

The Central Hierarchy in Fukushima Prefecture: A Study of Types of Rural Service Structure

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The Ideal Hierarchy and the Preceding Studies. In 1933, W. Christaller, a German geographer, published the works on the systematical distribution of urban areas in Southern Germany, in which he intended to give an explanation to the pattern and sizes of urban settlements from view-point of central service functions of urban areas against rural ones. Though the problem had been referred some times before in the field of geography and the other disciplines, this seems to be the first methodical information on the mechanical system of the urban constitution in a phase of rural-urban interrelationship. In his works, three important facts were suggested; that is, (1) some types and many centers of one type have to be differentiated under one largest center, (2) the same type of centers have to distribute with equal intervals from each other, and (3) therefore, the actual size differentiation of urban centers must be a relatively simple building of a few classes and the distribution must have a relatively simple geometric diagram, hexagonal system in his case⁽¹⁾

The word urban hierarchy means, the writer thinks, such an orderly arrangement of several grades of the urban centers, raised by the stratified mechanism of rural services. It was often said that the urban area consumes the rural products in return for the material supply of all things which suffice the mental and material demands of rural population. But, in practice, there exists, in the kinds of demands of rural population, some difference of frequent intensities or cost levels, and, in the natures of enterprises, the difference of the necessity of the capital centralization or the adequate size of hinterland. So, each kind of enterprises must distribute with their own pattern and density because the location factor differs in each other, until the numerous points may get the possession of some one type of central actions. And on the other hand there is some restriction of the number of central places in practice. The concentration of enterprises is necessary both for the better management of enterprises and for the facilities of rural consumers. For example, a flourishing shopping street must be conformed for the successful retail of goods of shopping class⁽²⁾ and the retail services must

(1) Walter Christaller : Die Zentralen Orte in Süddeutschland. 1933, Jena S. 48, 60, 63-85

(2) H. E. Agnew, H. A. Conner & W. L. Doremus : Outlines of Marketing. 1950, New York pp. 49, 55-57, 200

also be combined to the other such services as governmental, administrative and financial in order to satisfy the desire of customers who want to do as many business as possible at one place and one time of visit. Thus the isolated location of enterprise will not be successful except a few cases in which servers suffice the very frequent and inexpensive demands. For those reasons, each enterprise must be located in company with the other enterprises of similar level as many as possible (forming the center as large as possible), but keeping the density approximate to the best one peculiar to each kind. This is the basic feature of urban hierarchy and the reason why the several kinds of centers (from simple but many number type to the various services but few number type) have to differentiate as a function between the facility of rural consumers and the advantage of urban enterprises (as well as for the smooth supply of rural products to urban area).

Such theoretical differentiation of urban centers was ascertained in practice by the works of English geographers, R.E. Dickinson⁽³⁾, A.E. Smailes⁽⁴⁾ or F.H.W. Green,⁽⁵⁾ in which the urban status of each class of centers has gradually become apparent and the set-grouping of some services in the classes was argued with particular concern. Dickinson found the differentiation of some grades of urban centers in his observation in East Anglia, and he said, "Each of these functions is graded in itself, ranging, for instance, from... They also tend to occur in groups at different levels, so that grades of urban settlement may be recognized." Such view-point was also elected out in the precise study by Smailes in Wales. He said, "These symbols of urbanism are usually found in association; they hang together as members of a trait-complex. Where this is so, and the group is complete, there cannot be any doubt about recognition of a fully fledged town".

Owing to these studies together with many other brief sketches such as Hartmann's rectangular system⁽⁶⁾ or the Brush's review⁽⁷⁾ of the studies, the problem seems to be on the one secured step as to the basic aspects of it, and the writer feels a little interest in its application to the analysis of rural service structure. In the almost all studies in the past, the view-point is essentially in the analysis of the urban side, that is, the main subject seems to be laid on a law of the

(3) R. E. Dickinson: *The Distribution of Functions of the Smaller Urban Settlements of East Anglia*, *Geography*, 1932, pp. 19-31; *City Region and Regionalism, A Geographical Contribution to Human Ecology*, 1947, London, pp. 47-48

(4) A. E. Smailes: *The Urban Hierarchy in England and Wales*, *Geography*, 1944, pp. 41-51

(5) F. H. W. Green: *Urban Hinterland in England and Wales*, *Geographical Journal*, 1950, pp. 64-88; *Some Relations between country and Town in Scotland*, *Sct. Geogr. Mag.*, 1952, pp. 2-12

(6) G. W. Hartmann: *The Central Business District. A Study in Urban Geography*, *Econ. Geogr.* 1956

(7) J. E. Brush: *The Urban Hierarchy in Europe*, *Review. Geogr. Rev.*, 1953, pp. 414-416

distribution of urban areas or the classification of urban status itself, not specialized in the problem of the stratifying mechanism of centrality (relations among the classes) or the view-point of urban status as an expression of rural services. For instance, in such a view-point of the former studies, Smailes defined one kind of set-group alone as an expression of urban characters and decided the several classes different only in the relative status as to the possession of the very group. It is noticed that the respective set-group of each class was not mentioned in this case, although those would be a very important feature representative of the rural structures, and yet the author, too, referred to the similarity between the urban and the service hierarchy in regard to their nature of fluviability. As stated above, the hierarchy is a result of the differentiation of the central service functions of urban area, at least partly, and this is also evident in the fact that the studies of rural societies lead the Kolb's excellent scheme⁽⁸⁾ which is essentially similar to that of Christaller and has recently been ascertained by the Brush's applyment⁽⁹⁾ of the idea of hierarchy in the same field of Southern Wisconsin. Therefore, the writer thinks it possible to interpret the hierarchy in a form of "peculiar service group in each class" as a key feature to rural services, and intended to examine this idea locally in Japan in order to infer the rural service-structures which seem too extensive a problem to be studied by simple investigations. In Japan, the fact of hierarchy has been recognized in many places, in the Suo district,⁽¹⁰⁾ in Toyama Prefecture,⁽¹¹⁾ in the Tokai Region,⁽¹²⁾ in the Nagano Basin⁽¹³⁾ and in two small basins in the Tohoku Region⁽¹⁴⁾ but the detailed items of the services offered by towns in each class have not been enough acquainted till today.

