

Titulo: CITIES AND SOCIETY

Capítulo: FUNCTIONAL SPECIALIZATION OF CITIES

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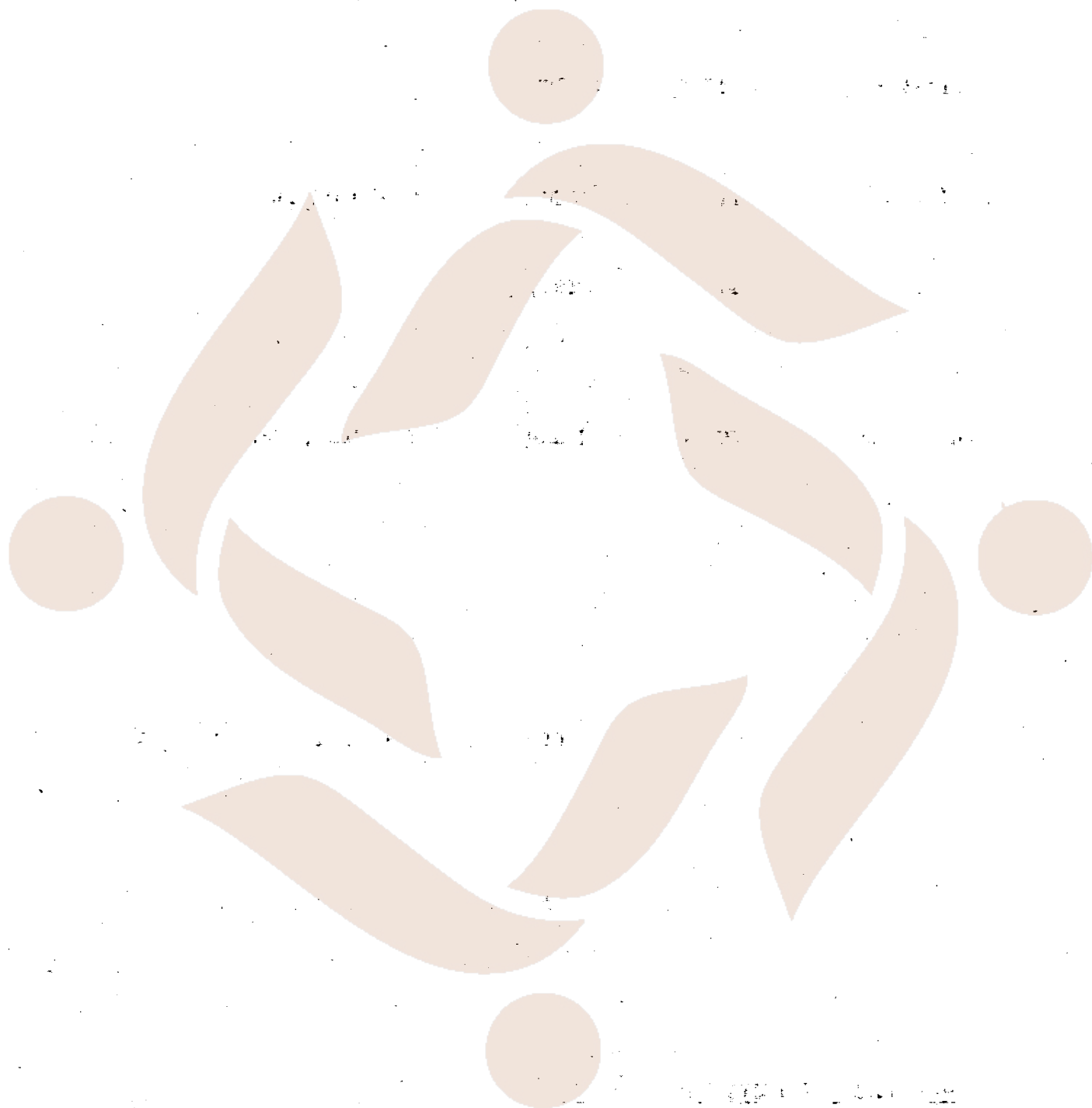
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CURSO: ESTABLECIMIENTOS HUMANOS

PROF: EDUARDO NEIRA ALVA

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FUNCTIONAL SPECIALIZATION OF CITIES

The principal economic activity of open-country communities ordinarily is either agriculture or an extractive industry. These communities, of course, may perform other economic functions for the population, such as providing for trade and other services. The pattern of economic activity in modern urban communities is more varied, however. Some places specialize in one or more forms of economic activity, while others have a more or less diversified set of industries. All relatively large cities nevertheless have some employment in each major non-agricultural industry group: construction; manufacturing; transportation; telecommunication; utilities and sanitary services; wholesale and retail trade; finance, insurance and real state; business and repair services; personal services; entertainment and recreation services, professional and related services; and public administration. The relative importance of these industries in the economic structure varies from city to city. This variation reflects functional differentiation.

The purpose of this paper is twofold: (1) to describe different kinds of functional specialization for cities, and (2) to determine demographic, economic and socio-economic differences among cities with different kinds of functions specialization.

CRITERIA OF FUNCTIONAL SPECIALIZATION.— There are a number of functional classifications of cities representing a variety of approaches to the problem of classification. (1) The theory followed in this paper bases functional specialization on the export of

(1) See in particular, Cauncy D. Harris, "A Functional Classification of Cities in the United States," *Geographical Review* 33 (January, 1943), 86-99; Grace M. Kneidler, "Functional Types of Cities," *Public Management*, 27, (July, 1945), 197-203; Victor Jones, "Economic Classification of Cities and Metropolitan Areas," *The Municipal Yearbook*, 1953, pp. 49-57; John Fraser Hart, "Functions and Occupational Structures of Cities of the American South," *Annals of the Association of American Geographers*, XLV (September, 1955), 269-286.

goods and services which brings in income to the community. Urban land economists refer to this export activity as the "economic base" of a community. (2)

A community may be thought of as having two major kinds of economic activity. There are those activities which satisfy local demand. These constitute the maintenance activity of a community. They include the activities required to maintain the physical city, such as construction, utilities, sanitary services and transportation; the services, including trade, necessary to maintain the level of living of the population; and manufacturing for local use or consumption. The export activity of the community by contrast, depends on extra-local demand for goods, services or capital which are exported to and consumed by persons in other communities. Export and maintenance activities, then, make up the total economic activity of a community. The percentage of local employment in maintenance activities generally is greater than that in export activities. Hoyt, for example, estimated that about 68 per cent of the employed persons in the New York metropolitan region in 1940 were engaged in producing for, or servicing, residents of the region. (3)

Most cities export a number of goods and services, and in this sense have a more or less diversified economic base. The contrast between "diversified" and "specialized" cities, therefore, is only a matter of the number of specialized activities or the degree of functional specialization. In this paper, an urban or metropolitan community is said to be diversified if its export

(2) See, for example, Richard B. Andrews, "Mechanics of the Urban Economic Base: The problem of Terminology," *Land Economics* 29 (August, 1953), 263-268.

