THE
SCIENCE AND PRACTICE
OF
URBAN LAND VALUATION

An Exposition of the Somers Unit System

BY

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INTRODUCTORY PREFACE

This work, as announced on the title page, is an exposition of the Somers Unit System of Land Valuation, as devised by the late William A. Somers.

Its purpose is to explain and demonstrate the practicability of the use of scientific methods in the appraisal of urban land, based on accurate observation of facts.

Part I, comprising Chapters I to VIII, outlines the Somers principles of land valuation and explains the theoretical basis of the Somers System.

Part II, comprising Chapters IX to XXIII, describes the practice of land valuation, and explains the origin, development and use of the Somers curve of value for city lots, having a single-street usefulness only, the Somers zone and overlap tables, and the Somers corner tables. In these chapters methods are suggested for ascertaining public and private opinion as to the comparative usefulness of streets and highways and for expressing that opinion in terms of price of the Somers unit of quantity, the unit-foot. After describing practical methods of determining street unit-foot valuations, Somers analytical methods of computing or appraising frontage, corner, alley, waterway, railway and other factors affecting city lot values are explained in detail. There are also a number of illustrations of specific appraisal, not merely for purposes of taxation, but also for land condemnations and other purposes.

Part III, comprising Chapters XXIV to XXVIII, is devoted to a discussion of the social and economic significance of scientific urban land valuation.

The Appendix contains, in diagramatic form, ten of the one hundred Somers corner tables for computing lot values in retail business districts in American cities; also twenty-five pages of the Somers zone and overlap tables for computing values of irregular sites, for measuring the overlap or reflected values of parallel streets on opposite sides of a block at different unit-foot valuations, and for locating the point of overlapping of value for intersecting streets.

The first-named author, Walter William Pollock, has practiced the profession of Appraisal Engineer for more than twenty-five years. He made the acquaintance of William A. Somers in 1909, and was associated with him until Mr. Somers' death in 1916. He has used the Somers principles in the appraisal of sites for commercial purposes to the value of more than $100,000,000, and has directed the installation of the Somers System for purposes of taxation in over seventy American communities. He has for years planned the publication of a book descriptive of the Somers System, but pressure of other activities has prevented his doing so. He finally secured the collaboration of Dr. Karl W. H. Scholz, Assistant Professor of Economics in the Wharton School of Finance and Commerce, University of Pennsylvania, who has correlated, analysed, and comprehensively arranged a large amount of the uncoordinated material prepared by Mr. Somers and by Mr. E. W. Doty of Cleveland, Ohio, a former collaborator.

Valuation in general is a subject that is incomplete, both in theory and in practice. This is particularly true of land valuation. The authors believe that the Somers principles are sound, and that the Somers computation methods are far in advance of, and more complete than, any formulæ so far devised by other students of land valuation. They offer this work as a sincere contribution to the literature on this important subject, with the hope that it may be found a practical aid to real estate and other appraisers, to assessors and other taxation administrators, and to those of the legal profession who may wish to reduce to a practical basis the science of guessing, so often presented as evidence in the law courts.

This book is not designed as a complete handbook for the appraisal of all land. The authors hope to publish such an enlarged work at a later date. Other writers have outlined the circumstances which create the growth of cities and which influence the minds of appraisers in determining urban land values. The present treatise is intended to show how opinion or judgment as to urban land values, however created or developed, may be systematically applied. It is also intended to show that no appraiser is capable of exact judgment of the value of a city lot—that to his judgment he must bring analytical methods of comparison and of computation, if his appraisals are to be accepted as sound evidence of accurate valuations.

There have been some fair criticisms of the mathematical and empirical formulæ prepared by Mr. Somers. His depth curve of urban land values, for instance, contains certain irregularities that interfere with perfect mathematical recession from a street frontage. These slight inaccuracies have not militated against the continuous and successful usage of the Somers depth percentage for many years, since the effect of these irregularities upon the computed valuations has been practically negligible. The book contains (on page 90) a new depth percentage projected through the same point of 72½ per cent. at a depth of 50 feet, which table has been devised in exact mathematical ratio, although maintaining the essential percentage at the 50-foot depth. A comparison of the two depth percentages shows but slight differences between the exact mathematical ratios and those in the original depth percentages as prepared by Mr. Somers.

Criticism of the Somers corner tables for the computation of city lots within the area of corner influence has not proved the incorrectness or the lack of utility of these tables, which partake of the same slight inaccuracies that are observed in the depth percentages. The differences in computation between these tables and other tables which might be prepared on exact mathematical ratios as illustrated on page 141 are so small that it has never been found necessary or desirable to modify them for practical use in the appraisal of corner sites.

The Somers System of Land Valuation was devised originally for the uniform appraisal of city land for taxation, but the usefulness of the System is not limited to assessment purposes. It has been satisfactorily used for the appraisal of business sites in many cities throughout the United States. It is true that the System possesses peculiar usefulness in the simultaneous comparative appraisal of all of the sites within a given community for the equalization of assessments, and much space is given in the book to the description of the processes necessary in the fulfillment of this public function. But the appraisal of a single site is simplified and made more accurate by following the Somers methods of analysis.

The authors do not anticipate full agreement on the part of critics with all of the theories and practical methods of valuation presented in this book. They believe so earnestly in these theories and methods, however, that if they should fail to convince their readers of the correctness of their point of view, they feel that such failure may properly be ascribed to lack of clarity in the presentation of their thesis.

If as a result of the publication of this book a better understanding of the science of land valuation may be developed on the part of buyers, sellers, users and appraisers of urban land in particular and on the part of students of the problem of urban land valuation, in general, the authors will feel that they have been amply repaid for their efforts.

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LAND may be defined as the surface of the earth, together with the natural resources and productive powers over which possession of the earth's surface gives man control. It includes not only the exposed outer crust of the earth, but also those characteristics of land which make it useful to man, such as fertility of the soil, natural vegetation, mineral deposits, wild animals, running waters and the solidity of the earth's outer surface, making it suitable for habitation. It is this latter characteristic of land which is of particular significance in the case of urban, or city, land. An acre of land in the center of a city, no matter how fertile its soil may be or how rich the mineral deposits below the surface, will sooner or later be relatively unimportant because of these characteristics, but will derive its usefulness primarily from its location for purposes of building construction or for other community purposes.

Location is therefore the chief characteristic which makes urban land useful and therefore valuable. Unless urban land is so situated as to make it accessible it will be relatively unimportant for community uses.

At times other characteristics than the extent and solidity of its surface make urban land valuable. This is the case, for example, in a number of industrial centers where water power is extensively employed to drive the wheels of industry. Such water power constitutes a part of land; it is identified with land, and in the practical process of appraisal should be construed as a characteristic of land. In some states riparian rights are appraised separately for taxation purposes, and a tax rate is levied against the value of these rights, apart from the rate levied on the value of the land derived from its utilization for building purposes. Where such laws pertain, it obviously becomes necessary to express separately the values of certain characteristics of land from the values of others.

The often debated question whether the air above the land forms a part of land has invited much discussion in recent years with the advent of the aeroplane and of other forms of air navigation. The best legal opinion on the subject tends to bear out the definition of land which excludes air from the concept of land, since possession of the earth's surface does not give man control over the air. At times, however, sunshine and the possibility of air circulation add to the site values of certain urban locations, and to the extent that they can be definitely identified with specific locations, they may enhance their values, and must therefore be appraised.

But in the final analysis it is location, made accessible by means of communication, which constitutes the chief external factor of value of city land. For purposes of differentiation the means of access to land may be divided into two classes, natural and artificial. The natural means consist of harbors, waterways of all kinds, lakes and rivers, which nature has provided to make possible communication between different localities. These constituted the chief avenues of communication in primitive times, for very early in history man employed his ingenuity to construct devices to carry him across the water's surface. When it was discovered in the course of time that it was of advantage to man to establish definite land paths for travel, rather than to roam haphazardly from place to place, he began to build roads. The importance of roads and highways has been greatly enhanced during the past century and a half, for a number of reasons. In the first place, the development of the high degree of specialization in industry has necessitated a system of exchange which for its proper functioning requires ever-improved means of communication. Secondly, the rapidly increasing concentration of population in different centers throughout the civilized world during the past century has made the development of means of communication between country and city extremely important. Finally, in the concentrated centers, in towns and cities, because of the increased interdependence of man, streets have become of utmost importance as avenues of approach to different locations. The word "streets" is here employed to include roads, highways, thoroughfares and other public avenues of intercourse which may be freely used as such by man. For practical reasons to be explained later in this treatise alleys have not been included in the definition of streets, although in the strict sense of the word they do constitute public avenues of intercourse.

Thus in the course of time accessibility to locations for different purposes, through the medium of streets, has become the primary external factor imparting usefulness to urban land. Without streets, in the absence of natural means of communication or of transportation, different tracts of land would be inaccessible at present, unless we were to take air transportation into consideration.

A distinction is commonly made between improved and unimproved land, the former term being applied to land which has been made more useful to man by virtue of the fact that human labor has been expended on or near it. In the strict sense of the word, improved land is a misnomer, for to the extent that human energy has been expended in making land either more accessible or in increasing the fertility of the soil, its original natural state has been modified, and it has become land plus improvements. But since the term improved land has attained common usage it will be employed subsequently in this work to designate urban land, improved by streets, water mains, sewers, drainage, irrigation, and lighting facilities, as well as by structures on land.

A careful distinction should be drawn between improvements to land and improvements on land. The former, particularly in cities and towns, are made primarily for the purpose of increasing the accessibility and hence the possible usefulness of locations to the community at large. They are commonly made by public agencies at public expense, although at times the cost of such improvements to a certain location is assessed against the particular site made more useful by virtue of the improvement. Familiar illustrations of improvements to urban localities are street paving, curbing, grading and the like.

An English statute of 1864 (27 and 28 Vict., C114) entitled "Improvement of Land Act," provides for drainage, irrigation, reclamation and clearing of land and the construction of embankments, weirs, jetties, etc., on streams, tide waters, etc. All such improvements should be construed improvements to land as distinct from improvements on land, since they tend to increase the accessibility to specific lands, and thereby give them greater usefulness.

These and similar improvements to land are usually identified with improved land, and in practice are appraised as part of the land. They have altered the usefulness, not of a particular site as such, but usually of a number of sites simultaneously. They represent a general benefit accruing to a location, where the specific benefit to any one site may at times be approximated and apportioned and thus assessed against that specific site.

On the other hand, improvements on land are usually made by the private agency having control over a particular site. Within certain limitations prescribed by law and custom, an individual owning a tract of land to which definite public improvements have been made, can decide whether he shall make improvements on the land in the form of dwellings, industrial establishments and the like, or whether he shall keep the land lying idle. At times, however, improvements on land may reflect value, as it were, to adjacent sites, making them more desirable by virtue of these improvements. Such reflected value, as we shall see later, is also identified with land values. The distinction here drawn between improvements to land and improvements on land attains importance in communities where centrally-located tracts, made fully accessible by public improvements, nevertheless remain undeveloped, and are withheld from the market in anticipation of higher future land values. The problem of the proper valuation of such lands, particularly for purposes of taxation, is one which has attracted much attention in many rapidly-growing communities.

A distinction should also be made between real estate and land. Although all land is real estate, all real estate is not necessarily land. The two terms are frequently employed as though they were synonomous and interchangeable. The

Century Dictionary (cf. Landed Property) defines real estate, in law, as "land, including with it whatever by nature or artificial annexation inheres with it as a part of it or as the means of its enjoyment, as minerals on or in the earth, standing or running water, growing trees, permanent buildings and fences. In this sense the term refers to those physical objects which are immovable."

Real estate or real property is distinguished from personal property by virtue of the fact that it is regarded as immovable and is identified with land rather than with persons. It does not follow, however, that because real estate is identified with land, or presupposes land, that whatever is permanently attached to land is a part of land. If this conclusion were sound all buildings would have to be regarded as part of land, and the distinction between land and improvements on land would practically vanish. The fact that permanent improvements on land have so frequently been regarded as a part of the land has led to the erroneous impression still prevalent in the minds of many that since a physical separation of land and of improvements on land is practically impossible, separate valuation of the two is likewise impossible.

There is a basic difference between so-called reproducible goods and land. Most improvements on land can be reproduced. Their supply can be increased by the energy of man. The supply of land on the other hand, except within certain narrow limitations, is fixed by nature and cannot be increased by man. Not only is the total supply of land definitely limited by the extent and solidity of the earth's surface, but the supply of specific grades of land or specific tracts of land in particular locations is definitely limited. No matter how valuable a building site in a congested business district of a city may be, it cannot be duplicated in that specific locality. Whereas improvements on land have a supply price, based in the long run on the costs of production, land as such has no supply price based on the costs of production, but derives its value from the importance which various members of the community attach to the possession of it. This general observation will be elaborated in greater detail in a later chapter.

Furthermore, improvements on land tend to depreciate, to wear out, and thus from time to time to decrease in usefulness and hence in value. Land, on the other hand, so far as its extent and solidity is concerned, is permanent. In general it does not depreciate, but as various locations increase in relative importance to a growing community, their value will tend to rise. These increased land values are the direct resultant of the growth in population and increasing prosperity under the conditions of land scarcity. And as the population tends to center around specific localities land values in such localities will tend to rise accordingly.

Since, therefore, a basic difference exists between the chief determinants of the value of land and of improvements on land, the same principles of valuation, i.e., of fixing their value, cannot be applied in both cases. To do so is to apply principles not based on an accurate observation of facts, and to that extent is unscientific, for scientific land valuation implies the application of principles based on accurate observation and analysis of facts. Even a superficial analysis reveals to us that the chief determinants of the value of land and of improvements on land, respectively, are essentially different. Urban land values should reflect the expression of the comparative usefulness, the relative importance, of different locations to the life of the community. Any scientific system of land valuation must be established on this basic fact.

In the following chapters the principles of land valuation will be further discussed, and the practical methods of observing, recording and analyzing community opinion regarding land values, and systematically computing on the basis of such value-opinion for different urban sites, as exemplified by the Somers System of Land Valuation, will be developed.

CHAPTER II

THE VALUATION OF LAND

URBAN LAND VALUES BASED ON COMMUNITY EXPRESSION OF THE RELATIVE IMPORTANCE OF LOCATIONS—DISTINCTION BETWEEN USE VALUE AND EXCHANGE VALUE—LAND VALUES CANNOT BE JUDGED ON THE BASIS OF INDIVIDUAL OPINION OR ON THE AVERAGE OF INDIVIDUAL OPINIONS—IMPOSSIBILITY OF ARRIVING AT LAND VALUE BY SUBTRACTING THE COST OF IMPROVEMENTS FROM THE SELLING PRICE OF REAL ESTATE—MANY ADJECTIVES USED TO CONVEY THE CONCEPT OF SOUND VALUE—COMMON STANDARDS OF JUDGMENT MUST BE MADE THE BASIS OF EXPRESSING VALUE-OPINION—THE FUNCTION OF THE APPRAISER—METHODS OF EXPRESSING JUDGMENT IN OTHER TRANSACTIONS—AN ILLUSTRATIVE STORY.