The Field and the Source of the data The writer takes an example in the field of Fukushima Prefecture in the southern part of the Tohoku

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- (8) J. H. Kolb & E. de S. Brunner: *A Study of Rural Society*, Education Manual 268 for the United States Armed Forces, copyright 1940 and 1935, p. 128; Source: *Service Relations of Town and Country*, Research Bulletin 58, 1932, Agricultural Experiment Station, University of Wisconsin.
 - (9) J. E. Brush: *The Hierarchy of Central Places in Southern Wisconsin*, *Geogr. Rev.* 1953 pp. 380-402
 - (10) Tadahiro Ono: *Structure of Life Region in Suo District*, *The Human Geography (The Jinbun-Chiri)*, 1951, pp. 40-49, 100 (in Japanese)
 - (11) Kiyoshi Sawada: *Life Circles and Communications in the fan-area of Tedorii*, *The Nature and Society (Shizen-to-Shakai)*, 1953 pp. 14-15 (in Japanese)
 - (12) F. Takano; *Study of Rural-Urban Interrelating sphere of Medium and Small Regional Urban Centers*, read before the Meeting of The Association of Japanese Geographers (in Oct. 1954)
 - (13) Takeshi Koide: *A Study of the Rurban Community Area of Nagano City*, *The Geographical Review of Japan*, 1953, pp. 145-154 (in Japanese)
 - (14) Yoshio Watanabe: *The Rural Services in the Inawashiro Basin*, *Fukushima Prefecture, Ann. Tohoku Geogr. Assoc.*, Vol. 6, No. 1. pp. 56-60 (in Japanese); *The Service Pattern in the Shinjo Basin*, *Sci. Repts. Tohoku Univ.* 7th Ser., No. 4 (1954)

Region. The prefecture, about 120 km N-S and 150 km in E-W, is penetrated by three N-S mountain ranges of different kinds, the Abukuma Plateau, the narrow and ragged Oou tertiary mountains and the wide and locally steep Aizu Mountain group. Among them, run the eastern coastal plain with diluvial table lands, the Abukuma Valley Lowland which is separated into several basins by hilly barriers and the Basin Group of Aizu. The habitation is most widely dense in the Abukuma Lowland extending to the broad marginal hilly lands of Abukuma Mountains, but the highest one appears in the southern part of the coastal plain where the coal mining has been flourishing and in the northern half of the Abukuma Lowland especially in the Fukushima Basin where the developed type of garden and sericultural agriculture has prevailed, and on the west in the Aizu Basin in which the paddy is its chief economic substance. The mountain areas are usually settled very dispersedly except the Abukuma Plateau where the agricultural occupation has developed for a long time on the gentle relief of the uplifted peneplain of 300-700m in height, while, in the small valleys intersecting these mountain lands, the local concentration of the habitation can be often traced continuously from the neighbouring large lowland. There are a few places of agglomeration of modern industry attracted by the water power of Lake Inawashiro, but they are all local appearances with a little influence

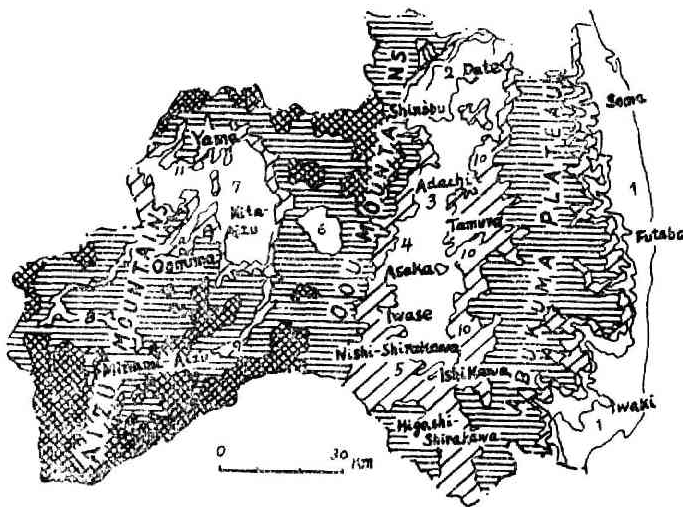


Fig. 1 Index map of the Prefecture

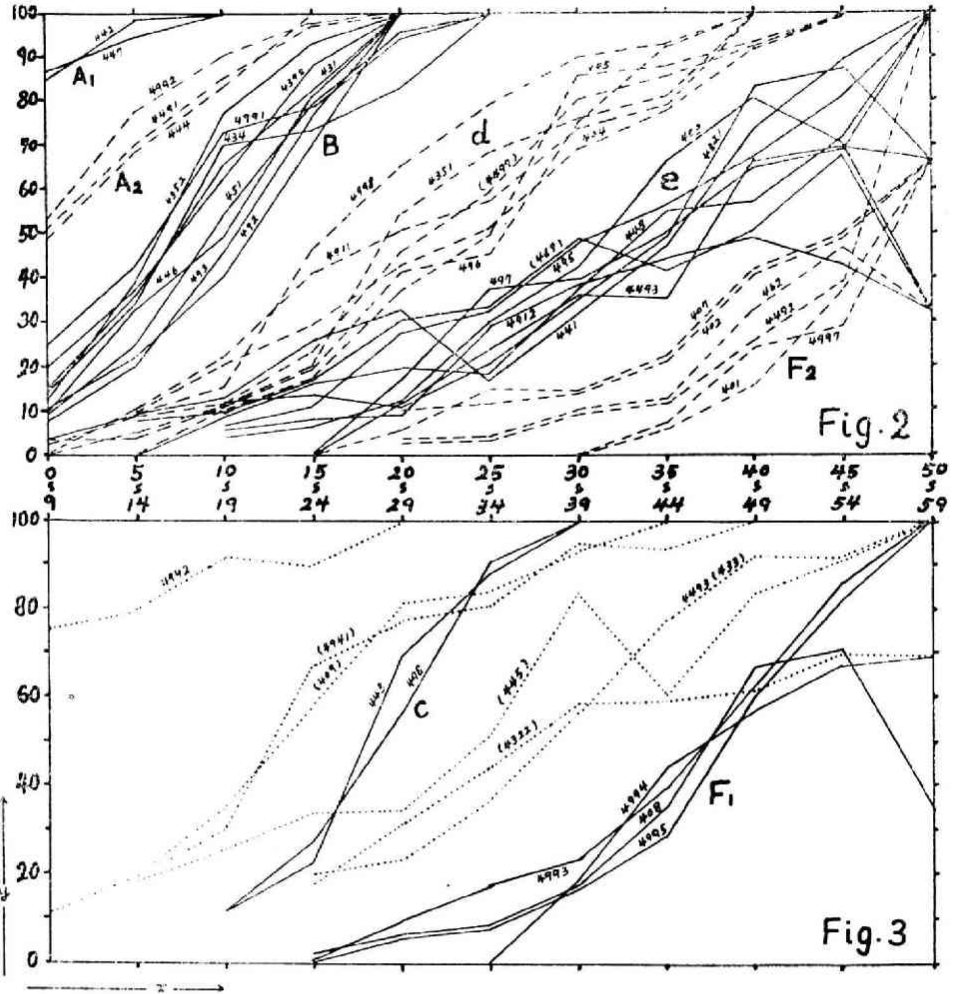
1. coastal plain
2. Fukushima Basin
3. Adachi (Nihonmatsu) Basin
4. Asaka (Koriyama) Basin
5. Shirakawa Basin
6. the lake & Basin of Inawashiro
7. Aizu Basin
8. Ina Basin
9. Tajima Basin
10. Abukuma Hilly Land
11. Nozawa (Aganogawa) Hilly Land

limited to the neighbouring area. In the prefecture there were five urbanized areas named “-shi (city)” in 1950, . . . Fukushima-shi (the site of prefectural office, population 93,435), Koriyama-shi (pop. 70,866), Wakamatsu-shi (pop. 60,034), Taira-shi (pop. 42,891) and Shirakawa-shi (pop. 31,669), . . . none of them