(3) The New York Regional Plan Association, Inc. *The Economic Status of the New York Metropolitan Region in 1944* (New York: 1944), table 4, p. 6.

activity is about the same as that of the "average" community while it is a functionally specialized one when the export activity is greater than that of the average community. Unfortunately, data are not available to measure or estimate directly the kind and volume of export activity for each S.M.A. and urban place with 10,000 or more population in 1950. Functional specialization, therefore, is measured indirectly. It is assumed that a high proportion of employed persons or a high per capita output in a given industry, relative to other comparable communities, represents an export of the products or services of that industry. A place is classified as specialized when it meets this criterion. For example, when a community has a much larger proportion of its labor force employed in manufacturing than the average of a comparable group of communities, it is presumed to export manufactured goods, and therefore to be specialized in manufacturing.

Two other factors affect the criteria of functional specialization: the size and metropolitan status of a place. Communities which differ in size and location in a region "divide" the goods and services to be exported. The study, therefore, does not apply a uniform criterion of specialization to all places. Rather, the criteria are varied for the eight groups of places included: four metropolitan status groups, consisting of standard metropolitan areas, central cities, suburbs and independent cities; and two size classes within each group.

TYPES OF FUNCTIONAL SPECIALIZATION.- The type and number of economic activities in which a city can specialize depends upon the degree of specificity given the definition of the activities. The following economic activity were selected for this study: manufacturing; wholesale and retail trade; public administration; higher education; transportation; military; entertainment and recreation; finance, insurance and real estate; and medical and other health services. There follows a brief statement of the

criteria for determining operationally whether a city may be said to specialize in the activity. (4)

Manufacturing: A place is said to be specialized if it falls in the upper quintile on the distribution of places by the percentage of all employed persons in manufacturing. The quintile limits range from 39 per cent for large independent cities to 50 per cent for suburbs.

Higher Education: A place is defined as specialized if it falls in the upper quintile on the distribution of the percentage of all persons in the age interval, 20 to 24, enrolled in school. The upper quintile is about 19 to 20 per cent, depending upon size and metropolitan status.

Public Administration: A place is said to be specialized if it falls in the upper decile on the distribution of places by the percentage of employed males in public administration. The upper decile ranges from 7 to 10 per cent, depending upon size and metropolitan status.

Transportation: A place is designated as specialized if it falls in the upper decile on the distribution of places by the percentage of all employed persons in transportation. The upper decile range from 8 to 12 per cent depending upon size and metropolitan status.

Military: A community is designated as a "military center," given evidence that there is a sizeable military establishment located in or near it. Central cities and S.M.A.'s with more than 100,000 inhabitants are classified as military center if they contained 2,000 or more members of the Armed Forces in 1950. All S.M.A's and all urban places of 50,000 to 100,000 population are required to have at least 500 military persons, and all urban places with less than 50,000 population are required to have 200

(4) A more detailed statement of the operational procedures and their limitations is to be found in Otis Dudley Duncan and Albert J. Reiss, Jr. Social Characteristics of Rural and Urban Communities, 1950 (New York: John Wiley & Sons, 1956), chapter 16.

or more military persons residing within their boundaries to be classified as military center. These statistics almost necessarily undertake the size of the military establishment, since only a fraction of the military personnel are enumerated as residents of the community.

Entertainment and Recreation: A place is defined as specialized if it falls in the upper decile on the distribution of places by the percentage of employed males in entertainment and recreation. The upper decile is roughly 2 per cent for all but the S.M.A.'s, where it is 1.5 per cent.

Finance, Insurance and Real State: A place is designated as specialized if it falls in the upper decile on the distribution of places by the percentage of employed persons in finance, insurance and real estate. The upper decile is defined by from 4 to 9 per cent, depending upon size and metropolitan status.

Medical and Other Health Services: A place is said to be specialized if it falls in the upper decile on the distribution of places by the percentage of all employed persons in medical and other health services. The upper decile is defined by from 5 to 8 per cent, depending upon size and metropolitan status.

Trade: Each of the eight groups of places is subdivided into high and low income categories to control the correlation between income and trade. Then each urban place and S.M.A is classified by its quartile position on both wholesale and retail trade. This yields 16 classes: four wholesale times four retail quartiles. By combining certain of these, five categories are obtained. These are identified as: Wholesale Trade Center, a high per capita value of sales in wholesale trade but a low per capita value of retail sales; Retail Trade Center, a high per capita value of retail sale with a low per capita value of sales in wholesale; Trade Center, a high per capita value of sales in both wholesale trade and retail trade; Maintenance Trade Center, the per capita value of wholesale trade and retail sales is about average for that of all cities, and it is therefore roughly considered to be a level of trade necessary

to maintain the local population; Non-Trade Center, a low per capita value of sales in both wholesale and retail trade. It can be seen that every S.M.A. and urban place will be classified in one of the five trade center classifications. Only those classified as Wholesale Trade, Retail Trade, or Trade Centers are considered to export trade, however.

RELATIONSHIP AMONG TYPES OF FUNCTIONAL SPECIALIZATION.-

Many communities show more than one form of specialization, given the operational definitions employed in this research. The occurrence of several types of specialization in a community is referred to as "linkage" among these types. Table 1 presents information on the extent of linkage among manufacturing, retail trade, and the minor types of functional specialization.

There is some variation in the percentage of places with type of functional specialization among the S.M.A. and urban place groups, but the variation is quite small. Roughly 85 per cent of the places in each group are functionally specialized. The absence of specialization in a place is not due to any artifact of definition, since the categories are inclusive enough to permit every urban place to be specialized and, in addition, at least two-fifths of the places in each group to have two forms of functional specialization. Each metropolitan status-size of place group has approximately the following proportions of specialized places: manufacturing centers, 20 per cent; higher education, 20 per cent; trade centers 30 per cent; wholesale trade centers, 11 per cent; retail trade centers, 9 per cent; (5)

(5) The percentage reported for trade centers, wholesale trade centers and retail trade centers are the percentages for all urban places. The percentages vary somewhat for metropolitan status-size groups, since the proportion in each type of trading center is a function of the correlation between wholesale and retail trade in that group.

public administration centers, 10 per cent; transportation centers, 10 per cent; entertainment-recreation centers, 10 per cent; finance, insurance and real estate centers, 10 per cent; medical and other health service centers, 10 per cent. To the total represented by these ten types of specialization, a percentage of military centers, varying in proportion by metropolitan status and size of place, must be added. The third line from the bottom in Table 1 gives the per cent of places which are expected to have a double specialization, given the fact that by definition the number of specializations is greater than the number of places in any metropolitan status-size of place group and the assumption that each place has at least one specialization. About one-seventh of the places each group have no functional specialization, so that the expected percentage of places with a double specialization is even greater. In point of fact, about 10 per cent of the places in each group have three types of functional specializations, and at least an additional 2 per cent have four types, so that the number of places with a double specialization is less than the number expected. The difference between these expected and actual values in the last line of Table 1 varies from--2.9 per cent for small suburbs to--41.5 per cent for large S.M.A.'s. In general, small places are somewhat less likely to have multiple forms of specialization than are large places.