SINCE urban land values are based on the community expression of opinion as to the relative importance of locations, what is the nature of the evidence which is commonly accepted as an indication of such values?

The answer to this question involves, first of all, a clear understanding of the term "value." In theoretical economics a sharp distinction is drawn between "use value" and "exchange value." The former is usually referred to as utility, usefulness, or the power of any good to gratify a human desire. In this sense air and sunshine have value, for they gratify desires of man. But they do not possess exchange value or economic value, which may be defined as the power of one good to obtain control over another good. In order to have exchange value, anything must have use value. It must possess utility or usefulness, for normally no one would give anything for an object which did not gratify a desire, either directly or indirectly. This is equally true of so-called necessities, conveniences and luxuries.

On the other hand, no one would ordinarily give anything in exchange for something he could get for nothing. Anything which exists in such abundance that one can have all of it he desires without giving anything for it, has no exchange value—it is considered a free good.

In order, therefore, to have exchange value or economic value, a good must not merely have utility, but it must also be limited in quantity. In early colonial days, land in America was so abundant in relation to the small number of settlers, there was more than enough to satisfy every one's desire for it. Land was a free good; it had no exchange value, although it possessed use value or utility. When population increased and the total supply of land no longer sufficed to gratify every human desire for land, it attained economic importance; it attained exchange value. Furthermore, since all lands did not possess the same degree of fertility, the same amount of natural resources, the same favorable location, the better grades of land were naturally more desirable and consequently attained a relatively greater exchange value. This difference in the productivity or income-yielding capacity of various grades of land in different localities is reflected in the difference in exchange values of specific tracts of land. One will give more in exchange for a certain tract of land than for another because it is better located for community uses, because its soil is more fertile, because its natural resources are more abundant. The relative importance of specific locations to an individual is reflected in the price—i.e., exchange value expressed in terms of money—which he is willing to pay for such locations. In the following discussion the terms "economic value" and "exchange value" will be used interchangeably.

We have noted that the exchange values of urban locations are due to the patronage of or use by the community of these localities for any one of a variety of purposes. The use-value or worth of land is a social product arising from the presence of people, and the necessities for the use of land by people. The exchange value or price represents what people are willing to pay for the possession of land at a given locality. How then is it possible to ascertain the opinion of the people at interest as to the prices of various land sites, based upon their relative importance, their comparative usefulness and their differing locations?

If it were possible to obtain from each individual of the community an opinion of the relative importance to him of each of a certain list of articles, expressed in monetary terms, there is no doubt that in many of the lists some one or more of the articles not desired by a certain individual would be marked worthless to him; and possibly one or another article would be found on each one of the lists thus marked. Therefore the average value of any number of articles, based on individual opinion, would be quite unsatisfactory as a basis for judging values in general, since such opinion would not apply a common, but an individual standard of judgment.

This process of averaging individual opinion based on individual standards of judgment has been commonly employed in expressing urban land prices, and explains to no small degree the general dissatisfaction with prevailing methods of appraising and assessing city lands. It makes plain one of the reasons why the assessment or valuation of city land for purposes of taxation is generally condemned as inequitable and unjust. The attempt to use individual opinions is the basic cause for wide variations in the appraisals of land by land valuers. An appraisal of a particular site may represent the honest, conscientious opinion of the assessor or appraiser, but is open to criticism by every other citizen, each of whom may have an opinion, based on the common knowledge of every one in the community, as to the relative importance of specific locations. Not until the method of expressing such opinion by everyone in the community is standardized can the judgment of the community be effectively and properly used.

If every plot of land in a city were sold each year, a definite idea would arise from such sales that would fairly represent a community opinion of land values. But in reality only a very small proportion of land in any city is sold during a single year, and it is not uncommon to find tracts of land in cities which have not been sold for several generations. Furthermore, in most cities extensive improvements have been made on different sites, and the actual selling price of a parcel of real estate includes the value of these improvements as well as the value of the land. To subtract the estimated or known costs of the improvements, based on new reproduction costs less depreciation, from the total selling price of a parcel of real estate, in order to arrive at the value of the land, is manifestly unsound. Unless the improvements are peculiarly adapted to a particular location, that is, unless the maximum usefulness of the site is attained by virtue of the improvements, the fair or normal value of the land, as indicated by the maximum importance of the location to the life of the community, will not be realized by subtracting the value of the improvements from the total selling price of a parcel of real estate.

The terms "fair value," "full value," "sound value," "true value in money," "fair exchange value," "normal value," "full market value," "competitive value," and convenient combinations of these terms, are commonly employed in connection with land appraisals to express the best opinion of the community as to the relative importance of specific locations for the purposes for which they are best suited. They are not necessarily synonymous with actual selling price at any one time, but are attempts to estimate what a tract of land would possibly sell for after full public notice of sale and due knowledge of its productive capacity.

The fact that the actual selling price of urban land usually does not indicate fair or normal value has been noted by some authorities on land valuation who appear to distinguish between actual selling price and sales price. The former seems to express the actual total monetary consideration involved in a transfer, while the latter implies what, in the opinion of the appraiser, a tract of land would sell for, after due notice in a competitive market. It is, in other words, an opinion of the fair exchange value of a certain tract of land, and may or may not be the same as the actual selling price. But, as we have noted, unless this individual opinion of fair exchange value is based on common standards of judgment and on uniform computation, it is purely a matter of coincidence if two appraisers arrive at the same conclusion as to the fair value of a certain site.

The function of an appraiser is to express an opinion regarding the value of an object based upon accurate observation and analysis of facts. He cannot pass accurate judgment unless he has something to judge, and unless he has definite standards according to which he shall judge that something.

An engineer does not guess at the length of a bridge, but employs definite linear units in terms of which to express his judgment. A produce merchant does not guess at the volume of a consignment of goods, but carefully weighs it or determines its volume by employing a unit of quantity. The appraiser, expressing an opinion regarding land values, however, ordinarily employs evidence on which he bases his judgment, which, as we shall note subsequently, is often inaccurate and unsound. There is, moreover, another great danger that unless a common basis of judgment is employed in determining land values, such valuations will be inaccurate.

Most appraisals are made for specific purposes in the interest of certain factions or agencies. It is sometimes a matter of financial interest to appraisers, merely exercising individual opinion, based on their so-called expert knowledge, to make valuations favoring those who employ them for a specific purpose. If science can be brought to the aid of individuals in order to minimize the possibility of human error, the danger of erroneous expressions of opinion can be materially reduced. We do not have to search long to find instances where valuation experts, estimating the values of certain parcels of real estate, using their own standards of judgment and representing specific interests, differ one hundred per cent. or more in their respective conclusions.

A well-known trial judge in a mid-western city who was invited by the local Real Estate Board to discuss the general subject of appraisals of land for purposes of condemnation emphasized in his address the great variation in the sworn testimony of witnesses in his court.

"Many of the members of your Board are frequent witnesses in my Court," he said, "representing either the owners of property to be condemned for a public purpose or the municipality or semi-public corporation possessing the power of eminent domain and seeking to acquire such property. Under the rules of evidence the expert witness may define his opinion as to the value of a property, but he cannot be compelled to give his reasons for reaching the opinion to which he testifies. His general experience and qualifications as a real estate expert are deemed sufficient to give him a standing in the court.

"Mr. A. (referring to a member of the Real Estate Board) recently testified in a certain case that a certain property was worth $2,000.00 a foot. His client was the owner of the property. Mr. B., (another equally prominent member of the Board), representing the municipality which sought to acquire the property, testified that it was worth only $750.00 a foot. It is manifest that both of them could not be right. It is equally true that if by any means it would be possible to determine beyond doubt the 'fair value' of a piece of ground, there could be no other valuation worthy of consideration.

"A case was recently tried in my Court wherein the difference between the sworn opinion of two experts was surprisingly small, only fifty cents a foot, one testifying that the property was worth one dollar a square foot while the other testified that it was worth only fifty cents a square foot."

At this point in the Judge's address it was apparent that he was disposed to be facetious with his audience, but he quietly turned the talk to a general discussion of the desirability of reducing front foot and square foot judgments to a more easily standardized method of observing and of expressing opinion.

Unless opinion regarding urban land values can be judged by employing common standards and can be uniformly computed on the basis of such judgment we cannot hope to realize an accurate system of land valuation.

CHAPTER III

THE VALUE OF LAND AND THE PRICE OF LAND

VALUE AND PRICE NOT SYNONYMOUS—FUNCTION OF MONEY IN EXCHANGE TRANSACTIONS—THE EQUATION OF EXCHANGE—SIGNIFICANCE OF CHANGES IN PRICE LEVELS—MONEY NOT AN ACCURATE MEASURE OF VALUE OVER A PERIOD OF TIME—CHANGES IN PRICE AND CHANGES IN VALUE DIFFERENTIATED—EFFECT OF RISE IN PRICE OF A REPRODUCIBLE COMMODITY—EFFECT OF RISE IN PRICE OF LAND—SUPPLY OF DESIRABLE URBAN SITES LIMITED BY NATURE—URBAN SITE VALUES DETERMINED BY COMMUNITY PATRONAGE DIRECTLY OR INDIRECTLY—BASIC DIFFERENCE BETWEEN THE PRICE OF LAND AND THE VALUE OF LAND SUMMARIZED.

IN the preceding chapter value has been defined as the power which one good has to obtain control over another good, and price as value expressed in terms of money. The fact that value is commonly expressed in terms of money, as a certain price, has led to the erroneous concept that value and price are synonymous. A change in the general level of prices does not necessarily mean a corresponding change in the values of commodities—that is, their relative importance to each other—but merely a change in their relation to money or its equivalent. If the value of money falls, prices will rise, and if the value of money rises, prices will fall. But such changes in prices do not imply corresponding changes in the values of commodities. Money and its substitutes represent the media of exchange, through the instrumentality of which ownership of goods is transferred from one person to another. The ratio between money or its equivalent, and goods entering into exchange, here referred to as exchangeable goods, at any one time expresses the general level of prices. This may be expressed in the form of a simple equation thus:

$$\frac{M}{G} = P$$

in which M equals money or its equivalent, G the exchangeable goods, and P the level of prices of these goods.

If now the media of exchange were to be increased or decreased or its circulation accelerated or retarded, the M in our equation would change, and without a corresponding change of G would result in a change in the price level. Since the quantity of the different media of exchange does vary from time to time without corresponding variations in the quantity of exchangeable goods, changes in price levels do occur. In other words, the value of money changes, and as a measure of value it is not stable, but fluctuates from time to time. Money may be regarded as an accurate measure of the value of commodities at any one time, but over a period of time this is not necessarily true. Its value will tend to change with changes in the supply of circulating media, unless such changes in supply are directly proportional to changes in the supply of exchangeable commodities. Because of changes in the value of money itself, it is an unstable measure of value.

Other units of measurement remain fixed and constant. A foot is always the same length, a pound is a fixed unit of weight, but a monetary unit may or may not be the same after a lapse of time. Still, the impression prevails that changes in prices are synonymous with changes in the values of commodities. If for example a suit of clothes sold for $30 at one time and some years later a suit of clothes of the same quality sold for $60, many believe that the value of the suit of clothes has doubled in the interval. The price has doubled, to be sure, but its value, that is its relative importance, compared with other commodities, may or may not have changed. We must therefore guard against confusing a change in the level of prices with a change in values. But if it is discovered that over a period of time the price of a single commodity rises more rapidly than the prices of all other commodities, then it becomes obvious that not only the price of this commodity but also its value has risen.

This observation is of particular significance in connection with land values. In the long run a decided increase in the price paid for a definite amount of a reproducible commodity (an increase in the demand), without a corresponding increase in the prices paid for definite amounts of other reproducible goods, will invite increased production of this product, and by increasing the supply tend to lower the price so that the value-relationship between this and other reproducible goods may not be greatly modified. Competition among producers, wherever competition exists, will tend to keep the price of reproducible goods at or near costs of production. The long run or normal price of such goods will not be far in excess of such costs, and at intervals may actually be below the costs of production. This is true in periods of forced liquidation during which business men sell their products at a sacrifice to realize immediate purchasing power. But in the long run the price of a reproducible good will be determined primarily by the production costs, and this so-called normal price will not tend to vary to any great extent, unless new discoveries, new inventions, should materially alter the production costs.

Not so in the case of land. Even though the price of land were to rise more rapidly than the prices of other goods, and if its value were to increase, competitive forces would not begin to operate, except within narrow limits, to increase the supply. The extent of the earth's surface is definitely limited by nature, and the supply of desirable urban locations is likewise limited. Improved transportation facilities might indeed increase the supply of desirable urban locations, but even this possibility is ultimately limited. If therefore the prices of urban sites rise because of increased demand for them with increasing population, without corresponding rises in prices of reproducible goods, it is obvious that the value of such land has likewise risen. And the productive agencies, which in the case of reproducible goods tend to keep the value-relationship among reproducible goods fairly constant (assuming no change in their utility) cannot operate except within rather narrow limitations to increase the supply of land.

That land values in general will continue to rise with increasing population and increased production is generally conceded. What, then, is the cause for such increases in land values? With reference to urban land, it is the importance attached to the possession of a specific locality because of its income-yielding capacity, and its income-yielding capacity is in turn determined primarily by community patronage of the locality, or by its accessibility to the life and the activities of the community. An urban site is valuable because it can yield its owner an income. Income is here used to designate a flow of services or commodities over a period of time. In practice such income is usually evaluated in terms of money, and expressed as so many dollars per year.

Furthermore, many prospective purchasers, conscious of the fact that a certain urban location will in all probability enjoy increased community patronage as the community expands, and will thus increase its income-yielding capacity, will frequently pay a price at present for the anticipated future greater income from a specific site. But in each and every case the income of urban sites is conditioned by the patronage of the community, directly or indirectly, and thus, in the final analysis, the value imparted to urban sites is a community product.

In summing up, it should be clear that there is a basic difference between the price of land and the value of land. The price of land may change without a corresponding change in its value. But regardless of changes in the price of land, the value of land will tend to increase. This is due to the fact that unlike reproducible goods the supply of land in general, and of specific sites in particular, cannot be materially increased, and that the value of the land is derived from its income-yielding capacity. This, in turn, particularly in the case of urban land, is derived primarily from community patronage of specific localities, made accessible by streets and other channels of communication.

CHAPTER IV

INADEQUACY OF USUALLY ACCEPTED EVIDENCES OF LAND VALUES

ATTEMPTS TO ESTABLISH UNIFORMITY AND ACCURACY IN LEGAL ENACTMENTS PERTAINING TO LAND VALUATION—MOST LAWS INADEQUATE; THEY DEFINE WHAT SHOULD BE DONE, BUT DO NOT TELL HOW TO DO IT—WILLING BUYER AND WILLING SELLER THEORY ANALYZED—A LARGE PROPORTION OF ALL TRANSACTIONS IN URBAN LAND MADE FOR ONE OF TWO PURPOSES, EITHER BECAUSE OF NECESSITIES OF BUYER OR FOR SPECULATIVE REASONS—NEITHER CLASS OF TRANSACTIONS CONSUMMATED AT FAIR OR NORMAL LAND VALUES —PRICES PAID FOR URBAN LAND USUALLY DO NOT REPRESENT THE FAIR VALUE OF THE LAND—LONG TERM LEASES CRITICIZED—VALID EVIDENCES OF FAIR OR NORMAL VALUES—CAPITALIZED INCOME FROM LAND ALSO INADEQUATE EVIDENCE OF URBAN LAND VALUE—THE CONCEPT OF MARKET VALUE OF URBAN LAND ANALYZED AND CRITICIZED—NEITHER ACTUAL SELLING PRICE, LONG TERM LEASES, CAPITALIZED RENTALS, NOR MARKET VALUES ARE ACCURATE INDICES FOR URBAN LAND VALUATION.