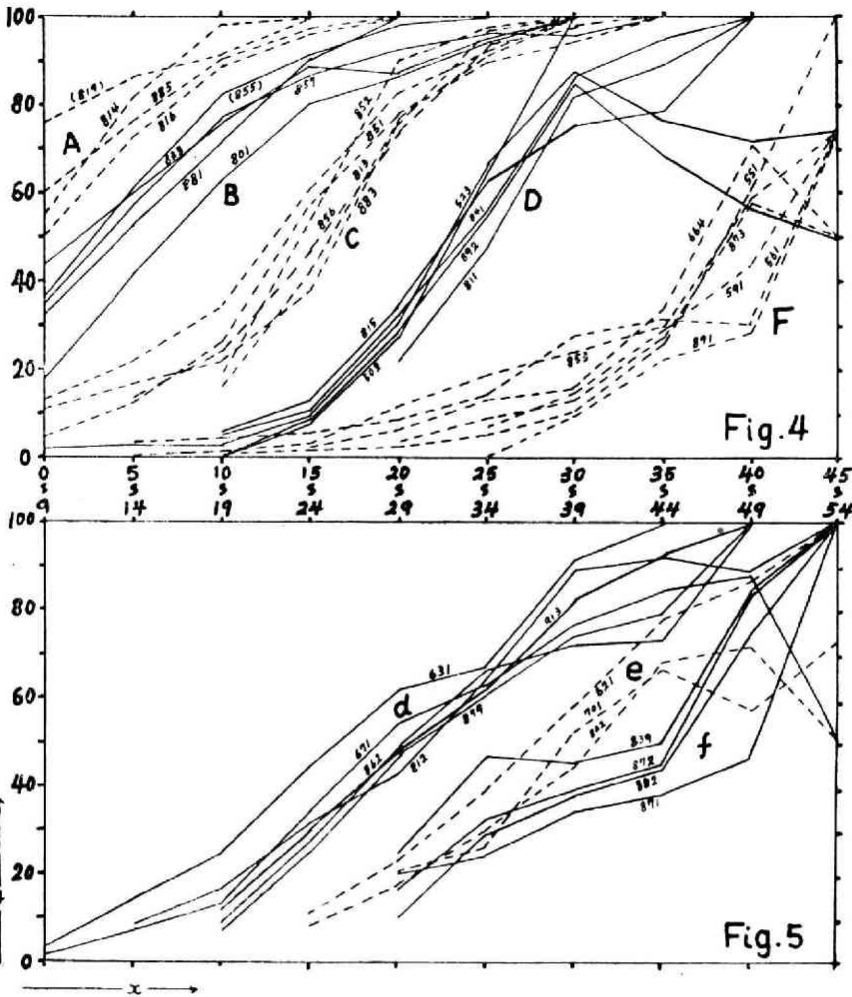
possessing the overwhelmingly strong influence over the others as populations show, though they are all well equipped as a modest regional center in the Tohoku Region. They are separated from each other from 30 to 50 km in straight distance, and many kinds of towns and auxiliary rural centers (which include 62 town communities as their leading actors) have transmitted the work of city supply to the 1,763,499 consumers living in the rural area (containing the 315 *mura* communities) and in the centers themselves. Those small centers and such terminal structure of urban supply will mainly be studied in this paper.

For various reasons to be blamed on the writer partly, two kinds and two years of census data had to be adopted to examine the distribution of enterprises. The 1951 Establishment Census by the government will show the distribution of the enterprises belonging to such groups as finance, insurance, real estate, transportation, communication, other public utilities and all other kinds of services. (They will be called simply as general services in the following.) While, 1952 Commercial Census was used to show the distribution of commercial services, because the most detailed classification in Establishment Census (the minor groups in the classification system of National Bureau of Statistics) was not detailed enough to analyse commercial characters as compared with that of Commercial Census (which corresponds to the most detailed groups in that system). There exist, as may be expected, some troublesome problems in use of them.

(1) In the later census, the number of commercial services decreased in its census appearance about 7.8%. Therefore, the commonness will be over-estimated in the general services than in the commercial services. The writer intended to lighten the ill result by separating the treatments of these two groups in the procedure of the work. And the writer excluded, out of the study, such enterprises as relating to both the groups . . . for example, the bicycle retailers and bicycle repairments (2) The ability of census actors in application of classification system differs to some degree not neglectable. The writer has often experienced, in a comparison of his own investigation, a fact that some kinds of enterprises tend to be registered surpassingly in some unit areas by the misjudgement of another item. But this is out of consideration. (3) In both census, the enterprises were classified on a base of the fact, "What kind of operation brings the largest advantage to the unit?" Therefore, all subsidiary services were neglected in the survey. The writer possesses the data of the service items dealt in by a service unit in the case of the central street of Kanayama-machi, a modest town community in Yamagata Prefecture. According to the classification of the most minor groups in National system, the units dealing in one kind of services were only 48 against the total of 68, and there were 17 units of two kinds of services, 12 of three kinds, 3 of four kinds and 6 of more than five kinds. Concerning the 74 subsidiary works ($17 \times 1 + 12 \times 2 + 3 \times 3 + 6 \times 4$), in this case, there seemed likely



to be some veiled ones which were actually in operation and not registered in the census. Therefore, the result of the investigation in the following must not be understood as showing the fact that the consumers can receive there only the kinds of service the census shows but as the fact that the shops, mostly specialized in the kind, exist there. This character of the census seems to be the largest obstruct to the study. (4) The census data was given by the administrative unit as *machi* (town) or *mura* (rural community). But they will be enough representative of the status of the central place contained in units so far as the kinds of services are inquired, because it is a rare case that the pure rural areas possess some kinds of services which have never been seen in the centers dominating there. After such considerations as above, the writer judged the census data to be available in



comparison with the other kinds of data for example, directories or telephone directories.