The results from Table 1 clearly show that although most S.M.A.'s and urban places are functionally specialized, the majority of them develop only a minimum of functional specialization, i.e., either a single specialization (50.6 per cent of all urban places) or a double specialization (34.3 per cent of all urban places), give a fairly definite number of types of functional specialization by definition. Only a relatively small percentage of specialized places (less than one-fifth in every metropolitan status-size group) have more than a single or a double specialization.

The extent of linkage among the types of specialization is related to the nature of the specialization. It is related, for example, to the percentage employed in the industry of specialization. Table 1 shows that no more than 9 per cent of any group of places has manufacturing linked, with trade, a minor form of functional specialization, or both. Manufacturing is more likely to be linked with trade, however, than with a minor form of functional specialization. That manufacturing is more likely to be linked with trade is surprising, as manufacturing and trade are the two largest single industry group employers in the United States. Both trade and the minor forms of specialization nevertheless are more likely to occur with one another than with manufacturing. The linking of trade with a minor form of functional specialization occurs with relatively greater frequency than the linking of two or more minor forms of specialization. This suggests that perhaps certain, if not all, minor forms of specialization are more likely to occur with trade than with one another. Detailed examination of the data shows that specialization in entertainment and recreation and in finance, insurance and real estate is more likely to occur with retail trade than with other minor forms, that transportation and wholesale trade are quite frequently linked in an urban place, and that specialization in higher education is linked with specialization in both wholesale and retail trade.

About 22 per cent of all urban places in 1950 were specialized in two or more functions. The majority of these involved a double specialization, as only about one-fourth of these places had three or four types of functional specialization. Examination of the kinds of linkage among the minor forms of specialization shows the following patterns predominating. Higher education is most likely to be linked with entertainment and recreation, and the converse is true. Places where this linkage occurs include the central cities of Los Angeles, Calif. and Salt Lake City,

Utah, and the independent cities of Santa Barbara, Calif. and Saratoga Springs, N.Y. Higher education also is fairly closely linked with both finance, insurance and real estate and medical and other health services, although the latter two types of specialization are seldom linked. Examples of places where all three of these specialties are linked include the Boston, Mass., S.M.A., the central city of Columbia, S.C., and the suburb of Evanston, Ill. Specialization in public administration is more often linked with military specialization than with any other type, and vice versa. The central cities of Washington, D.C. and Montgomery, Ala. illustrate this pattern. Transportation is frequently linked with other minor forms of specialization.

CORRELATES OF FUNCTIONAL SPECIALIZATION.— Structural characteristics of a community are intimately related to the functions its population performs. To the degree that all cities share common maintenance functions and a characteristic division of labor, their structure will be very similar. A city that is highly specialized, however, is apt to have a distinctive social structure. For example, manufacturing centers employ large numbers of unskilled operatives. Hence, manufacturing cities like Detroit, Mich. have a high ratio of manual to white-collar workers. The question arises, however, whether most functionally specialized places of a given kind differ significantly in their demographic, economic, and socio-economic characteristics from communities which lack this particular functional specialization. This question is considered for each of the functional types defined above.

TRADE SPECIALIZATION.— Trade, historically, was one of the major forces producing urbanization. The typical preindustrial city was a trade center. Today, despite extensive industrialization, many American communities continue to specialize in trade because they are the source of goods and the center of

TABLE 1-- PERCENTAGE DISTRIBUTION OF PLACES BY TYPE OF FUNCTIONAL SPECIALIZATION AND DEGREE OF LINKAGE AMONG TYPES OF SPECIALIZATION, BY METROPOLITAN STATUS AND SIZE: 1950.

| Functional Specialization and Degree of Linkage | S. M. A's | | ALL | CENTRAL | CITIES | SUBURBS | | INDEPENDENT CITIES | |
|--|-------------------|-----------------|--------------|---------------|-----------------|------------------|----------------|--------------------|------------------|
| | 50,000 to 250,000 | 250,000 or more | Urban Places | Under 100,000 | 100,000 or more | 10,000 to 25,000 | 25,000 or more | 10,000 to 25,000 | 25,000 to 50,000 |
| Total places | 91 | 77 | 1262 | 98 | 95 | 276 | 134 | 502 | 157 |
| Per cent | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |
| Manufacturing specialization | 19.8 | 20.8 | 19.6 | 20.6 | 18.9 | 19.9 | 20.1 | 19.3 | 19.7 |
| Manufacturing, only | 12.1 | 13.0 | 13.7 | 13.3 | 9.5 | 12.3 | 11.2 | 15.3 | 15.9 |
| Manufacturing & Trade | 4.4 | 3.9 | 4.0 | 5.1 | 8.4 | 4.7 | 8.2 | 2.2 | 1.3 |
| Mfg., & Minor Specialization | 3.3 | 3.9 | 1.8 | 1.1 | 1.0 | 2.9 | 0.7 | 1.8 | 1.9 |
| Mfg., Trade & Minor Specializations | 0.0 | 0.0 | 0.1 | 1.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.6 |
| Trade specialization (1) | 39.5 | 45.4 | 36.7 | 42.6 | 45.3 | 29.0 | 36.6 | 37.5 | 38.2 |
| Trade, only | 12.1 | 14.3 | 13.3 | 16.2 | 11.6 | 12.7 | 12.7 | 12.7 | 15.9 |
| Trade & 1 minor specialization | 14.3 | 13.0 | 13.8 | 14.3 | 20.0 | 10.9 | 10.4 | 15.6 | 11.4 |
| Trade & 2 minor specializations | 8.8 | 7.8 | 7.4 | 8.1 | 8.4 | 5.1 | 10.4 | 6.8 | 9.6 |
| Trade & 3 minor specializations | 4.3 | 10.3 | 2.2 | 4.0 | 5.3 | 0.3 | 3.1 | 2.4 | 1.3 |
| Minor forms of specializations only (2) | 25.3 | 20.8 | 27.5 | 21.5 | 23.2 | 32.7 | 27.6 | 26.7 | 28.1 |
| Single specialization | 13.2 | 13.0 | 15.4 | 9.2 | 10.5 | 15.6 | 16.4 | 17.1 | 15.9 |
| Double specialization | 11.0 | 5.2 | 9.5 | 9.2 | 9.5 | 12.7 | 9.0 | 8.4 | 8.3 |
| Triple specialization | 1.1 | 2.6 | 2.2 | 3.1 | 3.2 | 3.3 | 2.2 | 1.0 | 3.2 |
| Quadruple specialization | 0.0 | 0.0 | 0.4 | 0.0 | 0.0 | 1.1 | 0.0 | 0.2 | 0.7 |
| No specialization | 15.4 | 13.0 | 16.2 | 15.3 | 12.6 | 18.4 | 15.7 | 16.5 | 14.0 |
| Total number of specializations | 138 | 129 | 1777 | 148 | 159 | 370 | 198 | 678 | 224 |
| Number of specializations minus number of places | 47 | 52 | 515 | 50 | 64 | 94 | 64 | 176 | 67 |
| Expected per cent of places with a double specialization (3) | 51.8 | 67.5 | 40.8 | 51.0 | 67.3 | 34.1 | 47.7 | 35.1 | 42.7 |
| Actual per cent of places with a double specialization | 33.0 | 26.0 | 19.1 | 29.5 | 38.9 | 31.2 | 28.3 | 28.0 | 22.9 |
| Actual minus expected percent | -18.8 | -41.5 | -21.7 | -21.5 | -28.4 | -2.9 | -19.4 | -7.1 | -19.8 |

