units of different levels, namely to the semantic level and the phonetic one. These components represent SUBGRAPHEMIC units of the Chinese writing system. Subgraphemes referring to the semantic level can be termed SIGNIFICS (in the so-called phonoideograms standing as CLASSIFIERS or RADICALS in some respects), while those referring to the phonetic level are usually termed PHONETICS. An examination of the internal graphemic structure of the graphemes, from the viewpoint of the linguistic reference of their subgraphemic constituents, is carried out on the GRAPHEMIC level which is second to the grapholinguistic.

The contemporary Chinese writing system is the product of a long development, in the course of which considerable changes of the graphic form of its graphic symbols have taken place. This manifests itself especially in the formalization of the graphic form of graphemes resulting in a gradual concealing of their original pictographic form. As a consequence of this formalization, the graphic symbols of the contemporary Chinese writing system form a uniform graphical type in spite of their different genetic origins. From the point of view of their graphic form, the Chinese characters consist of subordinate graphic units arranged in the graphic structure in different ways. Problems concerning the graphic form and the graphic structure of Chinese characters, without regard to their linguistic reference, are the subject of an analysis on the GRAPHIC level. The maximal graphic units operating on this level of analysis can be termed GRAPHS (G), the minimal units are traditionally called STROKES (S). As to the other graphic units on the graphic level, their delimitation will be discussed in the following chapters.

The above-mentioned brief outline of the different levels of analysis of the Chinese characters forms a general framework for further description to be applied in the present study, which is devoted to the analysis and description of the minimal units on the graphic level.

2. Delimitation of the subject of analysis

As far as the typological specificity of the Chinese writing system is concerned, the synchronous analysis at the graphic level must proceed from the quantitative delimitation of the subject of analysis, i.e. the total number of the graphic symbols to be analysed must be stated. Generally speaking, they will be those graphic symbols that in a given period (e.g. in the period of contemporary Chinese) serve for graphic designations of linguistic units. Thus the starting point for the quantitative delimitation of the subject of analysis will be a linguistic one: it will start from the delimitation of the vocabulary of a given period. Due to the dynamic nature of language, which permanently changes and develops in an organic continuity with the preceding stage, the vocabulary, apart from its relative stability in any given period, shows at the same time certain variability (growth of the vocabulary, obsolescence and disappearence of part of the vocabulary), so that it is difficult to state exactly the number of words in use in the period under discussion and, consequently, to delimit the corresponding number of graphemes as well. Moreover, there is also the problem of determining to what extent to include the graphemes designating technical terms, words with dialectical colouring, slangs, proper names etc., which appear in standard dictionaries in a limited extent. For the above-mentioned reasons, the number of the graphemes delimited linguistically (for example within the scope of any standard dictionary) will represent an aproximative estimate of the graphemic "vocabulary" of the period under discussion.

Thus, the quantitative delimitation of the maximal graphic units on the graphic level should proceed from the delimitation of the maximal graphemic units on the grapholinguistic level. But the total number of those units examined on both levels will not be the same. For example, forming the subject of an analysis on the grapholinguistic level will be such variant forms of graphemes only, the subgraphemic components of which show differences in their linguistic reference, while the subject of an analysis on the graphic level will include all (normative) graphic variants of the graphemes. In the case of the homographic representation of the linguistic units, an analysis on the

grapholinguistic level should deal with the relation between every homographic grapheme and its linguistic reference, while on the graphic level, they will appear as one graphic unit.

Since graphemes and graphs represent units on different levels of analysis, the quantitative delimitation of the subject of the graphic analysis based on the grapholinguistic approach requires in fact proceeding from the "inadequate" level. While relevant to the analysis of graphemes is their relation to the denoted linguistic units (both in their entirety and from the viewpoint of their graphemic structure), for the graphs, it is the graphic form following from the given GRAPHIC STYLE or DUCTUS of the Chinese characters. It is a well known fact that various kinds of graphic styles have been formed in the course of the development of the Chinese characters, and that the last one, named "kǎishū" (i.e. the model script), was getting stabilized at the end of the period of archaic Chinese (i.e. about the third century). That is to say that the total number of graphs of the "kǎishū" style (based on the number of graphemes having been in use since that time) will exceed the number of graphs following from the aproximative number of graphemes having been in use in the period of modern Chinese (i.e. last sixty-seventy years). It follows from this that the synchronous analysis of graphs of the linguistically delimited period will operate with an incomplete number of really existing graphic forms of the respective graphic style. There is also another aspect of this question: the given ductus forms a graphic frame within which the new graphic forms can be produced. However, these potential graphic forms will not be the subject of our analysis.

The basic form of the "kǎishū" style is a hand-written one which naturally enables the occurrence of a variety of individual modifications of this style. As to its calligraphic form, it has been usually patterned on the styles of famous calligraphers differing from one another in some respects as well (for example, there are differences in the width of strokes, in the shape of their initial or final parts, in the way of the arrangement of the storkes in the structure of graphs etc.). The calligraphic form of the Chinese characters with the variety of its individual modifications is beyond the frame of this work. Our examination is based on the current "standard" form that can be found in some standard Chinese dictionaries.

A special subject of an analysis, which is also beyond the frame of our examination, is the printed form of the Chinese characters which differs in some respects from the hand-written form. Similarly, the variant written forms of "kǎishū" employed for ordinary writing and known as "xíngshū" (running script) and "cǎoshū" (coarse script) will not be included in our analysis either.[5] These two graphic styles represent a special kind of graphic stylization of the standard form of "kǎishū" style, manifesting itself by greater or smaller subordination of the graphic elements to the motoric aspect (conjoining of strokes — particularly in the "cǎoshū" style — and drawing more or less the basic contour of graph according to the succession of its elements).

In the course of the reform of the Chinese writing system after the establishment of the People's Republic of China, a part of the Chinese characters have been simplified.[6] Since our examination concerns the Chinese writing system in the period of modern Chinese, the simplified graphemes have to become the subject of the analysis as well.

The following sources will form the basis ot the analysis on the graphic level:

Taken as the basic source will be the dictionary "Tóngyīn Zìdiǎn"[7] with its more than 10,000 entries, which can be considered as representing the essential part of the graphemic "vocabulary" of modern Chinese, including the graphemes denoting part of technical terms, proper names (particularly geographical) and also a certain number of expressions from classical Chinese. If necessary, other standard dictionaries are consulted (particularly Xīnhuá Zìdiǎn[8]). The simplified graphemes, a summary list of which was published in 1964, will be examined in their written form according to the book "Hànzìde bǐhuà hé bǐshùn"[9].

FOOTNOTES AND REFERENCES

[1] There are considerable differences in the terminology as well as in the employment of the terms in individual works dealing with the Chinese characters as well as with the script in general. As to the term "grapholinguistic" itself, it is used in our conception for the denomination of one of the levels of analysis of the Chinese writing system (see also the author's above-mentioned work Synchronní charakteristika čínského znakového písma) while e.g. in the Sariti's paper "Chinese Grapholinguistics" (in: Journal of the Chinese Language Teachers Assotiation, Vol. III. No 1, February 1968) it defines one of the systems of the Chinese language (i.e. the linguistic system and the grapholinguistic system of the Chinese language). For some terminological problems concerning the Chinese characters (or the script in general), see e.g. Peter A. Putberg, The Chinese Script: An Esssay on Nomenclature (the firs hecaton), in: The Bulletin of the Institute of History and Philology, Academia Sinica, Vol. XXIX, Studies Presented to Yuen Ren Chao on his Sixty-fifth Birthday, Taipai, Taiwan, November 1957, C. A. Grossland, Graphic Linguistics and its Terminology, In Mechanical Translation, 1956, vol, 3. N 1., Ye. V. Mayevskiy, Yedinici graphiki yaponskogo yazyka (The Units of Japanese Graphics), in Vestnik Moskovskogo Universiteta, No 1, 1973, etc.

See the employment of the terms with prefix "grapho-" in Sariti's above-mentioned paper.

See the author's above mentioned article "On the Nature of Chinese Characters".

This question is discussed in the author's article "Specificity of Monosyllabic Denominations in Chinese Semantic and Graphemic Systems" (in print).

Both graphic styles are characterized by a variety of variant forms with individual persons, due to the fact that the strictness of the normative composition of graphs to one degree or other does not impose itself on the graphic form.

517 simplified characters in four successive groups were published from 1956 to 1959 (the first group of January 1956 includes 260 simplified graphs, the second one of June of the same year, 95 simplified graphs, the third group of May 1958 includes 70 simplified graphs and the fourth group of July 1959 includes 92 simplified graphs and 54 graphic components). Subsequently, in 1964 the total list of simplified characters was published in three groups: Included in the first group were 352 simplifed graphs which cannot be taken as subgraphic components of other graphs, the second group includes 132 simplifed graphs and 14 simplified subgraphic components that can be used in other graphs, and the third group includes 1.745 frequent graphs in which also those subgraphic components appear that have been introduced in the second group.

同音字典，北京，1955年

新華字典，北京，1955年

文从战：汉字的笔画和笔顺，上海，1964年

II. Units on the graphic level
(Preliminaries)

The basic and maximal graphic unit on the graphic level of analysis is the graph. Being a formal graphic unit, it can be defined by formal criteria: 1. Graphs are those maximal graphic units that are separated in the written text from one another by distinct (and as a rule unvaried) space, 2. A graph is the maximal graphic unit delimited graphically by a graphic square (either marked out or imaginary) which stands as its structural graphic frame.

In accordance with the specificity of script in general, from the point of its material presentation, i.e. the recording of visible marks on the writing surface enabling their visual perception, the graphs can be characterized as being of a motoric-visual nature. In the process of their graphic realization, the graphs manifest themselves as the succession of hierarchical subgraphic constituents arranged in some way in the graphic square. From the motoric point of view , i.e. manifested by writing, a graph shows itself as a dynamic graphic unit. From the visual point of view, i.e. as the resulting product of writing, the graph stands as the static graphic unit.

Minimal graphic units, of which every graph consists, are traditionally called strokes. Motoric and visual aspects can be employed in the case of strokes as well. From the motoric point of view, the stroke is the minimal graphic unit that, according to the Chinese tradition, is written "at one go", i.e. uninterrupted. From the visual point of view, it is a continous line of various shapes, the boundary of which is sometimes marked by certain specific features of its contour in its initial or/and final part (for example, by the presence of a hook-like tail in the final or initial part of some strokes).

Every graph consists of a definite number of strokes (for example, in the dictionary Tóngyīn Zìdiǎn there are graphs consisting of 1 to 36 strokes). The quantitative delimitation of graphs by the number of their strokes belongs to one of their characteristics on the graphic level, and it is relevant for orthography, lexicography etc.

An overwhelming majority of graphs consist of two or more strokes, which enter into mutual combinations within the frame of a higher graphic unit. One-stroke graphs, i.e. those with zero stroke combination, represent merely an extremely minimal part of the stock of graphemes in the Chinese writing system (in the dictionary Tóngyīn Zìdiǎn there are two one-stroke en-

tries only). The stroke can be thus defined as the minimal combinative unit of graphs.

The strokes can enter into mutual combinations either within the frame of the graph or of the subgraphic constituent — SUBGRAPH (SUBG), e.g. the combination of S 一 and S 丨 in G 十 and in SUBG 十 of G 早 The subgraphic constituents can be decomposed from the graphic structure of graphs on the basis of some formal criteria, such as graphic coincidence of a subgraphic element with a certain graph, according to the reccurrence of such an element in other graphs, according to its position in the graphic structure, etc. The immediate subgraphic constituents decomposed according to the structural type of graphs can be of a simple or complex nature, which can be further similarly decomposed into the ultimate subgraphic constituents forming the immediate frame of stroke-combinations.

The simple graphs and subgraphs, considered from the viewpoint of their composition, form a certain configuration of strokes, which might be termed STROKE COMPLEX (SC). This term will also be used to designate any stroke-configurations within the frame of which the combinative features of strokes can be examined. The relation between individual strokes in various SCs can be more or less close: cf. for example the relation between the strokes in the G 下 , where there is a close relation between the strokes 一 and 丨 (SC 丅) and between the strokes 丨 and 丶 (SC 卜), while this does not hold good for the relation between the strokes 一 an 丶 . The immediate mutual combination of strokes is one of the main criteria for the delimitation of either two- or more-stroke combinations of graphs and subgraphs. Many SCs with immediate stroke combinations frequently occur in various graphs and subgraphs, e.g. SC 𠂉 which occurs in the graphs 失 , 每 , 告 , 𠂉 , etc., while some others are infrequent, or appear in one graph only (which, of course, can act also as a subgraph), such as SC 𠂤 in G (or SUBG) 𠂤 . The ultimate SCs arrived at the decomposition of graphs are the minimal SCs consisting of two strokes; those SCs consisting of three, four or more strokes will be termed multiple SCs.

The principle of immediateness in the stroke-combinations is relevant to the description of distributional features of strokes. In the minimal SCs, every constituent stroke will be described within the frame of the respective stroke-class. In the case of multiple SC, the SC with the strokes in a mutual immediate combination will be placed under every corresponding stroke class; for example, the SC 女 will be placed both under S 𠂇 , S 一 , and S 丿 . If all of the strokes are not in a mutual immediate combination in multiple SC, this SC will be only placed under the stroke in an immediate combination with the remaining ones, while the others strokes will be described in combination with their immediate Ss or SCs. For example, the strokes of SC 工 will be described as follows: S 丨 in combination with two Ss 一 in multiple SC 工 ;

S 一 in combination with S 丨 in minimal SCs 丅 and 丄 , or with SCs 丅 and 丄 in 工 .

The decomposition of graphs into underlaying structural graphic constituents is an operation concerning the graph regarded as a static graphic unit. The ultimate decomposed graphic constituents realized by the strokes in their mutual combinations are of the static nature as well.

If the graph is viewed from the motoric aspect, i.e. as a dynamic graphic unit, a reverse process can be seen as taking place. In the process of writing, the graphic realization of graphs proceeds from the minimal graphic units mutually combined according to habitual succession to higher graphic units that, again in the habitual succession, are located in the graphic structure of the graph. It is due to this habitual succession that the graphic constituents successively articulated in the process of writing will not always fully correspond with those obtained by the decomposition of graphs. See e.g.:

a) 匡 : 匚 王 — decomposition
b) 匡 : 一 王 乚 — articulation

III. Minimal graphic units — general characteristics

1. Graphic characteristics of strokes

Strokes arrived by the decomposition of the representative number of graphs represent a total inventory of minimal graphic units operating on the graphic level. From the viewpoint of their material graphic presentation, these minimal graphic units show certain mutual coincident and distinctive graphic features, according to which they can be classed and described. With the application of the motoric-visual aspect, the following basic characteristics can be found in the classification and description of the minimal graphic units: 1. shape, 2. length (dimension), 3. position (i.e. horizontal, vertical, skewed etc.) and 4. direction of writing. Some other graphic characteristics can be added if different writing instruments are considered: for example, when writing with a brush, strokes vary in their thickness, some parts of them are shaded etc. These secondary graphic characteristics, which depend on the writing instrument can be considered as additional in the description of strokes.

Specification of individual graphic characteristics of the strokes:

1. SHAPE is a graphic characteristic of a considerably complex nature. Three basic kinds of stroke-shape can be distinguished, namely "point", straight line and curved line — and their mutual combinations. In addition, some strokes have a small hook in their final, or in their initial part respectively.

"Pointness", straightness and curviformness manifest themselves in the shape of strokes, but only as a general tendency, so that the graphic characteristics concerning the shape cannot be understood as absolute. Strokes characterized as being of this or that shape in higher graphic units can vary, which can even lead, under certain conditions, to the so-called "graphic conversion" of strokes. Discussing the shape of strokes, some explanation must be given about the strokes termed "points". From the graphic point of view, the point is, as to the shape, invariable. As a conventional denomination of this kind of stroke, "points" are often exhibited by extremely short lines — either straight or curved. As to the straight and curved strokes in general, modifications of their shape can take place, leading sometimes to the curving of the straight lines and vice versa. In general, however, straight lines are essentially of one-shape nature (straightness is characteristic of its invariability), while curves, in

contrast, are variously shaped. The strokes that can be described as formed by a combination of elementary strokes (either in their basic or modified form) can vary in one part or another, which enables a great variety of their shape. As to the "hooked" strokes, some of them can be considered "hooked" variants of the "basic" strokes (i.e. strokes without the hook-like tail). Some of them, however, do not have a "basic" counterpart; nevertheless, they can be described within the frame of the combination of the elementary stroke shapes.

2. LENGTH (DIMENSION) is the graphic characteristics of strokes that is determined by various factors. In general, the relative length of strokes within the selected dimensional frame (i.e. the graphic square) of graphs depends on the dimension of the immediate higher graphic unit, on its complexity and position in the graphic structure. In addition, some conventional rules of writing concerning the mutual combination of strokes, are another factor which can exert influence on the length of strokes.

The dimension of the graphic units can be expressed in numerical data. Exact measures can, however, hardly be applied here because of the tolerance which naturally follows from the very nature of writing. The expression of the lenght of strokes by numerical data will therefore always be of an aproximate nature only. Applying the measures that are used for stating the sizes of the types and if, for example, one size of the graphic square is 30 points, the length of one-stroke graph — will be about 17 points, the upper straight stroke in the graph ⫟ about 7 points and the lower about 17 points etc.

The length of strokes in individual graphs shows a great scale of different numerical values. The classing of strokes according to their length, which can be carried out in greater or smaller detail, can be considered either from the viewpoint of the absolute dimension of the strokes within the selected dimensional frame, or from the viewpoint of the mutual proportions of the strokes in the immediate higher graphic unit. Thus the strokes can be devided into SHORT and LONG strokes, or into SHORT, MEDIUM and LONG strokes (even a more detailed division can be carried out if necessary, e.g. ULTRASHORT, SHORT, MEDIUM, LONG, ULTRALONG, etc.), or into SHORTER strokes and LONGER ones.

As to the relation between the shape and the length of strokes, a close coherency of both can be found in some cases. Relatively the shortest are, as a rule, the "points", while to the longest belong some strokes formed by a combination of simple strokes. In the case of "points", the dimension is, in fact, an integral part of their graphic shape, so that we can speak here about shape-dimensional characteristics of this kind of strokes. The difference in the length of strokes depending upon the dimension of the immediate higher graphic unit can, in certain cases, also influence some secondary characteris-

tics of the strokes (especially their thickness, particularly in the calligraphic style).

3. POSITION is one of the further fundamental graphic characteristics of strokes. There are three main positions of strokes, namely horizontal, vertical and skewed. With respect to the fact that there are also strokes of a combined form, certain strokes will consequently have their constituent parts of different positions. These three basic positions of strokes are not of the same character. While the horizontal and vertical positions are, in nature, invariable, the skewed position is of a variable nature (the skewed position is polyclinal). This holds true both for elementary strokes and for the constituent parts of combined strokes. More detailed classification of strokes with the skewed position can be carried out according to the different angles of their obliqueness.

It is necessary to underline that the above stated three basic positions should be considered as a tendency of the positional orientation of strokes rather than those determined geometrically. Consequently, a certain positional deviation can be noticed within different basic positions of strokes. That is to say, horizontal and vertical strokes need not always be of a quite horizontal, or vertical, position — they are often written in a slight oblique position (the same holds true for the constituent parts of combined strokes).

The position of strokes is one of the fundamental criteria for their classification: it distinguishes strokes of the same shape. Thus the straight strokes are divided according to their different positions into horizontal, vertical and skewed, and the curved strokes are classed analogously according to their different positions. The criterion of position is, however, not always applicable univocally to stroke classing, as it is sometimes not quite evident whether the positional differences under discussion are those within the limit of tolerance in writing whether they are a matter of the positional variant of the stroke, or represent another graphically conditioned modification.

4. DIRECTION OF WRITING is a graphic characteristics relating to the motoric aspect of strokes. The directional orientation in the process of writing of strokes from their initial to their final phases is essentially of five kinds: 1. from left to right → , 2. from up to down ↓ , 3. from left up to right down ↘ , 4. from right up to left down ↙ , 5. from left down to right up ↗ . In addition to the main directions of writing, there are also some cases, in which a constituent part of a stroke is written in a direction that is different from that mentioned above, for example, from down to left above, as in the case of S ↓ (↲).

The direction of writing is a dynamic graphic feature of strokes following from the conventional way of stroke-writing which has become established. There are some relations between the direction of writing and the other graphic characteristics of strokes. The graphic form of the so-called hooked

strokes has a close relation to the dynamic aspect of strokes: their tail-like hook is the marker of the final phase of writing, it marks the direction of the writing. The relation between the shape and the direction of writing is also exhibited in the thickness of certain parts of the stroke (situation in this respect is different with individual strokes—some strokes do not essentially change from the initial to final part, while others are thicker in their initial part and less thick in their final part, certain parts are shaded etc., especially in calligraphic style). A close connection is also apparent between the direction and the position of strokes. The direction of writing of horizontal strokes is always from left to right, the natural direction of vertical strokes is from above downwards. In the case of skewed strokes, the situation is as follows: the strokes skewed right down are always written from above to right downwards, while those skewed to the left stand for two kinds with opposite directions of writing: one kind of stroke is written from top to left down, the other is written from down to right up. As some of the strokes of these two different kinds are in other respects of the same or of similar graphic characteristics, the direction of writing becomes the main criterion for their classification. In the case of combined strokes, the direction of writing proceeds in succession of their constituent parts, starting, naturally, with the direction of the initial part of the stroke.

The different nature of the individual graphic characteristics as discussed above, has indicated their different employment in setting the criteria for stroke-classing. It also becomes evident that the individual characteristics of the strokes themselves often imply heterogenous phenomena which give rise to certain difficulties in the classification of strokes. In order to properly state which characteristic is primary and which is secondary in a given case, and to judge the nature of the distinctions of strokes in their mutual comparison, it is also necessary to take into account the various relations and coherency between these individual graphic characteristics.

2. Strokes in combinations and in the graphic structure

In the classification and description of strokes, the coherency between the graphic characteristics of strokes and their combinative features which follow from their nature as units of the graphic structure should be taken into account. Both the graphic and combinative characteristics of strokes and their mutual coherency should be considered and evaluated in the stroke classification. In other words, it must be ascertained whether strokes with various differences in their graphic characteristics should be considered as different strokes or merely as variants of the same strokes. For the time being, let us make a few remarks on this question from the general point of view only.

The relations between the form of the stroke and that of the graph are of mutually conditioned character, but this interdependence is of a varying character. The form of the graph is constituted on the next lower level by the combination of strokes of a more or less stabilized graphic form. On the other hand, the graphic form of the strokes is to a certain degree, dependent on the form and structure of the graphs, e.g. on the degree of their complexity, on the arrangement of the corresponding subgraphs in the graphic structure (the requirement of symmetry and proportionality in their arrangement being relevant), on the position of the stroke in combination with other strokes or with subgraphic elements etc. All these factors can result in the variant forms of strokes.

Strokes in SCs combine with one another in various ways. Three basic kinds of combinations can be distinguished here: 1. SEPARATE COMBINATIONS (individual strokes are separated from one another, as in the Gs 二, 三, 川, 八, etc.), 2. CONTACT COMBINATIONS (strokes are contiguous in a certain point, as in the Gs 丁, 刀, 几, 人, 入, 丫, 工, 己, 口, etc.; sometimes, however, it is proximity rather than contiguity of combined strokes that can be observed, as in the SC 亻 of the G 千, the SC 丁 of the G 可 etc.), 3. INTERSECTIONAL COMBINATIONS (strokes are mutually intersected in some points, as in the Gs 十, 七, 力, 九, 丈, 寸, 也, etc. Different kinds of stroke combinations can simultaneously occur in multiple SCs, such as the contact+intersectional combinations, e. g. in the G 女, the separate+intersectional combinations, e.g. in the G 为, etc.

Separate, contact and intersectional combinations also occur in combinations of strokes with subgraphs. There are many separate combinations of this kind, as in the Gs 引, 乱, 乞, 犬, 氏, 旦, etc. (in some cases the S-component of such a combination can be considered as a structural one, i.e. as a component of the horizontal structure, as in G 乱, of the vertical structure, in G 乞, etc./. In some cases a separate combination of S with more SUBGs occurs as well, as in Gs 丽, 閂, 亟, etc. There are frequent contact combinations of S with SUBG, such as the initial S 一 in Gs or SUBGs 百, 丙, 再, 西, etc., the final S 一 in Gs or SUBGs 丘, 丕, 蚩, etc., the initial S 丿 in Gs and SUBGs 白, 止, 禾, 臼, etc. Some cases of contact combinations of S with more than one SUBG can be found here as well, such as the final S 一 in G 非, the initial S 一 in 死 G etc.; a stroke combined with two SUBGs can be considered here as a connecting stroke of two structural components (i.e. it does not stand for an independent structural element). There are quite frequent intersectional combinations of S with one G or SUBG, as well as with more Gs or SUBGs, as in Gs or SUBGs 中, 申, 毋, 书, 必, 匆, 串, 肃, 册, 事, etc.

There are also cases of several different simultaneous combinations of S with Gs or SUBGs, as in the G 者 (intersectional+contact combinations), in SUBG 戋 (contact+intersectional combinations) etc.

There are also some cases where the S combined with SUBG is a constituent part of another SUBG. The issue here is a special combination of SUBGs in the graphic structure with the stroke of one SUBG acting in an integrating (connective) function. The above-mentioned G 死 can be ranked here (combination of SUBG 歹 with connective S 一 + SUBG 匕), further the G 重 with integrating S 丨, etc.