The Groups of Services Viewed from the Character of Distribution

The classes of central places will be defined most desirably by the detection of some kind of "set-group of services" in each class for example, the trait-complex by Smailes. But it can not be executed by any means of direct observation of the data on a base of previously established classification of centers, because the actual size order is so continuous, not step-like, that the previous classification may lead the miss-recognition of stratifying status of centers, the hierarchy itself. Further, the actual appearance of kinds of services seems to

have no regular form in every scale of towns for two reasons, the accidental occurrence of some services and inaccuracy of census. Here the ranking method is no more useful to offer the ready knowledge of the differentiation of classes⁽¹⁵⁾, due to so complicated the class formation in the areal varieties of this prefecture, and such differences of administration as *-shi*, *-machi* and *mura* will be too inaccurate an information as to the purpose. So, the writer intended to get such set-groups by gathering similar type of distribution after analyzing the tendency of each kind of services respectively.

Fig. 2-5 show what kinds of services appear in the centers of every scale of the services, 2-3 being the case of commercial services and 4-5, general services. The x-axis shows the scales of centers expressed by the number of kinds of services, and y-axis, the rate of appearance of the service in question. An example will be given by the tendency of distribution of drug stores as follows: The drug stores were possessed without exception by the centers with more than 20-29 kinds of commercial services, and the rate of existence was given as 100%; in the case of the centers of 15-24 kinds, 12 centers lack drug stores against the total of 47, and the rate is 74%; in the centers of 10-19 kinds, 61 against 110 lack drug stores and the rate was 45%; and so on. Then the line of drug-store was drawn by connecting the points of the rate. The many lines crossing the figure were thus acquired, and concerned the all kinds of services except several ones excluded either to avoid the miss treatment of census data, or because of their too disorderly tendencies.

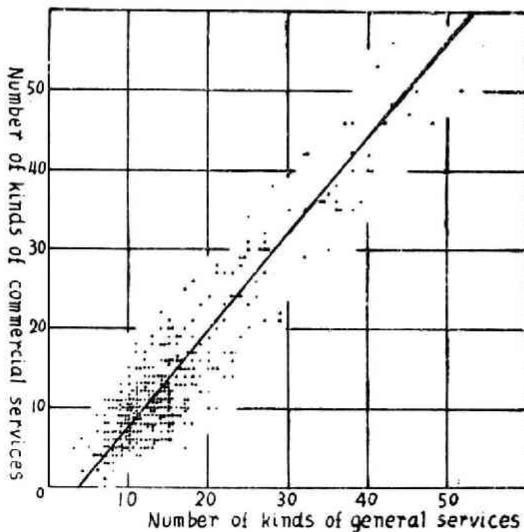


Fig. 6 Relation between the development of commercial and general services

In the figure, each line shows the peculiar tendency of its own distribution. For example, the shops of cakes "generally" exist even in the communities of the lowest level of service, and exist "without exception" in the communities possessing more than 10 kinds of services. The case of shoe store shows the middle class which appears firstly in the communities having 15-24 kinds of services and reaches the level of "in all communities" in that of 40-49 kinds of services. On the contrary,

the retailers of automobiles are found only in the communities of more than 35 services, and do not appear in even a half of the largest towns. In those various tendencies, there seemed, however, some similar types to be grouped into one, being probably not accidental but a result of the fact that "Each of these functions is graded in itself." Those are shown in the figure with the different kinds of lines and in alphabet. Then, these similar types must show the similar degrees and similar occasions of rural demands or the similar conditions of the server's wish — for example, the frequency of demands, the restriction of distance between site of enterprises and consumers or the adequate size of hinterland for each enterprise. Therefore, there might be a large probability of their appearance in association, in some grade of centers, as an equipment of perfect services of one level. The list and its major grouping is given in Table I after the correlation of the two different groups has been accomplished by Fig. 6.

The Classification of Centers and the Hierarchy From the forechapter, it will be hinted that each full-set of the groups in Table I may conform one step of urban development, and that, because of it, those groups will possibly be used as the trait-complex of each urban class in the classification. This was practised by the following setting: The full-set of group Ff will show the first class of towns; the group Ee, 2nd class ones; the group Dd, 3rd class ones; the group B, 4th class centers; and the group A, 5th class (non-centers). In this work the group G, the rarest type, was omitted from the study, being regarded as show the proper role of cities, and besides the same treatment was applied to the group Cc which contained too small number of services and lacked a peculiar character of its own as a group. And in practice, the appearance of 4/5 kinds of services is adopted as a criterion instead of "full-set," in order to exclude the bad effect of accidental absence which includes the miss-judgements by census actors. Those are named "complete" type of classes, and laid against "incomplete" one by the criterion of 1/2. Thus the centers were classified into seven classes in this prefecture, the names of the towns being listed in Table II.

Still, those classes, however, merely show the order of relative level of urban centers and, in this stage, do not imply any kind of arrangement which must indicate the mechanical service system in a strata-like differentiation of towns, or systems probably in practice. The relation of overlying and underlaid types must be sought among the classes, and the figures of 2-5 have to be recalled here. In these figures, there can be observed some cases of group relation, in which one group begins the service at the scale of the full-set of another group — according to the example of commercial service, the group D starts the operation in the scale of 16-25 kinds in which the group A reaches a level of full-set. Such relations

were assembled in Fig. 7 got by the schematization of the four figures, the correlation of two major groups being practised prior to it by Fig. 6. In the case of an ideal hierarchy, it is obvious that each stratified class must be characterized by the forte services perfectly of its own, because the clear separation of the proper role is required between the classes in term of differentiation. They will be most successful when they are characterized by some kinds of services found in the centers in lower strata as rarely as possible, while, their invasion towards the upper class must also be oppressed by the invaded class due to the same reason. The duplication of the forte service will not then be favourable to both the centers,