THE lack of an adequate system for recording judgment and analyzing judgment in the valuation of land has brought into evidence, and more or less common acceptance, certain theories of valuation. All of the constitutional and statutory attempts to define land values and to instruct appraisers in the principles to be followed in land valuation, are attempts to establish uniformity and accuracy. But none accords so closely to the description of the truth as to what actually takes place when land is appraised as to constitute a definite rule of valuation.

The Ohio State Constitution and the statutes based thereon require valuation for taxation purposes at "the true value in money." This definition is like an abstract rule of morality. It tells you what to do, but it does not tell you how to do it. The same criticism may be made of the Pennsylvania statute which requires the assessor to appraise at his opinion as to what the property would bring at a fair sale, after due notice of sale. Other statutory rules of valuation instructing the assessors to appraise at the "fair market value" or the "full cash value" are open to the criticism that they are based solely on the theory that one can arrive at the "true value in money,'' the ''fair market value,'' or the like, by expressing an opinion; while in reality the appraisal even of a single site necessitates an analysis, by determining the ''true value in money'' or the ''fair or normal value'' of a definite unit-quantity, and computing the land value by systematic methods. This method of analysis is particularly necessary in the assessments of hundreds of thousands of properties in a community for purposes of taxation, if any degree of uniformity in methods of valuation is to be accomplished, either locally or throughout a county or a state.

The courts have set up as an idealistic theory for the guidance of expert witnesses the so-called willing-buyer-willing-seller theory. Under this theory, the valuation of land is based on what a willing buyer who is not obliged to buy will pay a willing seller who is not obliged to sell.

This legal formula is supposed to describe a condition of complete agreement on the part of both willing buyers and willing sellers. As a matter of experience, however, the willing buyer and the willing seller seldom if ever meet. The process of buying and selling urban land is one of give and take, each party exercising his ingenuity and influence to buy at a low price or to sell at a high price, and quite often willingness is superseded by either coercion or necessity. The willingness to undergo a serious operation to save one's life differs essentially from the willingness to buy a new $5 hat, assuming the ability to pay in both cases. If for any reason the willingness of both buyer or seller should be accompanied by agreement upon a certain price, that agreement is more than likely to be based upon other circumstances than mutual willingness, which in reality has no definite relation to the actual price paid.

Actual selling price does not usually represent the fair exchange value of land. A large proportion of all transactions in land may be included in two general classes, so far as the reasons or causes for such transactions are concerned:

1. *The purchase of particular tracts of land for specific purposes.*

2. *Purchases for either investment or speculation.*

A seller of property under the first of these two classes of transactions is usually in a position to dictate the price at which the property shall be sold. He can, under ordinary conditions, compel the purchaser to considerably overbid any other possible competitor for the property, because there are imperative reasons why the purchaser requires this particular property for a specific purpose.

Sellers of property transferred under the second class of transactions are usually persons who for some reason or other are not aware of the fair value of their land, or persons who by reason of circumstances beyond their control are compelled to sell. Investors or speculators who purchase urban property usually do so because they believe the fair exchange value at a given time, or the potentiality of future location developments, make the present purchase price a profitable one to them; and in comparison with other investments they believe they will realize a bigger profit in the purchase of a particular tract of land.

A wide experience as a professional appraiser leads inevitably to the opinion that nearly all transactions in land may be fairly classified as abnormal, if by normality of price one means a fair or normal exchange value. The buyer of particular properties for specific purposes almost invariably pays more than a fair or normal exchange price, and the buyer of land for investment or for speculation almost invariably pays less than a fair exchange value.

If this be true, it is evident that the prices paid in many land transactions represent the necessities rather than the willingness of buyers or of sellers, as the case may be. If one looks for accurate evidence of normal land values, he must in general find it outside of the specific prices paid for specific land sites, and if a certain price for a specific site is found upon analysis actually to represent the "fair value" of a certain property, one should discover some means of definite comparison of that price in judging the values of other properties.

By way of illustration of the type of transaction where particular properties are purchased for specific purposes, it is common knowledge in any growing community that certain manufacturers, commercial enterprisers, and other residents are likely to require for the development of their industrial or mercantile businesses, or for the better enjoyment of their residential locations, the land adjacent to their present land holdings. The owners of the desirable land adjoining theirs, or under control of such individuals, are usually in possession of knowledge that their land may be required by their neighbors. If such owners are secure in the possession of their property they can exact a price in excess of its fair or normal value. At best, such a price will bear but an approximate relation to the theoretically fair price which would prevail, assuming a willing buyer, willing but not compelled to buy, and a willing seller under no compulsion to sell. In any such transaction the willing-buyer-willing-seller theory which the courts have set up as a guide to fair valuation is inapplicable. The will of the owner of the desired land is the predominating factor, and he as seller will, because of the absence of competition due to his ownership of a site that is greatly desired, exact all that the traffic will bear. Consequently the price thus exacted will almost inevitably be in excess of a fair competitive price.

Land acquired under the power of eminent domain possessed by governmental agencies and quasi-public corporations usually yields a price in excess of what is believed to be its fair or normal price. The agencies possessing such power cannot be certain that a jury will exercise fair judgment in determining the fair value of the land in question if it should be condemned, and will often privately offer more than its fair value. The average jury may ordinarily be expected to resolve any doubt which exists as to value in favor of the seller, and may render a verdict which will include in the land price a compensation for loss of business usefulness, of business goodwill and of occupancy of the property. This premium, when awarded for such considerations, is not a part of the fair value of the land, except in so far as it is considered in connection with the specific business of the seller. It is in fact likely to be an element which applies only to his specific land holding, under existing uses by him, and is not inherent in the fair or normal value of the property.

This is well illustrated in the case of the acquirement of land by railroads, which must have continuous rights-of-way, located in such manner as to give favorable grades, without involving unreasonable construction costs. "It is well-known," says Prof. David Friday in a recent magazine article, "that when the roads buy land it costs them several times as much per acre as could be secured for the land if it were sold for ordinary purposes in lots or parcels of conventional size or shape."

Prof. Friday's statement here quoted is true in rural localities where the purpose of a railroad to run its track over an obvious course is known to the entire community, including the owners of the required tracts of land. But in large cities, where the community knowledge of this fact is less well-developed, railroads have acquired land worth millions of dollars at reasonable prices before the owners were aware of the purpose to use their lands for rights-of-way or terminals.

Many farmers may be justified in asking for a strip that bisects a corn field a price that will compensate them for damages in addition to the normal value of the strip taken for railroad purposes, and for fire risk to their farms and danger to their persons and livestock resulting from the operation of the railroad.

Condemnation sales represent a condition wherein the owners of the property may or may not desire to sell, but are forced to sell under the assumption that the transfer of their property will benefit the general public, since the public is presumed to have rights which transcend the rights of the individual. The right of the public to the use of land under proper compensation is in this instance recognized as superior to the right of the individual. When a public improvement requiring the purchase of numerous parcels of land is imminent, and before knowledge concerning the proposed improvement has become general, it is often possible to purchase considerable quantities of the land required at prices closely approximating fair competitive prices. But as soon as the owners of land located in the line of the proposed improvements learn of the impending demand for their land, they will hold out for higher prices. The liberality of the ordinary condemnation court awards is so well known that a property owner may usually anticipate with a fair degree of certainty that a court verdict will award him a price well in excess of what is commonly regarded a fair competitive price for the property in question. Railroads are able to purchase land for terminal and track facilities at fair prices more readily in large cities than in rural towns, as was previously noted, because they can secure options on properties with less publicity in more densely populated centers. The liberality of juries in awarding damages for land has led to the claim of multiple valuation of property by public utility corporations in rate-making appraisals. This practice is comparable to the ordinary concept of "plottage." If fair or true values of land actually do exist they are certainly not reflected in the prices usually paid under the use of the power of eminent domain. No doubt the thought of the United States Supreme Court in the Minnesota Rate cases in laying down the rule of comparison with values of contiguous and similar land was intended to eliminate abnormalities in land valuation and thus to arrive at fair competitive values.

✓ The second type of transactions referred to, namely the purchase of land for investment or speculative purposes, includes all cases where owners, for reasons beyond their control, are compelled to part with their property. An overdue mortgage, the urgent necessity for funds for business or family purposes, inability to raise money for improvements commensurate with the proper or best usage of the land—all these will bring land into the market at relatively low prices. At private auction and at sheriff's sale good opportunities for investment in land may always be found. This fact is so well recognized that some courts and statutes, in attempting to define "market" value of land, have specifically excluded from consideration the prices obtained at such forced sales.

Furthermore, the land speculators who purchase land do so because they believe that its present fair value, plus an added amount for anticipated future increase in value, makes the present purchase price a profitable basis of speculation for them. They are not, like the conservative investor, purchasing a present income but rather an anticipated future income. The knowledge of a possible increase in the future returns on certain types of securities may force their present selling price well above the price of other securities yielding the same present net income, but not offering similar possibilities of future increased income. Can we contend that the price paid for such speculative possibilities reflects the general opinion of a fair or normal price?

Land purchased for the purpose of speculation is usually not bought because of its present income yield, but a price in excess of a fair or normal selling price is paid in anticipation of its increase in value. This is particularly true of urban land.

A careful investigation will reveal that nearly all of these two types of transactions are consummated at prices which do not conform to what is commonly regarded as fair or normal—they are either above or below the prices which, in the opinion of those most competent to judge, represent fair present exchange prices.

If this is true it becomes apparent that the prices paid for land in a great many instances are not fair or normal prices, and consequently cannot be regarded as an accurate index of current land values. If, as was previously noted, after careful observation and expression of opinion, it is disclosed that a certain price does represent the fair value of the land in question, a means should be found to employ that price as a basis for judging the values of all the other land in a certain locality, as well as in all other localities possessing the same characteristics.

If, then, the selling prices in the two classes of transactions discussed above, which appear to include a majority of all land transactions, are found to deviate from fair or normal values, and if it is held that fair or normal values of land actually do exist, where shall we look for better evidences of such fair or normal values, and for means of measuring them? Do the prices paid in any other class of transactions in land afford better evidence of fair or normal value than in the transactions described above? Eliminating all those sales which involve either necessity or compulsion, we look for evidence of fair land values to those transactions in which a "willing buyer who is not obliged to buy" pays a certain price to a "willing seller who is not compelled to sell," and we search long and earnestly before we find those entirely willing persons performing in actual practice this theoretically happy and willing function.

Some land valuation experts have claimed that long-term leases in important business centers are valid evidences of fair or normal values. But in the final analysis these values but reflect the purchaser's estimates of the present and future importance of certain locations to him, and no doubt many a lessee would gladly see his lease terminated because he has miscalculated the future importance of a certain location. Again, leases have been made at prices which are sometimes found, after only a few years, to be far below the prices which could then be realized, and result in a lucrative source of profit to the fortunate lessee. It is manifestly impossible to use long-term leases as accurate evidence of fair or normal land values.

Economists tell us that land values are based on the capitalized net income from land, and that this is the best evidence of actual land values. Although the theoretical soundness of this contention can perhaps not be questioned, its practical application involves difficulty. In the first place, the failure to differentiate clearly between income from land and income from improvements on land makes it impossible to ascertain accurately in all cases the exact income yielded by a certain tract of land. Furthermore, the practice of withholding certain tracts from the market, sacrificing present income for anticipated future income, implies that it is not actual but potential income which must be capitalized to arrive at the present fair valuation of the land. How are we to ascertain this potential income? Finally, we have noted that the actual income yielded its owners by a certain tract of land under a long-term lease may be either above or below the income which it could or would yield its owners, but for the lease. Thus the concept of capitalized income from land in the form of capitalized contract rent may furnish an index of the trend of land values in general, but cannot be employed with any degree of accuracy to ascertain fair or normal values of land in specific localities.

The term "market value" is frequently employed in appraising land. A market has been defined as a place where buyers and sellers meet, in person or otherwise, as buyers and sellers. Although the market for real estate in general is fairly wide, the market for a particular tract of land is usually limited. Consequently the competitive forces which in the long run tend to establish the normal competitive price cannot always operate, and the "market value" of land in reality resolves itself into a long series of market values—established in limited, local markets with decidedly limited competition. The law of one price—that in a competitive market at any one time one and only one price can prevail—is inapplicable with reference to land values, since the market for specific tracts of land is usually so closely limited.

A relatively small number of persons are prospective buyers of any particular land site, and at times it would require extensive publicity to interest even two persons in a possible land purchase. Due to the nature of the supply of land in specific localities for specific purposes the term "market value" is frequently not applicable to land valuation, at least not in the sense that as the price advances more sellers will be drawn into the market in the particular locality. Land sites cannot be physically reproduced, because, as has been observed, each site represents a specific portion of the earth's surface, which in general cannot be physically changed by any act of man, although the relative importance of sites is constantly changing. If all sites in a city afforded the same possible opportunities to prospective purchasers, we might speak of competition among sellers and of the establishment of a "market price" which could serve as a fair index for land valuation. But with the market for specific tracts of land decidedly limited at any one time, both with reference to buyers and to sellers, it is difficult to speak of a "market value" of land in the same sense that we speak of the "market value" of reproducible goods. To be sure, certain perishable commodities may also have a decidedly local market, but in such a local market the prices of such perishable commodities of the same nature and quality will tend to a common level.

This certainly is not true of land, and so it is impossible to speak of a "market value" of land unless we speak of the "market value" of a particular tract of land in a particular location to be used for a particular purpose. How can such "market value" of land be employed as evidence in evaluating other land used in other locations for other purposes? Can we take the average "market prices" paid for land over a series of years and consider this the basis of valuation? In a growing community the average price paid for specific tracts of land over a series of years would tend to be below the fair present price, since land values tend to rise, and the average would be below what may or may not be the fair present value of the tract of land in question.

We are thus led to the conclusion that neither actual selling price, long-term leases, capitalized rentals, nor so-called "market values" of land can serve as accurate bases or indices to be used as evidence for purposes of land valuation. Each one of these may be employed as evidence in checking up values arrived at on the basis of the principles to be outlined subsequently, but in themselves cannot be employed as accurate evidence of fair urban land values.