The different ways of combinations of strokes with other strokes and subgraphic constituents show certain specificity. The separate combination is one of the ways of the graph-formation, and it is also the graphic-visual marker of the structural elements of the graphs. Some strokes themselves act as structural components in combination with subgraphic components in the graphs, such as S 丨 in G 引, S 乚 in G 乱 etc. (cf. separate combination of both graphic units in G 引 with their intersectional combination in G 弗). Even in the case of simple graphs, the individual constituent strokes occupy the position of structural elements of the graphs (this does not, however, hold true for the extremely short strokes like "points"); compare e.g. the simple G 川 and the complex G 衍. The contact combination acts in the graph-formation as a connective component linking the individual strokes in various points of contact (cf. various contact combinations in Gs 人, 入, 己, 已, 巳, etc.). Its connective function appears in the graphic structure as well, as. in Gs 支, 圭, etc. The intersectional combination is characterized by its integrating function. In the graph-formation the strokes can be combined in various points of intersection (cf. various intersectional combinations in Gs 十, 丈, 乂, 九, etc.). As has been mentioned above, there are frequent cases of intersectional combinations of SUBGs with a stroke where the latter plays an integrating function. Two or more SUBGs, can also be intersectionally combined, e.g. SUBGs 弓 and 丿丨 in G 弗; in such a case it is possible to interpret this kind of combination of the graphic components in the graph as a special type of graphic structure, namely as intersectional, in addition to the horizontal, vertical, outer-inner (and their combinations).

Different kinds of combinations of strokes with other strokes and with SUBGs can, to a certain degree, influence the graphic form of the given stroke.

In the case of a separate combination of strokes, we can find a partial dependence of the form of some strokes on the different kinds of separate combinations, on the position of strokes in the stroke-combination etc. There are various positional relationships of strokes in separate combinations, according to which different kinds of separate combinations can be distin-

guished, such as parallel combinations (e.g. in SCs 二 , 三 , 川 , 彡 , ⺀ , etc.), inclining combinations (e.g. in SC 𠂉), deflectional combinations (e.g. in SC 卜), convergent combinations (e.g. in SC 丷), divergent combinations (e.g. in SC 八), etc. In SCs with parallel stroke-combinations a certain influence of the positional relationships of strokes on their graphic characteristics can be noted. Compare e.g. the different lengths of strokes of the same kind in the above stated examples, the different shape and position of S 丿 in the parallel separate combination in G 川 with those in the contact combination in G 人 .

The graphic form of strokes in separate combinations is to a certain degree, conditioned by the position of the strokes in the given SC. Viewed from their positional relationship in the stroke-combination, the position of strokes can be termed RELATIVE POSITION. The relative position of the stroke can also concern its position in relation to the higher graphic unit with which it is combined. Different relative positions of the stroke can thus be distinguished: the upper position, lower position, left position, right position, outer position, inner position, or the upper left position, upper right position, lower left position, etc. The relative position of the stroke can affect its length — for example, strokes in the lower or right positions in SCs with separate parallel combination are often longer, while those in upper, inner or left position are often shorter in these combinations; cf. the length of the strokes in the above quoted graphs 三 and 川 . Different relative positions of strokes can co-condition the shape and the geometric position of the strokes; cf. the shape and geometric position of "points" in different relative positions in SCs 忄 , 丷 , ⺀ , etc.

While the separate combinations, by virtue of their own nature, enable the forming of combinations of strokes with different or with the same graphic features, in the case of contact combinations the mutual combinations of strokes of the same graphic characteristics are out of the question — except for the case of combinations of strokes with certain differences in their graphic form (so that they can be considered as variant forms of the same type of stroke), e.g. SC 𠂆 (in G 斤) with two Ss 丿 . Different kinds of contact combinations can be distinguished according to the different point of the stroke contiguity, for instance upper-end combination (in SC 𠆢), upper-middle combination (in SC 丆), upper-left-end combination (in SC 冂), upper right-end combination (in SC 冖), central combination (in SC 人), lower-end combination (in SC 乂), lower-middle combination (in SC 𠂉), lower-left combination (in SC 𠂉), lower-left-end combination (in SC 乚), etc. Further kinds of contact combinations can be distinguished according to the mutual positional orientation of the strokes to be combined, just as in the cases of separate combinations, i.e. convergent combinations (in SC 乂), divergent combinations (in SC 𠆢), etc., in addition to those determined according to the point of he stroke contiguity. Different kinds of contact combinations can in some cases, co-condition certain graphic characteristics of the strokes. Compare e.g. the shape and position of the final strokes in the following SCs with different kinds of contact combinations: a) central 人 , b) upper 𠆢 , c) lower-left-end 辶 .

Analogically to contact combinations, intersectional combinations, too, can be distinguished according to the point of their mutual intersection (naturally, with the exception of those kinds of combinations that are characteristic for contact combinations only, such as the so-called "end" combinations). Different kinds of intersectional combinations can also co-condition the graphic characteristics of the strokes occuring in these combinations (cf. the position of the final strokes in SCs 乂 and 叉).

We have so far mentioned a certain dependence of the form of strokes on the different kinds of stroke combinations which are of the same type. Certain dependence of the graphic form of strokes on stroke-combinations can be stated between the different types of stroke-combinations as well. From the specificity of individual types of stroke-combinations certain differences follow in the graphic characteristics of the strokes that can be classed as the same type (for example, in comparable cases the length of the strokes is as a rule greater in SCs with intersectional stroke-combinations than in those with separate or contact combinations, cf. SC 乂 with SCs 八 and 人).

Graphic differences between strokes that can be classed as the same type and are conditioned as has been mentioned above, can be named COMBINATIVE MODIFICATIONS.

Another type of graphic modifications within the strokes that can be classed as one type are the STRUCTURAL MODIFICATIONS, i.e. modifications of the form of strokes which are conditioned by the variant form of the immediate higher graphic unit occurring as/in graphs of different structural complexity, in different kinds of combination or in different positions in the graphic structure:

a) The stroke-modification is dependent on the complexity of the graphic structure; cf. the strokes of the G 目 with those in corresponding SUBGs of the Gs 眼 and 矐 .

b) Stroke-modification is dependent on the type of combination of the immediate higher graphic unit; cf. the modification of the constituent strokes of the G 弓 if the latter stands as a subgraph in a separate combination in G 引 and in an intersectional combination in G 弗 .

c) Stroke-modification is dependent on the relative position of the given subgraphic unit in the graphic structure, i.e. the left, right and middle positions in the horizontal graphic structure; the upper, lower or central positions in the vertical graphic structure; and the outward and inward positions in the

external-internal graphic structure. Cf. the different modifications of the strokes of the G 耳 if this stands for the subgraph in various positions in the structure of the following different Gs 弭, 聳, 聶, 聞, 趣.

From these kinds of stroke-modifications that are structural in the true sense of the word, those which follow from the different sizes of the graphs or from their complexity, must be differentiated. (Cf. the corresponding strokes in GS 口 and 国, or in Gs 木 and 耒.)

For the purpose of the stroke classification, it is necessary to state which of the dependent modifications of strokes should be qualified as variant forms of the identical type of stroke, and which as "graphic conversion".

3. Combinative features of strokes

The combinative features of individual strokes express themselves as follows:

1. In their ability to combine with other strokes and with higher graphic units.

2. In their ability to occupy certain places in the stroke succession in various SCs or in combination with higher graphic units.

Combinative features of individual strokes show considerable differences. Some of them enter into combinations with a great number of strokes or with SUBGs, others are strokes with medium, low or unique combinative possibilities. While the basic simple strokes belong mostly to those with a high degree of combinative power (there are, however, considerable differences in the case of individual strokes in this respect), the so-called combined strokes, on the contrary, are characterized by relatively restricted possibilities to enter into combinations with other strokes, or with higher graphic units respectively.

From the motoric point of view, stroke-combinations occur as stroke-successions which can be regarded from two aspects:

1. According to the relation of a given stroke to the neighbouring strokes in the stroke-succession; from this point of view, the stroke can be determined as ANTECEDENT or POSTERIOR. In combinations of more than two strokes, one stroke can be both antecedent (in relation to the next stroke) and posterior (in relation to the preceeding stroke), as e.g. in SC 扌 where the stroke 丿 is antecedent in relation to S 丿 and posterior in relation to S 一.

2. From the viewpoint of the stroke-order in SC; the first stroke in SC is INITIAL, the following strokes are SUCCESSIVE (the first successive stroke, the second successive stroke etc.), the last (successive) stroke in SC being FINAL.

There are certain relations between the combinative features of strokes

and their ability to occupy various places in stroke-succession. Strokes with restricted combinative possibilities are also limited as to their position in the stroke succession.

The succession of strokes in SCs partly follows from the natural stroke-order based on the conventional way of graph-writing, i.e. from top downward, from left to right, and partly from certain conventional orthographic rules concerning the succession of strokes in their mutual combinations. For example, for intersectional combinations of horizontal and vertical strokes, it is the succession 1. horizontal, 2. vertical strokes that holds good, while for the same kind of combination of ascending and vertical strokes, it is the succession 1. vertical, 2. ascending strokes that holds true (cf. e.g. the stroke order of the last two strokes in G 牛 and those in its modified form if it stands as the subgraph, i.e. SUBG 牜 : a) 丿 𠂉 𠂆 牛, b) 丿 𠂉 牜 牜

4. Stroke types

In various works enumerating the strokes of the Chinese characters, considerable differences among individual authors can be ascertained — both in number and classification, and in their terminological designation. This applies to the works of the Chinese as well as foreign authors, and follows both from the different purposes of the classification proposed and from the different approaches to the analysis and denomination of the minimal graphic units.[1] Speaking about the strokes of the Chinese characters, it is necessary to distinguish between the strokes taken out from a given number of graphs on the basis of graphic continuity, and those concieved as abstract graphic units of the Chinese writing system. Before classing, the strokes of concrete graphs can be termed PRIMAL STROKES (Sp); after the classification has been made, every class of strokes will be represented by an abstract graphic unit — STROKE TYPE (St). The individual classes of strokes can be further divided into subclasses; the representatives of such subclasses will be termed STROKE SUBTYPE (Sst).

5. Classification of strokes

The classification of strokes in the present work takes into consideration:

1. The degree of the graphic coincidence of primal strokes.

2. The nature of graphic differences between the individual primal strokes.

3. The distributive characteristics of strokes—the delimitation of the combinative and structural dependence of the form of the strokes.

The above stated three aspects are closely connected: the degree of the

graphic coincidence of strokes will be judged simultaneously with the question of the relevance of their different features; and both aspects will be considered again in regard to the distributive specificities of the individual strokes. The division of the strokes into strokeclasses starts from the graphic-visual features of the minimal graphic units examined in relation to their distributive features. However, neither the visual-graphic features of the strokes nor their combinative and structural dependence can always be determined exactly. Consequently, the application of the suggested criteria for the classification of the strokes is not always univocal. As the presented classification of the strokes is carried out on the graphic level, the classed-out stroke types, as representatives of the stroke-classes, are not regarded here as the functional units (i.e. units on the grapholinguistic level).[2] The distributional features of the strokes are regarded here as the graphic characteristics of strokes in combination, thus representing one aspect of the stroke-classing.

Owing to the fact that it is not always possible to use exact criteria for the graphic characterization of strokes, a certain degree of subjectivity in their classification cannot be avoid. The classification can be carried out from either more or less distributional aspects, so it is possible to suggest alternative classifications to those suggested below.[3]

Stroke Classes:	**Stroke Types:**
Elementary Strokes	
I. Simple Strokes	
1. Horizontal (H)	St —
2. Vertical (V)	St |
3. Left Skew (L)	St /
4. Right Skew (R)	St \
5. Ascending (A)	St /
6. Right (skewed) Point (RP)	St \
7. Left (skewed) Point (LP)	St /
II. Hooked Simple Strokes	
8. Horizontal — Hook (H-h)	St ¬
9. Vertical — Hook (V-h)	St]
10. Curved Vertical — Hook (Vc-h)	St)
11. Right — Hook (R-h)	St ↳
12. Hook — Ascending (h-A)	St ↙)

Combined Strokes

III. Compound Strokes

13. Horizontal — Vertical (H-V)	St ⅂
14. Horizontal — Left (H-L)	St ↗
15. Horizontal — Vertical — Horizontal (H-V-H)	St ㄴ
16. Horizontal — Vertical — Ascending (H-V-A)	St ⅂
17. Horizontal — Vertical — Horizontal — Vertical (H-V-H-V)	St ㄱ
18. Horizontal — Left — Horizontal — Left (H-L-H-L)	St ⅁
19. Vertical — Horizontal (V-H)	St L
20. Vertical — Ascending (V-A)	St ⅂
21. Vertical — Horizontal — Vertical (V-H-V)	St ㄱ
22. Vertical — Horizontal — Left (V-H-L)	St ㄴ
23. Left — Horizontal (L-H)	St ∠
24. Left — Right (L-R)	St <
25. Left — Ascending (L-A)	St ∠

IV. Hooked Compound Strokes

26. Horizontal — Vertical — Hook (H-V-h)	St ⅂
27. Horizontal — Left — Hook (H-L-h)	St ⅂
28. Horizontal — Left — Curved Vertical — Hook (H-L-Vc-h)	St ⅁
29. Horizontal — Left — Horizontal — Left — Hook (H-L-H-L-H)	St ⅁
30. Horizontal — Right — Hook (H-R-h)	St ↳
31. Horizontal — Vertical — Level Right — Hook (H-V-Rl-h)	St ⅂
32. Horizontal — Left — Level Right — Hook (H-L-Rl-h)	St ∠
33. Vertical — Level Right — Hook (V-Rl-h)	St ⅃
34. Vertical — Horizontal — Left — Hook (V-H-L-h)	St ⅁

FOOTNOTES AND REFERRENCES

For the detailed discussion concerning the classification of minimal graphic units and their terminological designation, see Appendix I.
Some functional aspects of the strokes are briefly discussed in Chapter V.
For examples of alternative classification of minimal graphic units, see Appendix II.

IV. Stroke classes and subclasses
(Description)

ELEMENTARY STROKES

SIMPLE STROKES

1. Horizontal (H-strokes) — St —

a) Graphic features

The basic graphic characteristics of strokes belonging to the class of H-strokes are:

1) a straight line of various length,
2) horizontal position,
3) left to right direction of writing.

Owing to the fact that the straight line is one of the basic characteristics of the class of H-strokes, there are no preconditions for their shape variability. In contrast, the dimensional variability of H-strokes is rather great. For the interclass classification, the different length of H-strokes is of varying relevancy; while in the case of long H-strokes their dimensional variants cannot lead to any graphic coincidence with strokes of other classes, the shortest variants of H-strokes coincide with the horizontal variants of the point strokes. As to the position of H-strokes, certain variability can be found here as well. In spite of the fact that the basic position of the H-strokes is naturally given as horizontal, they often have a slightly ascending positional tendency and, in certain cases, this is quite evident. In the latter cases a graphic coincidence with the levelled variant of the ascending strokes takes place.

b) Combinative features

i. Distribution:

H-strokes are of high combinative power.

Combinations of H-strokes with other strokes in minimal SCs:

+H 二 ：

+V 丅 丆 厂 亻 十 十 卜 丄 亅

+L 厂 ナ 𠂇 𠂉 𠂊 𠂋

+P 𠂆

+V-h 丁 丁 亅

+Vc-h 亅

+R-h 七

+H-V 𠃌 コ

+H-L 𠃍

+V-H 匚 匕 七

+V-A 工 匕 七

+L-H 𠂇 厶 𠂉

+V-H-L-h 丐 与

+V-Rl-h 匕 七

Combinations of H-strokes with other strokes in multiple SCs:

+L+L-R 女

+V+H-V 丩

+V+V 艹

+L+R 大

+L+V+P 不

+V+L+R 木

+L+V-h+R 长

Combinations of H-strokes with SUBGs, or with SUBGs and strokes:

𠂇 儿 𠂢 冂 亠 艹 歹 五 王 灬 不 夫 天 匹 歹

屯 𠂢 弋 𡈼 灬 丙 未 末 疋 灬 亘 百 亚 再 西

覀 曲 亞 亘

鳥 開 成 凹 凹 凸 升

丩 丬 三 尸 匕 七 子 彐 𠂉 廿 夕 丗 母 主 丘 且 曲

其 丗 聿 竝 韭 纽

ii. Types of combinations:

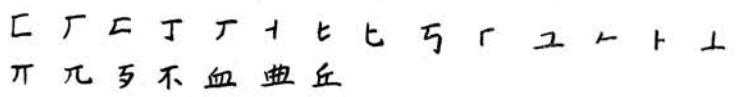
All three kinds of combinations can be found with the H-strokes — in combinations with other strokes as well as with SUBGs. Examples:

1. Separate combinations:

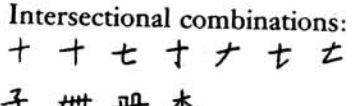
二 三 丄 𠂉

亘 六 亘 亠

2. Contact combinations:



3. Intersectional combinations:

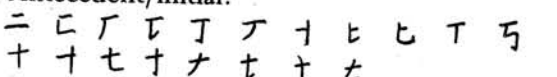


In multiple SCs different kinds of simultaneous combinations of H-strokes with others can be found, such as: contact + intersectional combinations in SCs 女, 丑, 大, etc.

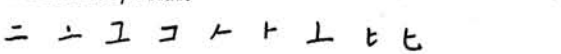
iii. Succession in stroke-order

H-strokes are combined with other strokes both as antecedent and posterior and they are initial, successive or final in the total succession of strokes in SC:

1) Antecedent/initial:



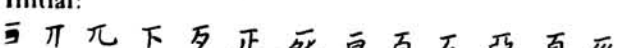
2) Posterior/final:



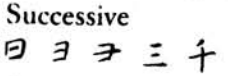
3) Antecedent and posterior/successive:

Further examples of the succession of H-strokes concern their combination with SUBGs:

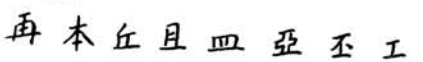
1) Initial:



2) Successive

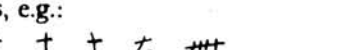


3) Final:



Specificity of H-strokes from the viewpoint of the stroke-order:

1. H-strokes are usually antecedent in intersectional combination with other strokes, e.g.:



2. In some multiple SCs or in combinations with SUBGs they are, in contrast, final: 女 子 册

(The succession of strokes is sometimes not fixed, as in the graph 世 stroke-order can be 1. 一 丨 丿 一 乚 or 2. 一 乚 丨 丿 一 or 3. 丨 丿 一 一 乚)

3. The H-stroke in a contact combination with the V-stroke in the right central position is posterior, e.g. in SC 卜 . If it combines with a combined stroke in its initial vertical part, the stroke-order is not fixed, as e.g. in SC 匕 , the stroke-order being 一 乚 or 乚 一

4. In the graphs of the outer-inner structure, the outer component of which surrounds the inner one on all four sides, the succession of strokes of the outer component is discontinuous: while the writing of the graph with this kind of structure starts with the outer component, the H-stroke of this component, if it is at the bottom, is written after the inner component, i.e. it is final. For example: 因 : 冂 大 一

c) Classification of variant forms

1. The positional differences of H-strokes manifest themselves by deviations from the horizontal position to the ascending skewed position, so that some variants of the H-strokes coincide, to a certain degree, with some variants of the A-strokes. As the shape differences between the H-strokes and A-strokes are not very great, it is often difficult to identify the stroke in question. A certain criterion for their distinction can be found on the level of the stroke-combinations, because the succession of both kinds of strokes is not always identical here: while the H-strokes in combinations with strokes of the vertical position are, as a rule, antecedent, the A-strokes are posterior in such combinations; compare e.g. the SCs 十 (stroke-order 一 丨) and 𠂉 (stroke-order 丨 丿). With the help of this criterion, positionally differentiated stroke forms can be evaluated in SCs, for example in G 牛 and SUBG 牛 (in the left part in the graphic structure, e.g. in 牺). This kind of graphic conversion of the H-stroke into an A-stroke, conditioned by the position of the subgraph in the graphic structure, can by analogy, also be applied to such SUBGs, where the H-stroke is not in an intersectional combination; cf. e.g. G 工 and SUBG 工 (in G 巧), G 土 and SUBG 土 (城), G 目 and SUBG 目 (眼), G 金 and SUBG 金 (剑), etc.

Besides the above mentioned cases, an obvious ascending tendency of the H-strokes can be found in some SCs with intersectional combinations; in such combinations the H-strokes are, however, antecedent, e.g. in Gs 弋, 戈, 七 etc. The ascending tendency of the H-strokes is here conditioned by the combination with certain kinds of strokes (i.e. with those being oriented to the right). Owing to the relatively considerable deviation of these H-strokes

from the horizontal position, which is one of the basic characteristic features of the H-strokes, this combinative modification can be viewed as a sufficient reason for establishing the subclass of H-strokes, the specific graphic characteristics of which will be an ascending position. This subclass can be named as ASCENDING HORIZONTAL STROKES (Ha-strokes), represented by Sst ㇀

2. The H-strokes of different length can be essentially considered as dimensional variants, as the different length of this stroke form cannot be taken as a criterion for their interclass classification. It is not fully valid, however, for the shortest variants of H-strokes, as the "shortness" is a characteristic graphic feature of "points" and consequently, the graphic appearance of both kinds of strokes can coincide. Cf. the level variant of the P-stroke in SC (SUBG) 忄 with the short variant of the H-stroke in SC 卜 of G 卡 . These shortest variants of the H-strokes can form a subclass of the H-strokes which can be termed ULTRASHORT HORIZONTAL STROKES (Hush-strokes), represented by Sst - .

As to the dimensional variants of the H-strokes, certain combinative and structural contingency can be stated here:

a) The long variants often occur in the following cases:

In such graphic units (Gs and SUBGs) where the H-stroke is initial and forms an intersectional or contact combination with the other strokes. Examples:

Contact combinations: 丁 下 万 丌 歹 不 百

Intersectional combinations: 十 寸 士 才 大 丈 斗 弋 友 卅 世

In such graphic units where the H-stroke is final and is:

1) In the lower position in a separate combination, e.g. in Gs 二 三 旦

2) in the lower position in a contact combination, e.g. in Gs 土 工 上 王 五 丑 立 主 旦 业 丞

3) in the central position in an intersectional combination, e.g. in Gs 子 女 册

In certain graphic units where the H-stroke is successive and is in the central position in an intersectional combination, e.g. in Gs 千 壬 升 半 平 吳

In graphs where the H-stroke joins the subgraphs in the horizontal graphic structure, e.g. in Gs or SUBGs 我 戋 戠

b) The short variants of H-strokes (including Hush-strokes) often occur:

In SCs where the H-stroke is in a right or left contact combination with other, usually vertical strokes, or strokes with vertical initial part, e.g. in SCs

卜 卜 厂 匕 丂 扌 扌

In graphic units where the SC with a horizontal stroke is the inner component which is in a contact or separate combination with the external component, e.g. in Gs 目 貝 見 且 具 直 真 月

The above given examples cannot however, be regarded as having general validity. Moreover, in many cases it is the relative dimensions of the H-strokes that should be taken into consideration rather than their absolute length. Thus in graphic units comprising H-strokes both in the upper and lower, or also in middle, positions, the H-stroke in the upper, or middle, position is often shorter, whereas in the lower position it is usually longer. Compare, for example, the H-strokes in following Gs: 二 三 于 工 土 王 井 五 耳 互 正 車 立

The same holds true for certain combinations of the H-strokes with some strokes in a vertical succession, e.g. in Gs (SUBGs) 千 丰 毛 乇 匸

d) Modifications in the graphic structure

Besides the positional changes of the H-strokes leading to their graphic conversion, structurally conditioned modifications of the length of the H-strokes regularly occur:

1. Shortening of the H-strokes of SUBGs in the horizontal graphic structure. Compare for example: 土, 止 — 址　　木, 才 — 材

王, 丁 — 玎　　言, 身, 寸 — 謝　　口, 下 — 吓

弓, 米, 弓 — 粥

2. In the vertical graphic structure, the length of the H-strokes in the upper and lower SUBGs remains essentially the same (sometimes even somewhat longer — cf. e.g. 曰, 十 — 早　士, 口 — 吉 etc.).

3. In the Gs of the inner-outer graphic structure, the length of the H-strokes in the inner part becomes shorter, while in the outer it can become either shorter or longer, depending on its position in the subgraphic component. Examples:

i. H-strokes as parts of the inner component:

耳 — 聞　　大 — 因

ii. H-strokes as parts of the outer component:

a) shortened: 走 — 超

b) lengthened: 广 — 廣

In complex graphic structures the dimensional modifications of H-strokes are similarly conditioned. Naturally enough, the above-mentioned modifications of H-strokes only have certain general validity; their dimensional modifications are affected by further factors as well, such as the total complexity of the given graphic unit, the proportional relations of the structural components etc.

2. Vertical (V-strokes)—St |

a) Graphic features

The basic graphic characteristics of strokes belonging to the class of V-strokes are:

1) a straight line of various length

2) vertical position

3) above-to-down direction of writing

As to the shape, V-strokes are in principle of a uniform nature; some deviations from the basic shape, however, can be observed in certain cases, manifesting themselves in a slight bend, which is as a rule accompanied by a deviation from the vertical position, so that a graphic coincidence can occur with the variants of the L-strokes. The differences between the V-strokes can further concern the secondary shape features, i.e. the thickness of the stroke, especially of its final part.
pecially of its final part.