Table 1. Group of Services viewed from the character of Distribution

κA_1 { 513 banking facilities for primitive industries { 911 elementary school (primary) { 912 senior high school κA_2 { 814 barber and beauty parlors business { 816 clothes sewing shop (repair shop) { 885 midwife	cA_1 { 447 candy and cake { 442 <i>Sake</i> and condiments { 4942 agricultural instruments cA_2 { 4992 tobacco { 444 fresh fish { 4491 rice shop { 412 commission merchant and broker
κB { 633 transportation business by light vehicles { 801 hotel { 881 medical office (clinic)	cB { 431 clothes { 434 second-hand clothing { 446 green grocery { 4991 stationery and books { 4392 foreign and small wares { 493 drugs and cosmetics { 4352 foot wear { 492 Tatami (Japanese floor-mat) { 451 taven and restaurant { 4943 kitchen wares)
κC { 856 ironware repair { 852 time-piece repair { 851 machine repair works { 813 photographic studio { 883 medical treatment-massage and the like	cC { 443 butcher's meat { 498 fuel { 4941 hard wares)
κd { 631 motor trucking business { 671 forwarding business { 812 dying { 879 amusement place { 862 movie-theatre { 913 high school κD { 502 bank { 523 banking organ for commerce and industry { 815 bath house { 841 motor-car-repair { 892 notary, public notary	cd { 405 W.S. agricultural and aquatic products { 404 W.S. food stuff and drinking { 4351 shoes and boots (leather made) { 4911 furniture { 496 chinass and glass { 4998 time-pieces and eye-glasses { 4322 order-made European clothes)

ke	<ul style="list-style-type: none"> 621 taxi (passenger motor car) transportation 701 electrical enterprise (industry) 802 lodging house 	ce	<ul style="list-style-type: none"> 403 W.S. clothing and other personal furnishing 4321 ready-made European clothes 441 grocery in general 448 milk 495 electric instruments (radio, etc.) 4912 house furnishing 497 second-hand articles in general 4493 teas
kf	<ul style="list-style-type: none"> 871 theatre 872 <i>Geisha</i>-house, <i>Machiai</i> assignation house and the like 882 hospital (818 under taker) 	cF ₁	<ul style="list-style-type: none"> 408 W.S. machines, metallic instruments, hard ware 4995 toys 4993 sporting goods and others for recreation 4994 flowers and plants
κF	<ul style="list-style-type: none"> 541 bielrbusiness 551 life insurance 561 insurance agency 591 a real estate agent 664 agricultural ware housing business 853 furniture repair 873 dancing-hall 891 counsel, attorney 	cF ₂	<ul style="list-style-type: none"> 401 W.S. automobiles 407 furniture, fittings, household-utensils 402 chemicals, drugs, cosmetics 4492 dishes prepared 4997 cameras 462 automobiles
κG	<ul style="list-style-type: none"> 552 marsine and fire ensurance 611-2 local line (railway) and bus 661 free ware housing business (normal) 711 water service 712 drainage works and dust transaction 831 advertising agency etc. 	cG	<ul style="list-style-type: none"> 406 W.S. instruments for tele-communication, domestic electric instruments 433 clothes for ladies and children 4391 furs (coats, etc.) 471 gasoline or petroleum 4996 music instruments etc. etc.

Table. II Classification of the Towns

class	-machi	-mura	names of the towns
c.1	2	0	Sukagawa, Kitakata
ic.1	5	0	Haranomachi, Nihonmatsu, Nakamura, (Yumoto, Onahama)
c.2	6	0	Motomiya, Inawashiro, Kawamata, Bange, Miharu, Iizaka
ic.2	7	0	Tanakura, Takada, Hobara, Ishikawa, Tajima (Ueda, Nakoso)
c.3	12	0	Odaka, Tomioka Namie, Yanagawa, Yabuki, Hanawa, Ononimachi, Funabiki, Nozawa (Ena, Uchigo, Yotsukura)
ic.3	11	0	Kashima, Iino, Koori, Fujita, Kakeda, Asakawa, Naganuma, Hongo, Yamato, Matsukawa Shiokawa
c.4	13	8	Hisanohama, Kido, Futaba, Date, Yuno, Tsukidate, Obama, Yui, Takine, Oogoe, Tokiwa, Fukuyama, Atami, [Kagamiishi, Toyosato, Bandai, Nagahama, Yanaizu, Showa, Narahara, Oomiya]
ic.4	5	59	Ootsuki and other 64 Communities

() : south corner of the coastal plain [] : *mura* communities

especially to the overlying one, and it seems unsuitable to the ideal stratification. For this reason, the forte service group, that is generally the maximum highest group in each class, must perfectly be identified in the classes of one hierarchy system at least ideally, and such relation of overlying type to underlaid one seems to be traced well by the relation as viewed in Fig. 7. Then, the situation of every class was assessed in the figure by the kinds of services, and finally the hypothetical hierarchy was supposed as Fig. 8.

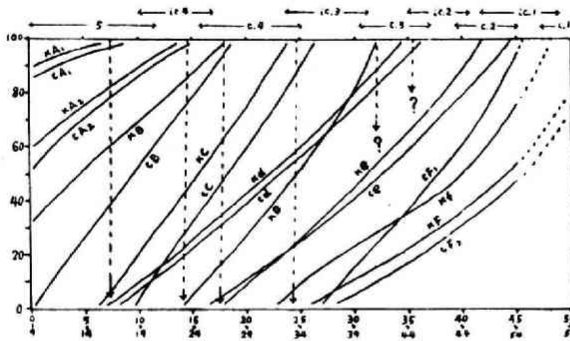


Fig. 7 Non-duplicated Relation of the set groups of services *x-axis*: (Scale of town is expressed by the number of kinds of commercial Services.)

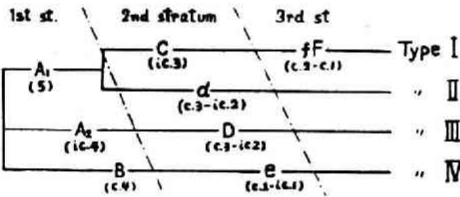


Fig. 8 Hierarchy Systems in Supposition

The Central Pattern and its Types in Fukushima Prefecture The list of the towns in Table II was plotted spatially as in Fig. 9. Here the notice will be given to the general similarity between the scheme in Fig. 8 and the actual distribution of towns. In spite of many conspicuous example of exceptional scale of towns, the stratified distribution of every town is not so disorderly that the ideal one could not be applied in its classification at all. The writer divided the prefecture into four types, referring Fig. 8.