(1) Places specialized in trade are: Wholesalers; Retail Trade Centers; and Trade Centers, specializing in both wholesale and retail trade

(2) Minor forms of specialization are: Education; Transportation; Public Administration; Entertainment and Recreation; Military; Finance, Insurance and Real Estate; and Medical and other Health Service.

(3) Assuming no linkage among the types of specialization.

TABLE 2 -- SUMMARY OF COMPARISONS AMONG FIVE TYPES OF WHOLESALE-RETAIL TRADE CENTERS FOR ALL STANDARD METROPOLITAN AREAS AND URBAN PLACES OF 10,000 POPULATION OR MORE BY 1949 INCOME LEVEL

NUMBER OF COMPARISONS IN WHICH THE FIRST NAMED TYPE OF SPECIALIZED PLACED HAS
A HIGHER FIGURE THEN THE SECOND NAMED TYPE OF SPECIALIZED PLACE (1)

| CHARACTERISTIC | Ww-Rr | Ww-TC | Ww-MT | Ww-NT | Rr-Tc | Rr-MT | Rr-NT | TC-MT | TC-NT | MT-NT |
|---|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Per cent of population 21 years old and over | 0 | 1 | 3 | 6 | 12 | 15 | 15 | 14 | 14 | 9 |
| Sex ratio | 10 | 12 | 8 | 6 | 11 | 5 | 3 | 3 | 1 | 3 |
| Persons per household | 10 | 16 | 13 | 10 | 7 | 5 | 1 | 5 | 1 | 1 |
| Per cent living in same house, 1949 and 1950 | 12 | 10 | 9 | 6 | 7 | 8 | 3 | 4 | 4 | 3 |
| Per cent in labor force | | | | | | | | | | |
| Male | 12 | 7 | 9 | 9 | 3 | 4 | 6 | 8 | 8 | 9 |
| Female | 8 | 2 | 7 | 10 | 4 | 10 | 12 | 14 | 16 | 12 |
| Per cent employed in manufacturing | 10 | 12 | 6 | 4 | 8 | 3 | 0 | 3 | 2 | 4 |
| Per cent government workers | 4 | 7 | 8 | 5 | 11 | 10 | 10 | 8 | 8 | 10 |
| Per cent employed in transportation | 16 | 11 | 12 | 14 | 1 | 4 | 5 | 9 | 11 | 9 |
| Per cent employed males in--- | | | | | | | | | | |
| Public administration | 6 | 8 | 7 | 9 | 10 | 9 | 10 | 9 | 10 | 11 |
| Hotels and lodging places | 3 | 1 | 3 | 7 | 8 | 9 | 11 | 12 | 14 | 11 |
| Entertainment and recreation | 5 | 3 | 5 | 10 | 9 | 8 | 13 | 12 | 13 | 13 |
| Per cent of males employed as white collars | 3 | 2 | 6 | 10 | 9 | 12 | 16 | 15 | 13 | 13 |
| Per cent of males employed as-- | | | | | | | | | | |
| Professional, technical & kindred worker | 1 | 2 | 4 | 6 | 12 | 11 | 13 | 10 | 11 | 10 |
| Managers, officials and proprietors, except farm | 4 | 4 | 8 | 11 | 8 | 12 | 16 | 15 | 12 | 12 |
| Clerical and kindred workers | 12 | 10 | 10 | 13 | 5 | 2 | 7 | 10 | 12 | 12 |
| Sales workers | 4 | 2 | 7 | 11 | 7 | 9 | 15 | 14 | 14 | 13 |
| Craftmen, foremen and kindred workers | 7 | 10 | 6 | 6 | 10 | 5 | 5 | 1 | 4 | 6 |
| Operatives and kindred workers | 14 | 16 | 9 | 3 | 5 | 1 | 0 | 1 | 3 | 3 |
| Private household and service workers | 5 | 5 | 7 | 12 | 7 | 12 | 13 | 14 | 13 | 11 |
| Laborers, except farm and mining | 11 | 11 | 9 | 9 | 5 | 4 | 4 | 9 | 6 | 6 |
| Per cent of females employed as-- | | | | | | | | | | |
| Sales, clerical and kindred workers | 8 | 4 | 7 | 10 | 4 | 5 | 10 | 10 | 11 | 13 |
| Operatives and kindred workers | 11 | 12 | 9 | 3 | 7 | 4 | 2 | 1 | 3 | 5 |
| Private household and service workers | 7 | 6 | 6 | 10 | 10 | 11 | 12 | 9 | 15 | 14 |
| Median school years completed | 2 | 2 | 5 | 5 | 11 | 13 | 11 | 11 | 11 | 9 |
| Per cent enrolled in school, persons 20 to 24 years old | 5 | 4 | 3 | 9 | 10 | 11 | 13 | 10 | 12 | 11 |
| Per cent of dwelling units owner-occupied | 4 | 8 | 5 | 4 | 9 | 10 | 8 | 5 | 3 | 6 |

(1) Sixteen comparisons are involved; two size groups by two income groups, of S.M.A.'s, central cities, suburbs, and independent cities.

of exchange for a rural hinterland. In the urban United States as a whole, wholesale and retail trade employ a larger proportion (21.9 per cent) of the urban working force than any other major industry group except manufacturing (29.4 per cent). (6) A community may specialize in wholesale trade, in retail trade, or in both. The average U.S. urban community has a smaller volume of wholesale than of retail trade, since wholesale trade is concentrated in fewer places. Retail trade, of course, also provides relatively more urban employment (17.6 per cent) than does wholesale trade (4.3 per cent). The effect of wholesale specialization on an urban place, therefore, may be less pronounced than that of retail specialization.