A great variety of differences in length is a characteristic dimensional feature of the V-strokes. Some of the long variants of the V-strokes are secondarily differentiated by a pointed final part of the stroke. As with the H-strokes, so the shortest variants of the V-strokes coincide with "points" of the vertical position.

The basic position of the V-strokes is vertical. A skewed deviation exists which can go in both directions: to the right \ and to the left / . While in the first case the graphic coincidence with strokes in similar positions is comparatively small, in the latter case there is a coincidence with L-strokes.

b) Combinative features

i. Distribution:

V-strokes are of a high combinative power.

Combinations of V-strokes with other strokes in minimal SCs:

+H

+V

+L

+A

+RP

+V-h

+H-V

+H-L

+V-H

+V-A

+L-H

+H-V-h

+H-L-h

+H-L-Vc-h

Combinations of V-strokes with other strokes in multiple SCs:

+H+H

+H+H+H

+L+H

+L+H+H

+L+V

+H+L+R

+H+L+RP

+LP+L

+RP+L

+LP+RP

+H+A

+H-V+H

+H-V+H+H

+L+V-Rle-h

+H+H+H-L-h

+H+V-H-L-h+L

+H-L+H-L-h+RP

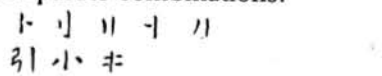
+H+H-L-h

Combinations of V-strokes with SUBGs, or with SUBGs and strokes:

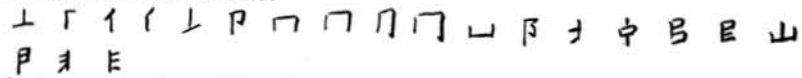
ii. Types of combinations:

V-strokes combine with other strokes and subgraphs separately, contactly and intersectionally. Examples:

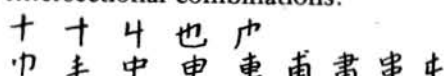
1. Separate combinations:



2. Contact combinations:



3. Intersectional combinations:



In multiple SCs, V-strokes occur in mixed combinations, for example:

a) separate + contact:

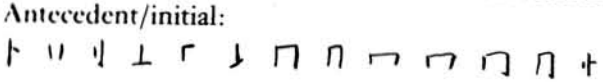
b) separate + intersectional:

c) contact + intersectional:

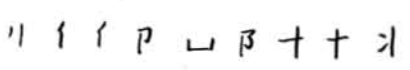
iii. Succession in stroke-order:

V-strokes are antecedent or posterior in combinations with other strokes, and are initial, successive or final in the total succession of strokes in SCs:

1) Antecedent/initial:



2) Posterior/final:



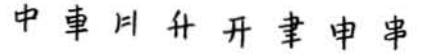
3) Antecedent and posterior/successive:

Examples of succession of V-strokes in combination with SUBGs:

1) Initial:

2) Successive:

3) Final:

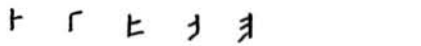


From the viewpoint of the stroke order in combinations with other strokes, V-strokes can be characterized as follows:

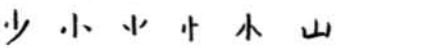
1. In intersectional combinations with H-strokes or with strokes including a horizontal part, V-strokes are as a rule, posterior:

2. In combinations with "points" or with A-strokes, they are as a rule, antecedent:

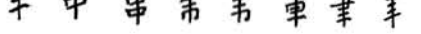
3. In contact combinations with strokes the location of which is on the left or right side of the V-stroke, the V-stroke is antecedent:



4. In the cases in which the V-strokes combine in a central position with strokes or subgraphs separately or contactly, they are as a rule, initial:



5. In intersectional combinations with SUBGs, the V-strokes is usualy final (in an elongated variant form, except for its limitation by some graphic element in the downward position. Examples:



c) Classification of variant forms:

1. Deviations of V-strokes from the basic position:

i. V-strokes with an obvious inclination to the right frequently occur in the left position in SC, where they combine, as a rule, with combined strokes, their initial part being horizontal. The occurrence of this variant of V-strokes has its dimensional limitation: it is especially characteristic of short variants of V-strokes; cf. the first strokes of Gs 中 , 央 with those of Gs 同 , 国 .

Since these positional deviations are of a more or less facultative nature, V-strokes with this inclination might be considered as variant forms within the class of V-strokes.

ii. If a stroke is not quite vertical but inclined to the left, it is often difficult to state whether it is a positional variant of a V-stroke, or a variant of an

L-stroke (resulting for example, from the graphic conversion). Difficulties arise, above all, if there are no other specific combinative or structural criteria for their identification — for example such criteria as is the different succession of V-strokes and L-strokes in the upper left-end combination with H-strokes (in combinations of H-strokes with V-strokes, the H-strokes can be posterior, while in those with L-strokes they are antecedent). The above is, however, a weak criterion, as in combinations of H-strokes with V-strokes this succession is not always observed. For example, there are not sufficient criteria for an univocal identification of the first successive stroke in SC, 五 i.e. S / , which is slightly oblique and skewed to the left. Nevertheless, certain secondary graphic features, such as the thickness of this stroke and its upper and lower combination with H-strokes, do indicate that this stroke can be considered as a V-stroke. Owing to the tendency of parallel combinations of V-strokes to become convergent in some SCs, the positon of the V-stroke on the right part has an inclination to the left, which is very conspicuous in cases where the corresponding subgraph is in the upward position in the vertical graphic structure. Cf. the second V-stroke in G 廿 with that in the corresponding SUBG in G 革 .

For strokes which form a sort of intermediate type between the V-strokes and the L-strokes, subclasses of V-strokes or L-strokes can be established. If ranked in the class of V-strokes, they can be termed LEFT SKEWED VERTICAL (Vl-strokes) represented by Sst / .

2. The dimensional differences of V-strokes are scarcely accompanied by their combinative specificity. Some degree of exception to this is demonstrated by elongated variants having the following specific features:

i. They are often final strokes in SC, or — if the final stroke is "point" — they are the last preceding the "point":

a) final: 十 升 千 井 中

b) successive: 午 书

ii. The prevalent combination of this V-stroke is intersectional, sometimes it is also contact:

a) intersectional: 十 十 斗 千 丰 升 干 廾 中 羊 平 申 甲 車

b) contact: 丁 尸

Strokes with the above mentioned graphic and combinative features can be established as a subclass of V-strokes and named ELONGATED VERTICAL STROKES (Ve-strokes), represented by Sst | .

d) Modifications in the graphic structure

1. Positional-shape modifications of V-strokes in the graphic structure occur above all in SUBGs located in the upper or the left part of the graphic structure:

a) upper position: 十 — 南

b) left position: 羊 — 判 羊 — 羚 辛 — 辣 丰 — 邦

The modifications in the latter case are so conspicuous that a graphic conversion of V-strokes into L-strokes actually takes place.

2. The length of V-strokes in the horizontal structures of the graphs remain essentially the same, while those in the vertical structures are relatively shorter:

a) horizontal structures: 中 — 仲 申 — 神 車 — 陣

b) vertical structures: 王 — 弄 不 — 否 山 — 岳

工 — 貢 下 — 忘

3. In the graphs of the outer-inner structure, the length of V-strokes in the inner component gets shorter, while in the outer it gets longer in some cases:

a) in inner component: 工 — 左 巾 — 布 木 — 困

山 疝

b) in outer component: 工 — 巫

4. Ve-strokes in SUBGs, limited in the vertical direction by another graphic element, get reduced to the dimension of St; cf. e.g:

丰 — 慧 斤 — 近 中 — 忠 巾 — 匝

斤 — 丘 聿 — 書 羊 — 羔

3. Left skew (L-strokes) — St /

a) Graphic features

The basic graphic characteristics of strokes belonging to the class of L-strokes are:

1) a slightly concave and left skewed line of various length

2) right-above-to-left-down direction of writing

Due to the nature of the graphic characteristics of L-strokes, their variety is considerable: there are differences in their shape, namely in the degree of their bending which can moreover differ from one part of the stroke to another; some variants are slightly bending or are even straight. As to the posi-

tion of L-strokes, considerable differences can be found here as well. The basic position can be considered the one of the L-stroke in G 人 . Positional variants of L-strokes deviate from this basic position of St — some variants come close to the vertical or horizontal positions. Besides, considerable dimensional variants occur with L-strokes as well, and certain correlation between the shape, position and length can be ascertained here.

b) Combinative features

i. Distribution

L-strokes are of a high combinative power. They enter into mutual combinations with all kinds of strokes, except the A-strokes, LP-strokes and some kinds of the combined strokes.

Combinations of L-strokes with other strokes in minimal SCs:

+H 𠂉 𠂆 𠂇 𠂇 𠂇

+V 川 亻 亻 亻

+L 𠂉 𠂉 𠂉

+R 人 入 𠆢 八 𠆢 𠆢 𠆢 乂 乂 乂

+RP 八 𠂉 𠂉 𠂉 𠂉 人 乂

+H-h 尸

+V-h 川

+ Vc-h 𠂉 𠂉

+ R-h 𠂉

+ H-L 𠂉 𠂉

+ V-H 儿

+ V-A 𠂉 𠂉

+ L-H 𠂉

+ H-V-h 门

+ H-L-h 𠂉 力 刀 冂

+ H-L-Vc-h 乃

+ V-Rl-h 儿 乚 𠂉

+ H-R-h 八

+ H-V-Rl-h 几 九

Combinations of L-strokes with other strokes in multiple SCs:

+H +V 才

+RP +V 丫

+H +V +RP 不

+H +V +R 木

+H +L-R 女

+RP +L +R 火

+RP +H-L-h +RP 为

Combinations of L-strokes with SUBGs, or with SUBGs and strokes:

未 夭 么 𠂉 乏 幺 升 孚 门 冂 白 白 目 血 片 疋 𠂉 帀

皂 采 垂 禹 身 囟 重 囿 鸟 鳥 鸟 乌 身 彡 𠂉 毛 川 儿

ii. Types of combinations

All three kinds of combinations occur with L-strokes, both in combinations with strokes and SUBGs:

1. Separate combinations:

八 𠆢 刂 儿 𠂉 儿 儿 𠂉 丷 𠂉 𠂉

𠂉 么 乏 幺 川 儿 彡 丷

2. Contact combinations:

几 几 𠂉 𠂉 𠂉 人 𠆢 入 入 𠂉 𠂉 𠂉 𠂉 𠂉 𠂉

𠂉 𠂉 𠂉 𠂉 𠂉 刀 刀 尸 厂 匕

白 千 壬 夫 禾 自 门 冂 帀 皂 禹 鸟 鳥 鸟 乌 身 身

囿 血 采 录 少 乡 𠂉 毛

3. Intersectional combinations:

乂 乂 𠂉 乂 九 匕 乂 𠂉 𠂉 𠂉 力 才

少 手 必 步

Mixed combinations of L-strokes in multiple SCs:

1. Separate + contact combinations: 火
2. Separate + intersectional combinations: 为
3. Contact + intersectional combinations: 女 大

iii. Succession in stroke-order

L-strokes combine with other strokes both as antecedent and posterior, and are initial, successive or final in the total succession of strokes in SCs; the succession of strokes essentially accords with the natural order of writing:

1) Antecedent/initial:

𠂉 𠂉 乂 𠂉

2) Posterior/final:

𠂉 乂 尸

3) Antecedent and posterior/successive:

戈 大 火 女

In some cases, when the L-strokes form contact or intersectional combinations with combined kinds of strokes, the L-strokes can be antecedent, or posterior:

a) Antecedent:

几 九

b) Posterior:

刀 力

There are some SCs with L-strokes, where the stroke order is optional:

刀 : 𠃌丿 or 丿𠃌　　力 : 𠃌丿 or 丿𠃌

匕 : 丿乚 or 乚丿　　尸 : 𠃌丿 or 丿𠃌

了 : 丿亅 or 亅丿　　及 : 𠃌乃 or 乃丿乀

Examples of succession of L-strokes in combination with SUBGs:

1) Initial (very frequently in contact but also separate combinations):

白 夫 升 禾 自 门 勹 冂 帀 自

幺 幺 乏 幺

2) Successive:

号 戈 承

3) Final (very often in contact or intersectional combinations):

手 尸 户 尸 承 少 乡 乐 乡 羊

The specificity of the combinative features of L-strokes consists, among others, in their ability to mutually combine, not only in separate but also in contact combinations:

1) Separate combinations:

氵 彡

2) Contact combinations:

𠂆 亻

c) Classification of variant forms

1. The variability of the shape of L-strokes is, to some degree, conditioned by the combinative specificity and by the location of the SUBG in the graphic structure:

i. A relatively great curving of the L-stroke can be seen particularly in those strokes which combine with other strokes or subgraphic elements intersectionally and which, at the same time, combine with R-strokes or SUBGs in the lower right position or, in addition to this, with the SUBGs in the lower central position. In these cases, the L-strokes are comparatively long and the bending is evident, above all in the lower part of the stroke. Examples:

大 丈 天 夫 史 央 央 更 禹 疌 寿 春

ii. Some L-strokes of medium dimensions, which are in intersectional combinations with other strokes and occupy the lower position in the SC, show variants with a comparatively great and symmetrical curving. For example: 女 文 攵

iii. Straight or nearly straight variants of L-strokes can frequently be found among short and medium variants in all kinds of combinations, but most often in contact combinations.

a) Separate combinations:

亻 八 彡

b) Contact combinations:

厶 厶 𠂇 勹 白 血 自 攵 臼 舟 臼 𠂆 升

𠂉 壬 毛 毛 禾 我 手 手 重 采 丆 牙 不 木 衣

第 录 差

c) Intersectional combinations:

乂 ナ 才 身

There are a few cases of comparatively long straight L-strokes; they appear especially in graphs where the L-stroke "integrates" the components in the graphic structure: 考 老 考 為

The bending of L-strokes is very often difficult to specify, which is due to being treated optionally. Thus, differences can be found in the shape of L-strokes not only in different graphs which are comparable in their stroke combinations and graphic structure, but also in the same graphs in individual styles and even in standard dictionaries, as Xīnhuá Zìdiǎn and Tóngyīn Zìdiǎn; cf. the shape of L-strokes in the following graph in both dictionaries:

石 — Xīnhuá Zìdiǎn

石 — Tóngyīn Zìdiǎn

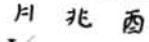
Two almost contrary variants of the shape of L-strokes, which have their combinative and structural specificity, can be classified as a subclass of L-strokes: those characterized by a great degree of bending can be termed BENT LEFT SKEW (Lb-strokes) represented by Sst 𠃌 , and those characterized by a straight shape can also form a subclass with the name

STRAIGHT LEFT SKEW (Lst-strokes), represented by Sst 丿 .

2. The positional differences of L-strokes, ranging from nearly vertical to nearly horizontal, are also conditioned, to a considerable degree, by their combinative and structural specificity. A certain coherency between position, shape and length of L-strokes can be observed here:

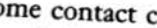
i. Vertical variants of L-strokes can be found among strokes of various length having the following combinative features:

a) In separate parallel combinations with vertical strokes or with strokes with a vertical initial part (either in minimal SCs or in multiple SCs where the minimal SC is further combined): 川 川 儿 儿 井 井 井

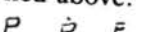


b) In contact upper-right-end combinations with various kinds of strokes:

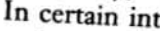
Some contact combinations with SUBGs can be added to the examples mentioned above:



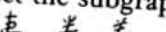
c) In certain intersectional combinations, especially where the L-strokes intersect the subgraphic elements:



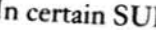
d) In certain SUBGs occupying the left position in the horizontal graphic structures (especially in the case of the "graphic conversion" of a V-stroke into an L-stroke):



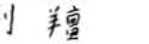
e) In intersectional combinations with V-strokes, when the corresponding SC is an upper SUBG in the vertical structure (graphic conversion of a V-stroke into an L-stroke):

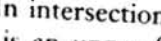


ii. Horizontal positional variants of L-strokes occur above all among short or medium L-strokes under certain combinative conditions: 1. they are as a rule, initial strokes in graphs or subgraphs, 2. they are in parallel combinations with H-strokes and in upper-middle combinations with V-strokes or with strokes initiated vertically, e.g.



There are also cases, where a level variant of the L-strokes occurs in SCs with separate or contact combination only. In the latter case it is usually the uper-left-end combination; examples:

a) Separate combination: 

b) Contact combinations: 

The two opposite positional variants of L-strokes described above can form subclasses: VERTICAL LEFT SKEW (Lv-strokes), which are characteristic of the long variants of L-strokes and will be represented by Sst 丿 , and LEVEL LEFT SKEW (Lle-strokes), which are characteristic of short and medium variants and will be represented by Sst 丶 .

3. As to the dimensional differences between L-strokes, the different length of these strokes can be considered as a variant within the class or subclass of L-strokes — with the exception of the shortest variants of these strokes, wich to a considerable degree coincide with the corresponding positional variants of "points", but differ from them by secondary characteristics in shape (different thickness of the initial and final parts of both kinds of strokes). Compare for example the short variant of L-stroke in G 只 (i.e. initial stroke of SC 丿) and the "point" in G 小 (first successive stroke). These very short variants of the L-strokes, roughly coinciding with "points", can be termed ULTRA-SHORT LEFT SKEW (Lush-strokes), represented by Sst 丶 .

d) Modifications in the graphic structure

The following modifications of L-strokes take place in SUBGs in different positions in the graphic structure:

1) In SUBGs in the left or right position in the horizontal graphic structure, the L-strokes are comparatively shorter, cf. e.g.:

木 — 朽 , 休　　谷 — 欲 , 峪

In both the left and right parts of the horizontal graphic structure, the L-strokes are often relatively vertical:

石 — 研　　方 — 旋　　月 — 刖　　八 — 扒　　九 — 杌　　少 — 抄

Certain shape modifications of L-strokes can often be found in the positions mentioned above, cf. e.g.:

女 — 好　　斤 — 欣　　夫 — 佚　　斤 — 圻

As far as the position and shape are concered, there are also certain cases with an opposite tendency in their modifications:

力 — 叻　　乃 — 扔

2) In subgraphs representing the upper or lower components of the ver-

tical graphic structure, the L-strokes are relatively short and sometimes more skewed:

人 — 介　　入 — 全　　木 — 查　　石 — 砦

The degree of bending of L-strokes in the upper subgraphs is often smaller:

大 — 奋　　斤 — 兵

L-strokes in subgraphs occupying the lower position in the graphic structure often have a comparatively greater bend; their positon, however, is not necessary more slanted than that in corresponding autonomous graphs. Examples:

斤 — 芹　　夭 — 笑　　女 — 妥

There are different modifications in the outer-inner graphic structures:

a) Besides the usual dimensional modifications, i.e. the shortenness of the length of L-strokes in subgraphs in the inner position, the L-strokes in some cases are relatively straight, in others relatively more bent:

i. more straight variants: 斤 — 匠　　大 — 因

ii. more bent variants: 女 — 囡

b) In the external component, the L-strokes are usually straighter:

九 — 旭　　尸 — 尼

The L-strokes in the graphic structure can be converted into other kinds of strokes — as is usual in subgraphs in the lower position in the graphic structure where the L-strokes convert into V-strokes:

冂 — 背　　甩 — 甭

4. Right skew (R-strokes) — St 丶

a) Graphic features

The basic graphic characteristics of strokes belonging to the class of R-strokes are:

1) relatively long line with a slight wave,

2) right skewed position,

3) left-up-to-right-down direction of writing.

R-strokes vary in length, shape and position. Besides relatively long strokes, there are also shorter variants of a modified shape. The shape variants of R-strokes concern the way and degree of the bending of the strokes; some

variants have a very slight bending in the initial part, others lack it entirely. In comparison with the shape of St, apparent differences can be found among the short variants of R-strokes, these being convex 丶 . As to the position of R-strokes, there is a considerable variability between the skew position represented by St and the almost horizontal position.

b) Combinative features

i. Distribution:

The number of combinations of R-strokes with other strokes and SUBGs is relatively limited. They mostly combine with L-strokes and combined strokes, the final part of which is left skew. There are also a few combinations with other strokes.

Combinations of R-strokes with other strokes in minimal SCs:

+V 卜 卞

+L 乂 乂 犬 人 入 𠆢 𠂆 𠂉 𠂉 人 人 八 八

+V-h 𠆢

+H-L 又 又 之 之

+H-L-H-L 叉

Combinations of R-strokes with other strokes in multiple SCs:

+H +L 大 戈

+L +L 𠂉

Combinations of R-strokes with SUBGs, or with other strokes and SUBGs respectively: 辽 辽 及 奴 尺 久 久 𠂆 孑 爪 爪 斥

ii. Types of combinations:

There are the following types of combinations of R-strokes with other strokes and SUBGs:

1. Separate combinations: 𠆢 𠆢 八 八　　𠂆

2. Contact combinations: 入 人 𠆢 𠂉 𠂉 人 人 之 尺 辽 辽 久

3. Intersectional combinations: 卞 乂 乂 犬 乂 又 犬 叉 及 奴 斥

Mixed combinations of R-strokes in multiple SC: Contact + intersectional combinations: 及

iii. Succession in stroke-order:

R-strokes combine with other strokes as posterior (see the above mentioned examples); thus, in SCs they are, as a rule, final, with the exception of some SCs, where it is the "point" that is final, the R-stroke being then successive (e.g. in Gs 又 , 犬 etc.).

c) Classification of variant forms

The variability of the shape of R-strokes depends on the type and way of stroke combinations. In comparable cases (in combination with strokes of the same stroke-class) it can be noticed that there are some differences in the initial part of R-strokes according to its graphically limited or unlimited nature in combination with other strokes. Compare the combinations of R-strokes and L-strokes, where the initial part of the R-strokes in not limited with those where it is limited:

a) 乂 入 八

b) 人 𠂉 𠆢

In the first case, the R-stroke is slightly waved in the initial part, in the second case the waving is omitted.

The shape variability of R-strokes correlates to a certain degree with the length, both again correlating to a certain degree with the type of stroke combinations: In intersectional combinations, R-strokes are comparatively longer than in those combinations where the R-stroke is limited by other strokes (in contact combinations), or where the R-stroke is in a separate combination with other strokes. These shape differences, however, are not great enough to constitute subclasses. But there are some other variants of R-strokes that distinctly differ from those of St, namely the shortened variants. Compare the R-strokes in Gs 木 , 人 and 火 with those in corresponding SUBGs 木 (in G 𣏌), 亻 (in G 从) and 灬 (in G 炎). Besides these positionally conditioned modifications of R-strokes in the graphic structure, similar variants also appear in graphs, where they are not modified positionally; compare the final strokes in SCs 斤 , 夕 , 歹 etc. The graphic characteristic of these strokes correspond with the long variants of the right skewed point as well (see below), so that they might be ranked among the "points". If we rank them among the R-strokes, we can classify them as a subclass and term them SHORT RIGHT SKEW (Rsh-strokes) with Sst 丶 .

A considerable variability also appears in the position of the R-strokes. The deviation from the position of the St usually consists in the skew becoming horizontal. The position is conditioned here by the contact of the combination: a relatively horizontal position can be found in intersectional combinations provided the R-strokes are in the lower position, such as in SCs 𠂇 or 𠂆 (in G 史), while in the lower-end contact combinations, the position of R-strokes is nearly horizontal, such as in SCs 辶 or 辶 . This kind of R-strokes can be taken for a subclass of the R-strokes and termed HORIZONTAL RIGHT SKEW (Rh-strokes), represented by Sst 一 .

d) Modifications in the graphic structure

Principal modifications of R-strokes as conditioned by the way of combination or by the location of the corresponding SUBG in the graphic structure:

1. If the graph stands as a subgraph in the left or inner position in the graphic structure, the R-stroke converts into the Rsh-stroke:

木 — in left position: 材
木 — in inner position: 困

2. In SUBGs in the vertical graphic structure, both in the upper and lower positions, a variability between the R-strokes and Rsh-strokes is often ascertained, for example:

木 — in upper position: 李 or 李
木 — in lower position: 果 or 果

3. Rsh-strokes occurring as the basic form in the lower SUBGs in vertical graphic structures, convert into the form of R-strokes (i.e. the elongated form) if the corresponding SUBG is vertically followed by another SUBG:

其 基

4. If a graph with a R-stroke stands as subgraph in the right position, the short form of R-strokes (i.e. Rsh-stroke) is conventional in some cases, while in others the long form (i.e. the form of St) is more common; compare:

忄夬 (less common is 忄夬)

犭欠 (less common is 犭欠)

5. G 穴 used as a subgraph in the upper position in the graphic structure can have two variant forms differentiated by a different conversion of the R-strokes:

a) 冖 (in G 空)—R-stroke converts into the "broken" stroke;

b) 宀 (in G 空)—R-stroke converts into the Rsh-stroke.

5. Ascending (A-strokes)—St ㇒

a) Graphic features

The strokes included in the class of A-strokes have a straight shape and various length, and are written from left down to right up. Some of the A-

-strokes are also written with a little hook in the initial part of the stroke; the hooked form is, however, of a facultative nature.

A-strokes, as static graphic units, have certain graphic features similar to those of L-strokes (i.e. in length and position of the strokes and, to some degree, in shape as well — there are certain graphic similarities with the straight variants of L-strokes). The fundamental differences between A-strokes and L-strokes concern the motoric aspect, i.e. the direction of writing which is here in opposition. The secondary shape differences, such as the different shading (thickness) of both kinds of strokes, follow from the motoric aspect mentioned above.