CHAPTER V

CUSTOMARY METHODS OF COMPARING URBAN SITE VALUES ANALYZED

NECESSITY FOR TRUSTWORTHY UNIT OF QUANTITY IN TERMS OF WHICH URBAN SITE VALUE COMPARISONS CAN BE MADE—METHOD OF MAKING VALUE COMPARISONS IN OTHER INSTANCES—CUSTOMARY UNITS OF QUANTITY IN TERMS OF WHICH COMPARISONS ARE MADE—THE FRONT FOOT CRITICIZED—GIVES NO INDICATION OF DEPTH BEHIND THE FRONT FOOT—DOES NOT RECOGNIZE SIGNIFICANCE OF ALLEY INFLUENCE—DOES NOT ALLOW FOR CORNER INFLUENCE—DISREGARDS SHAPES OF SITES—THE SQUARE FOOT AS A QUANTITY UNIT FOR URBAN SITE COMPARISONS EQUALLY DEFECTIVE—MAKES NO ALLOWANCE FOR DECREASE IN SITE VALUES WITH INCREASING DISTANCE FROM STREET FRONT.

WE have noted that the value of urban land is based upon the relative importance which the community attaches to certain locations. How can the expression of such importance be measured and recorded to serve as evidence in land valuation? In many cases neither actual selling prices, nor capitalized rentals, nor any of the other generally accepted evidences of land values can serve as accurate indices of the values of certain locations to the community.

It appears impossible to compare the relative importance of urban sites without a trustworthy unit of quantity as the basis for comparison. To compare the value of one site with that of another without employing such a unit would be as futile as to compare the value of a cargo of coal with the value of another cargo without employing a unit of weight.

When we know the value per ton of a cargo of coal and know that another cargo is of the same quality, we have but little difficulty in comparing the values of the two cargoes. It is merely necessary to measure them by the common unit-weight, and then to multiply the resultant quantity of each cargo by the price per weight-unit of that quality. A 1,000-ton cargo of coal of the weight-unit price of $10 has the same aggregate value as another 1,000-ton cargo of the same price per weight-unit. If there should be a difference in the quality of the coal of the two cargoes a comparison of the aggregate values of the two cargoes can be made by simply ascertaining the unit-weight price of each cargo. A thousand tons of $10-a-ton coal will have an aggregate value twice as great as 1,000 tons of $5-a-ton coal, and a 500-ton cargo of $10-a-ton coal will have half the aggregate value of a 1,000-ton cargo of the same quality, selling in the same market. The same process of reasoning applies to every cargo of coal, of whatever quality or weight. Such comparisons cannot be made without an applicable unit of quantity.

In comparing the value of coal the customary unit of quantity is a unit of weight. In comparing the value of liquids the customary unit of quantity is a unit of volume. In comparing the value of cloth the customary unit is a linear unit; and similarly in comparing values of other commodities. But in comparing urban land values, as a rule no customary unit is employed; at least none that is applicable. Urban sites are usually bought and sold or evaluated at so much per front foot; or in some localities, or for land used for specific purposes, such as commercial or industrial sites, at so much per square foot. But these units are no more applicable with any degree of accuracy as units of area for land valuation than a chunk of coal would be as a unit of weight. Except for purposes of expressing relative land values, mathematically exact and generally accepted units of quantity, such as tons, yards, pounds, bushels, feet and the like, are employed in commerce and trade. With such basic units of quantitative measurement the relative values of definite unit-quantities of marketable commodities can be readily expressed in monetary terms as definite prices. Without definite common units of quantity no satisfactory relative values of similar commodities can be expressed. Is it possible to compare the relative value of a yard of cloth, not knowing its width, with the value of a square yard of cloth? Even though a definite price had been established on each, of what practical significance would a comparison of the two prices be. Yet this is the customary procedure in comparing urban land values. Front feet are compared, without due regard to depth or corner or alley or other advantages, as though the line of frontage possessed actual value.

Without a monetary unit the number of exchange ratios for the expression of exchange values would be almost infinite, and it would be a physical impossibility for any one to remember all the ratios of exchange. But by reducing all ratios to a common denominator, by employing a common unit of value, the dollar, the pound, the franc, and similar monetary units, we make possible the expression of the comparative values of unit-quantities of all commodities with reference to the value of a common basic unit of value. So, also, we usually express quantities in terms of unit-quantities and thus make possible their comparison. But when we compare urban site values we find that the usually employed units are largely inapplicable and unsatisfactory.

The front-foot or foot-front, as pointed out, gives no indication of the depth of the strip lying behind the front-foot. In reality it is an imaginary line one foot in length paralleling the street, and having attached to it, as a sort of appendix, strips of varying lengths. Without a definite uniform depth of the front foot it becomes obvious that this front-foot unit cannot be employed as an accurate unit of quantity to serve as a basis for comparing land values.

To say, for example, that a certain site on Main Street is worth a certain price per front-foot, means very little except to one who already knows the site, and who is aware of each factor of its value. To the uninformed such a front-foot estimate conveys no more information than would a similar statement with reference to a case of cloth, unidentified as to quality and quantity.

In estimating the value of a lot fronting on a certain street the dimensions and shape of the lot must be taken into consideration. This is particularly difficult where lots on one side of a street are deep and those on the other side are shallow. In both cases the frontage value per linear foot might be the same. If, therefore, appraisals were made on the basis of front-foot values, it would be the same for either side of the street. Nevertheless the deeper lots will have a greater total value than the shallower ones.

Any appraisal on a front-foot basis involves a misleading assumption, namely, that the depths of the front-feet are uniform and equal. But it is a well-known fact that this assumption is not sound, since building sites, particularly in older sections of a city, where land transfers have been frequently made, vary considerably in depth.

Four specific reasons may be cited why front-foot valuation is defective and misleading: In the first place, the front-foot takes no proper account of the area of land behind the front-foot, that is of the depth of the sites. Secondly, it fails to recognize rear or side alley influence as such. In the third place, it takes no proper account of street-corner influences. Finally, it disregards variations in shape caused by irregularities of side lines and rear lines. Front-foot valuation thus precludes accurate exchange of opinion regarding urban land values by the community. It is in reality synonymous with buying sugar by the pile or wheat by the shovelful.

The square-foot is likewise an unsatisfactory unit of quantity to be employed in the valuation of urban sites. It is a well-recognized fact that a square-foot of urban land depends for its value upon its location primarily with reference to street facilities. If located at a street frontage, it would always be worth more than if it were at a distance from the street front. One could, to be sure, compute the average value per square foot of an urban site, twenty feet wide on a street front and extending at right angles 100 feet in depth, to be $4.00 if the total value of the site were fixed at $8,000. But no accurate comparison of the value of another lot either 150 feet deep or 50 feet deep could be made from such a computation. In fact, no comparison of value could be made between any sites which differ either in shape or size from the lot worth $8,000.

Using the square-foot basis of valuation, a 20x100 foot lot (2,000 sq. ft.), valued at $8,000, would imply that a 20x150 foot lot (3,000 sq. ft.) similarly located would be worth $12,000, and a 20x50 foot lot (1,000 sq. ft.) would be worth $4,000. It is apparent, however, that such comparative values would be excessive for the lot 20x150 feet and deficient for the lot 20x50 feet. It is common knowledge among observers of real estate values that although a 20-foot front lot 100 feet in depth is always worth more than one only 50 feet deep (other factors being the same) and less than 150 feet deep, yet the differences in value per square foot are disproportionate. The square-foot unit does not allow for the differences in the depth, side street or alley factors, if any, and so cannot serve as an accurate unit of quantity for urban site valuation.

Both the front-foot and the square-foot units give us a certain average unit-valuation of a lot having a certain total value. It is analagous to giving us the average temperature of a body of water hot at the top and cold at the bottom, or vice versa, which information may be significant if we desire to know the average temperature, but is worthless if we wish to know the actual temperatures at different depths. Neither the front-foot nor the square-foot unit reflects the varying area values of a given lot. If, for example, the assumed lot, 20x100 feet, were owned by two individuals, one having a four-foot frontage and the other a sixteen-foot frontage, with the party line diagonally drawn to give the owner of the four-foot frontage a rear width of sixteen feet and the other owner a rear width of four feet, how could either the front-foot or the square-foot be employed in comparing the two site values?

It is obvious from what has been said that neither the front-foot nor the square-foot valuation of a site of which the total value is given can serve as a guide for the valuation of other sites differing in shapes or dimensions, even though they were equally desirable as to location. It would be equally impossible to express with the front-foot or square-foot as quantity-units the comparative values of urban sites differing not only in size and shape, but also in their relations to intersecting streets, to alleys, to railroad advantages, to waterway facilities, to wharfage service, and to similar factors. Unless a unit of quantity can be found to serve as a basis for comparing urban values which will be applicable in all cases, and which can be employed as a common quantity-unit in terms of which community opinion regarding the relative importance of streets in cities can be measured and expressed as to their effect upon the value of contiguous land, we cannot hope for a greater degree of scientific accuracy in land valuation than exists to-day.

CHAPTER VI

FACTORS AFFECTING VALUES OF URBAN SITES

FACTORS AFFECTING URBAN SITE VALUES TWOFOLD, EXTERNAL OR PHYSICAL AND PSYCHOLOGICAL—LOCATION AS A CHIEF EXTERNAL FACTOR AFFECTING URBAN SITE VALUES—STREET IMPORTANCE IN MAKING SITES ACCESSIBLE—EVOLUTION OF CITIES—DEVICES EMPLOYED TO ASCERTAIN RELATIVE IMPORTANCE OF URBAN SITES—SECONDARY PHYSICAL FACTORS AFFECTING URBAN SITE VALUES; ALLEYS, RAILROADS, PARKS, BUILDING RESTRICTIONS, PLOTTAGE—PSYCHOLOGICAL VALUE FACTOR; UTILITY—UTILITY OF SITES REFLECTED IN THE PRICE INDIVIDUALS ARE WILLING TO PAY FOR THEM—THE PRICE MEASURES THEIR OPINION OF THE RELATIVE IMPORTANCE OF DIFFERENT LOCATIONS—JUDGMENT AS TO RELATIVE IMPORTANCE OF LOCATIONS MUST BE BASED ON ACCURATE OBSERVATION—UNIFORM STANDARDS FOR JUDGING URBAN LAND VALUES OF PARTICULAR SIGNIFICANCE FOR TAXATION PURPOSES.

TO arrive at a sound basis for determining urban land values let us next observe and analyze the factors which affect the values of such sites. For purposes of analysis they may be divided into two main groups, namely, the physical or external factors, and the psychological factors.

What are the physical, or external, factors which affect urban site values? First and foremost among these is the location of each particular tract of land. But location is a relative term, and attains significance only when we ask, Location with reference to what? That location of an urban site is important which makes it accessible to the activities of the community.

How is such accessibility usually indicated? By various means of communication, chief among which, as we have noted, are the streets and highways. Without these, some locations would be inaccessible, and consequently would be of little significance to the life of the community. Accessibility through the medium of streets and highways is the chief external factor affecting urban site values. Streets are usually the media of physical communication between the members of a community, and consequently determine to a large extent the relative importance of the several locations to the life of the community.

In the course of the development of towns and cities certain natural lines of evolution or growth may be observed. A retail business center will develop where people are most accustomed to congregate from time to time, usually at a point which is most accessible to the members of the community. Such accessibility is frequently artificially enhanced by making improvements to streets and highways, and these improvements tend to increase the value of lands affected by them. As the relative importance to the community of specific locations for different purposes increases, this will be reflected in increased land values of such locations. Individuals desire specific locations because they feel reasonably certain of the relative importance of such locations to the community. Numerous devices have been employed in recent years to ascertain and record this relative importance of urban locations for specific purposes. Traffic counts are commonly used to determine the extent to which people patronize certain localities.

Inasmuch as urban land is made accessible to the community primarily through the medium of streets it is street influence upon location which must be carefully observed and analyzed in connection with urban land valuation. Even a superficial observation of street influence upon site values will reveal the fact that not all streets impart the same degree of relative importance. Land located along some streets is more valuable than land located along other streets, and not infrequently land on opposite sides of a street in the same block differs in value. This difference in values is due to differences in the relative importance attached by the community to specific locations.

Although streets are the chief or primary external factor determining the accessibility and thus affecting the values of urban land, certain secondary physical factors must also be borne in mind. The influence of alleys, canals, railroads, parks, building restrictions, plottage, and similar factors all affect land values in a town or city, and must be given separate consideration in any systematic attempt to appraise the effect of all the external factors affecting or influencing site values.

In some of the newer towns and cities which have been carefully planned, there is a fair degree of uniformity in the shapes and dimensions of lots. In older towns and cities, which, like Topsy, "just grew," this is not always the case.

Sites frequently differ not only in size and dimensions, but also in shape. Inasmuch as such irregularly-shaped lots of varying sizes are usually privately owned and extensively improved, and consequently cannot be readily redivided, it is difficult to determine the relative importance of such irregular sites to the community by employing any of the hitherto accepted bases of valuation. How is it possible to compare the value of a rectangular lot 30x100 feet with an irregularly shaped lot in the same locality containing the same area? Any scientific system of land valuation must take into consideration all of the physical factors which affect land values separately, and must devise methods by which their relative importance may be determined with a fair degree of accuracy.

But when we have considered all the external physical factors influencing the relative importance of urban sites to the life and activity of the community, in the final analysis the concept of usefulness or utility or the measure of relative importance is subjective; it is psychological. Accessibility due to external factors would be meaningless and insignificant if such accessibility were not conducive to gratifying human desires.

But the comparative usefulness of separate tracts of urban land is reflected in the community expression of opinion, in the community judgments of the relative importance of these tracts for the purpose or purposes for which, in the opinion of those best able to express an opinion, the land is best suited. As a rule when an individual is willing to pay a certain price for a site (although he may not be able to acquire it for that price) he has in reality estimated the relative importance of that particular site to the community in connection with his possible ownership of it. It possesses value for him either because of the patronage which he expects to receive in that particular locality or because it is accessible to the source of his income, and he weighs such patronage or such accessibility very carefully. His opinion of its importance to him is reflected objectively in the price he is willing to pay for a site in that particular location. It is his expression of opinion regarding the value imparted to a certain location by virtue of its accessibility to the life of the community; it is his estimate of the value of the socially created product, the value of the land.

But one man's opinion does not suffice. It is a matter of primary importance that any scientific system of land valuation should endeavor to record the judgment, the opinion of the community at large, or at least of a representative group of citizens, as to the relative importance of various locations in the community to the life and activity of the community. The judgment of one individual, or even of a few individuals, no matter how sound their observation and how thorough their knowledge, is inadequate to completely estimate this importance, particularly if they continue to employ the evidence employed heretofore as a basis of their judgments. Not until their judgments are based on accurate observation and analysis of fundamental facts as to the relative importance of locations can we hope to achieve a greater degree of scientific accuracy in land valuation.

The question may be asked, Is it always possible to obtain an expression of community opinion as to the comparative usefulness of urban sites? Are people always ready and willing to give the information which they possess?

Experience has shown that a person will usually not hesitate to express an opinion when his own interests are involved. The question of accurate land valuation for purposes of taxation is one which affects every taxpayer, either directly or indirectly. As a rule it is relatively easy to arouse interest in the question of equitable assessment, and if taxpayers know that they themselves have been instrumental in establishing the uniform basis of land valuation much of the dissatisfaction with the present methods of land valuation for taxation purposes will be removed.

But the principles of urban land valuation here developed are not merely applicable to the problem of land valuation for purposes of taxation. They constitute the basis of scientific land valuation for any purpose whatsoever. When public interest is not at stake it may be found difficult to obtain community expression of opinion as to the relative importance of urban locations, on which a uniform system of land valuation must be based.