Table 2 summarizes comparisons of the demographic, economic, and socio-economic characteristics of the five classes of trade community considered in this paper. Comparisons among the types of trade centers and of each type with those lacking specialization in trade shows that the degree of retail trade specialization affects a number of the differences among communities. The major contrast occurs between communities which specialize in retail trade, either as Retail Trade (Rr) or Trade Centers (TC), and those which do not, i.e., Wholesale Trade (Ww), Maintenance Trade Centers (MT) and Non-Trade Centers (NT). This contrast reflects the fact that employees in retail trade are on the average four times as numerous as in wholesale trade.

The impact of specialization in retail trade on community morphology may be summarized as follows: (1) Rr and TC have somewhat older populations and smaller households, on the average, than do Ww, MT or NT places. (2) Rr and TC places have somewhat

(6) Table 55, U.S. Census of Population: 1950, Vol. II, Part I, p. 102.

other factors are involved, however. (2) NT and MT places have a greater percentage of persons employed in manufacturing than do Rr, Ww or TC communities, except for Ww and TC suburbs. As manufacturing and retail trade are the largest industry groups in terms of employment, the fact that the two forms of specialization seldom occur together is not unexpected. Detailed examination of the data shows that wholesale trade is more likely to locate with manufacturing than is retail trade, a fact which human ecologists often have noted. (3) NT, MT and Ww places have higher proportions of male operative and kindred workers than do Rr and TC places, while the proportion of females so employed is generally highest in NT and MT places. This relatively high proportion of operatives and kindred workers in places with a relative absence of trade as compared with those specialized in trade probably can be attributed to the higher percentages employed in manufacturing in the former, although some minor types of functional specialization also are associated with a relative absence of trade.

Manufacturing Specialization.— Manufacturing exerts a powerful influence on the morphology of a community which specializes in it. This influence is partly due to the fact that specialization in manufacturing except in suburbs, decreases employment in other industries. The data in Table 3 disclose, in fact, that the percentage employed in transportation, public administration, hotels and lodging places, and entertainment and recreation, and the per capita wholesale and retail sales, are lower in manufacturing centers than in all places of comparable size and metropolitan status. Specialization in manufacturing furthermore, shows very little linkage with the minor forms of specialization, or with trade. Only two per cent of all urban places combine specialization in manufacturing with a minor form of specialization.

Manufacturing specialization exerts a substantial influence on the labor force of a community in that the proportion of males in the labor force is considerably higher in manufacturing com-

munities than in all generally differs little from that of other specialized places, except that the populations of manufacturing places are residentially more stable and the average household is larger.

The data in Table 3 show that manufacturing specialization exercises its greatest influence on the socio-economic level of the community. Specialization in manufacturing produces substantially smaller proportions of all white-collar workers and of manual service workers and laborers than are found in all places. There are substantially larger proportions only of craftsmen, foreman and kindred workers, and of operative and kindred workers, and of operative and kindred workers, who, of course, comprise a sizeable proportion of all manufacturing workers. The effect of manufacturing specialization, then, is to truncate the occupational distribution for all places by employing disproportionate numbers of workers at the top of the working class and fewer at the top and the bottom of the rank order of all occupations. Both the highest and lowest paid occupational categories consequently have fewer workers in manufacturing centers than in all comparable places. This results in a higher median income level for manufacturing places than for all places of comparable size and metropolitan status, except for suburbs.

COLLEGE COMMUNITIES.- The community specializing in higher education typically exports a service, education, by importing students into the community as temporary residents. The college or professional school student purchases a rather large number of goods such as foods, clothing and housing, and services such as entertainment, recreation, and personal services. The selective nature of these purchases appears to have important consequences for the social morphology of college communities. Only a very small proportion of the employed persons in communities specializing in higher education are employed by educational institutions.

Unless a place is very small, therefore, actual employment in higher education has relatively less effect on the social morphology of the community than do the purchases made by the student population.

College communities, when compared with places of comparable size and metropolitan status in Table 3, have an above-average socio-economic status level. Their economic base is favorable to employment in white-collar occupations. A higher percentage of men and women in college communities than in all comparable places are employed in all specific white-collar occupations, except that of male clerical and kindred workers and the median level of school completed is higher. Correlatively, places specialized in higher education have a lower percentage of men and women in all manual occupations, other than private household and service workers. The relatively high socio-economic level of a college communities cannot be traced solely to the fact that it specializes in an industry with a relatively large proportion of white-collar workers. The higher socio-economic level also can be attributed to the fact that college communities attract other industries employing white-collar workers, as is shown by the relatively higher levels of employment in government, public administration, and entertainment and recreation than in all comparable places.

As to demographic composition, the male population in college communities is less likely to participate in the labor force than is the male population generally. This, of course, is expected since a majority of college students are not in the labor force. The proportion of men 14 years old and over who are married is somewhat lower in college communities than in all comparable places, although this finding is not consistent with the findings for the sex ratio. The population of college communities

TABLE 3--SUMMARY OF COMPARISONS WITH ALL STANDARD METROPOLITAN AREAS AND URBAN PLACES OF 10,000 POPULATION OR MORE, FOR MANUFACTURING CENTERS AND EACH OF THE MINOR TYPES OF FUNCTIONAL SPECIALIZATION.

NUMBER OF COMPARISONS IN WHICH SPECIALIZED PLACES HAVE A HIGHER FIGURE THAN ALL PLACES (1)