The Hierarchy Type I appears in such districts as northern one-fourth of the coastal plain, north of Sukagawa town in the Abukuma lowland, and the bottom of the Aizu Basin proper. They seem to be almost a perfect representation of ideal one. The composition of the towns was shown in Table III, in which one may notice the three agglomeration zones (c.1, ic.1, c.2 - ic.3, c.4 - 5) and two low density zones (ic.2.c - 2, c.3 - ic.4) of towns. Iizaka town in the 2nd stratum is a peculiar case raised by the outsider's consumption at the famous hot-spring resort and in spite of the presence of some public institutions to be added to its high range of service facilities, the nature of the town seems to be that of the 2nd

Table III Town arrangement

	Type I	Type II	Type III	Type IV
c.1	34 Sukagawa 43 Kitakata			
ic.1	3 Haranomachi 1 Nakamura 25 Nihonmatsu			
c.2	26 Motomiya 27 Miharū 22 Kawamata 45 Bange 18 (Iizaka)			
ic.2	19 Hobara 47 Takada		{ 37 Ishikawa 39 Tanakura 51 Tajima	
c.3	16 Yanagawa	{ 4 Odaka 5 Tomioka 6 Namie 36 Yabuki 32 Onoshinmachi 28 Funabiki 50 Nozawa	(Hanawa)	
ic.3	{ 2 Kashima 23 Iino 17 Koori 15 Fujita 20 Kakeda 48 Hongo 44 Shiokawa 24 Matsukawa	40 Asakawa 35 Naganuma 49 Yamato		
c.4	{ Date Tsukidate Obama Yui Fukuyama (Yunō) (Atami)	(Kagamiichi) (Toyosato)	{ Kido Futaba Yanaizu Narahara Oomiya Hisanohama	{ Takine Oogoe Tokiwa
ic.4	few	few	almost all	few
5	{ very common	{ very common	very few	few

stratum in its focussing sphere of rural services. The habitants in the surrounding area are rather accustomed to purchase something of higher shopping class in the near-by Fukushima city than in Iizaka town. Yunō town in c.4 class is also of noncentral type which must be considered as a part of Iizaka town, if the administrative and governmental boundary is disregarded. Atami town in ic. 3 class is somewhat similar to the case of Iizaka town but having the further compacted scales of the hot-spring and size of the town. On the contrary, three towns in ic.2 and c.3 class clearly show the mid-type of the strata, which has performed peculiar services more diversified than an ordinary 2nd stratum town but has taken its place on the same level of the 2nd stratum with regard to some kind of the services.

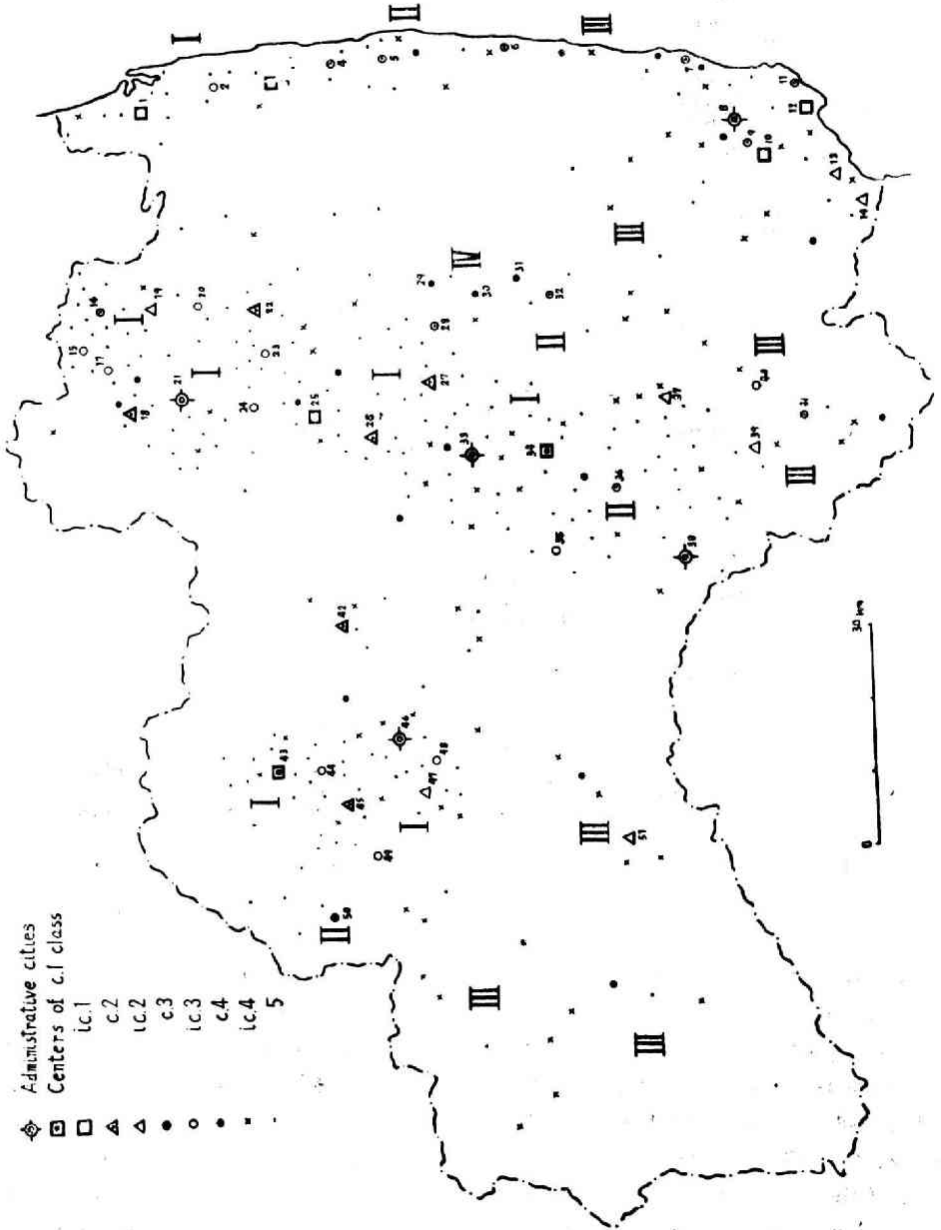


Fig. 9 Distribution of centers classified (Town numbers are given in Table III)