Besides the shape variability (i.e. plain and hooked variants) and the dimensional variability, the A-strokes also vary in the degree of their skewed position.

b) Combinative features

i. Distribution:

The number of combinations of A-strokes with other strokes and SUBGs is limited.

Combinations of A-strokes with other strokes in minimal SCs:

+H 亠
+V 𠂉 乚
+RP 冫 冫
+V-h 扌
+H-V-h 刁 刁
+V-H-L-h 勻

Combinations of A-strokes in multiple SCS:

+V +RP 𠂆

Combinations of A-strokes with SUBGs, or with strokes and SUBGs respectively: 扌 灬 氵 灬

The occurrence of the A-strokes in SUBGs in the left position of the graphic structure is comparatively frequent, where they are usually converted from the original H-strokes. For example: 工 — 功 王 — 玩 丘 — 邱
立 — 站 目 — 眼 土 — 地 且 — 助 金 — 針 豆 — 頭
血 — 蚌 正 — 政 耳 — 聪 日 — 明 金 — 剑 女 — 好
子 — 孔 鱼 — 鲤 亲 — 新 身 — 躺 亩 — 鹤

ii. Types of combinations:

1. Separate combinations:
亠 冫 氵 刁 刁 勻
灬 灬 亩
2. Contact combinations:
𠂉 乚 工
日 目 血
3. Intersectional combinations:
扌 扌
耳 身 亲
Mixed combinations in multiple SCs:
Contact + intersectional combinations:
女

iii. Succession in the stroke-order:

Appearing usually in the lower position, A-strokes are, as a rule, posterior in stroke-combinations as well as in combinations with subgraphic units, being frequently final from the viewpoint of the total succession in the SCs. More rarely they are also antecedent (successive), e.g. in SCs 𠂆 , 身 (in G 躬) etc.

c) Classification of variant forms

The differences in the graphic features of the strokes within the class of A-strokes might be characterized as follows:

1. The differences concerning the shape of A-strokes, i.e. the presence or absence of the initial hook, are essentially of an optional nature. Nevertheless, a certain relation between the shape and the stroke combination can be observed here: Hooked A-strokes often occur in combination with RP-strokes, however, a variant without a hook can also be found in this combination. In combinations with other strokes, the hooked variants of A-strokes are not common. The same holds true for A-strokes converted from H-strokes in modified subgraphs.

Owing to the graphic and combinative specificity of the hooked variants of A-strokes, they can be classed as a possible subclass of A-strokes, and termed HOOKED ASCENDING (h-A-strokes), represented by Sst ✓ .

2. The positional differences of A-strokes depend on the type of stroke combinations, on the complexity of the graphic structure as well as on the position of the corresponding SC in the higher graphic unit. Variants with a tendency to a vertical position appear in some SCs where the A-stroke is in a separate convergent combination with RP-strokes, if the corresponding

SUBG is in the left position in the vertical graphic structure, e.g. SUBG 氵(in G 冰) or SUBG 氵(in G 江). However, this stroke combination in other SUBGs or in a different position in the graphic structure can be manifested in the A-stroke with a tendency to the horizontal position, for example in Gs 习 or 将. This variant of A-strokes appears not only in the modified graphic forms in the SUBGs, but also as the "basic forms", e.g. in Gs 虫 and 习. If these Gs stand as SUBGs in the left position in the graphic structure, the A-strokes become more vertical again: 蝉, 羽. A nearly horizontal position generally appears in the A-strokes which are converted from H-strokes, i.e. especially in the SUBGs occurring in the left part in the graphic structure.[1] However, the A-strokes in these cases do not have the same skew: besides nearly horizontal A-strokes, there are also quite skewed ones:

a) with a tendency to the horizontal position:

封 站 政 針 轴

b) with a more skewed position:

玩 孔 聰 物

The positional variety of the A-strokes under the conditions just mentioned is sometimes caused by the complexity of the graphic structure (cf. e.g. the A-strokes in the left SUBGs in Gs 鲸 and 坪); however, it is more often only a question of convention; moreover, there are considerable differences in individual styles as well. Besides, in many subgraphs in the left part in the graphic structure, the conversion of H-strokes into A-strokes is of a facultative nature only, as in Gs 野, 勤, 明, 眼, 盼, 颤, 好 etc.

The variants of A-strokes with a nearly horizontal position closely coincide with Ha-strokes; they can be classed as a subclass and termed LEVEL ASCENDING (Ale-strokes) with Sst

d) Modifications in the graphic structure

Some modifications of A-strokes have been mentioned above. In general, it can be said that A-strokes in SUBGs of the vertical structure have a tendency to the level position, while in the horizontal structure, both in the left and right part, their position is usually more skewed; cf. e.g.:

虫 — in lower position: 蟹
— in left position: 虹
匀 — in right position: 均

POINTS

The term "points" denominates such strokes whose characteristic feature is their shortness, which corresponds to the formative aspect of this kind of strokes: the continuous motion is more or less reduced here to the indicated direction of writing. "Points" written with the usual writing instruments (pen, pencil, etc.), however, can be considered as having more or less linear character as well, and the criteria for their classification may be analogous with those used for the other strokes.

There is a close relation between the length and the shape of the "points"; characteristic of their shape is the short length. There are, of course, differences between the "points" in shape — in their curving, which is often optional. The differences between individual "points" also concern the length; although the "points" are very short, shorter and longer variants can be found in some cases.

A further characteristic feature of the "points" is the various position in which they occur, including the contrary position. The positional contrast is one of the main classificatory criteria for stroke-classing. If this criterion is also used for the interclass delimitation of the "points", the "points" can be divided into two separate classes, i.e. "right skewed points" and "left skewed points". However, in the case of "points", this criterion is much weaker than in that of other stroke-classes, which is due to the frequent dependence of the position of the "points" on their location in the graphic structure, and to the strong optional nature of their geometric position. The following division of "points" into two seaparate classes is therefore optional.

6. Right (skewed) points (RP-strokes) — St

a) Graphic features

The basic graphic characteristics of strokes belonging to the class of RP-strokes are:

1) a short line which can be slightly convex or concave,

2) right skewed position,

3) from above do right down direction of writing.

RP-strokes have variants mutually differentiating in length, shape and the degree of skew.

As the characteristic feature of the "points" is their short length, the longer variants of RP-strokes must be considered as a deviation from St. Graphically, the long variants of RP-strokes coincide with the short R-strokes (Rsh-strokes).

b) Combinative features

i. Distribution:

Strokes of this class are of high degree of combinative power.

Combinations of RP-strokes with other strokes in minimal SCs:

+H 亠
+V 丬 刂 卜 冂
+L 丿 丿 丿 丶 乀 ㇒
+A 冫 冫
+RP 氵 氵 丶丶
+LP 丷
+H-L 尸 ㇇ 冖 夕
+V-A 𠂉 𠂉
+L-H 厶
+H-V-h 亅
+H-L/-H)-L 𠃌
(+H-h)

Combinations of RP-strokes with other strokes in multiple SCs:

+V +LP 忄
+L +V 丫
+H +L +V 不
+V +H-V-h 门
+LP +RP +Rl-h 心

Combinations of RP-strokes with SUBGs, or with strokes and SUBGs respectively, are quite frequent:

广 ㇇ 灬 氵 宀 亡 户 主 圭 良 艮
𠂆 犬 太 义 术 刃 凡 丸 氐 斤 乒 兔 寸 弋 戈 夕 攵
勺 歹 𠂇 厶 尸 艮 尤 术 甫 瓦 又 下 疒 冂 心 幺 𠂉
小 𠂆 戊 戍

II. Types of combinations:

1. Separate combinations of RP-strokes with other strokes and SUBGs are more frequent:

亠 ㇇ 冖 丿 刂 卜 丿 亅 灬 氵 氵 冫 冫 氵 丿 乀 卜 𠂉 门
户 宀 广 良 艮 主 亅 义 戊 寸 太 犬 戈 弋 玉 术 甫 又 兔

2. Contact combinations:

丫 厶 人 𠂇 ㇇
厶 艮 良

3. Intersectional combinations:

卜 𠂇
夕 歹 刃 丑 丸 斤

iii. Succession in the stroke-order:

RP-strokes in combinations with other strokes are both antecedent and posterior, and in SCs, they are often initial and final, sometimes successive:

1) Antecedent/initial:
亠 ㇇ 冖 刂 卜 丿 𠂇 亅 灬 氵 氵 冫 冫 冫
门 户 宀 广 良 艮 主 圭 亅
2) Posterior/final:
氵 氵 灬 八 卜 ㇒ 𠂉 ㇇ 人 𠂇 卜 乂
义 戊 寸 弋 戈 太 犬 尤 玉 术 求 甫 又 兔 凡 勺 氐
乒 𠂆 自 攵 瓦 厶 夕 刃 丸 疒 艮 艮
3) Antecedent and posterior/successive:
氵 丑

There is a certain relation between the succession of strokes in SCs and the positional orientation of these strokes. Thus, for example, in the case of inclined combinations of RP, strokes with other strokes, the former are usually antecedent:

亠 ㇇ 冖 刂 卜 丿 丿 亅

In contrast, in deflectional combinations they are posterior:

卜 卜 八

Similarly, in convergent combinations RP-strokes are usually antecedent, in divergent ones posterior:

a) Convergent combinations: 冫 冫 冫
b) Divergent combinations: 乀 ㇒

c) Classification of variant forms

1. As far as the concave or convex curving of the RP-strokes is concerned, this difference does not, due to its optional nature, represent a sufficient criterium for a further division of the RP stroke-class into subclasses.

2. The longer variants of RP-strokes, which deviate remarkably from the chracteristic dimension of the St, can be classed out as a subclass under the term ELONGATED RIGHT (SKEWED) POINTS (RPe-strokes), represented by Sst 丶.

In their longest variants, RPe-strokes grafically coincide with Rsh-strokes. There are not enough formal criteria for an exact delimitation of both kinds of the strokes; for the sake of convenience, it might be possible to classify, in certain cases, the strokes of the above mentioned graphic features as

Rsh-strokes; for example, if the corresponding SUBG can be identified as a structurally modified one, originally containing an R-stroke (as e.g. the final stroke of SUBG 大 in G 奇 , which is converted from R-stroke of G 大).

RPe-strokes occur in all three kinds of stroke-combinations, i.e. separate combinations (𠂉 ノ 丶), contact combinations (人 丷) and intersectional combinations (十 乂). RPe-strokes are mostly posterior (e.g. in 𠂉 ハ 十 乂 人), sometimes also antecedent (e.g. in 丶 丷).

As to the relation of the occurrence of RPe-strokes to the type of stroke-combinations, it can be said that in the intersectional combinations, only RPe-strokes can occur, while in the SCs with separate or contact stroke-combinations, both RP- and RPe-strokes can occur:

a) Separate combinations of RP-strokes: 𠂇 𠂆 𠂉
Separate combinations of RPe-strokes: 𠂉 ハ 𠂉

b) Contact combinations of RP-strokes: 𠂉
Contact combinations of RPe-strokes: 丫

3. The positional differences of RP-strokes show themselves, above all, in their tendency to becoming more horizontal. The extreme positional variant here is the level RP-stroke, which nearly coincides graphically with the short variant of H-strokes. The distinction between these two kinds of strokes consists of their potential variability, following from their different graphic nature. The graphic coincidence of both kinds of strokes is differently conditioned: Hush-strokes are dimensional variants of H-strokes (i.e. showing differences in length), while the level RP-strokes are positional variants (i.e. showing differences in position). These positional variants of RP-strokes can be classed out as a subclass of RP-strokes, and can be termed LEVEL RIGHT (SKEWED) POINT (RPle-strokes), represented by Sst - .

RPle-strokes are unicombinative; they only occur in SC 𠂆 .

d) Modifications in the graphic structure

The following main structural modifications of RP-strokes take place in the graphic structure:

1. In SUBGs in the upper position in the graphic structure, RP-strokes become shorter:

只 — 咫　　央 — 盎

In the upper part of the graphic structure, they show positional modifications as well:

小 — 尖

2. RPe-strokes in the outer part convert into R-strokes:

與 — 舉　　樊 — 攀

3. RP-strokes in the left part of the graphic structure have, as a rule, a more vertical position, cf.:

火 — 烟　　歹 — 殮

4. RPe-strokes in the inner part of the graphic structure become relatively shorter, cf. e.g. SUBG 大 in the upper and inner positions:

奇　　因

7. Left (skewed) points (LP-strokes) — St

a) Graphic features

The class of LP-strokes is formed by short strokes which are skewed to the left, may be concave or convex, and are usually written from top to the left down.

LP-strokes vary in shape, length and position; however, their dimensional variations are not so apparent as those of RP-strokes. Differences also occur in the direction of writing.

b) Combinative features

i. Distribution:

The number of combinations of LP-strokes with other strokes is very limited. LP-strokes can form minimal combinations only with V-strokes 丿 , with L-strokes 𠂆 , with RP-strokes 丶 and with H-h-strokes 𠂇 .

The occurence of LP-strokes in multiple SCs is limited as well, as there are only two multiple SCs where LP-strokes occur, namely G 心 and SUBG 𠂆 .

There is also one combination of LP-strokes with SC of RP-strokes, namely in SUBG 灬 .

ii. Types of combinations:

LP-strokes only form separate or contact combinations with other strokes:

1. Separate combinations:
丶 𠂆 灬 丿 𠂆

2. Contact combinations:
𠂇

iii. Succession in the stroke-order:

LP-strokes combine with other strokes as antecedent; in SCs they are, as a rule, initial (see the above given examples).

c) Classification of the variant forms

1. The dimensional variants of LP-strokes are not distinctive enough or conditioned by any expressive combinative specificity, so that there are no conditions for their further classification. But a certain graphic coincidence can be ascertained between the LP-strokes and the ultrashort L-strokes.

2. There are certain variants of LP-strokes in shape, conditioned by their direction of writing, which occur in individual styles, namely variants written from left down to right up (i.e. similarly as A-strokes); for example, the successive stroke in SC 小 which is an individual variant of G 小 . This kind of LP-strokes can be classified as an optional subclass of LP-strokes, termed ASCENDING LEFT POINT (LPa-strokes), represented by Sst ˎ .

3. The positional variants of LP-strokes differ in the degree of their skew. Among them, the nearly vertical one represents an apparent deviation from the position of that of the LP-strokes represented by St. This kind of positional variants of LP-strokes can be classified as a subclass, and termed VERTICAL LEFT POINT (LPv-strokes), represented by Sst ˈ .

d) Modifications in the graphic structure

There are certain positional modifications of LP-strokes in the graphic structure, conditioned by the position of the corresponding SUBG in the graphic structure. The nearly vertical position of LP-strokes in subgraphs in the right part of the graphic structure is rather striking. Compare e.g. LP-strokes in G 小 and in the corresponding SUBG in G 劣.

The "points" are characterized by their optional form. The relative instability of the graphic form of the "points", particularly the variability of their position, follows from their graphic and combinative specificity. In "Hànzìde bǐhuà hé bǐshùn"[2], the "points" are chracterized as follows: "The most important aspect in writing the "points" is their way of combination with and adaptation to other strokes"[3].

The position of "points" determined by their location in SC or in the graphic structure, is often of an optional nature. For example, the successive "points" in SC 灬 which have a level position, conditioned by their inner location in the stroke-succession, are also written in a quite vertical position: 灬. In individual styles, a different selection of the "points" is quite usual.

For example, the grapheme representing the word "xiǎo" — little, is manifested by G 小 in the dictionary Xīnhuá Zìdiǎn, while in the dictionary Tóngyīn Zìdiǎn it is G 小 ; in the first case the successive stroke is LP, while in the other it is RP. Many other identical graphemes in both dictionaries are represented by Gs with different kinds of points. Compare, for example, Gs 赤 , 赤 , 余 , 余 in the dictionary Xīnhuá Zìdiǎn, where LP strokes are used, with those in the dictionary Tóngyīn Zìdiǎn, where various "points" occur: in Gs 赤 and 赤 the nearly vertical variants of LP-strokes can be found, which approach the RP-strokes; in G 余 it is the RP-stroke, while in G 余 it is an LP-stroke again.

Sometimes, a fluctuation between the two kinds of "points" can be observed in two-stroke SCs with mutually correlative stroke positions, which are either convergent or divergent; for example, the graphemic representation of the word "ban" - half, can be realized by two Gs, 半 and 半 . In the first case, the SC in question is 丷 where the RP-stroke and L-stroke are in a convergent combination, while in the latter case, in SC 丷 , the constituent strokes are an LP-stroke and RPs-stroke which are in a divergent combination. Similarly, the fluctuation between the "points" and other strokes also takes place in some SCs. In Xīnhuá Zìdiǎn, for example, the grapheme representing the word "dōng" — winter is realized by G 冬 , where two RP-strokes in successive combination occure, while in the dictionary Tóngyīn Zìdiǎn the corresponding G is 冬 , where in a SC 冫 the RP-stroke with the A-stroke (or LPa-stroke respectively) is in a convergent combination.

The analysis of the first group of minimal graphic units, of elementary simple strokes, has shown that they fall into two groups: 1) linear strokes and 2) "points". In "noncalligraphic" forms the latter lose the character of points, and thus a close coincidence with the shortest variants of the linear strokes takes place. In any case, a parallel system of simple linear strokes and "points" can be suggested here:

Table 1:

PARALLEL SYSTEMS OF SIMPLE LINEAR STROKES AND "POINTS"

Linear strokes:		"Points":	
S-class	St	S-class/S-subclass	St/Sst
H-strokes	—	(RPle-strokes)	-
V-strokes	|	(LPv-strokes)	ˈ
L-strokes	丿	LP-strokes	ˎ
R-strokes	丶	RP-strokes	丶
		(RPe-strokes)	丶
A-strokes	丿	(LPa-strokes)	ˎ

The summary of simple stroke-classes and subclasses is as follows:

Table 2:

SUMMARY OF CLASSES AND SUBCLASSES OF SIMPLE STROKES

Class	St	Subclass	Sst			
			Main Differentiating Features			
			Shape	Position	Dimension	Direction of writing
H-strokes	—	Ha-strokes		—		
		Hush-strokes			-	
V-strokes	|	Vl-strokes		/		
		Ve-strokes			|	
L-strokes	/	Lb-strokes	⌋			
		Lst-strokes	/			
		Lv-strokes		⌋		
		Lle-strokes		/		
		Lush-strokes			/	
R-strokes	\	Rh-strokes		—		
		Rsh-strokes			\	
A-strokes	/	h-A-strokes	✓			
		Ale-strokes		—		
RP strokes	\	RPle-strokes		-		
		RPe-strokes			\	
LP strokes	'	LPv-strokes		'		
		LPa-strokes				'

HOOKED SIMPLE STROKES

The group of hooked simple strokes comprises linear strokes in which the final part is hooked. From the graphic point of view, this kind of strokes might also be interpreted as combined strokes, i.e. as strokes consisting of two parts — one longer and one shorter, where the latter has certain features of the L-strokes or A-strokes. Nevertheless, in the present work the hooked strokes will be interpreted as a kind of simple strokes with a specific termination. Thus, the hooked strokes can be taken for (hooked) variants of simple linear strokes; both form pairs of simple and hooked simple strokes. The parallel systems of simple and hooked simple strokes are not, however, complete; some of the simple strokes do not have their hooked counterparts and vice versa (see Table 3).

1. Horizontal — hook (H-h strokes) — St ¬

a) Graphic features

The class of H-h strokes consists of horizontal strokes with left skewed hooked termination. The graphic characteristics of H-h strokes is thus in general, analogous to that of the plain H-strokes, with the exception of the final part.

The hooked form of a stroke affords the theoretical possibility of a shape variability. In some graphic units, there are indeed strokes which show certain resemblance with those characterized as hooked strokes. Compare, for example, strokes ¬ and ¬ in G 為, stroke ¬ in G 书, stroke ¬ in SUBG 丗 etc. However, the final part of these strokes, in comparison with that in H-h strokes as represented by St, shows differences both in length and position, as well as in the way of curving. Thus, the above quoted strokes can be considered as combined strokes rather than variants of hooked strokes. It can therefore be stated that the H-h strokes have no outstanding shape variants.

As to the variability of other graphic characteristics, certain dimensional variability can be ascertained here.

b) Combinative features

i. Distribution:

The number of H-h stroke combinations with other strokes and SUBGs is very small.

Combinations with other strokes are limited to those with LP-strokes 冖, V-h strokes 了, 孑; in multiple SCs with V-strokes and L-strokes 尸, and with V-h strokes and L-strokes 孑.

There are also a few cases of combinations of H-h strokes with SUBGs:

疋 圭 买 去

ii. Types of combinations:

Contact combinations:

冖 了 孑 孑 疋 去

Mixed combinations:

1. Contact + intersectional combinations:

尸

2. Separate + intersectional combinations:

圭

iii. Succession in the stroke-order:

H-h strokes are antecedent or posterior in combination with other strokes and are initial, successive or final in the total succession of strokes in SCs:

1) Antecedent/initial:

2) Posterior/final:

3) Antecedent and posterior/successive:

c) Classification of variant forms

The dimensional variability of H-h strokes is, as a rule, conditioned by the complexity of the graphic structure and by the position of the corresponding SUBG in the graphic structure. This kind of structural variants of H-h strokes is not further classified into subclasses.

d) Modifications in the graphic structure

Only certain dimensional modifications in the graphic structure can be observed among the H-h strokes.

2. Vertical — hook (V-h strokes) — St

a) Graphic features

The class of V-h strokes includes those vertical strokes which are hooked left upward in their final part. The other graphic characteristics are similar to those of plain V-strokes.

Essentially, the V-h strokes differ in length only.

b) Combinative features

i. Distribution:

Combinations of V-h strokes with other strokes are relatively limited.

In minimal SCs, they combine with the following strokes:

+H

+V

+L

+A

+H-h

In multiple SCs they also appear in a limited extent:

+H +L

+H +A

+H +RP

+L +R

+H-h +L

+L +H +A

More frequent are combinations of V-h strokes with SUBGs, or with other strokes and SUBGs respectively; V-h strokes more often occur here in the central position:

Sometimes they also occur in the right position:

ii. Types of combinations:

V-h strokes form all three kinds of combinations with minimal or higher graphic units:

1) Separate combinations:

2) Contact combinations:

3) Intersectional combinations:

4) Mixed combinations:

iii. Succession in the stroke-order

V-h strokes in minimal SCs are, as a rule, posterior:

In multiple SCs, they are antecedent and posterior:

From the viewpoint of the total succession in SCs, they can be initial, successive and final.

Beside the cases, in which the stroke-order follows the general rules of the stroke succession, there are also some that are conditioned by the manner of combination.

a) In separate or contact combinations with SCs of a discontinuitive nature, V-h strokes are intitial:

小 水 氷 尒 木

b) V-h strokes in central intersectional combinations with subgraphic elements are usually final:

于 事 尹

c) V-h strokes in central intersectional, and at the same time contact or/and separate combinations with subgraphic constituents are successive; they are posterior in relation to the graphic elements with which they are in intersectional combinations, and are antecedent to the graphic elements with which they are in contact or separate combinations:

束 束 柬 秉

c) Classification of the variant forms

V-h strokes have no conspicuous shape or positional variants; differences between individual V-h strokes concern, above all, their dimension, and mainly follow from the complexity of the graph, from the position of the corresponding SUBG in the graphic structure, etc. Compare the dimensions of V-h strokes in G 小 and in the corresponding SUBG in G 示. The type of combination is also relevant for the size of V-h strokes. Generally speaking, V-h strokes in intersectional combinations are usually relatively longer than those in separate or contact combinations. Compare the length of the V-h strokes in the following graphs:

a) Separate and contact combinations:

小 水 示 尸 弓

b) Intersectional combinations:

事 束 束 柬 隶

The different length of the V-h strokes will be considered as variant forms within one class of strokes.

d) Modifications in the graphic structure

In certain graphs, there is a fluctuation between V-h and V-strokes in autonomous positions:

未 or 未　　末 or 末　　乘 or 乘

In the graphic structure, a mutual conversion of V-h and V-strokes often takes place:

1. If the graph with V-h stroke is the upper SUBG in the graphic structure, the hooked termination of the V-h stroke is often omitted:

可 — 哥　　求 — 裘　　束 — 速　　利 — 梨

果 — 裹　　予 — 畬　　亦 — 変，蛮

Similarly, the V-h stroke converts into a V-stroke, if the graph closely combines with another stroke in the lower part:

小 少

However, it is necessary to stress that this kind of structural modifications do not occur in all graphs and subgraphs comprising V-h strokes, and that the conversion of V-h into V-strokes is often of an optional nature.