| | Mgf. | Ed. | PA | Tr. | My. | ER | F,I,RE | MHS |
|---|------|------|----|------|-----|------|--------|-----|
| Per cent of population 21 years old and over | 5 | 5 | 2 | 1 | 3 | 7 | 8 | 5 |
| Sex ratio | 7 | 4 | 6 | 4 | 7 | 4 | 2 | 1 |
| Per cent nonwhite | 2(2) | 2 | 8 | 5 | 6 | 7 | 1 | 4 |
| Per cent living in same house, 1949 and 1950 | 8 | 0 | 0 | 2(3) | 1 | 1 | 0 | 2 |
| Per cent married males, 14 years old and over | 5 | 0 | 4 | 6 | 3 | 6 | 5 | 2 |
| Persons per household | 8 | 1 | 3 | 5 | 3 | 0 | 1 | 2 |
| Per cent in labor force | | | | | | | | |
| Male | 8 | 0 | 4 | 6 | 6 | 3 | 1 | 0 |
| Female | 5 | 4 | 5 | 2(2) | 3 | 4 | 6 | 5 |
| Per cent employed in manufacturing | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Per capita wholesale trade | 1 | 0 | 1 | 6 | 5 | 3 | 6 | 3 |
| Per capita retail trade | 1 | 6 | 1 | 1 | 3 | 8 | 7 | 4 |
| Per government workers | 0 | 7 | 8 | 6 | 8 | 6 | 6(2) | 8 |
| Per cent employed in transportation | 0 | 0 | 4 | 8 | 3 | 1 | 4 | 4 |
| Per cent employed males in-- | | | | | | | | |
| Public administration | 0 | 6 | 8 | 6 | 8 | 6 | 6 | 6 |
| Hotels and lodging places | 0 | 5 | 7 | 3 | 6 | 8 | 8 | 6 |
| Entertainment and recreation | 0 | 8 | 2 | 1 | 7 | 8 | 6 | 2 |
| Per cent of males employed as white collars | 0 | 8 | 7 | 3 | 5 | 8 | 8 | 8 |
| Per cent of males employed as-- | | | | | | | | |
| Professional, technical and kindred workers | 0 | 8 | 7 | 0 | 5 | 7 | 8 | 8 |
| Managers, officials and proprietors | 0 | 8 | 4 | 6 | 5 | 8 | 8 | 6 |
| Clerical and kindred workers | 1 | 3 | 8 | 8 | 4 | 1 | 6 | 3 |
| Sales workers | 0 | 8 | 4 | 0 | 6 | 8 | 8 | 6 |
| Craftsmen, foremen and kindred workers | 8 | 2(4) | 5 | 6 | 5 | 2 | 1 | 0 |
| Operatives and kindred workers | 8 | 0 | 0 | 2(2) | 0 | 0 | 0 | 0 |
| Private household and service workers | 0 | 6 | 7 | 4 | 8 | 7 | 7 | 8 |
| Laborers, except farm and mining | 2(2) | 0 | 7 | 8 | 6 | 4 | 2 | 3 |
| Per cent of females employed as-- | | | | | | | | |
| Sales clerical and kindred workers | 0 | 8 | 8 | 6 | 6 | 1 | 8 | 3 |
| Operatives and kindred workers | 8 | 0 | 0 | 2(2) | 1 | 0 | 0 | 0 |
| Private household and service workers | 0 | 7 | 8 | 7 | 6 | 7 | 6 | 8 |
| Median school years completed | 0 | 8 | 6 | 2 | 5 | 8 | 8 | 4 |
| Per cent enrolled in school, | | | | | | | | |
| persons 20 to 24 years | 1 | 8 | 4 | 1 | 2 | 5 | 8 | 7 |
| Median income, families | | | | | | | | |
| and unrelated individuals | 6 | 3 | 2 | 1 | 1 | 2(2) | 7 | 3 |
| Per cent of dwelling units owner-occupied | 5 | 6 | 2 | 4 | 0 | 3 | 6 | 2 |

(1) Eight comparisons are involved; two size groups each of S.M.A.'s, central cities, suburbs, and independent cities. The symbols refer to the following types of specialized places: Manufacturing (Mfg.); Education (Ed.); Public Administration (PA); Transportation (Tr); Entertainment and Recreation (ER); Military (My); Finance, Insurance and Real Estate (F,I,RE); medical and other Health Services (MHS).

(2) S.M.A.'s only.

(3) Independent cities only.

(4) Suburbs only.

is some what more residentially mobile than that of all comparable places. This does not appear to be primarily due to the college population itself, suggesting that the mobility is due to other causes.

PUBLIC ADMINISTRATION CENTERS.- Governments employ rather substantial numbers of persons in American communities, since a large number of community functions now are carried on by government. Public administration includes only those government activities, however, which are uniquely governmental functions, such as legislative and judicial activities and most of the executive agency activities of Federal, State and local governments. Government provision of educational and medical services, for example, is not classified as public administration, while government employment in the administration of the law-police, courts, penal and treatment institutions-for example, is considered public administration. Most municipal administrative activity functions solely to meet the needs of the local population. By contrast, Federal, State and County and agencies function largely for the population beyond the confines of the place in which the agency is located. These centers are said to export administrative services, or to specialize in public administration. They often are referred to by particular names such as "county seat," "state capitol," or by the name of some government institution which is localized in the community, such as a penal institution or a military installation.

The demographic composition of public administration centers is similar to that of all places (Table 3). The stability of residence is somewhat below that of all places, however. This seems due in part to the fact that centers of public administration induce residential mobility through personnel transfer policies, patronage systems of employment, bureau changes, and so on. There also are somewhat greater sex ratios and percentages of nonwhite persons in public administration centers.

Employment opportunities in centers of public administration are similar to those in the average place of comparable size and metropolitan status. Specialization in public administration markedly affects the industry composition of a place, however. Centers of public administration are below the average place with respect to employment in manufacturing, wholesale and retail trade, entertainment and recreation, and finance, insurance, and real estate. By contrast, specialization in public administration increases employment in hotels and lodging places and is often linked with military specialization.

Public administration centers have a substantial excess of white-collar workers as compared with the average place, mainly accounted for by clerical and kindred workers and male professional, technical, and kindred workers. The percentage of female sales, clerical, and kindred workers in public administration centers is greater than that in any of the other minor types of specialized places except those specialized in finance, insurance and real estate. The occupational composition of public administration undoubtedly accounts for the relative importance of clerical and professional workers. Public administration centers show an overall deficiency of manual workers as compared with all comparable places. Table 3 discloses that there are slight excesses in some lower-status manual occupations--male laborers, and male and female private household and service workers. The average educational level of the population in public administration centers is consistent with the occupational composition, but the income level of the population is not. The excess of the lower-income clericals among white-collar workers and of laborers and private household and service workers among the manual workers may account for the relatively low median income level of public administration centers.

TRANSPORTATION CENTERS.- Cities of any substantial size require some employment in transportation to facilitate the local movement of goods and services. There are urban places which specialize in transportation, nevertheless, in that they either are the place of residence or of employment for workers who are connected with the movement of people and goods to and from a hinterland or other centers by motor, rail, air, or water transport. Transportation usually becomes a specialized function in a city that is a collection point for distribution to other places, or when the city is located at the point where people and goods are shifted from one means of transportation to another, e.g., from rail to motor transport. (9) There also are some places which become specialized in servicing transportation at a convenient point. The railroad town of Altoona, Pa. is such a servicing point at the foot of the Alleghenies, although dieselization of railroads has somewhat reduced this function.

There is very little to distinguish the demographic composition of centers of transportation from that of all places of comparable size and metropolitan status (Table 3). Opportunities for male, but not female, employment seem to be increased by specialization in transportation. This is not surprising, as transport employs relatively few women. The labor force participation rate of women in transportation centers, in fact, is generally below that of all comparable places or that in the minor types of functionally specialized places.