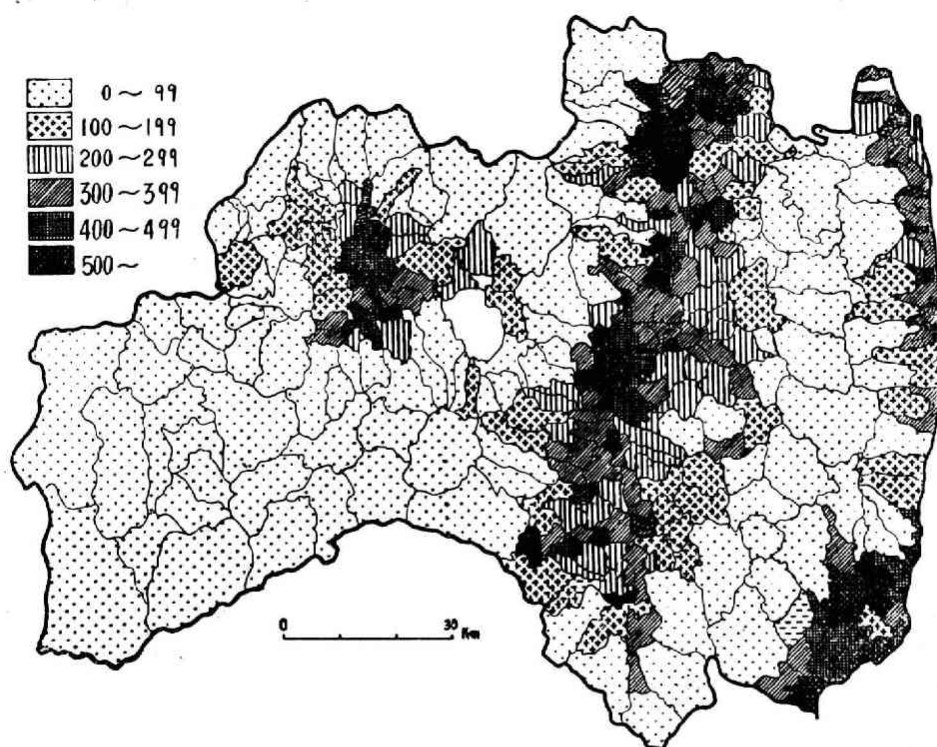


Fig. 10 Boundaries of administrative units and population density

The Hierarchy Type II forms the marginal zone of the above type, but so little the difference lies between two types that the boundary can not be recognized distinctly in the map. Its distribution is, therefore, decided, mainly by the class of the towns which conform the 2nd stratum, to be in the middle part of the coastal plain, the middle part of the eastern marginal zone of the Abukuma Plateau, the southern Abukuma Lowland and the west of the Aizu Basin along the Agano river. This type apparently lacks the 3rd stratum, but that of type I performs part of the role especially in the coastal plain. In this system, three towns in the ic. 3 class, Asakawa, Naganuma and Yamato, seem to present the commercial services to their surrounding areas as the supplemental centers of c.3 class, but the two centers in c.4 class have no character of an areal service center.

The Hierarchy Type III is found in the south of the above two, as in Southern Abukuma Plateau, the southern-most small area of the Abukuma Lowland, vast Aizu mountain lands and, though indistinctly, a part of coastal plain in the south of II type. The 1st stratum is very characteristic and clearly distinguished in the map from the areas of the other types. The 2nd stratum, which is also very

clearly differentiated, is, however, in all the three towns replaced by ic.2 class instead of c.3 class in the ideal system. The high level of Hanawa town seems to be questioned, because it is not so large a center as to compete with neighbouring Tanakura town.

The presence of Hierarchy Type IV is a matter of question, if accurately said, in this prefecture. The type of Kaneyama town⁽¹⁵⁾ in Yamagata Prefecture, a self-servicing one to a high degree but not a one unifying the other communities will offer the most suitable example of the element of this system. Such towns as Takine, Oogoe, and Tokiwa, show undoubtedly such tendency in the eastern marginal zone of the Abukuma Plateau, but they occupy too narrow a zone to be called an areal type.

Besides them many towns distribute in the south corner of the coastal plain, being not referred in the above description. Here the dominant factors of the town formation are coal mining and fishery, and not a service function in any town. Therefore the classification seems to be useless to so arbitrary the arrangement of towns. In addition, one more case of the Inawashiro Basin must be referred here. The area is essentially of type I, though it lacks the 2nd stratum under too large center of the old castle town Inawashiro. Recently the private small railway connected the governmental rail-ways with the site of hot spring and mining, and by this, two terminals in two communities raise some level of services, disorganizing the apparent stratification. The area should be labeled by type I, notwithstanding its disorderly hierarchy.

The nature of each hierarchy system In the above descriptions, the nature of each hierarchy system will be inferable if the careful comparison is made between the class arrangement of towns in Table III and the list of forte services of each class or the average figure of them in Table I and IV. But it will be needed here to refer to their main characteristics or their areal differences. And in the following, it will help one understand the subject to know that a unit of the 1st stratum means in rural Japan such social units as are usually found in combination with the smallest administrative unit as *mura* or *machi*, that several of them conform one unit of the second stratum, and that the latter ones become a unit of the 3rd stratum which corresponds to the *gun* realm in loose meaning.

The Hierarchy Type I. The type is developed in such districts as vast alluvial plains, the area of the alternation of alluvial plains and low diluvial table lands, or lower hilly lands surrounding them, the habitation being generally dense and showing the figure of more than 300 people per square kilometer. Here only the services in group A are commonly found in the ordinary *mura* communities which conform the 1st stratum, and their services have the nature of the daily ones with

(15) Yoshio Watanabe: The Service Pattern in the Shinjo Basin, opp. cit.

relation only to the neighbouring habitants, and that show the nature of the following; daily needed various foods and luxuries, agricultural demands, public institutions required in national law, or some others such as barbers, bicycle repairers, or midwife, all of whom require the shorter distance in avail between the establishments and consumers. There exist very scarcely and arbitrarily some of B, C groups, for example, second handed wears, foot wears or stationery. Such a character is most typical in the Fukushima Basin in the northern Abukuma Lowland, where almost nothing seems to be added to the services of group A, while in the case of the other districts, such as Asaka-gun, Adachi-gun or the bottom of the Aizu Basin, a little more diversifications are observed in the range of services, the external case being Soma-gun where some commercial services of the B, C groups are scattered extensively such as second handed wears in one-fourth of *mura*, and clothes, drugs, foot wears, stationery and ready-made wears respectively in about one-fifth of *mura*, though they never appear in an assembling type in one *mura*. In the last case, there are truck transportations in a few *mura*, which may show the activeness of lumbering, and also the common existence of inns may suggest the frequent demands of hawkers' and other out-siders' temporary staying in the relatively wide *mura* distant from the towns. And it is interesting that only clinics are the rarest in this district, but commonest in the Fukushima Basin probably due to the difference of level status in rural life.

Underlying those, the 2nd stratum, composed of ic.3 and c.4 classes, show the very distinct nature which is well represented, in comparison to the items of A group, by the remarkable progress of retail services compiled in C group. Those show the role of the towns supplying the commodities of lower shopping class, that is the ones consumptive but of somewhat long duration used in rural life. Further, more specialized retail services in D, E groups appear in the towns of from one-third to half such as shoes, time-pieces, glasses, glass, home machines, radios, and furniture. There are repair of hard ware as well as some other repairing services in B group, and also cinema and amusements in general, and junior high school in more than half of towns, showing the towns having three functions other than retails, amusing and educational functions and the repair of goods which are purchased in larger centers of the 3rd stratum. However it is worthy of note that towns perform very few part of areal productive activities even if they won all the items of general services of B, C groups. Actually almost all towns have nothing of such establishments in D or E group but two kinds of branch offices from the 3rd stratum, the truck transportation and local finance. It seems clear that the towns have the facilities of meeting the secondary rural consumptive demand, but the role of productive centrality of the focus of regional economy is brought to the centers of the next 3rd stratum, which are well equipped not only in such a phase of centrality but also in all the phases including the supply

of some commodities in E, F groups which are of "not inevitable" type even in the urbanized life. These characters of the 2nd stratum is most typical in the towns of the Abukuma Lowland, and are presented only faintly in the case of the coastal plain, overwhelmed by the activeness of the 3rd stratum.