2. In contrast, V-strokes can have a hooked termination if they occur in SUBGs in the lower or right parts of the graphic structure:

木 — in lower part: 果 采 栗 束
木 — in right part: 林

木 — in lower part: 稟
木 — in right part: 酥

3. Curved vertical — hook (Vc-h strokes) — St 丿

a) Graphic features

The class of Vc-h strokes is formed by hooked strokes of different length which have a vertical position and are curved to the right. The direction of writing is regular, from top downward. As the curving can be of a varying degree, there are shape variants of Vc-h strokes in addition to the dimensional ones.

b) Combinative features

i. Distribution:

Combinations of Vc-h strokes with other strokes and SCs are very limited:

1. In minimal SCs they combine with L-strokes only:

丿 勹

2. In multiple SCs they also appear to a limited extent:

+L +L　　乡

+L +H +H　　手

+H-h +H　　子

3. There are few cases of combinations of Vc-h strokes with SUBGs:

乎 豸 豕

ii. Types of combinations:

Contact combinations with other strokes are performed in minimal SCs, while in multiple SCs they enter into contact, intersectional or mixed combinations:

1) Contact combinations:

𠂉 𠂇 万 豕

2) Intersectional combinations:

豸

3) Mixed combinations:

乎 子 手 豸

iii. Succession in the stroke-order:

In combinations with L-strokes they are posterior/final:

𠂉 𠂇

In multiple SCs they are antecedent and posterior (successive) or posterior (final):

a) 子 豸

b 乎 手

c) Classification of the variant forms:

Besides the usual dimensional variants conditioned by the position of the SUBG in the graphic structure, there are also relatively distinct shape differences between individual Vc-h strokes. Two fundamental variants can be classed out here: one with moderate bending, corresponding with the shape of St, and one with a great bending, which can be termed BOW-SHAPED VERTICAL —HOOK (Vbo-h strokes), represented by Sst 𠃌 .

However, smaller or greater bending can be found with individual strokes, especially among the variants classed with the strokes of St; besides the bent strokes there are also nearly straight variants. Compare the following variants of Vc-h strokes:

a) 手 乎 子

b) 豸 豸

d) Modifications in the graphic structure:

Besides the usual dimensional modifications following from the position

of the SUBG in the graphic structure, there are also some shape-modifications of Vc-h strokes:

1) The degree of bending is somewhat smaller in horizontal structures:

豕 — 豚

2) In vertical structures, on the other hand, the degree of bending is somewhat greater:

豕 — 家

The same holds true for Vc-h strokes in the inner part:

豕 — 逐

4. Right — hook (R-h strokes) — St

a) Graphic features:

The class of R-h strokes is formed by the right skewed concave strokes with hooked termination, which are written from up to right down. The variability of these strokes concern their dimension, shape and position.

b) Combinative features

i. Distribution:

Combinations of R-h strokes with other strokes and SCs are limited. In minimal SCs, R-h strokes only combine with the following strokes:

+H 𠂉

+L 𠂆

In multiple SCs they combine as follows:

+H +RP 𠂉

+L +RP 𠂆

+LP +RP +RP 心

+H +L +RP 戈

They combine to a small degree with SCs as well:

戋 戋 𠂤

ii. Types of combinations:

R-h strokes form separate and intersectional combinations only:

1) Separate combinations:

心 𠂤

2) Intersectional combinations:

3) Mixed combinations:

iii. Succession in the stroke-order:

R-h strokes are both antecedent and posterior; from the viewpoint of the total succession in SCs, they are sometimes initial or final, but mostly successive:

1) antecedent/initial:

2) posterior/final:

3) antecedent and posterior/successive:

c) Classification of the variant forms:

1. Shape differences of individual R-h strokes consist in the degree of bending. Considerable bending can be found among variants having a nearly level position. It occurs in the original graphic form of autonomous graphs, as not structurally dependent. These R-h variants can constitute a subclass and be termed LEVEL RIGHT—HOOK (Rle-h strokes), represented by Sst .

Rle-h strokes occur in multiple SCs only, namely as constituents of SCs, which can stand as autonomous graphs or subgraphs in the lower part of the graphic structure.

2. The dimensional differences depend, above all, on the position of the corresponding graphic unit in the graphic structure. In graphs with a horizontal structure where the R-h strokes are not vertically restricted by other graphic units, the length of these strokes is the greatest. In vertical structures, and also in the inner part of graphic structure, their length gets shorter. Compare the following graphs with R-h strokes of different length:

a)

b)

c)

The dimensional differences of R-h strokes can be considered as variant forms within one stroke-class.

d) Modifications in the graphic structure

Apparent modifications can be observed, above all, in subclass Rle-h, especially if the graph containing the stroke under discussion, i.e. G , is employed as SUBG in the lower part in the graphic structure; the bending is in that case smaller and the position more level:

The above-described hooked variants of A-strokes can also be ranked among the hooked strokes, i.e. h-A strokes. As there are, however, somewhat different characteristics of hooked strokes and of h-A strokes, the latter should at least be considered as a special class of hooked strokes. Nevertheless, the fact that h-A strokes are ranked among the hooked ones represents a possible classification only.

Table 3:

PARALLEL SYSTEMS OF SIMPLE AND HOOKED SIMPLE STROKES

Plain Simple Strokes		Hooked Simple Strokes	
Class	St	Class	St
H-strokes	—	H-h strokes	⌐
V-strokes	|	V-h strokes	⌊
		Vc-h strokes	⌋
L-strokes	/		
R-strokes	⌒	R-h strokes	⌣
A-strokes	⌒	(h-A strokes)	✓
RP-strokes	`		
LP-strokes	´		

Table 4:

A SURVEY OF CLASSES AND SUBCLASSES OF HOOKED SIMPLE STROKES

Class	St	Subclass	Sst	
			Main Differentiating Features	
			Shape	Position
H-h strokes	⌐			
V-h strokes	⌊			
Vc-h strokes	⌋	Vbo-h strokes	⌋	
R-h strokes	⌣	Rle-h strokes		⌣
(h-A strokes)	✓			

COMBINED STROKES

The term "combined strokes" designates the minimal graphic units consisting of two or more parts, the graphic characteristics of which correspond essentially to those of elementary strokes.

The designation "combined strokes" and the description of this kind of strokes in terms of elementary strokes follow from the decomposition of the entire shape of these strokes (which is, from the genetic point of view, primarily determined by the entire shape of a higher graphic unit) when the individual parts are graphically compared with elementary strokes. Thus, the various modifications of the shape of compound strokes, or the differences in individual styles, can show themselves as differences in those parts of compound strokes that can be interpreted as "elementary strokes".

However, the shape of combined strokes cannot be satisfactorily described as simple combinations of elementary strokes in all cases; the different length of the individual parts of a stroke, the differences in their position as well as the differences in the way of transition of one part to another one, are also more or less relevant for the shape characteristics of individual combined strokes and for their classification.

In the graph formation, the combined strokes can act analogously to SCs (consisting of elementary strokes), i.e. they can stand as SUBGs; compare SC ㄱ (the SUBG of the G 어) and S ㄱ)the SUBG of the G 을).

Combined strokes can be divided into two main kinds: 1) compound strokes and 2) hooked compound strokes.

COMPOUND STROKES

1. Horizontal — vertical (H-V strokes) —St ㄱ

a) Graphic features

The class of V-H strokes is formed by broken strokes, the first (initial) part of which is horizontal, the second (final) vertical, with the transition from one part to another being more or less blunt.

H-V strokes have more variant forms with differences in the length of the individual parts; in some cases, the dimensional variants are accompanied by positional variants of the V-part of the stroke (i.e. the slight skew to the left).

b) Combinative features

i. Distribution:

The number of combinations of H-V strokes with other strokes is limited.

In minimal SCs they only combine with the following strokes:

+ H ㄱ ㅗ ㄱ ㅗ ㅋ

+ V ㄱ ㄴ ㄱ ㄴ

Combinations of H-V strokes with other strokes in multiple SCs:

+ H + H 킈 킈 킈 킈

+ H + V 킈 킈 킈 킈

+ H + H + V 킈 킈

+ H + V + H-V 킈

The number of combinations of H-V strokes with SUBGs is also limited:

킈 킈 킈

ii. Types of combinations:

H-V strokes form the following types of combinations with other strokes:

1) Contact combinations:

ㄱ ㄱ ㅗ ㅗ ㅋ ㄱ ㄴ ㄱ ㄴ

킈 킈 킈 킈 킈

2) Mixed combinations:

킈 킈 킈

킈 킈

iii. Succession in the stroke-order:

The stroke-order of H-V strokes in combinations with H-strokes and with V-strokes is complementary:

1. In combinations with H-strokes, H-V strokes are antecendent/initial:

ㄱ ㅗ ㅗ ㄱ ㅋ

킈 킈 킈 킈 킈

2. In combinations with V-strokes they are posterior/final:

ㄱ ㄴ ㄱ ㄴ

If in SC both H-strokes and V-strokes occur in combinations with H-V strokes, the stroke order is as follows: if the V-stroke is in the left-end position, the H-V stroke is antecedent to the H-stroke and posterior to the V-stroke; if the V-stroke is in the central position, the H-V stroke is also antecedent to the V-stroke:

a) 킈 킈 킈 킈

b) 킈 킈

From the viewpoint of the total stroke-succession in SCs, H-V strokes can be also successive:

c) Classification of the variant forms

As the H-V strokes consist of two arms each of which can vary in length and in position, H-V strokes can be found in many variant forms. Let us consider three dimensional variants of both parts of the strokes, i.e. long (lg), medium (md) and short (sh): the possible variants of H-V strokes might be the following:

1. Hlg-Vlg	4. Hmd-Vlg	7. Hsh-Vlg
2. Hlg-Vmd	5. Hmd-Vmd	8. Hsh-Vmd
3. Hlg-Vsh	6. Hmd-Vsh	9. Hsh-Vsh

If we compare the actual variants of H-V strokes in various graphs with those which are mechanically enumerated above, we find that this enumeration is, in principle, applicable; however, there are cases when it is rather difficult to determine the variant. Let us try to classify the actual H-V strokes in the corresponding graphs according to the scheme given above:

Variants:	**Examples:**	**Uncertain classification:**
1. Hlg-Vlg ㄱ	口	
2. Hlg-Vmdㄱ	甲 申 田 曲	四 皿
3. Hlg-Vshㄱ	中 史 央	弗
4. Hmd-Vlgㄱ	月 且	丑
5. Hmd-Vmdㄱ	五 曰 尹 艮	口
6. Hmd-Vshㄱ	尸 已 乙	
7. Hsh-Vlg ㄱ	凹	
8. Hsh-Vmd ㄱ	日 互 亙	
9. Hsh-Vsh ㄴ	尸	弓

In spite of the evidently different length of the individual parts of H-V strokes, which might be taken as the basis for their further classing, it is necessary to take into consideration the fact that the H- and V-parts of H-V strokes participate in the formation of the whole shape of the strokes, not only by their different length but also by their positions. Thus, any further classing of the variant forms of H-V strokes should be based on their entire shape characteristics. In the shape variability, the decisive part is represented, above all, by the V-part, where dependence of positions on length can be observed: strokes with a shorter V-part are usually somewhat left skewed. Considering

the apparent differences of the V-part of the strokes, the variant forms of H-V strokes can be devided into two main groups:

1. H-Vlg ㄱ ㄱ ㄱ
   H-Vmd ㄱ ㄱ ㄱ
2. H-Vsh ㄱ ㄱ ㄱ

In the second group, some variants are in close graphic coincidence with compound H-L strokes (see below). This kind of H-V strokes can be delimited as a subclass and termed HORIZONTAL — LEFT SKEWED VERTICAL (H-Vl strokes), represented by Sst ㄱ .

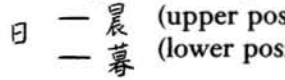
As mentioned above, H-Vl strokes are characteristic above all of H-V strokes with a short V-part. There are, however, a few cases, where the skew to the left is apparent with variants with a longer V-part as well, such as in G 丑 . This kind of strokes can be classified as H-Vl strokes, in the way of dimensional variants of this subclass.

d) Modifications in the graphic structure

Besides the usual dimensional modifications of H-V strokes which result from the dimensional variability of the subgraph in the graphs, positionally conditioned modifications also occur in the graphic structure:

1. In the vertical graphic structure, the H-part of the H-V strokes becomes longer, while their V-part is shorter with a tendency to skew left. Compare, the H-V stroke of the G 日 standing as SUBG in the upper and lower positions:

These kinds of positionally conditioned graphic modifications can lead to graphic coincidence of two different graphs originally differing from one another by the different dimension of the same constituent strokes. Compare e.g. G 日 (grapheme for the wor "rì" — sun, day) and G 曰 (grapheme for the word "yuē" — to say) in the same positions in the graphic structure:



2. In the horizontal structure, an opposite tendency can be observed, i.e. relative shortening of the H-part and relative lengthening of the V-part:

Analogous modifications occur in the remaining graphic structures. Compare the H-V stroke in the G 尸 with this stroke in the corresponding SUBG in the outer part of the graphic structure, where the lengthening of the H-part and the shortening of the V-part are analogous with the same phenomenon in the vertical sturcture:

尸 — 屠

2. Horizontal — left (H-L strokes) — St 𠂇

a) Graphic features:

The class of H-L strokes comprises broken strokes with initial H-part and final L-part; the transition from the first part to the next is sometimes sharper, sometimes blunter.

There are many variant forms of H-L strokes, the most decisive part in this respect being the L-part. While the H-part varies, above all, in length, the L-part is variable in shape (the degree of bending), in length and in position.

b) Combinative features

i. Distribution:

The number of combinations of H-L strokes with other strokes is relatively limited.

In minimal SCs they combine as follows:

+ L 𠂇 𠂉
+ R 又 犮 𠂆 𠂤
+ RP 𠂉 𠂇 𠂊 𠂉
+ V-h 𠃌
+ L-R 𠂉

In multiply SCs the H-L strokes combine as follows:

+ L+ R 𠂎
+ L + RP 𠂉
+ R + RP 之 𠂎
+ H-L-h + V + RP 书

There are a few combinations of H-L strokes with SUBGs:

𠂇 𠂉 正 耳

ii. Types of combinations:

1) Separate combinations:
   𠂉 𠂉 𠂉
2) Contact combinations:
   𠂇 𠂉 𠂆 𠂇 𠂊 𠂎 𠂉 𠂉 𠂤 𠂉
   正 耳
3) Intersectional combinations:
   又 犮
4) Mixed combinations:
   𠂎 之 𠂎 书

iii. Succession in the stroke-order:

H-L strokes are both antecedent and posterior; from the viewpoint of the total stroke succession in SCs they are initial, successive and final:

1) Antecedent/initial:
   又 犮 𠂆 𠂤 𠂇 𠂊 𠃌
   𠂉 耳 正
2) Posterior/final:
   𠂇 𠂉 𠂉 𠂉 𠂉
3) Antecedent and posterior/successive:
   𠂎 𠂎 𠂇 𠂇 之

The stroke-order in the above-quoted combinations is a natural one, and follows from the point of contact of the strokes: being compound strokes, H-L strokes can combine with other strokes with the H-part or the L-part; in the former case they are posterior (e.g. in SCs 𠂇 , 𠂉 , 𠂉 , 𠂉 etc.), in the latter case they are antecedent (e.g. in SCs 又 , 犮 , 𠂆 , 犮 , 𠂊 , etc.).

The H-L strokes can, of course, combine as a whole with other strokes as well (e.g. in SCs 𠂤 and 𠂉).

c) Classification of variant forms

As mentioned above, the differences within the class of H-L strokes concern, above all, the L-part, though there are certain differences — especially dimensional ones (in some cases also positional) — concerning the H-part as well.

From the dimensional point of view, two variants of the H-part can be distinguished, namely Hmd and Hsh, while the L-part which has more variant forms can be devided into Llg, Lmd and Lsh. Thus the following variants of H-L strokes can be stated:

1. Hmd-Llg

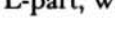
3. Hsh-Llg

5. Hsh-Lsh

2. Hmd-Lmd

4. Hsh-Lmd

As to the shape variant forms, the decisive part of the H-L strokes is, above all, the L-part, which can be either bent or straight (or nearly straight respectively):

1) Variants with the L-part bent: 

2) Variants with the L-part straight:

The positional differences of H-L strokes concern, above all, the L-part again, but sometimes also the H-part. Rather apparent deviations from the position of both parts as they appear in St are the following:

1) The L-part is more skewed, the H-Part has a slightly ascending tendency at the same time:

2) The L-part is less skewed:

3) The H-part has a slightly descending tendency:

Generally speaking, the shape variants of the straight L-part relatively deviate most from the shape of the St. These variants can be classed out as a subclass termed HORIZONTAL—STRAIGHT LEFT (H-Lst strokes), represented by Sst .

Some of the H-Lst strokes are conditioned by the way of combination with other strokes or SUBGs (as in G , SUBGs ,).

As mentioned above, there is a graphic resemblance between H-Vl strokes and some variants of H-L strokes. The identity of the strokes in such cases can be partly ascertained by combinative criteria: while characteristic of strokes of the H-V type are their combinations with H-strokes and V-strokes, the V-L strokes often combine with L-strokes and R-strokes. According to this criterium, the compound strokes in SCs and can be identified as H-L strokes, while in SCs and they will be H-V strokes. In some other cases, where such a criterion cannnot be employed, the classification of such a stroke as belonging to a class will be more or less optional, as the final stroke in SC where, merely on the basis of analogy with similar SC , it can be identified as an H-L stroke as well.

d) Modifications in the graphic structure

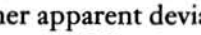
Various modifications of H-L strokes occur, depending on the position of the SC in the graphic structure.

In the vertical structure, when the H-L stroke occurs in the upper constituent which overlaps the lower one, the L-part of the H-L stroke is often

somewhat elongated and has a tendency toward a more skewed position ( ); compare e.g.:

The tendency toward a more skewed position of the L-part can be observed in the lower constituent as well, with a possible tendency to a greater degree of curving:

In graphs of the horizontal structure an opposite tendency in the modifications of H-L strokes can be stated — the L-part is often shortened and its position is a relatively vertical one:



If the H-L stroke appears in the inner part of the graphic structure, the L-part gets relatively shorter:

3. Horizontal — vertical — horizontal (H-V-H strokes) —St

a) Graphic features

The class of H-V-H strokes consists of combined strokes with the H-part initial passing into the V-part and terminating by the H-part. The transition from one part into another is relatively sharp.

b) Combinative features

i. Distribution:

The number of combinations of H-V-H strokes with other strokes is limited.

In minimal SCs, they occur in combination with L-strokes only:

H-V-H strokes occur in multiple SC in combination with two V-strokes.

ii. Types of combinations:

In the above stated SCs, the H-V-H strokes are in contact combination with other strokes.

iii. Succession in the stroke-order:

The H-V-H stroke is posterior (final) in SC and successive in the SC (Gs ,).

c) Classification of variant forms

H-V-H strokes have no conspicuous shape or positional variants. Their dimensional variants can be considered as variant forms within one class of strokes.

d) Modifications in the graphic structure

Only certain dimensional modifications in the graphic structure can be observed among the H-V-H strokes.

4. Horizontal — vertical — ascending (H-V-A strokes) — St 乙

a) Graphic features

The class of H-V-A strokes is formed by compound strokes with the horizontal initial part sharply passing into the vertical and ending with the ascending final part. Variants of H-V-A strokes differ above all, in the length of the H-part.

b) Combinative features

i. Distribution:

H-V-A strokes are bicombinative — they only combine with L-stroke in SC 𠂉 and with RP-stroke in SC 氵.

ii. Types of combinations:

In the above SCs, the H-V-A strokes are in intersectional and separate combinations.

iii. Succession in the stroke-order:

In both cases, the H-V-A strokes are posterior, and consequently final.

c) Classification of variant forms:

The differences in the length of the H-part are closely connected with the types of combination: in separate combinations, the H-part is shorter than in intersectional ones. This difference can be considered as a variant form within the stroke-class, without any further classification.

d) Modifications in the graphic structure

Besides the usual dimensional modifications, there are no further modifications of H-V-A strokes in the graphic structure, for SCs with given strokes stand as constituent with a fixed, i.e. left, position in the graphic structure. In the case of SC 𠂉, the H-V-A stroke is in fact converted from the H-V-Rle-h stroke, and this conversion is conditioned by the left position of the constituent in the graphic structure.

5. Horizontal — vertical — horizontal — vertical (H-V-H-V strokes) — St ㇆

a) Graphic features

The class of H-V-H-V strokes is represented by only one stroke where the initial H-part is short, the first V-part of medium length, and the second H- and V-parts are short. The transition from one part into another is relatively sharp.

b) Combinative features

The H-V-H-V stroke only occurs in SC 凸, where it combines with H-strokes and V-strokes in contact combinations, and is successive in the given SC.

As the SC 凸 with a H-V-H-V stroke represents a graph which does not function as a subgraph in the graphic structure, there are no modifications of the H-V-H-V stroke.

6. Horizontal — left — horizontal — left (H-L-H-L strokes) — St ㇇

a) Graphic features

The class of H-L-H-L strokes is formed by those compound strokes in which the horizontal initial part passes sharply into the left skewed part, then again sharply into the horizontal part, and finally, by a little bow, into the left skewed part again. The H-L-H-L strokes occur in variant forms, differing in the dimension and position of some part of the stroke, as well as in the transition of one part into another.

b) Combinative features

i. Distribution:

The number of combinations of H-L-H-L strokes with other strokes is very limited. There is only one minimal SC where the H-L-H-L stroke occurs, namely the combination with the Rle stroke: 乏

The combinations of H-L-H-L strokes with other strokes in multiple SCs are limited as well. They combine in G 及 with the L-stroke and Rle-stroke, and in SUBG 之 with the RP-stroke and Rle-stroke.

ii. Types of combinations:

The H-V-H-L strokes form the following types of combinations with other strokes:

1) Intersectional combinations:
   乏
2) Mixed combinations:

a) 及
b) 之

iii. Succession in the stroke-order:

H-L-H-L strokes are antecedent to R-strokes, with which they combine with the final L-part, and posterior to L- and RP-strokes, with which they combine with the initial H-part. From the viewpoint of the total stroke-order in SCs, they are either initial (in SC 乏) or successive (in SCs 及 and 之).

c) Classification of variant forms

The shape of H-L-H-L strokes in the SCs discussed above is not quite identical. In SCs 及 and 乏 their differences can be qualified as relatively small, more or less conditioned combinatively and by the position of the SC in the graphic structure: the SC 及 is an autonomous graph, where the H-L-H-L stroke combines with the L-stroke in the initial H-part too, while in SC 乏 the H-L-H-L stroke only combines with the R-stroke in the final L-part, and the SC as a SUBG occupies the outer position in the graphic structure, where the H-L-H-L stroke forms the left arm of this outer constituent.

As to the variant form of this stroke in SC 之, considerable shape deviation from the St can be seen: the initial H-part is very short, the skew of the following L-part is relatively more vertical, and the transition into the second H-part is almost entirely absent, being substituted for a bow linking the first L-part with the second. Owing to the distinct difference in the shape, the given stroke can be classed out as a subclass, and the fact that the second H-part is not apparent can be expressed by putting this H-part into brackets; thus, this subclass can be termed HORIZONTAL — LEFT — (HORIZONTAL) — LEFT (H-L-/H/-L strokes) and represented by Sst 彡 .

d) Modifications in the graphic structure

Modifications analogous with those of the H-L strokes also occur in H-L-H-L strokes in the graphic structure. In the horizontal graphic structure, the H-part becomes shorter, the L-part more vertical:

及 — 吸　　建 — 健　　追 — 鎚

In the vertical structure, the H-part is relatively longer, the L-part more horizontal:

及 — 岌　　廷 — 霆

7. Vertical — horizontal (V-H strokes) — St 乚

a) Graphic features

The class of V-H strokes is formed by compound strokes with vertical initial and horizontal final parts, with either a sharp or blunt transition from one part into another. V-H strokes occur in various variant forms differing from one another in length, in type of the transition from one part into another, and also in position.

b) Combinative features

i. Distribution:

The number of the combinations of V-H strokes with other strokes is relatively limited.

In minimal SCs they combine with the following strokes:

+H 𠂆 𠂇 𠂆 𠂇 𠂉 𠂊 𠂉 𠂊
+V 凵 凵 凵 𠃌 𠃌
+L 儿

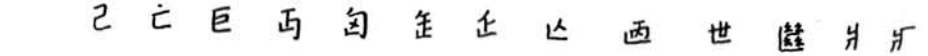
In multiple SCs the V-H strokes combine as follows:

+H +V 𠂢
+H +V 𠂣

+V +V 山

+V +L 屮

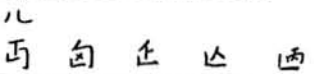
More frequent is their occurrence in combinations with SUBGs:



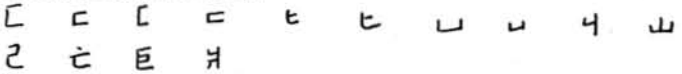
ii. Types of combinations:

V-H strokes form all three types of combinations, both with other strokes and with SCs:

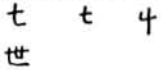
1) Separate combinations:



2) Contact combinations:



3) Intersectional combinations:

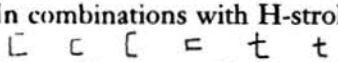


4) Mixed combinations:

iii. Succession in the stroke-order:

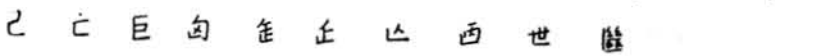
V-H strokes can be both antecedent or posterior depending on the strokes combined with them:

1. In combinations with H-strokes and L-strokes they are posterior:



2. In combinations with V-strokes they are antecedent:

From the viewpoint of the total succession in SCs they are initial, successive and final. While in minimal SCs they are frequently both initial and final (see the above stated examples), in combination with SCs they are mostly final:



Occasionally, they are also successive:

In some cases, when the V-H strokes combine simultaneously with H-stroke and SC (as in G 巨), a disparity between dynamic and static aspects occurs. While from the static point of view it is a matter of combinations of two SUBGs, namely SUBG 匚 and SUBG 冖 , from the dynamic point of view it is a combination of the initial H-stroke with SUBG 冖 and with the final V-H stroke:

1. 一 2. 冖 3. 乚

c) Classification of variant forms:

There are great dimensional variants of both parts of V-H strokes:

1. Vlg-Hlg 乚
2. Vlg-Hmd 乚 乚
3. Vmd-Hlg 乚
4. Vmd-Hmd 乚 乚
5. Vmd-Hsh 乚 乚
6. Vsh-Hlg 乚 乚
7. Vsh-Hmd 乚 乚
8. Vsh-Hsh 乚 乚 乚 乚

Certain deviations of the V-part and/or the H-part from their proper position can be found:

1. V-part is skewed to the left: 乚 乚 乚
2. V-part is skewed to the right: 乚 乚 乚
3. H-part is ascending: 乚 乚
4. H-part is descending: 乚 乚

There are also differences in the transition of one part of the stroke into another:

1. Sharp transition: 乚 乚 乚 乚 乚 乚 乚
2. Blunt transition: 乚 乚 乚 乚 乚

The different transition of one part into another is often accompanied by positional differences. These two graphic features which cause the distinct deviation from the shape of St, can serve as the basis for further classification of V-H strokes:

1. Variants with a blunt transition from the V-part into the H-part and with a descending tendency of the H-part, as in G 七 ; this kind of V-H strokes can be termed VERTICAL — DESCENDING HORIZONTAL (V-Hd strokes) with Sst 乚 .