Transportation fails to induce above average employment in any major industry group, other than wholesale trade. There is

(9) See James A. Quinn, *Human Ecology* (New York: Prentice Hall, Inc., 1950), pp. 173-176 for a discussion of the "median location" and "break-in-transportation" theories of urban location.

relatively little employment in manufacturing, retail trade or the minor types of specialized places, except public administration, in transportation centers in comparison with all other places.

Transportation centers have a relatively low socio-economic status level compared with the average place. Income and educational levels are somewhat below those of all places, and the transportation center has relatively small excess of manual workers. (See Table 3). The substantially lower median income in transportation centers cannot be attributed directly to specialization in transportation, however, since transportation provides a higher average income than most industry groups, including manufacturing. The occupational composition of transportation, however, would indicate lower levels of educational attainment. The deficiency of male white-collar workers in centers of transportation is largely due to a deficiency of professional, technical, and kindred, which counterbalances a slight excess of male managers, officials and proprietors, and of clerical and kindred workers. Transportation centers clearly reflect the fact that transport requires a relatively large unskilled work force, for there are substantially greater proportions of male laborers in these places than in all places. Transportation centers do not favor the employment of male operative and kindred workers, if suburbs are excluded, but they do have somewhat higher proportions of male craftsmen, foremen and kindred workers. Specialization in transportation can exercise little direct effect on the employment of women in specific occupations, for relatively few women work in transportation. The relatively higher proportions of employed women in sales work in transportation centers must therefore be due to other selective factors.

MILITARY CENTERS.- Historically, military centers usually were true "fortress towns." The early frontier in the United States had a number of such places. The typical military center in the United States today, however, is an S.M.A. or urban place which serves as a host community to a military establishment located either within its boundaries or in a nearby open-country area. The geographical location of these military bases was therefore that an ecologically competitive relationship determined their location than is true for other kinds of specialized places such as transportation centers. The size and number of military bases varies with national policy. The military centers in the comparisons which follows probably include only the relatively "permanent" military establishments prior to the Korean hostilities.

A military base has a double effect on the host community. It provides for some civilian employment at the military base, it creates a demand for goods and services which the host community may be said to export to the establishment and its personnel. The comparisons below do not permit one to discriminate between these effects.

A military establishment appears to have two major effects on the demographic structure of the host community. Table 3 discloses that the sex ratio is somewhat higher, reflecting the presence of relatively larger numbers of males, and that the population is less stable residentially, reflecting the high residential mobility of military personnel and their families. The relatively low rate of home ownership in host communities also reflects the high residential mobility.

Military specialization stimulates the demand for extra-family services, since the majority of military personnel at a base are either unmarried or without their families. The effect of this demand on industrial employment can be seen in that military

centers have somewhat larger proportions of males employed in entertainment and recreation and in hotels and lodging places than does the average place. Military specialization also appears to provide increase opportunity work with a government employer; host communities have substantially greater proportions of employed persons in government, and of employed males in public administration.

The socio-economic level of military centers probably is somewhat above that of all places of comparable size and metropolitan status when occupational composition and level of educational attainment in Table 3 are taken as indicators of socio-economic level. The occupational composition of military communities is primarily influenced by the relative absence of employment in manufacturing and trade as compared with the average place, and relatively more employment in the industries which cater to a transient population.

ENTERTAINMENT AND RECREATION CENTERS.- A community specializes in leisure by meeting extra-local demand for such services. A number of factors give rise to this extra-local demand. Local conditions may create an extra-local demand for their leisure facilities. This demand may be created by such diverse conditions as the legalization of gambling, the development of a religious shrine, or natural scenic endowment. Or, the demand may come from a nonlocal population or a transient sub-community which make demands on the larger or host community for special forms of leisure, such as the demand by populations with unbalanced sex ratios found at military installations, mining, or lumbering camps. Three major types of leisure center are produced by the differences in demand—those based primarily on (a) recreation and natural endowment, generally called resorts; (b) commercial forms of amusement or entertainment, often characterized in terms of a particular commercial form, such as the commercial and legalized

gambling for which Las Vegas is known or racing at Hialeah; (c) aesthetic institutions devoted to the arts and sciences, e.g., museums, art galleries, botanical and zoological gardens, musical festivals, and opera. Generally speaking, the United States has relatively fewer places which "export" the advantages of their aesthetic institutions, and large numbers of resort and commercial recreation centers. These several types of centers are treated as a single unit of entertainment and recreation centers in the comparisons below. Separate comparison would undoubtedly show, however, that the effects of the three types are not always the same.

The demographic composition of entertainment and recreation centers as a whole is substantially different from that of all places or any other type of specialized place. These specialized places have, as Table 3 shows, comparatively older populations, small households and a high incidence of residential mobility--characteristics expected of resort and retirement centers, if not of all types of entertainment and recreation centers.

The pattern of economic activity and the occupational structure of entertainment and recreation centers are conditioned somewhat by a complex of industries closely related to specialization in entertainment and recreation, as well as by the specialization itself. The centers show high per capita retail expenditures and fairly sizeable male employment in hotels and lodging places. The occupational structure shows a relative excess of male white-collar workers, largely accounted for by the excess of male managers, officials and proprietors, and male sales workers. Specialization in the commercial forms of entertainment and recreation, together with the auxiliary stimulation of the hotel business and of retail trade, probably accounts for this finding. The same complex of industries probably accounts too for the slight

excess of both male and female service workers. The median level of educational attainment in entertainment and recreation centers is consistent with the excess of white-collar workers.

FINANCE, INSURANCE AND REAL ESTATE CENTERS.— A community specializes in finance, insurance, or real estate when it exports these goods and services to a hinterland, region or territory. The institutional facilities which export these goods or services include Federal Reserve and private banking facilities, investment companies, security and commodity brokerage, insurance firms, insurance sales offices, and real estate sales offices. Cities which are specialized in finance, insurance and real estate may export one or more of these goods or services. Hartford, Conn. and Bloomington, Ill., for example, are recognized as cities providing sizeable employment in insurance, as the home offices of some very large insurance companies are located there. A few very large S.M.A.'s and central cities are highly specialized in all of the major forms of finance, insurance and real estate. Boston, Mass., New York City, N.Y., and San Francisco, Calif., are examples.

An examination of the demographic structure of finance, insurance and real estate centers summarized in Table 3 reveals that these centers have a substantial excess of older persons, a lower sex ratio, and a more mobile population than the average place. The need for a sizeable female clerical work force in finance, insurance and real estate firms undoubtedly affects both the sex ratio and the average residential mobility in these specialized places. Of the employed persons in finance, insurance and real estate in 1950, 41.7 per cent were women; (10) 72.5 per

(10) Based on data in Table 55, U.S. Census of Population: 1950, Vol. II, Part I, op. cit., p. 102.

cent of these employed women were clerical and kindred workers. (11) The sex composition of finance, insurance and real estate probably accounts, too, for the fact that the labor force participation of women but not of men is slightly greater than the of the average comparable place.