It thus becomes necessary to devise other methods of obtaining an expression of opinion as to the comparative value of urban sites. By consulting real estate dealers, trust and credit officers of banks, property owners, assessors, and other members of the community familiar with land values, as to their opinions of the comparative usefulness as well as the actual values of certain locations, accurate unit-foot values can be established for such street locations. These can be made the basis for computing the values of the particular sites in question. But whenever unit land values are adopted for any purpose they should not merely express the best opinion obtainable by the appraiser, but should also be opened to public review and criticism at all times. In this manner many members of the community will gradually acquire the experience and training requisite for an accurate expression of opinion as to location values.

No matter how the unit-foot values are obtained, the appraiser should spare neither time nor effort to obtain the best opinions regarding their accuracy, as they will form the basis for his computation of individual site values. The more nearly that unit prices coincide with the opinion of the community as a whole, the more acceptable will be the result of the valuation thus ascertained.

No process of valuation can be reduced to an exact science, but must remain partly descriptive. Human judgment, which is not infallible, is an all-important factor in any process of valuation. By standardizing the methods of expressing human judgment, and by and with the aid of definite mechanical devices or mathematical computations for applying such judgment uniformly, we can attain a degree of accuracy in urban land valuation which heretofore does not appear to have been attained.

CHAPTER VII

SCIENTIFIC PROCEDURE IN DETERMINING URBAN SITE VALUES

REQUISITES OF A SUITABLE AND CONVENIENT QUANTITY-UNIT IN TERMS OF WHICH URBAN SITE VALUE COMPARISONS CAN BE EXPRESSED—THE UNIT-FOOT DEFINED—RECOGNIZES DECREASE IN VALUES OF INCREMENTS IN DEPTH OF SITES—DEPTH PERCENTAGES AND DEPTH CURVES—WHO IS COMPETENT TO EXPRESS AN OPINION AS TO URBAN LAND VALUES?—OPINIONS CAN BE EXPRESSED ACCURATELY IN TERMS OF A QUANTITY-UNIT—METHODS OF EXPRESSING COMPARATIVE VALUES OF UNIT-QUANTITIES—RECORDING OF VALUE OPINION—CONSTRUCTION AND USE OF LAND VALUE MAPS AND LOT AND BLOCK MAPS—REQUISITES OF AN ACCURATE SYSTEM OF URBAN LAND VALUATION SUMMARIZED.

WE have noted in the preceding chapters that urban land values are in reality reflected in the expression of the opinion of the community, with reference to the relative importance of different streets. We have indicated why the customary methods of recording urban land values in terms of unit quantities, such as the front-foot or square-foot, are inadequate. Let us now consider, first, the requisites of a suitable and convenient quantity-unit which can serve as a convenient measure in terms of which to compare land values, and second, the method of applying this unit in accurately recording individual and community opinion of the relative importance of various streets to the life of the community.

The quantity-unit in terms of which relative land values may be accurately expressed is the unit-foot. The unit-foot may be defined: *A unit of area extending one foot along the street frontage and at right angles to the street frontage, to an agreed depth, affected by single-street accessibility.* For the sake of simplicity it has been found that the most convenient area for a constant uniform unit of quantity is one foot frontage, 100 feet deep. While efforts have been made to establish other depths as proper bases for determining a workable quantity-unit, it will be found that 100 feet is the most convenient depth for practical valuation purposes, and the adoption of that depth prevents the confusion of thought sure to arise when other depths or more than one quantity-unit is attempted.

This unit is devised upon the principle that a unit of urban site area, like the yard for measuring cloth, must be large enough to facilitate calculations, yet small enough to be readily comprehended. Its width of one foot recognizes the fact that the front-foot, though not a unit of area in itself, may readily serve as one of the two dimensions of such a unit. Its depth or length of 100 feet coincides approximately with the depth of an urban site at which land values due to depth tend to decline rapidly. In many cities, such as New York, Denver, and Portland, Oregon, a large majority of the city lots are 100 feet deep, and the unit-foot does not require translation to determine front-foot valuation.

Theoretically this decline in value of additional feet in depth begins with the second foot of depth from the street line, each additional receding foot being worth less than the foot immediately preceding it, as the rear lot line recedes from the street. This theoretical decline in value attains practical significance at a depth of approximately 100 feet, although its importance must also be borne in mind in computing the values of sites less than 100 feet in depth.

How can this decline in the usefulness of successive increments in depth be ascertained with mathematical accuracy? If we assume that the decrease in the value of successive units of area is uniform it can be represented graphically by a regular curve. Observation of land values, made by recognized authorities, tend to show that of two regular lots similarly located and affected by but one street influence, both having the same frontage, but one extending in depth fifty feet and the other one hundred feet, the former will absorb from the street more than one-half as much usefulness as is absorbed by the lot double its depth. This is in accordance with the observation that the areas nearest the street frontage are more valuable than those farther away from the street. Similar observations have been made in many cities regarding regular sites of varying depths, and on the basis of such observations certain averages have been obtained of the comparative values of similarly located regular lots possessing a single element of street accessibility, having the same frontage but varying in depth. Knowing the percentage of the total value of a lot 100 feet in depth absorbed by a similarly located lot of 50 feet in depth, and another, let us say, of 10 feet in depth receding from the street frontage, and affected by but one street influence, a curve may be constructed which will make possible the computation of the relative values of all square feet of land area within the unit-foot. In other words, if the unit-foot absorbs 100 per cent of the value, the percentage of this total value absorbed by every square foot within the unit-foot can be computed. This is the basis of the calculation of the so-called depth tables showing depth percentages which have been devised for computing land values.

✓ Having decided upon the basic unit of quantity for land valuation, the next step is its accurate application to record individual or community opinion of relative site values. Who is competent in any community to express an opinion as to land values? This question cannot always be answered by examining the rules concerning testimony affecting land values acceptable by courts. Notwithstanding the fact that the giving of testimony is usually limited by courts to dealers in land, expert appraisers, assessors, and so-called authorities on land values, a sufficient qualification to testify exists if the witness is a resident or property owner in the community. The courts are usually hampered by statutory rules and precedents in the acceptance of expert testimony, and much valuable information obtainable from citizens as to the comparative usefulness of locations in the community is ruled out as inadmissable. If courts were permitted to employ experts without allegiance to either party at interest they could often secure evidence that would greatly aid in establishing the facts covering the usefulness of litigated sites. If such evidence can be standardized in the form of its expression and accurately recorded, a forward step will have been taken in the effort to establish land valuation on a scientific basis.

Accurate expression of a consensus of community opinion of land values can be attained only if such expressions are in terms of a common unit of quantity and applied to a single external factor of value. It is therefore essential that land values should be resolved into single-street unit-values, reflecting the influence of the primary external value-factor, namely, location with reference to a single street. Since the primary external factor of value of urban land is street accessibility, it has become customary to speak of unit-foot valuations as street valuations. In the following discussion, street values, street unit values, unit-foot values and unit land values will, therefore, be used interchangeably.

Expression of unit land values in monetary terms under prevailing practices involves difficulty. Many members of a community may be fully conscious of the relative importance, the comparative usefulness of different locations, and yet be unable to express the value of any unit area in monetary terms. Which is the most important unit-foot location in this or that town or city may be a matter of common knowledge, but the monetary value of individual sites or of a unit-foot of single-street accessibility in a particular location may be the knowledge of relatively few, and even among them decided differences of opinion may arise.

The relative importance of locations may be expressed either in terms of percentages or in terms of monetary units. If, for example, it is found that one location, affected by but one street influence, is twenty-five per cent. less valuable than another location, this fact can be expressed in terms of relative values, 100 per cent. and 75 per cent. respectively. If the fair value of a unit-foot in the 100 per cent. location is $1,000, the corresponding value of the 75 per cent. location will be $750. In like manner unit values may be placed on streets either in terms of relative values or in monetary terms. The one can be readily deduced from the other.

When, however, the best opinion of an individual or of a community as to the relative importance of locations due to street accessibility has been ascertained, the next step necessary is the accurate and clear recording of this information so that it can be visualized by everyone. For this purpose unit-value maps are indispensable. Such unit-value maps should show only the street lines; all lots and usually the alley lines are omitted. While it is well to draw the maps to scale, it is advisable to exaggerate the width of the streets, particularly if two sets of figures are to be entered, because of the necessity of writing in the street spaces variations in unit-foot values on opposite sides of the same street in the same locality. By placing the names of the streets inside the block lines, the street spaces are left entirely free for inserting unit-foot valuations. Diagram I shows such a map of a section of a city at the point where the highest land values pertain.

When valuations have been marked on the unit-value maps on every street in a community, and when these valuations have received the general approval of the members of the community, the comparative values of interior lots can be

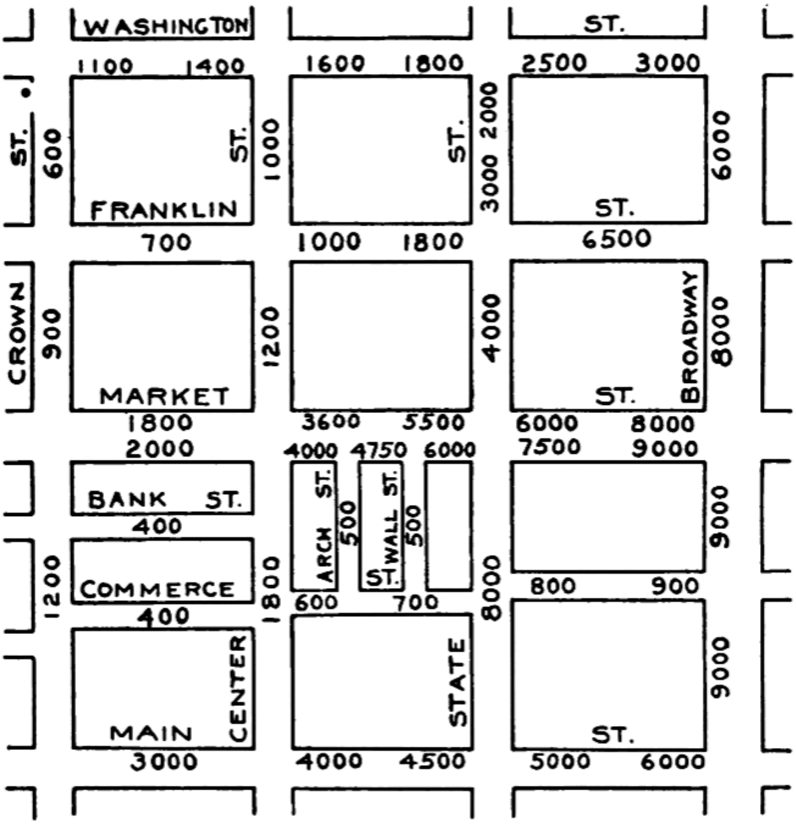


DIAGRAM I

Illustrative Unit-Value Map Showing Method of Recording Opinion as to Single-Street Unit-Foot Values for the Central Business Section of a City.

computed with the aid of a depth percentage previously devised. For purposes of recording the information thus obtained it is essential to employ lot and block maps, showing clearly the exact shape and dimensions of every individual parcel of land. In this manner it is possible to compute

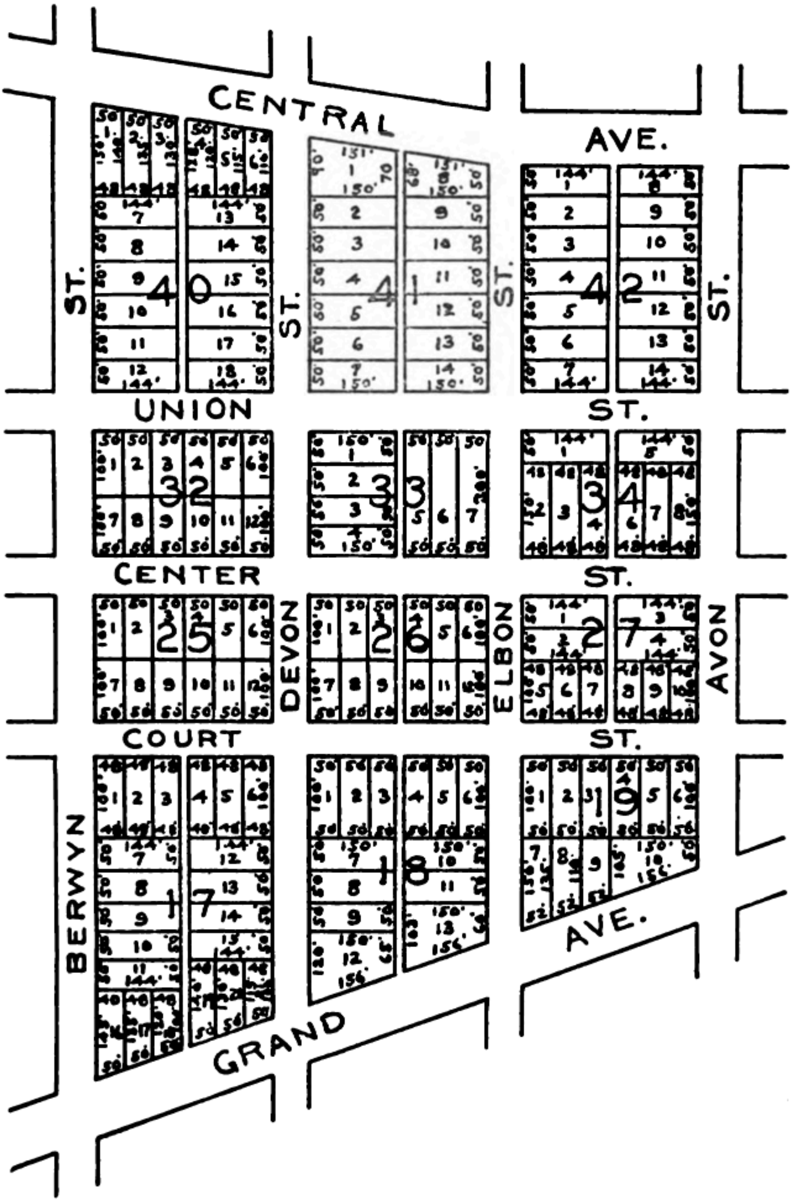


DIAGRAM II

Lot and Block Map, Illustrating the Division of City Blocks into Individually Owned Lots, with Systematic Numbering of Lots and Blocks clearly the valuation of every lot. Diagram II, page 43, is an illustrative lot and block map.

But at times the value of an urban site is affected by two or more street influences, when located at or near the intersection of two or more streets. The accurate computation of such corner influence, as it is commonly called, must be based on the generally observed fact that the increase in value of a corresponding interior lot due to two or more street influences tends to decrease as the distance from the street corner increases until it finally vanishes. Unless the increase in value due to corner influence is properly distributed over the areas affected by such influence, scientific accuracy in computing "corner influence" cannot be attained. If, for example, it is discovered that because of the possible window display space in a retail business district the first 100 square feet at the street corner are more valuable than 100 square feet removed, let us say, 50 feet from the intersection of the two streets, this fact should be reflected in an accurate computation of street corner influence upon urban site values.