2. Variants with a sharp transition from the V-part into the H-part and with an ascending tendency of the H-part; the V-part, usually relatively short, is often slightly skewed to the left. See the V-H strokes in the following graphs:

These variants can form a subclass under the term VERTICAL — ASCENDING HORIZONTAL (V-Ha strokes), represented by Sst 乚 .

V-Ha strokes occur in variant forms differing from one another in the dimension and in the skew of one or both parts of the stroke. Variants with an apparent skew of the respective part thus nearly coincide either with V-A strokes (乚), with L-H strokes (乚), or with L-A strokes (乚) respectively.

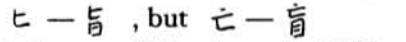
d) Modifications in the graphic structure

Various modifications of V-H strokes can be found in the graphic structure.

Besides the usual dimensional modifications, i.e. the shortening of the H-part of the stroke in the SUBGs in the left or the right part (e.g. 区 — 区欠，巨 — 柜) and the shortening of the V-part of the stroke in the vertical structure (e.g 亡 — 盲，亡 — 芒), there are further modifications concerning the shape and position of their constituent parts:

1. In the horizontal structure, the V-H strokes with a blunt transition of the V-part into the H-part occurring in the left part of the graphic structure, in some cases convert into V-Ha strokes or into V-A strokes; for example:

2. In the vertical structure, similar modifications sometimes occur as well, but in a moderate form and not regularly; e.g.:



3. In some SCs where the V-H stroke with a blunt transition combines with the L-stroke, if the corresponding graph stands as SUBG either in the horizontal or vertical structure, the V-H stroke can be converted into the V-stroke (the same holds good for the L-stroke). This conversion is, however, often optional. For example:

4. V-H strokes occurring in the left part of the graphic structure usually have their H-part more skew than in the original graph, so that they in fact convert into V-A strokes:

8. Vertical — ascending (V-A strokes) — St 丨

a) Graphic features

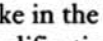
The class of V-A strokes is formed by compound strokes starting with the vertical part sharply passing into the ascending one. V-A strokes have dimensional, positional and shape variants.

b) Combinative features

i. Distribution:

The number of combinations of V-A strokes with other strokes is relatively limited.

In minimal SCs they combine as follows:

+H 

+V

+L

+RP

+H-L-h

In multiple SCs they combine with the following strokes:

+V +V

+L +RP

+L +H +R

+H +H-R-h +RP

Somewhat more frequent are their combinations with SCs:

ii. Types of combinations:

1) Separate combinationns:

2) Contact combinations:

3) Intersectional combinations:

4) Mixed combinations:

iii. Succession in the stroke-order:

V-A strokes are more frequently posterior in combinations with other strokes, and thus final from the viewpoint of the total succession in SCs:

As antecedent (initial) they are less frequent:

In some cases they are also successive:

The succession of V-A strokes in the above quoted SCs is partly of a natural character, partly it is given by the conventional rules of the writing (e.g. H-strokes are antecedent to V-strokes in intersectional combinations). Consequently, in combinations with H-strokes with which they combine in the V-part, V-A strokes are posterior, while in combinations with RP-strokes or R-strokes they are antecedent (see above).

c) Classification o variant forms

The dimensional differences between V-A strokes concern both the V-part and A-part:

The V-part of V-A strokes in the basic graphic forms occurs essentially in long and medium variants, in other graphic forms also short variants occur:

1) Vlg-A (e.g. in)
2) Vmd-A (e.g. in)
3) Vsh-A (e.g. in)

Dimensional variants also occur in the A-part. Considering the short A-part as typical of St of V-A strokes, those with a longer A-part are variant forms. They occur in the following cases:

1. In G , where the V-A stroke combines separately with RP ( ).

2. In some SUBGs in the left part in the horizontal graphic structure, where the V-H has converted into V-A and where the length of the A-part is given by the proportion of the respective SUBG, as in G .

As to the shape-positional variants, there are some SCs where the V-A stroke has the V-part slightly bent which may, moreover, be slightly skewed to the left. These variants are more or less of an optional nature and are conditioned by combinative and structural factors, as can be seen in the case of Gs or .

The following subclasses can be classed out on the basis of the graphic and combinative features of the variant forms of the V-A strokes described above:

1. The variants of V-A strokes with the A-part elongated, which only occurs in separate combination with the RP-stroke in the G , can form a subclass under the term VERTICAL — ELONGATED ASCENDING (V-Ae strokes), represented by Sst .

2. Strokes converted from the V-H strokes, the A-part of which is relatively longer and the skew relatively small, can, according to their positional specificity, be classed out as a subclass under the term VERTICAL — LEVEL ASCENDING (V-Ale strokes) with Sst .

3. An optional subclass can be formed of variants in which the V-part is bent (as in G); this subclass can be termed BENT VERTICAL — — ASCENDING (Vb-A strokes) with Sst .

d) Modifications in the graphic structure

Besides the usual dimensional modifications, there are some shape-positional variants in the Vb-A subclass, conditioned positionally; compare, the skew of Vb-a strokes in SC in the left position with that in the central position in G .

9. Vertical — horizontal — vertical (V-H-V strokes) = St

a) Graphic features

The class of V-H-V strokes is constituted by compound strokes, relatively sharply passing from the initial vertical part into the horizontal part and again into the final vertical part. The initial V-part is somewhat longer than the remaining two parts. There are some dimensional variants of the V-H-V strokes.

b) Combinative features

i. Distribution:

The number of combinations of V-H-V strokes is very limited. They only occur in a few multiple SCs:

+H +H
+H +V

There are two combinations of V-H-V strokes with SUBGs:

ii. Types of combinations:

V-H-V strokes only combine with other strokes in contact and separate or nearly separte combinations (see above).

iii. Succession in the stroke-order:

V-H-V strokes are both antecedent (initial), as in SCs   , and posterior (final), as in SC .

c) Classification ov variant forms

The dimensional variants of V-H-V strokes differ in the proportion or in the length of some part of the stroke. A very short middle H-part can occur in some small-sized variants; compare e.g. the V-H-V stroke in SC 𠂆 of G 舉 with that in SC 𠂆 of G 亞 . However, these variants conditioned by the complexity of the graphic form and by the position of the SC in the graphic structure, can be considered as mere variants within the class of V-H-V strokes.

d) Modifications in the graphic structure

The usual dimensional modifications in the graphic structure occur in V-H-V strokes. In the horizontal graphic structure the H-part of the stroke becomes relatively shorter (compare Gs 亞 and 啞).; in the vertical structure it is the V-part that is shorter (cf. Gs 亞 and 壺).

10. Vertical — horizontal — left (V-H-L strokes) — St ㇆

a) Graphic features

The class of V-H-L strokes is constituted by strokes in which the initial V-part passes sharply into the H-part and from here by a less sharp turn into the L-part. V-H-L strokes occur in two basic shape-dimensional variants, namely ㇆ and 𠂇 , which can be considered as combinatively conditioned.

b) Combinative features

i. Distribution:

The number of combinations of V-H-L strokes with other strokes and SUBGs is very limited. In the graphic form 𠂇 the V-H-L stroke only combines with the RP-stroke and with SUBG 二 , namely in G 𠂎 ; in the graphic form ㇆ it only combines with SUBGs 口 and 大 in G 吳 .

ii. Types of combinations:

Stroke ㇆ combines in the G 吳 with SUBG 口 in a separate combination and with SUBG 大 in a contact one. Stroke 𠂇 combines with RP-stroke contactly (𠂇), while with SUBG 二 it forms an intersectional combination (in G 𠂎).

iii. Succession in the stroke-order:

From the viewpoint of the total succession of the graphic units in the G 吳 ,stroke ㇆ is successive. In SC 𠂇 , stroke 𠂇 is antecedent; from the viewpoint of the total stroke-succession in the G 𠂎 , it is successive.

c) Classification of variant forms

The shape-dimensional variants of V-H-L strokes differ, above all, in the length of the constituent parts of the strokes; in addition, some positional differences in the initial part of the strokes can be observed. The stroke of the St form, i.e. ㇆ , has a short initial part (sometimes with a right-skew tendency), its middle part is of medium length, and the final part is very short. In the case of the variant form 𠂇 , the initial part of the stroke is of medium length and is usually slightly skewed left; the remaining two parts of the stroke are relatively short. Owing to the considerable shape-dimensional deviation of this variant form the St, it can form a subclass and be terminologically specified according to the dimensional feature of its initial part, which is longer in comparison with that of St-form. The subclass can be termed LONG VERTICAL — HORIZONTAL — LEFT (Vlg-H-L strokes), representedy by Sst 𠂇 .

d) Modifications in the graphic structure

Usual dimensional modifications of both V-H-L and Vlg-H-L strokes occur in the graphic structure, as the shortening of the H-part of the V-H-L stroke in the horizontal graphic structure (吳 — 誤), the shortening of the V-part of the Vlg-H-L stroke in the vertical graphic structure (𠂎 — 𠂎) etc.

11. Left — horizontal (L-H strokes) — St 𠂆

a) Graphic features

The class of L-H strokes consists of compound strokes in which the left skewed initial part passes sharply into the horizontal part.

There are some shape-dimensional and positional variants of this kind of strokes.

b) Combinative features

i. Distribution:

The number of combinations of L-H strokes is very limited. They only combine with other strokes in minimal SCs:

+H
+RP
+H-V
+L-A

ii. Types of combinations:

1) Contact combinations:

2) Intersectional combinations:

iii. Succession in the stroke-order:

The succession in stroke combinations depends on that part of the L-H stroke which is decisive in the combination: if the L-H stroke combines with other strokes in its L-part, it is posterior (e.g. in combination with H-strokes in SCs), and if it combines with other strokes in its H-part, it is antecedent (e.g. in combination with the RP-stroke in SC and in combination with L-A stroke in SC). In combination with H-V stroke it is antecedent as well:

c) Classification of variant forms

Some dimensional variants occur in both parts of L-H strokes:

Lmd-Hmd
Lmd-Hsh
Lsh-Hsh

L-H strokes also vary in the positions of both the L-part and the H-part. While the positional variants of the L-part are not very apparent and are more or less conditioned by combinative and structural factors (compare the position of the L-part of the L-H strokes in graphic forms , and), positional differencies of the H-part are more distinct in some variants. Besides the real horizontal position of the H-part of the L-H strokes, as e.g. in SC , there are variants with an ascending tendency of this part, as in SC ; there are also variants with a descending tendency, as in the initial stroke of SC .

Variants in which the H-part has an apparent ascending tendency can form a subclass of L-H strokes under the term LEFT — ASCENDING HORIZONTAL (L-Ha strokes) with Sst . The strokes of this subclass coincide with some variants of L—A strokes.

d) Modifications in the graphic structure

Besides the usual dimensional modifications, a greater skew of the H-part can be observed if the L-H stroke occurs in the left constituent of the graphic structure (e.g. —).

12. Left — right (L-R strokes) —St

a) Graphic features

The class of L-R strokes is constituted by compound strokes with the initial part skewed left which, by a sharp turn, passes into the right skewed part coinciding graphically with the Rsh-stroke. There are some variants of L-R strokes concerning the dimension and position of one or both constituent parts.

b) Combinative features

i. Distribution:

The number of combinations of L-R strokes with other strokes is relatively limited.

In minimal SCs, they only combine with the following strokes:

+H-L
+H-L-h
+L-R
+L-A

In multiple SCs, the L-R stroke only combines with L- and H-strokes, namely in SC , and there is one combination of L-R stroke with SUBG (in).

ii. Types of combinations:

1) Separate combinations:

2) Contact combinations:

3) Intersectional combinations:

iii. Succession in the stroke-order:

L-R strokes are antecedent only, with the exception of SCs with reduplicated or triplicated L-R strokes, where they are also posterior. Consequently, they are, as a rule, initial; in the above mentioned SCs they are also successive and final.

c) Classification of variant forms

The dimensional variants concern both parts of L-R strokes:

Lmd-Rmd

Lmd-Rsh

Lsh-Rsh

The positional differences concern, above all, the final part of L-R strokes, where the deviation from the typical skewed position to a more horizontal can be observed. These variants occur in SCs and , i.e. in combination with H-L and H-L-h strokes (as an optional variant in SC as well).

Considering the fact that the variants with a nearly horizontal R-part considerably deviate from the St, they can be classed out as a subclass under the term LEFT — LEVEL RIGHT (L-Rle strokes) with Sst .

As to the above stated dimensional differences between L-R strokes, they can be considered as mere variants within the stroke-class.

d) Modifications in the graphic structure

There are also some positional modifications of L-R strokes in the graphic structure in addition to the usual dimensional modifications. The position of both parts is more vertical in the constituents of the horizontal structure (cf. --) and more skewed in the vertical one (cf. —).

13. Left — ascending (L-A strokes) — St

a) Graphic features

The class of L-A strokes consists of compound strokes in which the initial part which is left skewed, passing sharply into an ascending one. Some shape-dimensional and positional variants of this kind of strokes can be observed.

b) Combinative features

i. Distribution:

The number of combinations of L-A strokes with other strokes is relatively limited.

In minimal SCs they combine as follows:

+RP

+L

+A

Combinations of L-A strokes with other strokes in multiple SCs:

+H +RP

+L +RP

+L-H +L

+L-H +A

+L-H +RP

+H +RP +H-L-Rle-h

ii. Types of combinations:

1) Separate combinations:

2) Contact combinations:

3) Mixed combinations:

iii. Succesion in the stroke-order:

Similarly to the other compound strokes, the succession in stroke combinations depends on that part of the stroke which is decisive in the combination:

1) Antecedent/initial:

2) Posterior/final:

3) Antecedent and posterior/successive:

c) Classification of variant forms:

Dimensional differences occur in both parts of L-A strokes, which are usually of medium length or short (L-part in some variants is relatively long):

Llg-Amd
Lmd-Amd
Lmd-Ash
Lsh-Ash

Positional variants of L-A strokes concern both the L-part and the A-part. Especially positional differences of the A-part are quite distinct: there are some variants of L-A strokes where the A-part is nearly horizontal. This kind of L-A strokes nearly coincides with L-H strokes, consequently, they can form a subclass of L-A strokes under the term LEFT — HORIZONTAL ASCENDING (L-Ah strokes) with Sst .

d) Modifications in the graphic structure

Some modifications of both L-parts and A-parts can be observed to be dependent on the position of the SC in the graphic structure, namely in the length and position of both parts in the horizontal structure as against the vertical one (cf. L-A strokes of the same SC in Gs 弘 and 去); a greater skew of the A-part can be observed if the L-A stroke occurs in the left or upper part of the graphic structure (cf. Gs 去 — 却 , 去 — 至 etc.).

Besides the usual dimensional modifications in the graphic structure (cf. SC with the L-A stroke in the following Gs: 么 , 尝 , 勾 衰 , 鬼 , 仇), the L-part in intersectional combinations with SUBGs is often elongated (cf. e.g. SC in Gs 禺 and 禹).

Table 5

SURVEY OF COMPOUND STROKES ACCORDING TO THEIR COMPOSITION

Initial Part \ Final Part	H	V	L	R	A	H-V	H-L
H							
V							
L							
H V							
H L							
V H							

Table 6:

SURVEY OF CLASSES AND SUBCLASSES OF COMPOUND STROKES

Class	St	Subclass	Sst			
			Main Differentiating Features			
			Shape	Position	Dimension	Transition
H-V		H-Vl				
H-L		H-Lst				
H-V-H						
H-V-A						
H-V-H-V						
H-L-H-L		H-L-(H)-L				
V-H		V-Hd				
		V-Ha				
V-A		V-Ae				
		V-Ale				
		(Vb-A)				
V-H-V						
V-H-L		Vlg-H-L				
L-H		L-Ha				
L-R		L-Rle				
L-A		L-Ah				

HOOKED COMPOUND STROKES

1. Horizontal — vertical — hook (H-V-h strokes) — St

a) Graphic features

The class of H-V-h strokes is constituted by compound strokes consisting of an H-part and a V-part with a hooked termination. H-V-h strokes vary in the dimension of the constituent parts; in addition, certain shape and positional differences between individual variants can be stated.

b) Combinative features

i. Distribution:

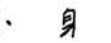
The number of combinations of H-V-h strokes with other strokes and SUBGs is relatively limited. Only the following strokes form combinations with H-V-h strokes:

+V
+L
+RP

Their combinations in multiple SCs are the following:

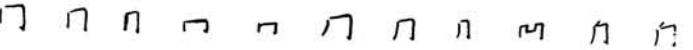
+V +V
+V +L
+V +RP
+V +H-V-H
+L +L

There are a few combinations of H-V-h strokes with SUBGS:



ii. Types of combinations:

Contact combinations of H-V-h strokes with other strokes are most frequent:



Other kinds of combinations:

Separate combinations:

Mixed combinations:

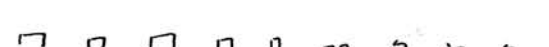
iii. Succession in the stroke-order:

H-V-h strokes usually combine with other strokes in their initial part; consequently, they are posterior (final). In combination with SUBGs they are, on the contrary, initial or successive. Examples:

1) Initial:

2) Successive:

3) Final:



c) Classification of variant forms:

There are dimensional variants of H-V-h strokes with differences in the length of both the H-part and V-part (the hooked termination does not essentially change). The following variants can be distinguished:

Hlg-Vlg-h Hmd-Vlg-h Hsh-Vlg-h

Hlg-Vmd-h Hmd-Vsh-h Hsh-Vmd-h
Hlg-Vsh-h

In the case of variants with a shorter V-h part, the dimensional differences of the variant forms of H-V-h strokes are usually accompanied by certain shape differences as well; the transition from the H-part into the V-part is not usually very sharp, the V-part is usually slightly bent or slightly left skewed, as S in G . This variant form of H-V-h strokes, the graphical features of which are similar to those of H-L-h strokes (see below), can be classed out as a subclass under the term HORIZONTAL — BENT VERTICAL — HOOK (H-Vb-h strokes) with Sst .

d) Modifications in the graphic structure

Besides the usual dimensional modifications in the graphic structure, i.e. the H-part gets shorter in the horizontal structure and the V-h part in the vertical structure, there are also some cases of positional modifications of the V-h part in the vertical structure; this concerns, above all, the H-Vb-h strokes the V-h part of which becomes more skwed to the left (compare Gs and).

2. Horizontal — left — hook (H-L-h strokes) — St

a) Graphic features

The class of H-L-h strokes is formed by those strokes in which the initial part is horizontal, often with as ascending tendency, passing by a blunter or sharper curve into the left skewed part with a hooked termination. There are some variants of H-L-h strokes which differ from one another in shape and dimension.

b) Combinative features

i. Distribution:

As to the combinations with other strokes, H-L-h strokes are of medium degree of combinative power.

In minimal SCs they combine with the following strokes:

+V
+L
+A
+V-H
+V-A

+L-R 勹
+V-Rle-h 已

In multiple SCs they combine with other strokes as follows:

+V +RP 尸
+H +RP 勺
+H+H +V 韦
+L +RP +RP 为
+H +V +V-H 丐
+L +V-H-V-h 鸟
+L +V-H-V-h + RP 鸟
+V +V-Rle-h 也
+H-L +V + RP 书

The are also a few combinations of H-L-h strokes with SUBGs, such as 卫，万，丹，幻，局，冏 .

ii. Types of combinations:

1) Separate combinations:

刀

2) Contact combinations:

尸 尸 刀 刀 勺 勺 勺 已 已 尸 丹 卫 万 鸟

3) Intersectional combinations:

力 也 勹

4) Mixed combinations:

丐 勺 尸 鸟 为 韦 书

iii. Succession in the stroke-order:

H-L-h strokes combine with other strokes or SCs either in their inital H-part, or as a whole. In the first case, the stroke order is dependent on the kind of stroke with which the H-L-h strokes combine, and on the mutual position of the strokes. H-L-h strokes are antecedent in combinations with V-strokes, with compound strokes with an initial V-part, and L-strokes, either in the left or left-end contact combinations, or in intersectional combinations; for example:

尸 尸 已 已 刀 丹
力 也

In combinations with short L-strokes with which they combine in the central or lower contact point, they are posterior, as in SCs 勺，勺，勹 .

In SCs where the H-L-h strokes combine with other strokes or SUBGs as a whole, the combination constitutes in fact an outer-inner graphic structure, where the H-L-h stroke stands as a two-armed outer component, or main part; the inner component can be realized by one stroke, such as the "point" or the A-stroke, or by SUBG. In these SCs, H-L-h strokes are antecedent to the inner component; see e.g.:

勺 为 刁 局

From the viewpoint of the total succession in SC, H-L-h strokes are initial (尸 尸 已 也 etc.), successive (勺 韦 鸟 为 etc.) and final (勺 勹 勹 万 etc.).

c) Classification of variant forms

The shape differences of the variant forms of H-L-h strokes concern the type of transition from one part into another. These variant forms are mostly of an optional nature, without any apparent combinative or structural contingency.

The dimensional variants, manifesting themselves by the differences in the length of the H-part or the L-part, are not usually accompanied by other apparent graphic specificities.

As to the positional variants, there are certain differences in the position of both the H-part and the L-part. The ascending position of the H-part in the SC 也 is very distinct. This variant with an apparent deviation of the position of the H-part from that of St can be classed out as a subclass under the term ASCENDING HORIZONTAL — LEFT — HOOK (Ha-L-h strokes with Sst 𠂉 .

d) Modifications in the graphic structure

Besides the usual dimensional modifications in the graphic structure, i.e. those where the H-part in the horizontal structure and the V-part in the vertical one get shorter, e.g. 力 — 𠂇力， 刀 — 前 , there are also some positional modifications of the L-part, namely in the graphic structure of the outer-inner type, where the H-L-h stroke is in the outer part, the inner part being realized by SC. In such a case, the L-part is nearly vertical, cf. the H-L-h strokes in Gs 勺 and 匆 .

3. Horizontal — left — bent vertical — hook (H-L-Vb-h strokes) — St 3

a) Graphic features:

The class of H-L-Vb-h strokes is constituted by compound strokes with

the short initial H-part sharply passing into the very short L-part, from which it passes into a relatively longer, bent, vertical part with a hooked termination. There are two basic dimensional variants of H-L-Vb-h strokes.

b) Combinative features

i. Distribution:

H-L-Vb-h strokes combine with only one stroke — with the V-stroke: 阝 阝

There are no combinations of these strokes with SUBGs.

ii. Types of combinations:

H-L-Vb-h strokes form contact combinations only.

iii. Succession in the stroke-order:

H-L-Vb-h strokes usually combine with V-strokes as antecedent, and are consequently initial. However, an opposite stroke order can sometimes be found.

c) Classification of variant forms

The above-mentioned dimensional differences are conditioned by the position of the SCs in the graphic structure: a smaller variant occurs in the left constituent of the horizontal graphic structure, a larger one in the right constituent of this structure:

陽 都

d) Modifications in the graphic structure

SCs 阝 and 阝 as bound graphic forms with their fixed positions can be the constituent parts of more complex graphic structures, where corresponding dimensional modifications of H-L-Vb-h strokes occur (cf. SUBGs 阝 inGs 陟 and 鷺).

4. Horizontal — left — horizontal — left — hook (H-L-H-L-h strokes) — St 𠃌

a) Graphic features

The class of H-L-H-L-h strokes is constituted by compound strokes the

initial part of which is horizontal, passing by a sharper or blunter turn into the L-part, from which it continues horizontally again and passes by a little bow into the L-part with hook.