Like all places specialized in a minor type of economic function, places specialized in finance, insurance and real estate have comparatively low manufacturing employment. Generally, employment in other minor forms of specialization is greater than that of the average place, except for transportation. The per capita expenditures for both wholesale and retail trade are also generally higher.

The striking feature of places specialized in finance, insurance and real estate, however, is their occupational composition. Among all minor types of functionally specialized places, finance, insurance and real estate centers have the highest percentage of white-collar workers in suburban and independent city comparisons. At least two-fifths of the workers in each size group of S.M.A.'s and type of urban place are white-collar workers, as are almost three-fourths of those in small suburbs. This white-collar excess is made up of substantial excesses in all major white-collar occupation groups, except that of male clerical workers. There are substantially fewer male and female manual workers, except for private household and service workers. The socio-economic level of finance, insurance and real estate centers is well above that of the average place, too, measure by the educational attainment of the adult population. It is, in fact, generally as great as that of places specialized in higher education. Except for small central cities, the median income level of residents in

(11) Based on data in Table 2, U.S. Census of Population: 1950, Vol. IV, p. 61.

finance, insurance and real estate centers is above that of all comparable places. The differences are relatively small, however, except for suburbs.

MEDICAL AND OTHER HEALTH SERVICE CENTERS.—Every city maintains some medical, dental and other health services for its local population. There is a tendency, nevertheless, for such services to concentrate in a few centers. This is so for a number of reasons. First, State and Federal governments locate large, specialized medical-health facilities in centers to serve primarily extra-local populations. Examples of such centers are Kankakee, Ill., where a state mental hospital is the basis of specialization; Chippewa Falls, Wis., where it is a state hospital for mentally deficient persons; and Coastville, Pa., where it is a Federal Veterans Administration hospital. The development of a medical center for the diagnosis and treatment of diverse forms of illness is a second basis for specialization. Such centers generally serve both local and extra-local populations. The most famous of these specialized centers in the United States is Rochester, Minn., where the privately developed Mayo Clinics serve a national patient clientele.

Specialization in medical and health services may affect the demographic structure of the community substantially. The effect is not uniformly the same, however, since it is a function of the kind of specialization, often, in fact, of the kind of medical institution or patient population. A medical custodial institution such as a mental hospital will have disproportionate numbers of older persons, while one for the mentally deficient will tend to have disproportionate numbers of younger ones; veterans' hospitals usually have a high sex ratio, while other hospitals have a more balanced one. Despite this lack of uniformity in effect, small differences were observed in the demographic composition of

medical and other health centers and the average place of comparable size and metropolitan status. The sex ratio and the per cent of males 14 years old and over who are married are somewhat less than that of the average place, the average size of household is smaller, and the population is somewhat less stable residentially. These latter measures suggest a greater transiency rate in the population.

Places specialized in medical and other health services are somewhat more favorable to the employment of women than is the average comparable place, while the reverse is true for men. This is not surprising, since of the major industry groups treated in this study, only educational services and medical and other health services, each with 63.9 per cent of all employed persons who are women, employ more women than men. (12) Government is a substantial employer of persons in places specialized in medical and other health services. Only public administration and military centers of the specialized types of places considered in this study have higher ratios of government workers to all workers. Government is a substantial employer in places specialized in medical and other health services since the larger medical-health institutions usually are government supported-mental hospitals, hospitals for tuberculars, the mentally deficient, the physically handicapped, veterans hospitals, charity patient hospitals, and state or municipally supported research hospitals.

Specialization in medical and other health services should affect the occupational composition for employed women more than that for men, since men comprise a relatively small proportion of all employed in these services. Among men, however, the proportion of professional, technical and kindred workers and of service workers should be higher than that of the average place as four-

(12) Based on data in Table 55, U.S. Census of Population: 1950, Vol. II, Part. I, op. cit., p. 102.

fifths of all employed men in medical and other health services are professional, technical and kindred workers (55.4 per cent) and service workers (25.1 per cent). This is the case in Table 3, as only these two major occupation groups appear in consistently higher proportions for employed males than in the average comparable place. The same occupational expectations exist for women in places specialized in medical and other health services, as 50.4 per cent of the employed women in medical and other health services are professional technical and kindred workers and 26.6 per cent are service workers. (13)

CONCLUSIONS.- This paper examines some of the demographic, economic and socio-economic consequences which particular forms of economic specialization have on the social morphology of human communities. The largest impact of economic specialization generally is on the socio-economic status structure of the community. Several points are worth noting, since they are significant for theories of social stratification. (1) Specialization in manufacturing decreases the proportion of workers in both the highest and lowest paid occupational categories in our society and leads to substantial excesses in the middle occupational categories of craftsmen, foremen and kindred workers and operative and kindred workers; hence, there is a fairly high median income for the average family in the community, but fewer extremes in income. The population in manufacturing communities tends, in most ways, to be less consumption oriented than the population in the average community. There is a smaller per capita expenditure for both wholesale and retail trade, relatively fewer employed in hotels and lodging places, entertainment and recreation, medical and other health services, relatively fewer younger persons locally enrolled in institutions of higher learning, and a lower average level of educational attainment than in the average place.

(13) The percentage for men and women are based on data in Table 2, U.S. Census of Population:1950, Vol.IV, Part I, p.68/71.

(2) The specialized community providing the sharpest contrast to the manufacturing community is the center of finance, insurance, or real estate. The community specialized in finance, insurance and real estate has substantial excess of all types of white-collar workers, but most particularly the male managerial, proprietary, and official and sales worker white-collar occupation groups. Manual workers are relatively absent, except for the male and female private household and service workers associated with higher socio-economic levels. The extremes of education, income and occupation are more apparent in these communities, particularly since both the lower-status clerical white-collar workers and higher-status craft and operative manual workers are relatively absent. The average person who resides in these communities, however, has a relatively higher educational and income level and is more likely to own his own home than is the average urban person in the United States. Residents of places specialized in finance, insurance and real estate are more consumption oriented than is the average urban resident (3) Communities specialized in higher education or in retail trade are reasonably similar to those specialized in finance, insurance and real estate, and therefore form a similar, though less marked, contrast to manufacturing centers. (4) Centers of public administration show substantial excess of workers in the bureaucratic clerical occupations, and induce a relatively low consumption orientation.

In summary, almost every aspect of a community's structure is related to its basic functions. Reliable differences among the functionally specialized types of communities are found with respect to age and sex structure, mobility rates, labor force participation, educational attainment, industrial and occupational composition, income and home ownership. This does not imply that

every functional type of community has a distinctive pattern for each of these characteristics, but that at least one functionally specialized type of place deviates considerably from the average for all places on each characteristic examined. The conclusion, therefore, seems warranted that type of functional specialization is a principal determinant of structural differences among communities.