In like manner the effect upon every unit area of land, due to such secondary physical factors of value as alleys, railroads, canals, and other means of accessibility subordinate to the street frontage, must be separately estimated and computed if we may hope to attain greater precision in analytical methods of determining land values. A scientific system of urban land valuation must appraise each of these factors separately. Without accurate observation and recording of opinion as to the value imparted to each land site by these factors, as well as the regular distribution of such values over the areas affected by them, scientific appraisals may not be accomplished.

On the basis of the foregoing analysis the requisites of an accurate system of city land valuation to be used for taxation or other purposes may be summarized as follows:

1. Community expression of opinion (or individual opinion based upon an interpretation of community opinion) of the relative values of streets and parts of streets and highways.

2. Expression of such opinion in terms of price of definite units of quantity, with reference to the primary external factor of value, single-street accessibility.

3. Recording of community or individual opinion in terms of price of unit quantities on unit-value maps.

4. Computation by the use of depth percentages, based upon the observation that the value of each increment to the depth of a site tends to decrease as the depth increases.

5. Computing or estimating other external factors of value, individually and separately, based on careful observation of the effect of these factors upon the value of each unit of area of a site.

6. Computing and recording, on lot and block maps and on permanent record cards, the valuations of individual sites.

These requisites constitute the basis of the Somers Unit System of land valuation. The system was the first comprehensive attempt to apply each of the foregoing principles to the practical problems of land valuation. Although the Somers System has been the subject of much discussion, often based on lack of understanding, it is undoubtedly the most scientific, elaborate and systematic method for the comparative valuation of land that has ever been employed. Before proceeding with the analysis of the Somers Unit System it is necessary to understand clearly the mechanical aspect of the valuation process.

CHAPTER VIII

MECHANICAL ASPECTS OF APPRAISING URBAN LAND

TWO STAGES IN THE APPRAISAL PROCESS—EXERCISING HUMAN JUDGMENT AND COMPUTATION ON THE BASIS OF SUCH JUDGMENT—MECHANICAL SYSTEM OF APPRAISAL MUST BE APPLICABLE TO COMPUTING RELATION OF SITE VALUES FOR VARYING DEPTHS AFFECTED BY EITHER ONE OR MORE STREET INFLUENCES—MUST ALSO BE APPLICABLE TO COMPUTING OR ASCERTAINING THE IMPORTANCE OF SECONDARY FACTORS OF VALUE—PRINCIPLES OF COMPUTATION OF SITE VALUES ILLUSTRATED—THE PROBLEM RESTATED—THE BASIS OF THE SOMERS SYSTEM OF APPRAISAL.

WHEN an appraiser has passed final judgment on the relative importance of street unit locations within a given area, based upon the formal expression of opinion and verified by community discussion and approval, the second step in the valuation process consists in allocating the values thus expressed proportionally to every tract of land area. This process constitutes the mechanical or mathematical aspect of land valuation.

The two distinct stages in the appraisal process should be clearly differentiated. The first is based on exercising human judgment. It is descriptive rather than exact. It cannot be reduced to an exact science, since the human factor, the subjective element, is involved in the expression of value-opinion. The second stage in the appraisal process, however, is based on an exact science, on mathematics. The mathematical computations of site values can be made with scientific accuracy when the unit land values have been accurately appraised. The basis of such computations will be discussed in this chapter.

Any mechanical system of appraisal employed to compute values of city sites, after the value of the unit-foot has been determined, must be applicable in calculating:

1. The relations of values for varying depths based on the principle of decreasing value for each foot of frontage as it recedes from the street, as found in actual experience.

2. The increase in value of sites at or near street corners, and the extent of corner influence.
3. The variations in value for every possible combination of street unit-valuations.
4. The relation existing in the values of two sites, one with an alley advantage and one without.
5. The values of sites at acute and at obtuse corners.
6. The relation of the values of irregularly-shaped sites to the values of the unit-foot.
7. The effect upon site values of other secondary external factors of value, such as alleys, railroads, waterways, plottage and the like.
8. The deteriorating effect of topographical irregularities and natural barriers. This is a question of judgment to be exercised before or after computation and the percentage or amount of deterioration should be deducted from the computed valuation.

A system which does not furnish the necessary data for computing or estimating the effect upon value of all these factors is incomplete. Rules for merely computing the values of inside lots, affected by a single-street influence, do not constitute an accurate system of land valuation. In the business districts of any large city such rules would probably not assist in the proportional valuation of more than 15 per cent. of the sites. A percentage rule providing for computing the enhancement in value of corner lots over inside lots is not a system applicable to all corner lots, and there is no real estate expert or assessor who can successfully rely on his guessing ability as to what the exact enhancement in value at a corner is. The relationship of the value of a corner lot, subject to intersecting street influences, can be expressed with mathematical precision, even as the simple relationship existing between the valuation of two inside lots can be expressed with mathematical accuracy, knowing the unit-foot values of the single streets upon which the lots front.

In general, we may thus formulate the law of appraisal: A definite calculable relationship exists between the values of all sites affected by the same street influences of community accessibility.

This generalization is the basis of the mechanical or mathematical aspect of the appraisal process. Its applicability can be readily illustrated. Let us take two city lots, A and B, each

50 feet wide and 100 feet deep, equally accessible as illustrated in Diagram III.

The comparative usefulness and hence the value of these two lots is exactly the same. It is thus easy to express the relationship existing between the values of these identical lots. It is as one is to one. Let us now increase the size of Lot A, making it 5 feet wider than before, without changing the size of Lot B, as shown in Diagram IV, page 49.

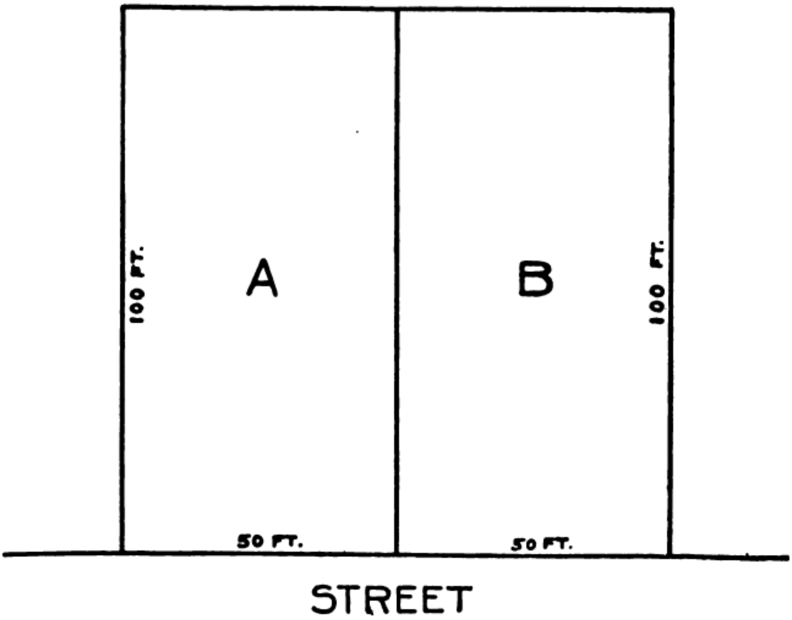


DIAGRAM III

Two Lots Equal in Size, Similar in Shape, Illustrating Similarity in Location Value.

It is relatively simple to calculate the relationship in the values of these two lots of different frontages, with identical depths. Lot A will be worth one-tenth more than Lot B. We have merely added to the 50-foot lot the value of the 5-foot frontage, 100 feet deep, which is one-tenth of the size of Lot B.

If we now assume Lot A, 50 feet in width, as in Diagram III, but increase the depth by 10 feet, keeping Lot B unchanged, as shown in Diagram V, then Lot A will be worth more than Lot B because it is deeper.

However, the problem of computing the increase in value of Lot A is not as simple as in the preceding illustrations. The areas added to Lot A in both cases are exactly the same, namely 500 square feet; but it is found upon investigation that 500 square feet so located that 5 square feet front on the street line, as in Diagram IV, Lot A, with the remaining 495 square feet lying behind it, is more valuable than 500 square feet, none of which is located nearer than 100 feet from the street line, as in Diagram V, Lot A. Nevertheless it is obvious that a definite calculable relationship exists between the values of Lots A and B in Diagram V. Any system of mechanical land valuation must provide the necessary data to compute the comparative values of the two lots illustrated above. The examples here used by way of illustration are

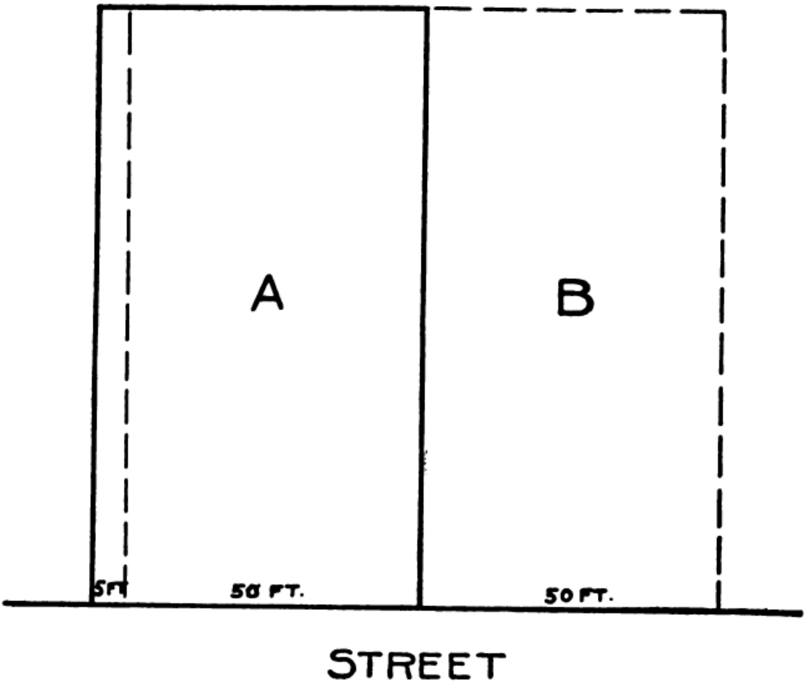


DIAGRAM IV

Illustrating Proportionate Effect of Increased Value of Increased Frontage Where Lots Have Identical Location Advantage.

relatively simple, although many city lots actually have the same frontages but vary in depth, as is illustrated in Diagram V.

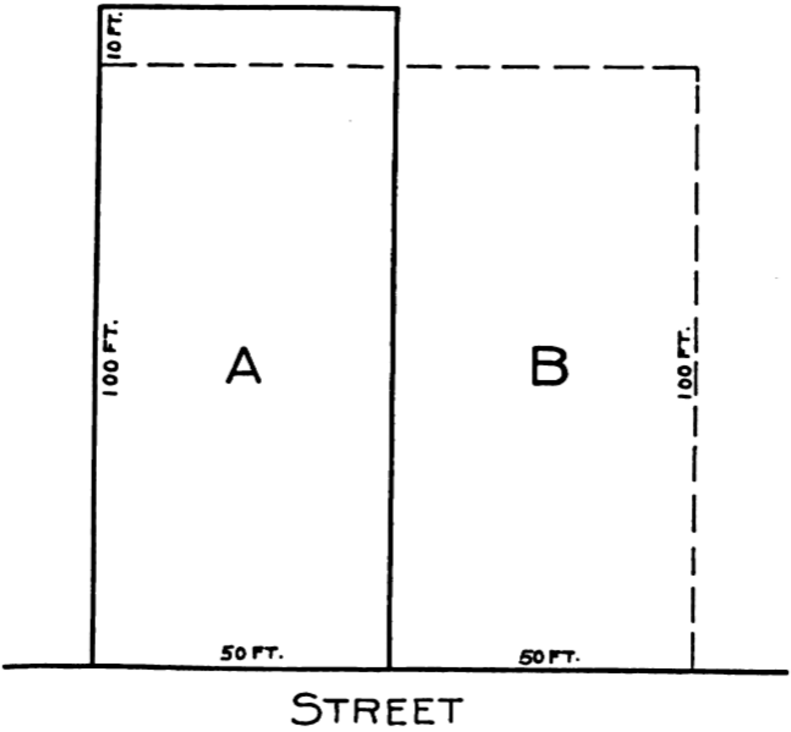


DIAGRAM V

Illustrating Disproportionate Increase in Value of Lot A Because of Increase in Depth as Compared with Lot B.

That a calculable relationship exists between urban sites affected by a single-street influence is recognized by most land appraisers. Practically every appraiser attempts, in some way or another, to solve valuation problems by assuming the existence of such a relationship. Some of these attempts are altogether inexact. Others are based on inaccurate observation of facts, or represent a blind intuitive groping for a solution. Where the appraisal problems are simpler such intuitive methods may appear adequate, but when the least difficulty or complication is encountered they fail to function.

But the definite calculable relationship between city sites is not limited to sites affected by a single-street influence. The value of a corner site is the result of the simultaneous operation of two or more component forces, measured by two unit-foot values, influencing the corner site from different directions, depending upon the angle at which the streets happen to intersect. Knowing the unit-foot values of the two intersecting streets, it is possible to compute, with a fair degree of accuracy, the effect upon the value of the corner site at these two intersecting streets, simultaneously affecting the value of the lot—the streets having been separately appraised under the unit-foot plan—and to distribute the computed values proportionately.

The solution of the problem of determining the exact distribution of the relation of values existing between sites affected by two street influences must be based on sound observation of facts. Any arbitrary rule, if set up, must be carefully tested by numerous experiments and proved reliable before it can be accepted for practical purposes of land valuation. In other words, the problem of mechanically computing land values must be approached both inductively and deductively. Generalizations must be established on the basis of observed facts, and must subsequently be repeatedly tested as to their accuracy and reliability.

This has been accomplished by the inventor of the Somers Unit System of land valuation. The mechanical features of the system comprise practical rules, developed in the form of a series of tables expressing the calculated relationship between the values of sites affected by similar street influences, as well as between any two or more parts of any one site, based on the best obtainable opinion of the relative importance of streets and of other means of accessibility. They have been referred to as "fixed rules of experience" and represent the first successful attempt to translate community opinion of the comparative usefulness of land into actual valuations by means of definite mathematical computations.

We may thus conclude this analysis of the underlying principles of scientific land valuation by once more stating clearly the two-fold nature of the valuation process:

1. Accurate ascertainment of opinion regarding the relative importance of different street locations, expressed in terms of definite unit areas.

2. Interpretation of this opinion by means of mathematical computations, so that the valuations will be proportionally distributed over the separate sites.

In the following chapters the Somers Unit System of land valuation will be expounded and illustrated with a view to indicating the methods applicable to the practice of scientific land valuation, both in its relation to the problem of equitable assessment of land, and in appraisals for commercial purposes. While much attention is given in the chapters which follow to the detailed explanation of working out community appraisals for taxation purposes, it should not be understood that this is the only field in which the Somers principles may be successfully applied. The individual appraiser, by following the methods described, may more accurately analyze his lump-sum opinions. He may personally judge the single-street values, and may standardize his judgments to conform with the variations from normalcy which each site possesses. Practical experience has demonstrated that the best and most accurate unit-foot valuations can be expressed as appraisals of the comparative usefulness of the streets. The sincere appraiser is one who carefully undertakes to interpret community opinion as to comparative street usefulness.