There are considerable shape-dimensional variants within this stroke-class.

b) Combinative features

i. Distribution:

Strokes of this class are of a low degree of combinative power. They combine with one L-stroke in minimal SC, i.e. in G 乃 , and with SUBG 〃 , which consists of two L-strokes, i.e. in SUBG 𠃌 .

ii. Types of combinations:

The H-L-H-L-h strokes combine with the L-stroke in SC 乃 contactly, and with SUBG 〃 in SUBG 𠃌 separately.

iii. Succession in the stroke-order:

The H-L-H-L-h stroke is posterior in combination with the L-stroke in SC 乃 , and initial in combination with SUBG 〃 in SUBG 𠃌 .

c) Classification of variant forms

In combination of the H-L-H-L-h stroke with SUBG 〃 in SUBG 𠃌 , shape-dimensional differences from the St can be seen. The St is the following: the relatively long initial part passes by a medium-sharp curve into an L-part, continues as a very short H-part, and passes by a little bow into the L-part with hook, i.e. 𠃌 . In contrast, in the variant form occurring in SC 𠃌 , the short initial H-part passes sharply into a relatively longer L-part, which by a sharp turn passes again into a relatively longer part, and then, by a little bow, into the L-part with hook, i.e. 𠃌 .

Owing to the considerable shape-dimensional differences of the above-mentioned variant forms in comparison with the St-form, a subclass of H-L-H-L-h strokes can be classed out, and termed according to the differentiating features, for example according to the length of its initial part. Thus the subclass can be termed SHORT HORIZONTAL — LEFT — HORIZONTAL — LEFT — HOOK (Hsh-L-H-L-h strokes), represented by Sst 𠃌 .

d) Modifications in the graphic structure

Besides the usual dimensional modifications of the St-form in the graphic structure (i.e. the shorter length of the initial H-part in the horizontal graphic structure and of the L-part in the vertical one), some shape modifications also occur, especially in the vertical structure: the hooked termination can be omitted if the SC is the upper constituent; cf. Gs 乃 — 孕 (besides 孕). SC 乃 can also stand as the outer constituent of the outer-inner type of the graphic structure; in such a case, the initial H-part becomes longer, cf. Gs 乃 — 盈.

In complex graphic structures the further dimensional modifications of the Sst-form are conditioned structurally; cf. Gs 荡 — 疡 etc.

5. Horizontal — right — hook (H-R-h strokes) — St 𠃌

a) Graphic features

The class of H-R-h strokes is formed by compound strokes with the initial H-part passing by a sharp turn into the R-h part.

There are variant forms of H-R-h strokes differing in shape, dimension or the position of their constituent parts.

b) Combinative features

i. Distribution:

The number of combinations of H-R-h strokes with other strokes as well as with SUBGs is very limited.

In minimal SCs the H-R-h strokes only combine with L-strokes, namely in SC 𠂆.

There are a few combinations of H-R-h strokes with SUBGs, as in Gs and SUBGs 气, 飞, 飛, 凡.

ii. Types of combinations:

The combinations of H-R-h strokes with L-strokes are contact (𠂆); those with SUBGs are the following:

1) Separate combinations:

气

2) Contact combinations:

飞

3) Intersectional combinations:

凡

4) Mixed combinations:

飛

iii. Succession in the stroke-order:

H-R-h strokes are antecedent or posterior according to the decisive part of the stroke in the combination: if they combine in their initial part, they are posterior (final), as in SCs 𠂆, 凡, 气, if in their final part, they are antecedent, as in SC 飞. H-R-h strokes can also be antecedent and posterior (successive) in the SC, as in SC 飛.

c) Classification of variant forms

There are dimensional variants within the class of H-R-h strokes, manifesting themselves by the different length of the initial H-part, which is comparatively long, as in the graphic forms 𠂆, 飛, 气, and of medium length, as in G 飞 and SUBG 凡.

Certain differences also concern the shape (the degree of curving) and position (skew of the final part), and are more or less conditioned by the way of combinations with other graphic constituents (cf. the G 飞 with SUBG 飞 in G 飛).

The above-quoted differences between the H-R-h strokes can be considered as variant forms of St; consequently, they are not further classified into subclasses.

d) Modifications in the graphic structure

There are some modifications of the graphic form of H-R-h strokes conditioned by the position of the stroke (SC) in the graphic structure: if the H-R-h stroke stands as the outer component of the graphic structure of the outer-inner type, and the inner constituent is in the bottom left-hand position, the R-h part is usually less bent and more skewed to the right; cf. Gs 气 and 氣. If the inner constituent is in the top right-hand position, the R-h part becomes bow-shaped and elongated; cf. Gs 风 and 颱. If the SUBG with an H-R-h stroke is in the top right-hand position the hooked transition is of an optional nature, i.e. 迅 or 迅.

6. Horizontal — vertical — level right — hook (H-V-Rle-h strokes) — St 乙

a) Graphic features

The class of H-V-Rle strokes is constituted by compound strokes where the short initial H-part passes by a sharp turn into the V-part followed by a little bow, and terminates by the R-part with hook. The variant forms of H-V-Rle-h strokes are only structurally conditioned.

b) Combinative features

i. Distribution

The number of combinations of H-V-Rle-h strokes with other strokes is very limited; they only combine with L-strokes in minimal SC, i.e. in SC 𠃌, and with L-strokes and RP-strokes in SC 𠃌.[4]

ii. Types of combinations:

H-V-Rle-h strokes occur in contact (in SC 𠃌) or mixed combinations (in SC 𠃌).

iii. Succession in the stroke-order:

The H-V-Rle-h stroke combines with the L-stroke as posterior; in SC 𠃌 it is antecedent to the RP-stroke. Thus from the viewpoint of the total succession in SCs it is either final or successive.

c) Classification of variant forms

There are no variant forms, except for those conditioned structurally. Consequently no further classification of these strokes can be carried out.

d) Modifications in the graphic structure:

Besides the usual dimensional modifications in the horizontal and vertical structures (cf. the stroke under discussion in SC 𠃌 standing as the right constituent in G 𢀛 and the lower one in G 𠂉), there is a modified form of H-V-Rle-h strokes in the construction of the outer-inner type, where the stroke is a constituent part of a three-armed outer constituent, e.g. in Gs 𠙵, 𠙶 etc. As this kind of structurally conditioned modified forms of the stroke graphically fully coincides with H-R-h strokes, we prefer to rank them in the latter class.

7. Horizontal — left — level right — hook (H-L-Rle-h strokes) — St 乙

a) Graphic features

The strokes included in this class start with a horizontal part which turns sharply and passes into the left part, from which it passes by a little bow into the level R-part with a hook. These strokes have some shape-dimensional variants.

b) Combinative features

i. Distribution:

Stroke H-L-Rle-h is one of the two strokes that can stand as a one-stroke graph, i.e. with zero stroke-combination.

The number of combinations of H-L-Rle strokes with other strokes and SUBGs is very limited. In minimal SCs they only combine with L-strokes: 𠂆. In multiple SCs they combine as follows:

+L +RP 𠂆

+H +V-A +RP 𠂇

They also combine with a few SUBGs: 𠂉 𠂊

ii. Types of combinations:

1) Separate combinations:

𠂉 𠂊

2) Intersectional combinations:

𠂆

3) Mixed combinations:

𠂆 𠂇

iii. Succession in the stroke-order:

The decisive part in the combinations with other strokes and SCs is the initial one, except in that with RP-strokes, where there is a multiple combination; thus, the H-L-Rle-h strokes are: a) posterior (final) and b) both posterior and antecedent (successive):

a) 𠂆 𠂉 𠂊

b) 𠂆 𠂇

c) Classification of variant forms

There are two basic variant forms of H-L-Rle-h strokes differing in the position of the L-part, which are conditioned by combinative-structural factors:

In combination with strokes in which the H-L-Rle-h strokes are in the right position, the L-part is less skewed (nearly in vertical position) than if the H-L-Rle-h stroke stands as an autonomous graph or if it is in the lower position in the graphic structure. Compare:

a) 九 九 瓦

b) 乙 乞 它

Variants with a nearly vertical L-part almost coincide graphically with H-V-Rle-h strokes; owing to their specific combinative features, they can be classed out as a subclass under the term HORIZONTAL — VERTICAL LEFT — LEVEL RIGHT — HOOK (H-Lv-Rle-h strokes) with Sst 乙 .

As to the dimensional variants of these strokes, the length of the initial H-part differs in dependence on the type of combination: variants combined intersectionally have the H-part longer than those combined separately, or those with zero combination. Compare S 乙 in Gs 九 , 丸 , 瓦 with S 乙 in Gs 乙 , 乞 , 它 .

d) Modifications in the graphic structure

Besides the usual dimensional modifications in the graphic structure, there are the following shape-dimensional modifications which occur, above all, in the subclass H-Lv-Rle-H:

1. The H-Lv-Rle-H stroke in SC 九 standing as the left constituent of the graphic structure converts into a H-V-A stroke:

鸠

2. In the right position in the same SC, this stroke is near to the V-R-h stroke:

轨 扒 瓶

3. If the Sc 九 occupies the upper position in the graphic structure, an optional hookless variant occurs here:

染

4. If the Sc 九 stands as the outer constituent of the structure of the outer-inner type, the final part of the stroke is elongated:

旭 瓶

The last three stroke-classes described above, i.e. H-R-h (St 乙), H-V-Rle-h (St 乙) and H-L-Rle-h (St 乙)show certain specific distribution-

al features permitting their alternative classification: they can be ranked into one stroke-class with one basic form represented by St 乙 ; the remaining forms can be considered as variant forms:

a) Characteristic of the basic form 乙 is separate combination, where the form of the second part of the stroke, which follows after the H-part, is not restricted by any other graphic elements. In the intersectional combination with an L-stroke this part is modified to a nearly vertical position and almost coincides with H-V-Rle-h strokes which also combine with L-strokes, but in contact stroke-combinations. Thus, strokes with a nearly vertical L-part and strokes with V-part can be considered as combinatively conditioned variants of the basic form.

b) The strokes with a H-R-h form (i.e. the above stated St 乙) also occur in combinations with L-strokes, but only as SUBGs standing as the external constituent in the outer-inner graphic structure (for example in Gs 风 , 夙 etc.), where their graphic form can be considered as structurally conditioned. In subgraphs 气 and 飞 their graphic form can also be considered as structurally conditioned, a it is restricted by other graphic elements. These subgraphs can now also represent simplified graphs which have kept the original subgraphic form. Consequently, they contrast with the basic form in the same structural conditions (cf. Gs 乞 and 气). However, as their original form was structurally conditioned and their variant form is, moreover, identical with the basic one (氣 氣) they can also be considered as variants of the basic form. In the case of SUBG 凡 , the form of stroke 乙 can be considered as combinatively conditioned.

8. Vertical — level right — hook (V-Rle-h/strokes) — St 乚

a) Graphic features

The class of V-Rle-h strokes is formed by compound strokes with the initial V-part passing by a little bow into the level R-h part.

There are some dimensional variants of V-Rle-h strokes which are conditioned structurally.

b) Combinative features

i. Distribution:

V-Rle-h strokes are of medium degree of combinative power.

In minimal SCs they combine as follows:

+H 七 匕 亡
+L 乜 儿 儿 儿
+H-L-h 也 已

In multiple SCs they combine with the following strokes:

+H +L 尤 毛 元
+L +V 儿
+L +RP 心 心
+V +H-L-h 也
+H +L +RP 尤
+H +V +H-V 罒

There are quite a lot of combinations of V-Rle-h strokes with SUBGs:

匕 毛 己 已 巳 巴 电 毛 甩 礼 扎 札 乱
毛 乳 耽 乳 亂 虬 朮 尤 㠯

ii. Types of combinations:

1) Separate combinations:

儿 儿 儿 心
礼 扎 乳 札 乱 亂 乳 乳 耽 虬

2) Contact combinations:

匕 匕 儿 巳 尤 罒
己 已 巳 巴 朮 㠯

3) Intersectional combinations:

七 匕 也 也
毛 电 甩

4) Mixed combinations:

尤 毛 元 心
毛 朮

iii. Succession in the stroke-order:

V-Rle-h strokes combine most often with other strokes and SCs as posterior (final); this follows from the conventional succession of the strokes and from the fact that it is the V-part that is decisive in the stroke-combinations. In a few cases, where the decisive part of the V-Rle-h stroke is the final one, or where the stroke is combined with points or with SUBGs as a whole, it is also antecedent or successive: 匕 心 尤 匕 朮

c) Classification of variant forms

The dimensional variant forms of V-Rle-h strokes differ in both the initial and final parts, in dependence on combinative and structural factors. The following variants can be distinguished according to the different length of the initial V-part:

1. Vlg-Rle-h 乚
2. Vmd-Rle-h 乚
3. Vsh-Rle-h 乚

The final Rle-h part has longer and shorter variants:

1. Variants with longer Rle-h part: 乚
2. Variants with shorter Rle-h part: 乚

d) Modifications in the graphic structure

Besides the usual dimensional modifications in the graphic structure, the following modifications can be mentioned:

1. If the V-Rle-h stroke is a part of the external constituent, its final part is usually elongated:

儿 心 尤 尬

2. If the V-Rle-h stroke is a part of the left, upper, lower or inner constituent, the hooked termination is optional in some graphic forms:

a) 包 — 刨
b) 能 — 熊
c) 已 — 卷
d) 元 — 远，园 巴— 爬

9. Vertical — horizontal — left — hook (V-H-L-h strokes) — St ㇆

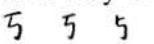
a) Graphic features

The class of V-H-L-h strokes includes compound strokes where the initial V-part sharply passes into the H-part, then by a less sharp turn into a vertical L-part with hook. There are shape-dimensional variants of V-H-L-h strokes.

b) Combinative features

i. Distribution:

The number of combinations of V-H-L-h strokes with other strokes and SUBGs is very limited. In minimal SCs they only combine with H-strokes:



In multiple SCs they combine with other strokes as follows:

+H-V +A

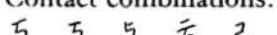
+H +A

+H +V +L

V-H-L-h strokes combine with the SUBGs as follows:

ii. Types of combinations:

1) Contact combinations:



2) Mixed combinations:

iii. Succession in the stroke-order:

According to the decisive part of the stroke with which they combine with other strokes or SUBGs, the V-H-L-h strokes are either antecedent or posterior:

1) Antecedent/initial:

2) Posterior/final:

3) Antecedent and posterior (successive):

c) Classification of variant forms:

The variant forms of the V-H-L-h stroke differ in the dimension of its parts:

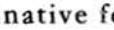
a) Variants with different V-parts

1. longer:

2. shorter:

b) Variants with different H-parts:

1. longer:

2. shorter: 

c) Variants with different L-h parts:

1. longer:

2. shorter:

The above-stated variant forms can be considered as mere variants within one class and need not be divided any further.

d) Modifications in the graphic structure

There are apparent dimensional modifications conditioned by combinative-structural factors: in the graphic structure with an intersectional combination of the graphic constituents and in the vertical structure, the H-part is relatively longer:

Table 7:

SURVEY OF HOOKED COMPOUND STROKES ACCORDING TO THEIR COMPOSITION

Initial Part \ Final Part	V-h	L-h	R-h Rle-h	Vc-h	H-L-h
H	ㄱ	ㄱ	ㄱ		
V			ㄴ		
H-V			ㄱ		
H-L			ㄱ	ㅋ	ㅋ
V-H		ㄴ			

Table 8:

SURVEY OF CLASSES AND SUBCLASSES OF HOOKED COMPOUND STROKES

Class	St	Subclass	Sst		
			Main Differentiating Features		
			Shape	Position	Dimension
H-V-h	ㄱ	H-Vb-h	ㄱ		
H-L-h	ㄱ	Ha-L-h		ㄱ	
H-L-Vb-h	ㅋ				
H-L-H-L-h	ㅋ	Hsh-L-H-L-h			ㅋ
H-R-h	ㄱ				
H-V-Rle-h	ㄱ				
H-L-Rle-h	ㄱ	H-Lv-Rle-h		ㄱ	
V-Rle-h	ㄴ				
V-H-L-h	ㄴ				

Tablo 9:

PARALLEL SYSTEMS OF COMPOUND AND HOOKED COMPOUND STROKES

Compound Strokes:		Hooked Compound Strokes:	
Class	St	Class	St
H-V	ㄱ	H-V-h	ㄱ
H-L	ㄱ	H-L-h	ㄱ
H-V-H	ㄴ		
		H-V-Rle-h	ㄷ
H-V-A	ㄴ		
H-V-H-V	ㄴ		
H-L-H-L	ㄹ	H-L-H-L-h	ㄹ
		H-L-Vc-h	ㄹ
		H-L-Rle-h	ㄷ
		H-R-h	ㄷ
V-H	ㄴ		
V-A	ㄴ		
V-H-V-H	ㄴ		
V-H-L	ㄴ	V-H-L-h	ㄴ
		V-Rle-h	ㄴ
L-H	ㄴ		
L-R	ㄴ		
L-A	ㄴ		

Table 10:

DISTRIBUTIVE FEATURES OF STROKES — A SURVEY OF THE OCCURRENCE OF STROKES IN COMBINATIONS

SYMBOLS:
I-SC — interclass stroke-combinations (i.e. combinations of Sts)
T-SC — total number of combinations of the stroke with other strokes
+ SUBG — combination of the stroke with subgraphs

St	High Occ.			Medium Occ.			Low Occ.			Zerou Occ.
	I-SC	T-SC	+SUBG	I-SC	T-SC	+SUBG	I-SC	T-SC	+SUBG	+SUBG
—	+	+	+							
ㅣ	+	+	+							
ㅣ	+	+	+							
ㄴ				+	+	+				
ㄴ				+	+	+				
ㆍ	+	+	+							
ㄱ							+	+	+	
ㄱ							+	+	+	
ㄱ				+	+	+				
ㄱ							+	+	+	
ㄱ							+	+	+	
ㄱ					+		+		+	
ㄱ				+	+				+	
ㄴ							+	+		+
ㄴ							+	+		+
ㄴ							+	+		+
ㄴ							+	+		+
ㄴ					+	+	+			
ㄴ				+	+	+				
ㄴ							+	+		+
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ㄴ							+	+		+
ㄴ				+				+		+
ㄱ					+		+	+		
ㄱ				+	+	+				
ㄴ							+	+		+
ㄴ							+	+	+	
ㄴ							+	+	+	
ㄴ							+	+		+
ㄴ							+	+	+	
ㄴ				+	+	+				
ㄴ							+	+	+	

FOOTNOTES AND REFERENCES:

[1] The identification of these strokes as variants of A-strokes and not as variants of H-strokes is based on their graphic and combinative features: the change of their position is accompanied by a change in shape (i.e. their sharpening in the final part), and with the change in the stroke-order in certain SCs (i.e. from antecedent to posterior).

[2] 文以战：汉字的笔画和笔顺，上海教育出版社，上海，1969年

[3] 写点最重要的是跟别的笔画相联系和呼应。
op. cit p. 21

[4] The SC 凡 can be also considered as a combination of SUBG 几 with a RP-stroke.

V. Functional aspects of strokes

As the minimal graphic units, strokes represent the material means of formation of higher graphic units (subgraphs and graphs). Considering these graphic units as exponents of units on the grapholinguistic level, the function of the strokes in these units is twofold: constituting and distinguishing.

The specificity of the constituting function of the strokes, if compared for example with that of the phonemes, consists, among others, in their arrangement, which is not linear as in the case of the phonemes, but on a plane: the strokes constitute graphic configurations, where they are arranged in various ways — vertically, horizontally, in outer-inner combinations, intercrossing combinations etc.

The strokes have different graphic forms in order to constitute the necessary different forms of graphic units standing as exponents of the grapholinguistic units. The distinctive function of the strokes is not, however, only a matter of the different forms of the strokes. Only in the case of one-stroke graphemes, as 一 yī (one) and 乙 yǐ (the second of the "Ten Stems") where both functions — constituting and distinguishing — are fulfilled by the stroke's integrity, it is the form of the strokes itself that forms a graphemic opposition. In the other cases, the distinctions between the graphic forms of the graphemic units can be manifested by various kinds of graphic and structural means. A detailed description of the various ways of constitution of the contrastive forms of graphemic units forming oppositions is, however, beyond the frame of the present work, for not all of them have a relation to the distinctive function of the strokes (for example, the graphemic opposition realized by a different structural arrangement of the same subgraphic elements, as e.g. in the case of graphemes 纹 wén — stripes and 紊 wèn - tangled, where it is the horizontal structure that is opposed to the vertical structure[1]. Let us make only some general remarks in this respect.

Generally speaking, graphs as exponents of the grapholinguistic units form oppositions by their entire graphic form. Contrasting graphic forms can be realized by the same or different number of strokes standing as immediate constituents either of simple graphs or of subgraphic constituents of complex graphs. Some contrastive forms of the graphs will thus express themselves by differences of the subgraphic units and/or their arrangement in the graphic structure, others by the differences of the constituent strokes and their combinations.

There are many graphic forms (graphs and subgraphs) in opposition which consist of the same number of strokes. If we consider those formed by

strokes as immediate constituents, their distinction consist in the type of strokes combined, in the type and way of their combination and sometimes also in the dimensional differences of the same type of stroke. The graphic forms can differ in such cases in more or even all distinctive features, as 人 — 二，又 — 九，山 — 大，中 — 尺，凵 — 匚，冫 — 勹 etc. Sometimes, the distinction seems to be concentrated on one distinctive feature, as in the case of graphic forms 刀 — 力，人 — 入，天 — 夭，尸 — 尸 etc.

Disscussing the contrastive graphic forms, some explanation concerning the quantitative aspect of the question should be mentioned. The share of every stroke in the formation of contrastive graphic forms will differ according to the number of strokes which the given graphic form consists of. Consequently, in the case of graphs consisting of two strokes, the degree of their graphic-visual contrast is immediately dependent on the graphic form of the differentiating strokes and on the type or way of the stroke-combinations. If we compare the contrastive graphic forms which only differ by one stroke, we find that the number of coinciding and divergent graphic features in the graphic forms consisting, for example of two strokes, differs from that in the graphic forms consisting of a greater number of strokes. Compare the graphic-visual differences of the pair of two-stroke graphs 十 and 七 with that of six-stroke graphs, for example 戍 and 戌, which all stand as exponents of different graphemes. Even in the case of more distinctive features of contrasting graphic forms consisting of a great number of strokes, the degree of their distinctness is often smaller than that in the case of the few-stroke graphs with only one differentiating stroke. Compare the following pairs of graphic forms standing as graphemes: 刺 — 刺 or 鳴 — 鳴 with 乂 — 九 or 乂 — 又.

Let us revert to the graphic constituting oppositions consisting of the same number of strokes and mutually differentiated by one distinctive feature. The following oppositions can be preliminarily stated here:

1. Oppositions of graphic forms consisting of strokes of the same type with the same type, with the same stroke-location, but differing in the type of stroke-combination:

a) Contact: intersectional combinations:

人	乂	入	乂	刀	力	于	于	大	丈
石	右	天	夫	开	井	元	无	午	牛
甲	申	田	由	生	生	矢	失	余	余
杲	果								

b) Contact: separate combination:

入：八　　人：八

c) Intersectional: separate combination:

乂　八　　书　引

2. Oppositions of graphic forms consisting of strokes of the same type with the same stroke-location and with the same type of stroke-combination, but differing in the way of combination:

人：入　　已：已：已　　太：犬

3. Oppositions of graphic forms consisting of strokes of the same type with the same stroke-location, and with the same type and way of stroke-combinations, but differing in the length of certain strokes:

a) The difference of length concerns one strokes:

目：且　　四：皿

b) The difference of length concerns two or more strokes:

土：士　　未：末　　口．冂　　日：曰

4. Oppositions of graphic forms with the same type and way of stroke-combination and with the same stroke-location, but differentiated by one stroke. Besides the oppositions of graphs standing as exponents of graphemes, there are also some oppositions of subgraphs standing for subgraphemic exponents (classifiers). Owing to the fact that subgraphs are bound graphic forms with various locations in the graphic structure, the minimal oppositions are realized only in the case of the same graphic structure with one differentiating subgraphic constituent. In the examples below, one graphic form is selected as the basic one, with which the others are compared:

a) Differentiating strokes are opposed to H-strokes:

一：乀（子：孑）
一：丿（子：孑）
一：丿（千：千，天：夭）
一：、（戍：戍）
一：フ（戍：成）

b) Differentiating strokes are opposed to V-strokes:

丨：乚（十：七，早：皂）
丨：乚（丌：兀，申：电，用：甩）
丨：亅（千：千）

c) Differentiating strokes are opposed to L-strokes:

丿：乚（尸：已）
丿：丶（乡：幺，乒：乓）
丿：乚（疒：亡）

d) Differentiating strokes are opposed to A-strokes:

丿 : 乀 (予 : 予)

丿 : 𠂆 (冫 : 氵 e.g. in graphemes in opposition 治 : 诒 , 冷 : 诒 , 清 : 请 , 凋 : 调 , 凉 : 谅 , etc.)

e) Differentiating strokes are opposed to RP-strokes:

丶 : 乀 (夕 : 久)

丶 : 𠃌 (贝 : 见 , 贝 : 見)

f) Differentiating stroke is opposed to V-H stroke:

𠃌 : 𠂇 (老 : 考)

g) Differentiating strokes are opposed to V-h strokes:

亅 : 𠂇 (亏 : 亏)

亅 : 𠃌 (手 : 毛)

亅 : 𠂆 (栋 : 栋)

h) Differentiating strokes are opposed to H-L-H strokes:

𠂆 : 乙 (力 : 九)

𠂆 : 𠃌 (阝 : 阝 in graphemic opposition 谷阝 : 郤)

i) Differentiating strokes are opposed to V-Rle-h strokes:

𠃌 : 𠂇 (乙 : 弓)

Some conclusions concerning the functional aspect of strokes can be drawn from the observations discussed above:

1. The constituting and distinctive function of strokes finds its application in a specific way, which in some respects differ from that of the phonemes:

a) The strokes fulfill their function simultaneously with other graphic factors (location of strokes, type and way of stroke-combinations etc.) constituting the higher graphic form. From the functional point of view, these factors can be considered as the way of stroke realization in a higher graphic form.

b) In the case of complex graphemes, the stroke is a subordinate graphic unit of a higher graphic form (subgraph) which, with other graphic factors (type and way of combination of different graphic units, their arrangement in the graphic structure etc.) acts as a higher functional unit of the graph. For example, strokes 丨 , 𠂆 , 一 constituting the graphic form 口 , and strokes 一 , 丿 , 乀 , 丶 constituting the graphic form 犬 , are in the G 哭 subordinated units of two SUBGs 口 and one SUBG 犬 ; in the G 器 they are subordinated units of four SUBGs 口 and one SUBG 犬 ; both these graphs, which form an opposition, differ by two SUBGs 口 with lower parallel locations in the graphic structure.