The Hierarchy Type II. The type serves the area of high diluvial table lands, typical hilly lands, or some lower parts of mountain lands, the population density being generally from 100 to 300 people per square kilometer. The status of *mura* communities in the 1st stratum is essentially same to that of type I, that is, mainly performing the services of group A. Among the districts, the *mura* communities in Tamura-gun present a similar status, despite of their lack of the 2nd stratum (c.3 class), and this is thought to be a result of their dependence on the subsidiary services of the 3rd stratum in type I and of ic.4 class which is properly in type IV system and not overlying type. The status in Soma and Futaba-gun will be compared with those of type I in the same area, — a little progress of retail services, the general presence of inns, truck transportation in a few *mura* and absence of clinics. In the Aganogawa hilly land, the status is similar to that of Soma-gun but shows the fewer kinds of commercial services in which the lack of fish supply is especially striking. The latter two will indicate the characters of such areas as the population disperse more thinly and more extensively, far apart from the adequate centres. The towns of the 2nd stratum a little more disperse than in the case of type I and have a character somewhat different from that of type I. That is, in addition to the retail services in C group, there exist some economic central institutions in d, D groups which are involved by the third stratum in the case of type I. The items belonging to d, D group will show the aspects of such nodality together with some services such as tailors, assignation houses, taxi and cloak-rooms which seem to be an evidence of centrality caused by the frequent visits of outsiders, though at the same time tailors might be an evidence of the development of the town as a facilitated dwelling place together with the appearance of public bath-houses. The activities of whole-sale services also progress distinctly to include those items belonging to E group (except one case of Yabuki situated in the midway of two near-by larger towns, Shirakawa-shi and Sukagawa-machi,) but only the retail services stay on a similar level as that of type I. In the phases, these towns are to be labelled as the auxiliary centers of the regional economy in an area distant from the major urban ones. Generally speaking, the centers in the Abukuma Lowland remain in the most similar status as that of type I, and this makes the differences of two types still more indistinct in the district.

The Hierarchy Type III. The type appears only in the mountain lands having the population density of less than 100 people per square kilometer, and it is likely to be the condition of its growth that the areas are not favoured by railway communication converging to the neighbouring large urban centers. The status of

mura forming the 1st stratum seems to some degree to approach to that of the 2nd stratum in type I. That is the native supply of some of B,C group. For example, one-third of *mura* possess the retail services of clothing, second handed wears and drugs, and one-fourth to one-fifth can serve the ready-made wears, order-made wears, foot wears, shoes, European goods, hard wares, radio-sets, and time-pieces. While such retail services appear in one-fourth of *mura* as green groceries, meat, tea, Japanese floor mat, fuel or furniture showing the purchase by the native dwellers living their urbanized lives. On the other hand, general services also increase such as those from the common existence of inns, clinics, eating houses, dealers in agricultural products or various repairing services, down to the cinema-houses, theaters and junior high schools in a few cases. And it will be one of the largest characteristics that truck transportation is established in one-third of *mura* on the back ground of lumbering or mining products popular in those *mura*. Such many kinds of general and commercial services are, however, scattered almost evenly in many *mura*, and therefore, the mutual dependence is possible among them, though it occurs in relatively few cases in practice. In their general tendency, those in Futaba-gun seem to be the nearest case of an ordinary *mura* community, and the most contrasting case is in southern Oonuma-gun and western Minamiaizu-gun occupying the southwestern corner of the prefecture. In this corner, some whole-sale services appear and many other services as above are typically found, but only the supply of fish is relatively scarce, showing the type of secluded region together with the case of the Soma and the Nozawa districts.

As viewed above, the 1st stratum in this type can be, to a high degree, capable of self-sufficiency or self-maintenance as to the common demands in rural life. Therefore, the second stratum which very dispersedly distributes is rather characterized in a phase of areal services not of so personal intimation. They are equipped with various kinds of services far from that of type II, including the least kinds to support the regional productive structure and urbanized life in the towns themselves as is shown in the items of E group which are possessed by all the towns without exception. They seem to be, in their manner of distribution and scales, rather near a stage of the 3rd stratum in the type I than the 2nd stratum in any type. However their facility in the higher level than F group is relatively little. . . . for example, two of the three towns lack such services as retail of automobile, sporting-goods, flowers and other plants, or music instruments, and those related to insurance, real estate agency, ware-houses or law business. They may be called the least but enough centers to make an independent region in the thinly populated districts for various reasons.

Conclusion

From the various figures the census data exhibit, the writer decided the three different systems of central hierarchy in Fukushima Prefecture, each of which represented the complete works of urban services and the particular peculiarity of class arrangements of these works. The fact is evident, and though the explanations of each system were given by a way of the description of central features, it will be obviously accepted that they directly represent the service hierarchy or the basic ground of rural services. Further, the problem of the spatial arrangement, such as the geometric pattern and intervals of the centers, was not referred in this paper, but it will probably be informed in the stage of more extensive study in future. Those diversifications of hierarchy, perhaps expectable of greater numbers in a wider area, are then believed to be the reflection of areal characters, which shows a phase of secondary human adaptation to the primary areal structures, a primitive productive structures of physical and human composition. Probably types will be seen relatively few numbers on actual lands in the meaning of essential classification, because they occur from the relatively simple combinations of a few elements, . . . for example, the importance of the limitation of service intervals in some kinds and the necessity of the least hinterland in the others, though they were not made clear in this paper. Therefore the conclusion of this short paper must be a proposition of systematical studies on such diversifications of hierarchy from the view-point of service mechanism visibly expressed or an areal indice.

Meanwhile, in order to develop the subject, the writer had to adopt in the procedure some mechanical treatments or interpretations of data, which would be perhaps riskful without the knowledgement of theoretical facts acquired by the predecessors and stated in the first chapter. The considerable reliableness of the result might warrant the process to some degree, but neither assessment nor justification of it is out of the question to the writer. These risks however, the writer believes, were caused by the lack of the census source suitable enough to the purpose, and do not mean that the procedure and the devices in the paper themselves are useless to trace the problem. Therefore he hopes that the procedure will be examined in the regions where more suitable comprehensive data can be availed.