One of Mr. Somers' maxims was: "To ascertain the value of anything, ask one who knows. His answer will be what he thinks it is worth, based upon what he thinks others think it is worth." The community knows the comparative street values, and the Somers System provides a vehicle for the expression of that knowledge, and for computing from this street-value factor common to all city sites, actual site values.

PART II

PRACTICE OF LAND VALUATION

CHAPTER IX

AROUSING PUBLIC INTEREST AND PROVIDING MEANS FOR RECORDING OPINION

SOMERS SYSTEM DEVELOPED PRIMARILY TO AID IN THE VALUATION OF LAND FOR PURPOSES OF TAXATION—AROUSING COMMUNITY INTEREST IN UNIFORM REAL ESTATE ASSESSMENT—AGENCIES AVAILABLE FOR PUBLICITY—ORGANIZING CITIZENS COMMITTEES OR COMMUNITY MEETINGS—TWO PRACTICAL METHODS OF ACCOMPLISHING SIMILAR RESULTS—ALL MEETINGS OPEN TO THE PUBLIC—EFFECT OF EXCHANGE OF OPINIONS AS TO URBAN LAND VALUES—EXPLANATION OF THE NATURE OF THE UNIT-FOOT ADOPTED BY MR. SOMERS—PREPARATION OF LAND VALUE MAPS—USE OF LOT AND BLOCK MAPS—CALLING TOGETHER COMMITTEE OR PUBLIC MEETINGS TO FIX TENTATIVE RELATIVE LAND VALUES.

THE general principles underlying a scientific system for land valuation in centers of population, based on careful observation and analysis of facts, have been outlined briefly in the preceding pages. Their practical application, as developed by the Somers System of land valuation, constitutes the second part of this work. The underlying principles will be restated from time to time to indicate the manner in which they are applied in practice.

Inasmuch as the problem of uniform and systematic land valuation is of particular significance for purposes of taxation, the following discussion presupposes this purpose but, as was pointed out before, the basic principles of land appraisal apply equally to appraisals of land values for any purpose. When unit-foot land prices have once been established, either for taxation or for other purposes, they can be employed as the basis for computing individual site values with the aid of the Somers System methods.

The first requisite for the successful installation of a scientific system of land valuation in any community for taxation purposes is to arouse the interest of the community in the movement. In other words, the common knowledge possessed by any representative group of citizens in a town or city regarding land values, heretofore lacking in expression, must be solicited, expressed and recorded. This is fundamental, since it represents the translation of community opinion into either relative or actual monetary land values.

Public interest can be readily enlisted through the coöperation of the newspapers and of public-spirited citizens, most of whom will be found in the membership of Business Men's Associations, Chambers of Commerce and civic clubs, not forgetting the Mayor, Aldermen, Assessors and other public officials, as well as the women, who in their patronage of the retail stores with their big purses are chiefly responsible for relatively high land values in business centers. The newspapers of any town or city will print the news that the Assessor, for the first time, is preparing to employ scientific methods in assessing the taxable land of the city, and that he desires the whole-hearted coöperation of all citizens.

When the Assessor has excited a fair degree of local interest in his appraisal experiment, he may take his second step, which is to either organize a citizens' committee or to call a meeting of citizens for the purpose of sounding opinion as to the relative importance of sites on the street frontages in the central business sections of the city.

All meetings, either of committees or of the community at large, for the consideration and discussion of land values, should be given the largest possible publicity. The Assessor will make a great mistake if he allows private hearings, or if he refuses any citizen or taxpayer the right to be heard. One must not lose sight of the fact that all citizens have an interest in the valuation of every parcel of land, particularly if such valuation is to be made the basis for levying taxes.

It is a legitimate concern of each citizen of a community that his particular site shall not be appraised at a figure so high as to make his taxes excessive, relative to those of other property owners. But it is equally important that it shall not be appraised at a figure so low as to make his taxes relatively less than others'. Citizens who own no city land at all, but whose taxes on personal property would be disproportionate if building sites were undervalued for tax purposes, are similarly concerned. Therefore the public at large should be given every opportunity to discuss the methods and results of the new assessment plan, and to voice their opinions as to the validity and fairness of the methods and the results.

The expression of varying opinions on the same subject usually invites argument. This general truth applies in particular to the discussion arising from opinions concerning the relative usefulness of the street locations of a community, when the question of taxation is involved, and ultimately serves to develop the best opinions held by citizens. Public conflict of opinion will tend to smooth over differences which arise at first, and aid in reducing the final range of differences in opinion regarding relative street usefulness to a minimum. Thus the Assessor, acting as judge, has comparatively little difficulty in arriving at his conclusions. His final judgment will conform very closely to that expressed by the citizens' committees or by the community at large after agreeing among themselves, and practically all will in the end be satisfied with the final decision of the Assessor as to both relative and the actual monetary values of street locations. The validity of this contention in any city where reassessment is undertaken in good faith, along lines here suggested, has been proved many times in actual experience.

Since the ultimate objective of the citizens' committees or of the public gatherings, to be described in the following chapters, is to establish actual unit-foot values for all the street fronts, based on the best opinion in the community, it is essential that the nature of the unit-foot to be adopted should be clearly and concisely explained by the Assessor, and the reasons for its adoption carefully stated. This may be accomplished by a series of analytical articles, published in the local newspapers, as well as by explanations made to citizens' committees or at the public meetings. It is advisable that the Assessor should, as soon as possible, allow the people to cultivate the habit of expressing opinions regarding land values in terms of a definite unit of quantity, in which terms their opinions are ultimately to find expression. It is not difficult to quickly guide the community to the practice of talking of land values in terms of street unit-foot values.

The unit-foot adopted by Mr. Somers is a unit of area, one foot wide and 100 feet long. It was devised upon the principle which has been previously stated, namely, that a unit of city site area should be large enough to facilitate calculation, yet small enough to allow of clear comprehension. Its width of one foot recognizes the fact that the front foot, though not a unit of area, is one of the two dimensions commonly employed to express a definite area, while its length of 100 feet coincides with the average minimum depth of city sites at which values due to depth tend to declined rapidly. Theoretically, as pointed out in a previous chapter, this decline in value begins with the second foot of depth from the street line, but it attains decided practical significance at a depth of approximately 100 feet. For this reason the length or depth of the Somers unit of area for expressing opinion of land values is fixed at 100 feet. The value-effect of greater or less width is of course readily determined—the value per unit-foot having once been ascertained—by multiplying that valuation by the number of feet of frontage. Conversely, knowing the total value of a regular site, let us say, 20 by 100 feet, it is relatively simple to ascertain the value of the unit-foot by dividing the feet of frontage into the total value.

In order to be able to record initial relative land values and ultimate unit-foot land values, ascertained in the manner to be explained in the following chapters, the Assessor should have outline unit-foot maps of the city or of definite sections of the city prepared. These maps are constructed so as to clearly show street frontage lines of blocks, but no lot or site boundaries are indicated. In small towns the entire area of the community can be shown on one map, but in larger cities it is necessary that the maps should be divided into convenient districts or sections. As previously explained, in order to record street frontage values, it has been found expedient to exaggerate on the unit-value maps the width of the streets, and to place the names of the streets inside the block lines. In this manner the street spaces on the maps are available for recording the unit-foot values, and two sets of figures can easily be inserted to indicate unit-foot values on opposite sides of the streets or at different parts of a long block on the same side of a street.

It is frequently advisable that reduced copies of these maps should be printed on small slips for circulation throughout the community, and that zinc etchings of unit-foot values should be made for newspaper publication. For posting in public places and for use at community meetings, enlarged copies of these maps should be made which are fairly legible from moderate distances. Diagram VI serves as an illustration of a unit-foot valuation map without any unit-foot values as yet entered.

The construction of unit-foot land valuation maps is an important adjunct to any system of land appraisal. It does not merely facilitate the recording of unit-foot values on the part of citizens' committees and at public meetings, but also constitutes an important aid in visualizing the actual locations of the blocks on which unit-foot values are to be placed. It has been found in practice that without the employment of such maps it is practically impossible to secure intelligent public discussion and criticism of tentative unit-foot values.

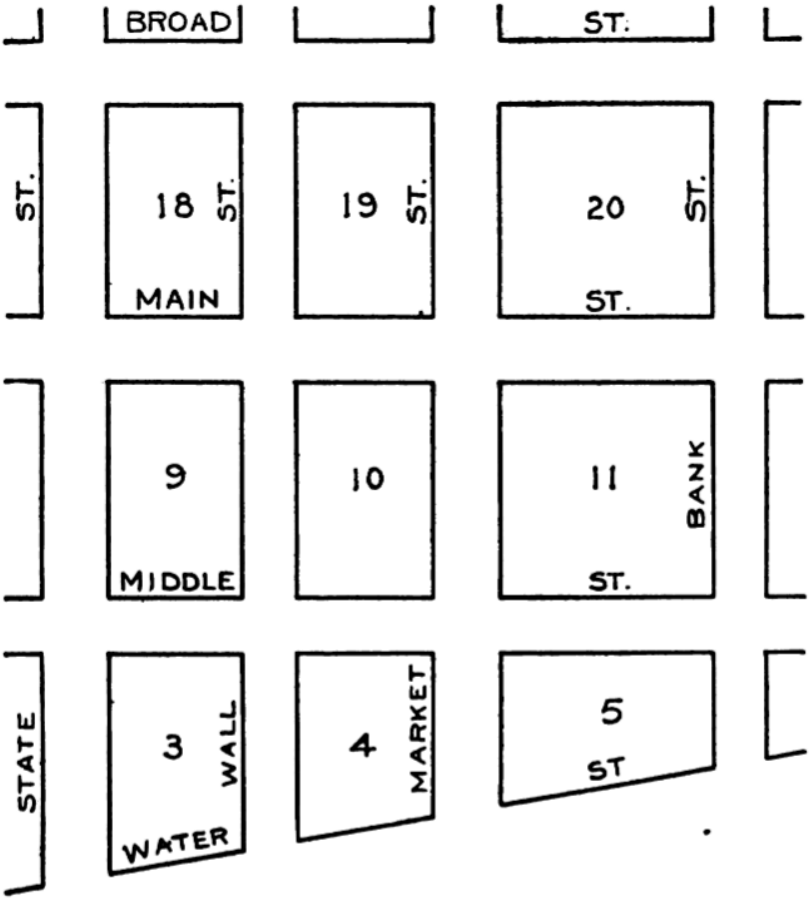


DIAGRAM VI

Unit-Value Map Before Appraisal of Street Values, Illustrating Exaggeration of Street Widths to Facilitate Recording of Value Opinion.

The unit-foot land valuation maps, as has been pointed out before, differ essentially from lot and block maps, which are employed as an inventory of the land to be computed, and also to record the computed valuations of individual sites after the unit-foot values have been finally established. The

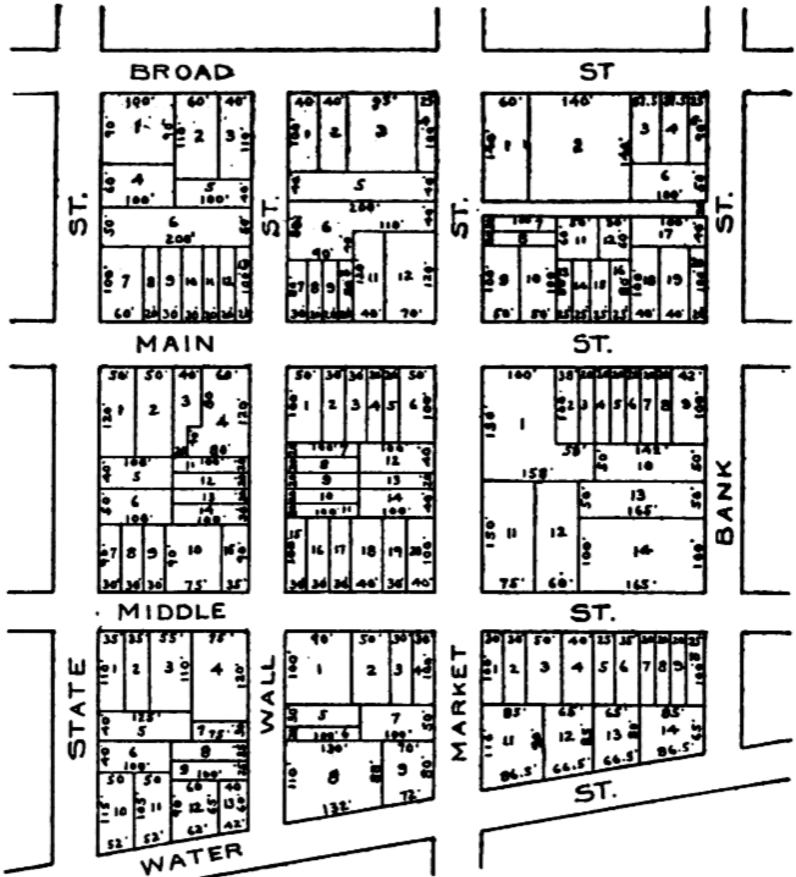


DIAGRAM VII

Lot and Block Map, Illustrating the Recording of Dimensions Inside Lot Lines.

lot and block maps should be drawn to scale and designate the exact boundaries of each lot. In larger cities the land areas are divided into a number of districts or sections, both for unit-foot land valuation maps, and for lot and block maps.

The sections are numbered consecutively, as are also the lots and blocks. In this manner it is relatively easy to designate specific lots, such as Lot 1, Block 2, Section 3, as shown in Diagram VII, on the preceding page.

Experience has shown that simplicity of expression and clarity of presentation are important adjuncts to the successful utilization of uniform methods of land valuation. Where public opinion is to be standardized and systematized it is a matter of vital importance that the public should understand clearly and concisely what function it is to perform. The Assessor, acting as judge, must therefore possess the happy faculty of presenting his plan of valuation with clarity and precision, or must employ expert assistants to help him. Whatever mechanical devices can be discovered to facilitate his work of presenting clearly the principles and practice of scientific land valuation, should be employed.

Having aroused public interest in the movement for an assessment of the city land by enlisting the aid of the community, and having provided the necessary maps on which to record the views of organized citizens' committees, or, if deemed advisable, on which to record community opinion at public meetings the Assessor proceeds to call his committee or a meeting of the public at large for the purpose of obtaining community assistance in determining the relative values of the streets, to serve as the foundation for an equitable assessment of the real estate of the city.

CHAPTER X

PRACTICAL METHODS OF ESTABLISHING RELATIVE URBAN LAND VALUES

THREE METHODS OF PROCEDURE POSSIBLE—ASSESSOR MAY MAKE UNIT APPRAISALS, SOLICIT AID OF CITIZENS' COMMITTEES OR LET THE COMMUNITY EXPRESS ITS OPINION AT A PUBLIC MEETING—RELATIVE MERITS OF THE THREE METHODS ILLUSTRATED—AN EXPERIMENT—NOT ALWAYS NECESSARY TO ASCERTAIN RELATIVE VALUES, BEFORE FIXING UNIT-FOOT VALUES FOR DIFFERENT STREETS—USUALLY THIS METHOD OF PROCEDURE IS MOST EXPEDIENT.