Labelling the constituting and distinguishing features of the graphs as graphonic[2], the strokes in simple graphic forms, being abstract units representing different variant forms of the stroke-type, represent the basic graphonic constituents of a graphonic complex functioning as a whole. In the case of complex graphemes, the stroke is then the basic subgraphonic constituent of a higher graphonic complex.

2. In certain cases, the full graphonic force is reached by the stroke itself, as in the case of one-stroke graphemes. In such a case, the stroke is a graphonic unit with a full constituting-distinctive function exhibited by its graphic form alone. In some other cases, i.e. in the cases of graphemes only contrasting by one distinctive stroke (in graphic forms with the same colocation of strokes and the same type and way of stroke-combination), the differentiating strokes have the nature of graphonic units performing above all the distinctive function in this case. The same also holds true for cases where two graphic forms constituting an opposition differ in the length of the strokes. The different graphonic value of these strokes can be summarized as follows:

a) Strokes as graphonic units with a constituting and distinctive function resulting from the form of the stroke itself:

一 乙

b) Strokes as graphonic units, viewed, above all, from the viewpoint of their distincitve function:

i. Strokes of different stroke-types:

一 丨 丿 丶 乀 乚 𠃌 亅 𠂆 𠃌 𠂇 乙 𠂆

ii. Strokes of the same stroke-type:

一 一

Note that in the case of graphic forms differing in the dimension of more strokes (as in 口 : 口 , 日 : 曰), it is the distinction in the dimension of the entire graphic form that has the graphonic value, and that the distinction in the length of their constituent strokes is derived from and subordinated to it.

In the approach to the elaboration of the basic conception of the classification and description of the minimal graphic units in the present work, the specificity of the functional aspects of the strokes has also been taken into account to a certain extent.

FOOTNOTES:

[1] This kind of opposition is not always graphemic, as in the case of Gs 群 and 羣 which are variant forms of one grapheme.

[2] Using Saraiti's term

Appendix I

Examples of some approaches to the classification and denomination of minimal graphic units

The examplification of different classifications of minimal graphic units stated below reflects the authors' different approaches and aims; it serves above all as an illustration of the many problems concerning the classification and denomination of strokes — whether in textbooks of the Chinese language or various treaties devoted to the Chinese characters (in addition to this, examples of the division of strokes for the lexicographic purposes are introduced here as well). The distinctions between the individual classifications of strokes moreover concern the different techniques of their reproduction: some of them are based on the calligraphic form written with a brush, others are introduced in "standard" written form or in printed form. Here all of them will be reproduced in an equalized form.

I. Textbooks

1. Hànyǔ jiàokēshū (Modern Chinese Reader), Part 1, Compiled by the Chinese Language Special Class for Foreign Students in Peking University, Peking 1958. 7 basic strokes are introduced:

1 — 5 丶
2 丨 6 ノ
3 ノ 7 亅
4 乀

2. Лин Шай-ло, Джан Мин-шен, К.Т. Молодый: Учебник китайского языка (Textbook of the Chinese Language), Москва 1953. 24 elements of writing are introduced here, some of them supplemented with variant forms:

1 — 5 乀 9 ノ 13 𠂉 17 ㇀ 21 乚 乚
2 丨 6 ノ 10) 14 ノ ノ 18) 22 乙 乙
3 丶 7 く 11 ノ 15 乚 乚 乚 19 乚 23 ㇇
4 丿 8 亅 12 乀 16 乙 20 ㇇ ㇇ 24 ノ

3. Švarný, O. a kol.: Úvod do hovorové čínštiny (Introduction to Spoken Chinese), Praha 1967. Six basic strokes with their more important variants (in brackets) are mentioned there:

I. Horizontal — {㇀ 𠃌 ㇇ 𠃌 𠃌 ㇋ 乙 乙 乙 ㇀}
II. Vertical 丨 {丨 乚 𠂉 乚 𠃌}
III. Vertical curved to the left at the bottom 丨 {)}
IV. Oblique to left ノ {) く 乙 𠃌 丿}
V. Oblique to right 乀 {丶 乀 乚}
VI. Point, or short stroke respectively 丶 {, ✓ ✓}

4. Е. Н. Драгунова, Т. П. Задоенко, Лю Цюань-ли: Учебник китайского языка (Textbook of the Chinese Language), Москва 1965. 15 "graphic elements" are introduced:

a) Basic graphic elements:
1. Horizontal —
2. Vertical 丨
3. Point 丶
4. Oblique to left ノ
5. Hook 亅
6. Oblique to right 乀

b) Variants of basic graphic elements:
1a. Horizontal with hook ㇀
3a. "Point" written from above downwards 丶
3b. "Point" written from down upward ノ
5a. Variant of hook (to right) 𠂉

c) Derived elements:
乚 乀 𠃌 𠂉 く

5. Т. П. Задоенко, Хуан Шу-ин: Учебник китайского языка (Textbook of the Chinese Language), Москва 1973; 7 basic graphic elements and examples of their variants are introduced:

a) Basic graphic elements:
1. Horizontal —
2. Vertical 丨
3. Hook 亅
4. Turned upward ✓
5. Oblique to left ノ
6. Oblique to right 乀
7. Point 丶

b) Examples of variants of the basic graphic elements:

- ㇀ Horizontal with hook
- ㇁ Broken horizontal
- ㇂ Vertical with hook to the right
- ㇄ Bent vertical with hook
- ㇇ Oblique to the right with hook
- 丶 Point written from top downwards
- 丿 Point written from down upward

II. Works on Chinese characters and their writing (both scientific and popular)

1. Sariti, A. W.: Chinese Grapholinguistics (in Journal of the Chinese Language Teachers Association, Vol. III. No 1, February 1968, Georgetown University. Ten "graphons" are distinguished here:

1. Long Horizontal (1h) 一
2. Short Horizontal (sh) 𠂇
3. Long Vertical (lv) 丨
4. Short Vertical (sv) 丨
5. Short Left Skew (sls) 丿
6. Long Left Skew (11s) 丿
7. Short Right Skew (srs) 丶
8. Long Right Skew (lrs) 丶
9. Dot (dot) 丶
10. Curve (cr) 𠃌

2. Zěnyàng xiězì (How to write), edited by Shànghǎi Jiàoyù Chūbǎnshè, Shànghǎi 1964; 8 basic strokes are introduced here (the last two kinds include several different strokes):

1. 点 丶
2. 横 一
3. 竖 丨
4. 撇 丿
5. 捺 ㇏
6. 提 ノ
7. 折 ㇀ ㇆ ㇄ ㇁
8. 勾 亅 ㇂ ㇈

3. Wáng Tiězhèng: Shūfǎ qiǎnshuō (An Outline of Calligraphy), Shěnyáng 1964; 22 kinds of strokes of "kaishu" style are introduced:

1. 点 丶
2. 横 一
3. 竖 丨

4. 撇 丿
5. 捺 ㇏
6. 提 ノ
7. 横 撇 𠂆
8. 竖 提 ㇂
9. 横 折 ㇁
10. 竖 折 ㇄
11. 撇 折 ㇇
12. 横 钩 ㇀
13. 竖 钩 亅
14. 左 弯 钩 乚
15. 斜 钩 ㇌
16. 撇 点 ㇍
17. 横 折 钩 ㇆
18. 竖 弯 钩 ㇉
19. 横 折 折 钩 ㇊
20. 横 折 弯 钩 ㇋
21. 竖 折 折 钩 ㇎
22. 右 弯 钩 𠃌

4. Guō Lirén: Zěnyàng xiě hànzì (How to write Chinese characters), Lanzhou 1964; altogether 34 strokes are distinguished, 8 among them as basic strokes, i.e.

点 丶，横 一，竖 丨，撇 丿，捺 ㇏，挑 ノ，勾 亅，折 乚，

the remaining as extended forms of strokes:

1. 点 丶
2. 长点 丶
3. 撇点 丿
4. 勾点 丶
5. 横 一
6. 竖 丨
7. 垂 丨
8. 撇 丿
9. 平 撇 丿
10. 竖 撇 丿
11. 横 折 撇 𠂆
12. 撇 点 ㇍
13. 捺 ㇏

14. 平捺 丶
15. 挑 ㇀
16. 橫折挑 ㇆
17. 竪挑 ㇉
18. 竪勾 亅
19. 橫勾 ㇁
20. 斜勾 ㇂
21. 竪彎勾 ㇃
22. 橫彎勾 ㇈
23. 竪折勾 ㇄
24. 橫折長勾 ㇋
25. 橫折折勾 ㇌
26. 橫折右彎勾 ㇍
27. 橫折左彎勾 ㇎
28. 竪折折勾 ㇏
29. 橫折短勾 ㇐
30. 橫折斜彎勾 ㇑
31. 竪折 ㇄
32. 橫折 ㇆
33. 撇折 ㇇
34. 竪折撇 ㇊

5. Wén Yǐzhàn: Hànzìde bǐhuà hé bǐshùn (Strokes and strokes-succession of the Chinese characters), Shanghai 1964; altogether 36 strokes in 4 groups are introduced:

a) Basic strokes:

1. 点 丶
2. 橫 一
3. 竪 丨
4. 撇 丿
5. 捺 乀
6. 提 ㇀

b) Positional variants of basic strokes:

7. 左点 丶
8. 右点 丶
9. 平点 -
10. 长点 丶

11. 橫撇 ㇇
12. 竪撇 ㇊
13. 平撇 ㇇
14. 平提 ㇀
c) Hooked strokes:
15. 橫鉤 ㇆
16. 竪鉤 亅
17. 彎鉤 ㇂
18. 斜鉤 ㇂
19. 臥鉤 ㇂
d) Combined strokes:
20. 橫折 ㇆
21. 橫折鉤 ㇇
22. 橫撇 ㇇
23. 橫折折撇 ㇌
24. 橫撇彎鉤 ㇋
25. 橫折彎鉤 ㇍
26. 橫折彎鉤 ㇍
27. 橫折提 ㇎
28. 竪折 ㇄
29. 竪彎 ㇃
30. 竪彎鉤 ㇃
31. 竪提 ㇉
32. 竪折折 ㇌
33. 竪折折鉤 ㇌
34. 竪折撇 ㇊
35. 撇折 ㇇
36. 撇点 ㇇

III. Dictionaries

1. Xīnhuá zìdiǎn, Peking 1953; altogether 24 strokes devided into 4 groups with 7 basic forms of strokes are distinguished here:

Kinds of Strokes	点	横		直		撇文	
Forms of Strokes	丶 点	一 横	𠃌 横折	丨 直	乚 直折	丿 撇	𠂉 撇折
Additional Forms	丶 丶 丿 丶 丶	一 𠃌 一 𠃌 丿 𠃍 𠃍		丨 丨 ㇇ 丿 乚 乛		丿 丿	𠂉 乙

2. Tóngyīn zìdiǎn, Peking 1952, gives 7 initial strokes, and 20 additional strokes:

Initial Strokes	点 丶	横 一	横折 𠃌	直 丨	直折 乚	撇 丿	撇折 𠂉
Additional Strokes	丶 一 丿 乀	丿	𠃌 𠂇 𠃍 一 乙	丨 丿	乚 ㇇ 𠂆 ㇇ 乛	丿 丿	𠂉

Different approaches to the classification of strokes can be ascertained in the above stated examples:

1. The term "graphone" is applied, defined as "a distinctive descriptive feature of the grapholinguistic system and thus differentiated from the 'basic strokes'".

2. The strokes are limited to the so-called basic strokes which form their variant and derived forms.

3. The enumeration of strokes covers a relatively great number of stroke forms, which include both basic and other strokes; no further division is given.

4. Strokes are divided into several groups on the basis of various criteria

The different criteria for the classification of strokes follow from the following aspects:

In the case of the so-called basic strokes, differences can be noticed concerning both the number and the form of the strokes. In most cases the number of basic strokes that has been introduced varies between 6 to 8 items; The divergent strokes were 丨 and 丿. Some kinds of strokes are represented by one form only, others by several forms. The differences between the classifying criteria employed in the divisions of strokes follow from the different evaluations of the graphical characteristics of the strokes that form the basis of their classification. For example, "hooked" strokes are sometimes interpreted as variants of "plain" strokes, sometimes as a specific class of strokes. Similarly, the ascending stroke 𠂆 is sometimes regarded as a basic stroke, elsewhere it is considered as a variant of the "points" or of the horizontal strokes. It also happens that one author uses different criteria for the classification of strokes While in the classification of some strokes (particularly of the basic ones) all graphical characteristics have been considered as a whole, in the case of some other strokes the classification has been based on one common characteristic feature (for example, "hooked" strokes, broken strokes etc.).

Two ways of introducting the strokes with a greater number of their forms can be found: 1. the strokes are merely enumerated, without any further classification, 2. the strokes are devided into several groups. In the latter case some criteria for the classing of strokes can be observed:

a) The classing of strokes is based on the conception of the so called "basic strokes", which are conceived of as the basic forms of strokes, the other strokes then being divided into several groups according to their graphic specificity in relation to the basic strokes (e.g. shape or positional variants of the basic strokes, strokes with hook in their final part, derived or composed strokes, etc.). The conception of the basic strokes is essentially based on shape simplicity (this criterion is not, however, fully observed in all cases). In this conception, the so-called basic strokes correspond esentially to the simple strokes.

b) Strokes are divided into several types, which are represented by the basic stroke forms (stroke types). Various forms which are included among the basic forms often vary both in number and the types of strokes.

Differences in the classification of strokes are accompanied by a certain disparity in their designation. Strokes are usually denominated by the terms which are of a motivated nature, belonging either to semantic (transpositional) or descriptive types of the motivated denominations. The names of strokes either involve certain specific features of the strokes, or are of an explicatory nature. Let us discuss now the terminology of the above mentioned Chinese

authors (the terms used by Chinese authors often serve as a basis for the corresponding denomination of strokes in foreign languages as well).

There are several monosyllabic words denominating the basic strokes, and these monosyllabic denominations form a terminological basis for the designation of other strokes. They essentially belong to the semantic type of motivated denominations. Principally, these monosyllabic denominations are the following:

点	diǎn	— point
横	héng	— horizontal
竖	shù	— vertical
直	zhí	— vertical
撇	piě	— left skew
捺	nà	— right skew
提	tí	— ascending stroke
挑	tiǎo	— ascending stroke
钩	gōu	— hook
折	zhé	— broken stroke
曲	qū	— broken stroke

The monosyllabic denominations discussed above enter into descriptive denominations, which from the viewpoint of their inner structure, are of an attributive, coordinative, or of a combined type. In these denominations, the monosyllabic units very often represent the genus classing component or the component of the coordinative construction; sometimes, however, they also represent the differentiating component, i.e. a determinating member of the attribute-head construction, in adddition to other morphemes which are usually employed in this function. These descriptive denominations are of an explicative nature: they characterize the stroke by describing its characteristic graphical features. There are considerable differences betwen individual authors in this respect, following from the different evaluations of the graphic characteristics of the strokes, from the different accents on these characteristics in the denomination, from their different arrangement in the graphic system, etc. Even a terminological disparity can be noticed with one and the same author, leading to certain terminological ambiguity.

Descriptive denominations of the attributive type occur above all in the names of the variant forms of the basic strokes, and in the names of various "hooks", where the differentiating component of a denomination denotes certain graphical characteristics which distinguishes one stroke from other strokes of the same class. Terminological differences in this kind of denominations concern the differentiating member of the attribute-head construction,

but sometimes the differences also concern their classification in one class of strokes or other. For example:

丿	弯钩	wān gōu — curved hook
	竖弯钩	shù wān gōu — vertical curved hook
	左弯钩	zuǒ wān gōu — left curved hook
乛	卧钩	wò gōu — recumbent hook
	横弯钩	héng wān gōu — horizontal curved hook
	右弯钩	yòu wān gōu — right curved hook
亅	钩点	gōu diǎn — hooked point
	提	tí — ascending stroke
	挑	tiǎo — rising stroke

A considerable disparity appears among denominations of strokes of the coordinative (or combined coordinative and attributive) type. In the designating combined strokes, the components of this kind of denominations designate and characterize the constituent parts of combined strokes, so that the denominations of these strokes are in fact descriptions of their graphic features. The terminological differences mostly apply to the presence or absence of certain graphic features involved in the descriptive denomination. There are also cases when one and the same term used by different authors designates different kinds of strokes. Certain terminological ambiguity which occurs in some cases results from the fact that there are no formal distinctions between coordinative and attributive types in the inner structure of the denominations, and that at the graphic level these two kinds of denominations were not expressed either (in the Chinese writing system, graphical means such as the hyphen or the separation of the characters, which might formally designate different kinds of constructions, are, as a rule, not used).

Some examples of the differences in the denomination of combined strokes:

𠂆	横撇	héng piě — horizontal — left skew
	横折撇	héng zhé piě — horizontal — break — left skew
𠃌	横折钩	héng zhé gōu — horizontal — break — hook
	横折长钩	héng zhé chánggōu — horizontal — break long hook
𠃍	竖弯钩	shù wāngōu — vertical — curved hook
	竖折钩	shù zhé gōu — vertical — break — hook
𠃎	横折折钩	héng zhé zhé gōu — horizontal — break — break — hook
	横折左弯钩	héng zhé zuǒ wāngōu — horizontal — break left curved hook

Several examples of employing the denominations of structural homonymity for the designation of different strokes:

丿 撇点 piě diǎn — left skewed point
㇒ 撇点 piě diǎn — left skew — point
亅 竖弯钩 shù wāngōu — vertical curved hook
㇄ 竖弯钩 shù wāngōu — vertical — curved hook

In addition to the above-mentioned problems of the denominations of strokes, there are further phenomena affecting the designative function of these terms:

1. Polysemic nature of the basic terminological units. One single term can express both an individual stroke and a class of strokes. Moreover, one and the same term can designate a certain kind of stroke as well as one of the graphic features of the stroke. For example, term 钩 gōu can mean "hook/hooks", "hooked stroke/strokes" or "stroke/strokes with hook"; similarly, 折 zhé can mean "broken stroke/strokes", "break" or "bending". Since the components of the denomination are not formally distinguished as to their mutual relation in the construction, certain ambiguity can appear in the case of some denominations. For example, the name of the stroke ㄴ can be interpreted as follows: a) vertical broken hook, b) vertical — broken hook, c) vertical — break — hook, etc. Similarly, the terms 横 héng, 竖 shù and 撇 piě designate, on the one hand, individual kinds of simple strokes or a constituent part of combined strokes; on the other hand, they also operate as determinants in descriptive denominations where they designate the position of the stroke:

a) 横 héng — horizontal —
横撇 héng piě — horizontal — left skew ㇀
横撇 héng piě — horizontal left skew ㇓
横钩 héng gōu — horizontal — hook } ㇈
横钩 héng gōu — horizontal hook
b) 竖 shù — vertical 丨
竖提 shù tí — vertical — ascending 𠃌
竖撇 shù piě — vertical left skew 𠃍
竖钩 shù gōu — vertical — hook } 亅
竖钩 shù gōu — vertical hook
c) 撇 piě — left skew 丿
撇点 piě diǎn — left skew — point ㇒
撇点 piě diǎn — left skewed point 丿

Several synonyms are often used for the designation of identical graphical features of the strokes. For example, the leveled skewed position of the

strokes in one terminological system is expressed by three terms "héng" (horizontal), "píng" (level) and "wò" (recumbent):

丿 横撇 héng piě — horizontal left skew
丿 平提 píng tí — level ascending stroke
㇂ 卧钩 wò gōu — recumbent hook

3. There is a certain disparity of motivation between the differentiating components in the denominations of strokes of the same class. For example, in the case of the so-called positional variants of the strokes, the motivating reference is sometimes supplied by the designation of the position of the stroke in the graphic structure, elsewhere by that of another graphic feature; cf. e.g.:

丶 左点 zuǒ diǎn — left point (according to the left position of the stroke in the graphic structure)
丶 右点 yòu diǎn — right point (according to the right position of the stroke in the graphic structure)
一 平点 píng diǎn — level point (according to the positional characteristics of the stroke; it occupies as a rule the right position in the graphic structure)
丶 长点 cháng diǎn — long point (according to the dimensional characteristics of the stroke; it occupies as a rule the lower or the right position in the graphic structure)

Nevertheless, this kind of disparity in the motivating basis need not be rejected a priori; it is sometimes useful to lay stress on the different characteristics of individual strokes in order to point out their specificity when being mutually compared.

Appendix II

Examples of possible alternative classifications of strokes

Two alternative classifications of minimal graphic units, besides the one suggested above, are presented here.

In the first alternative classification, the classes of RP-strokes and LP--strokes are united into one class — "point" strokes; the L-A stroke-class is ranked to the L-H stroke-class, the H-L-Vc-h stroke-class is ranked to the H-L-H-L-h stroke-class, and the stroke-classes H-R-h, H-V-Rle-h and H-L-Rle-h are united into one class, i.e. H-L-Rle-h.

In the second alternative some strokes, which are considered as subclasses in the suggested classification, are regarded as classes. In this classification the approach is more graphic-visual and less distributional.

Suggested Classification	1. Variant (simpl.)	2. Variant (ampl.)
1.	1.	1.
2.	2.	2.
3.	3.	3.
4.	4.	4.
5.	5.	5.
6.	6.	6.
7.		7.
8.	7.	8.
9.	8.	9.
10.	9.	10.
11.	10.	11.
12.	11.	12.
13.	12.	13.
14.	13.	14.
15.	14.	15.
16.	15.	16.
17.	16.	17.
18.	17.	18.

Suggested Classification:	1. Variant (simpl.):	2. Variant (ampl.):
19.	18.	19.
20.	19.	20.
21.	20.	21.
22.	21.	22.
23.	22.	23.
24.	23.	24.
25.		25.
		26.
26.	24.	27.
27.	25.	28.
28.	26.	29.
29.	27.	30.
30.	28.	31.
31.	29.	32.
32.		33.
33.		34.
34.		35.
		36.

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Systém čínského písma — minimální grafické jednotky

RÉSUMÉ

Systém čínského znakového písma tvoří hierarchické jednotky různých rovin. Základní jednotkou na rovině grafolingvistické je grafém, v systému čínského znakového písma typologicky vymezený jako logogram nebo morfemogram. Předmětem analýzy na této rovině je také způsob reprezentace jazykových jednotek jednotkami písma (monografická, homografická, multigrafická a heterografická reprezentace). Na rovině grafemické jsou pak zkoumány subgrafemické jednotky vztahující se k významové či zvukové stránce označované jazykové jednotky. Problémy týkající se grafické formy a grafické struktury jsou předmětem analýzy na rovině grafické. Maximální jednotkou na této rovině je grafa, minimální jednotkou je tah. Cílem práce je analýza a popis tahů na rovině grafické; závěrečná kapitola je věnová na některým funkčním aspektům tahů.

Tahy jsou minimální grafické jednotky, které se vyznačují jistými grafickými a kombinatorními vlastnostmi. Kombinují se v rámci grafy nebo subgrafy a vytvářejí tahové komplexy. Mohou tvořit různé typy kombinací a v grafické struktuře mohou zaujímat různé pozice. V grafách dochází k modifikaci tahů, jež může být podmíněna způsobem kombinace nebo vyplývá z grafické struktury, její složenosti, z různé pozice tahu v grafické struktuře apod. Kombinatorní vlastnosti tahů se projevují v jejich schopnosti kombinace s jinými tahy a vyššími grafickými jednotkami a ve schopnosti zaujímat určité místo v tahové posloupnosti.

Klasifikace tahů vychází z grafické shody tahů vydělených z graf; současně se posuzuje povaha diferencí jednotlivých grafických vlastností vydělených tahů a přihlíží se k jejich distributivní charakteristice. Jednotlivé třídy tahů reprezentují abstraktní grafické jednotky — tahové typy, podtřídy jsou reprezentovány tahovými podtypy.

Vlastní popis jednotlivých tahových tříd začíná charakteristikou grafických vlastností tahů, následuje výklad jejich kombinatorních vlastností (distribuce, typy kombinací, charakteristika z hlediska posloupnosti), dále pak klasifikace příp. variantních forem tahů a závěr tvoří popis modifikace tahů v grafické struktuře.

Pohlížíme-li na tahy jako na elementy jednotek grafolingvistické roviny, posuzujeme je z hlediska funkčního. Tahy vystupují z tohoto hlediska jako základní grafonické či subgrafonické elementy grafonického komplexu.