THERE are several practical methods of procedure which the Assessor may follow after the preliminary publicity work has been completed:

1. He may, from his knowledge of conditions within his city, personally determine the comparative usefulness of streets, and personally determine the unit-foot value of each single street to the land fronting thereon upon each block.

2. He may organize a committee of local real estate men, bankers, owners of central property, or other public-spirited citizens with a capacity for public business, to assist him in determining street frontage values.

3. He may take his whole problem directly to the community, and undertake to secure from the members of the community in joint meeting at first hand the information that will guide him in the initial act of comparing street values with street values throughout the city.

In any city special conditions may exist which make one of the three foregoing plans advisable, in preference to the others.

If the Assessor is a man who is thoroughly conversant with conditions affecting the use of real estate in his city; if he is conversant with selling and asking prices of land, the trend of city development, the actual and potential city growth in certain sections, the decadence or changes of utility in other sections, he can save much time by personally undertaking the appraisal of the tentative unit values in terms of dollars. These he may mark upon unit-value maps, publishing the maps in the newspapers with appropriate explanations, and then call meetings for the public discussion of the valuations. He should be careful to explain that the prices placed on different streets are tentative only, and subject to modification upon information which may be brought out by public discussion.

The second method of achieving the same results—the appointment by the Assessor of a group of representative citizens to serve as a volunteer committee, to appraise tentatively the street frontages, either in percentages or in dollars—has operated successfully in many Somers System installations. Usually this committee consists of from five to ten intelligent citizens—real estate men, bankers, merchants—men and women with knowledge and capacity for intelligent judgment. They need not all be owners of taxable real estate. In one city (Johnstown, Pa.) the chairman of the committee was an active Methodist minister who successfully managed the parliamentary and social side of the work, including the task of presiding at public meetings to discuss the tentative unit-values, while his citizen associates exercised the judgment necessary to make actual valuations. In Winsted, Conn., and Jamestown, N. Y., committees of capable business men under expert guidance performed the entire task of unit-foot valuation.

The third plan, that of presenting a map to the community, showing the block outlines, without values in any form, and asking the citizens to take the entire work of fixing unit values in their own hands, is more cumbersome, although in cities of comparatively small population it is easily workable, when properly managed. In one city of about 4,000 population—Easton, Maryland—unit-foot values were determined for the entire city at a single public meeting, participated in by about 400 persons. These unit-foot values, after being carefully reviewed by the Assessor, were found to be substantially accurate, and with slight modifications were adopted as the basis for lot computations, with results that were so satisfactory that the entire City Council was unanimously nominated and reelected. Moreover, it took only ten days to complete the entire reassessment.

When the Assessor individually, or through a citizens' committee, appraises the street frontages tentatively, a quantity of information is usually compiled which forms the basis of the final valuations; and the Assessor or the committee, having given the entire subject sufficient study to enable them to answer questions which may be asked or criticisms which may be made concerning their valuations, are able to present at subsequent public meetings clear-cut reasons for the appraisals made by them.

When the task of street valuation is initiated at a general public meeting, the citizens' minds will work more slowly in judgment than when the initiative has been previously taken by the more deliberate action of the Assessor or the committee. Naturally, when people have been accustomed to think of land values in terms of front-foot prices or in terms of valuation of individual sites, they do not always find it possible to change their habit of thought promptly, and require instruction and training in the unit-foot method of expression. But in actual experience it has been found that the citizens will quickly learn how to think and talk in terms of comparison of street importance, using the unit-foot as the basis of expressing their opinions.

When the problem of street comparison is clearly placed before a group of citizens of whatever class, the members of the community will be found to possess enough knowledge as to the use and usefulness of land, and the streets upon which land fronts in the central business district, to enable them to express intelligent opinions as to the location of the best block frontage in the city. In one western city a map of the central business district comprising the highest-valued blocks was presented to three separate meetings in one day—a large citizens' and business men's meeting sponsored by the Real Estate Board, a meeting of 500 high school students, and a meeting of the Women's Political Equality League. Each group readily determined the "best" block frontage, and made intelligent and almost identical comparisons of nearby frontages in terms of percentages of the best frontage. This experience confirms the opinion that there always exists in every community a certain consciousness of the comparative usefulness of the streets and highways under existing conditions. In the first meeting the Real Estate Board and other business men knew where they would prefer to locate their business enterprises, and they could tell why. Their reasons covered the facts concerning transportation from residence sections, and all other conditions which made locations desirable. There was a 16-year-old high school girl who knew the best place to locate a candy store; and the women knew all about the locations of the best retail merchants' stores, although they did not so readily express the underlying reasons for the development of these preferred locations.

It is not always necessary in an actual assessment proceeding to talk first in terms of percentages. Sometimes the opinion of an Assessor, of committees, or even of communities at large, is definite and precise as to the unit-foot values of the best frontages, and the comparisons can be easily extended to adjacent blocks, and thence to other districts, with the result that an entire city can be evaluated in terms of actual unit-foot values within a few days. In other cities the work proceeds more slowly. One clear-thinking leading citizen may become so deeply interested in the unit-valuation scheme that he will desert his business and "see the job through," carrying his associates along on the wave of his enthusiasm. The study of the use of land in one's home town is always interesting.

Percentage comparisons, or expressions of relative values, in the final analysis, no matter how made, are but primer lessons. They are a good practical preliminary to actual unit-foot value expression, but are not always necessary. Their necessity will depend upon the extent of public and official knowledge with reference to actual site value comparisons. Therefore, when circumstances are favorable, public discussions of relative values may be wholly dispensed with, and the Assessor or the citizens' committee may prepare for the first community meeting tentative monetary values of unit quantities, particularly in the highest-valued districts. This enables the Assessor to explain to the community at the first meeting the significance of the street valuations in monetary terms thus adopted, the meaning of the unit-foot with reference to which these tentative values have been expressed, and the fact that these unit valuations pertain to but a single external factor of value, a single-street frontage. Public discussion can at once be brought to the point where differences of opinion as to actual monetary values of street fronts may be considered without the delay necessitated by preliminary public discussions of relative values.

As a rule, however, it has been found in actual experience that the citizens of a community are not always able to express an intelligent opinion as to the actual money values of unit quantities of land located on different streets and affected by a single-street accessibility. It is for this reason that it is expedient to begin by establishing relative values for various street frontages in one of the three ways outlined, and to proceed from these to determine the actual unit-foot values, for when a community understands the process of expressing relative values, it will all the more readily grasp and apply the process of making similar comparisons in monetary terms.

In the next chapter the method developed by Somers System experts to obtain community opinion as to the relative importance of street frontages will be developed in greater detail. The procedure on the part of the Assessor, either at meetings of citizens' committees or in town meetings at large, is essentially the same. It is elaborated in considerable detail so as to give ample illustrative material to Assessors, attempting community assessments for the first time, and to indicate the general nature of the inquiries, criticisms and comments advanced by citizens.

CHAPTER XI

PROCEDURE AT COMMITTEE MEETINGS OR AT PUBLIC MEETINGS FOR THE PURPOSE OF COMMUNITY ASSESSMENT

PRESENTATION OF THE ASSESSMENT PLAN EITHER TO A REPRESENTATIVE COMMITTEE OR TO THE COMMUNITY AT A PUBLIC MEETING—DISPLAY OF LAND VALUATION MAPS—CENTRAL BUSINESS DISTRICT THE STARTING POINT—ANSWER TO POSSIBLE QUESTIONS RAISED BY CITIZENS REGARDING THE SIGNIFICANCE OR ADVISABILITY OF SOMERS SYSTEM APPRAISALS—ASCERTAINING HIGHEST RELATIVE LAND VALUES—CONTINUATION IN GATHERING EXPRESSIONS OF VALUE OPINIONS ON THE PART OF THE ASSESSOR—NATURE OF PROBABLE DISCUSSIONS—EFFECTIVENESS OF SOMERS SYSTEM METHODS OF OBTAINING ACCURATE EXPRESSION OF VALUE OPINION DEMONSTRATED ON MANY OCCASIONS AND IN MANY COMMUNITIES.

LET us assume a community in which the majority of citizens have as yet no clear concept of the actual money values of street localities, but where there is a decided opinion as to the relative importance of site locations. The Assessor, having decided to attempt a community appraisal, will proceed either to select a group of representative citizens to serve as a committee to aid in establishing relative frontage values, or to call a meeting of the community at large for the same purpose. In either case he may discover that some misapprehension and confusion exists in the minds of the citizens as to the significance, advisability or perhaps even the expediency of community assessments. In order that he may be prepared to explain his position clearly and to answer any possible inquiry or criticism, the following method of procedure has been found successful in a large number of communities where it has been employed.

Prior to the committee meetings or the preliminary public meetings organized for purposes of establishing comparative street prices the Assessor should place one of his large land valuation maps on the wall of the meeting room where it can be readily seen by all those attending. For the first meeting the map which includes that part of the city where the highest land values are commonly known to be, should be selected. This constitutes the city hub, land values usually radiating in various directions, like the spokes of a wheel, decreasing with increasing distances from the center. In larger cities, however, it may be found that the series of land value maps when put together resemble the mechanism of a clock, rather than the hub of a wheel, with one highest-value center, and a number of secondary or subsidiary centers, with relatively high land values at the wheel centers. But in most cities there is a point or location where land values are commonly conceded to be highest. This should constitute the starting point for fixing unit-foot land values. A map representing such a district, to be employed at the first public meeting, should resemble Diagram VIII.

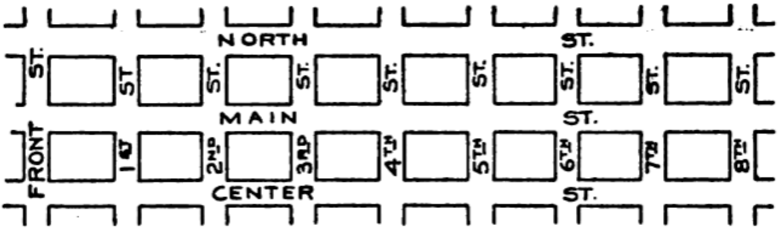


DIAGRAM VIII

Central Business District Map for Recording Tentative Street Values Either in Percentages or in Dollars.

Upon calling the meeting to order the Assessor or his representative should make a suitable explanation concluding with an announcement of his readiness to begin the task of ascertaining opinions as to comparative street values for taxation purposes.

Some members of the committee or of the public meeting will probably ask at the outset whether the employment of the Somers System of land valuation will mean increased taxes on building sites. Questions of this kind are not uncommon, and are raised frequently even by representative members of citizens' committees. They are at times designed to hint at a suspicion or to throw out the suggestion that a scheme for higher taxation of site values is concealed in the proposed appraisal reform. The reason for such a suspicion appears obvious, particularly when it is suggested that land is to be assessed or appraised in accordance with the law at its "full value" or "true value in money." Most land owners are aware of the fact that under the prevailing system of assessment in their community, their land has not been assessed at its full value. Consequently they fear that if the valuation of their site or sites were to be increased it would inevitably mean heavier taxes for them to pay. To destroy this common misunderstanding the Assessor should make an appeal to the sense of civic honor of the committee or the public meeting as a whole, and point out that the question of scientific assessment does not necessarily involve increased taxes on land values.

"Our city," he may explain, "must raise a certain amount of money every year to meet ordinary expenses. The taxes for this purpose should be levied equitably. They should not be levied upon the basis of unequal valuations of taxable property, so that some citizens must not only pay their own fair share of taxes, but also a share of taxes which other people evade."

Continuing, he might emphasize his design to make a comprehensive appraisal upon the basis of which every citizen would pay his own fair share of taxes, and only his own. "We propose to accomplish this," the Assessor could properly add, "by inviting your help as public-spirited citizens at these meetings to determine the relative values of locations in our city. Our aim is to make fair and uniform appraisals, so that there may be equitable taxation. If this and subsequent meetings are successful, property owners who are now paying less than their fair shares of municipal expenses will have their taxes increased, which you no doubt consider right. On the other hand, those who are now paying more than their fair shares will have their taxes lowered, which, I am sure, you will consider equally right."

Explanations of this kind, made in the spirit of fairness to everyone, should silence the possible adverse critics, and stimulate the interest of excessively burdened taxpayers in the purpose to establish equitable assessments.

Essentially the same thought as that contained in the first question may be expressed in a more ingenious form. "Do you intend," some one may ask, "to make full land values the basis of taxation?"

The answer to this question may in most instances be made in the same spirit and to the same effect as before. The Assessor might explain to the committee or to the community meeting that the law requires that land should be taxed on its "fair market value," or its "full value in money," adding that although the phrases may be different in different States, the intent of the law appears to be that land should be taxed on a full-value basis, or on some stated percentage of full value. "This requirement of the law," he should continue with as much elaboration as may to him be pertinent and desirable, "is generally violated under present conditions to the injury of home-owners and of proprietors of less favorably located lands, and to the particular advantage of owners of highly desirable city sites."

The Assessor should furthermore not forget to explain that if for any reason the members of the community really objected to assessment at full values, and the law did not require it, they might, with the aid of the Somers System assess the land at less than its full value without any favoritism. "This system is intended to determine the full relative values of all sites," he may explain; "and if the law permits, with your advice, we may subsequently adopt a fractional valuation. Taxes may thus be levied fairly on 50, 60 or 70 per cent. of the full value of the land. If full value of all sites has once been ascertained, any definite percentage basis of this full value will mean uniform land assessments. It will not be, as often happens now, when percentage values are roughly guessed at, 50 per cent. of full value for some, 60 per cent. for others, 70 per cent. for others, and 100 per cent. or more for still others."

By way of further explanation he may add: "It is much easier to think primarily in terms of full value when appraising city sites than in terms of fractions of unknown wholes—in terms of 100 per cent. of ascertained values than in terms of 50, 60 or 70 per cent. of unknown values."

Having made his preliminary explanations and having answered such significant general questions as those suggested above, the Assessor will proceed with the chief business of the meeting. It may quickly be found—indeed experience has amply shown that it usually is—that the citizens attending the meeting, whether selected as a representative citizens' committee or whether representing the community at large, especially if this is their first experience in expressing opinions as to relative street values, have practically no idea of actual site values. But it will be found just as quickly that they have quite definite opinions as to the relative importance of various street-fronts, and that they can express these opinions with a fair degree of accuracy in terms of relative street values, meaning by relative street values the importance of one street or part of street as compared with another, expressed in terms of percentages.

An enlightened controversy may thus ensue, if thoughtfully inspired and stimulated by the Assessor. After explaining that the map displayed before them is an outline map of the central part of their city, or of the whole city, as the case may be, he might proceed somewhat as follows:

"We are here to study the streets on this map for the purpose of sounding your opinions as to the relative values, the comparative usefulness, of the streets to the land fronting thereon which the map outlines. The first thing to do in this connection is to ascertain with approximate accuracy the location of the best street frontage. By 'best' I mean the most useful, the most desirable, the most valuable street outlined on this map—the street frontage that would in your opinion command the highest price. Look at the map, please, and give me your opinion freely."

Some one may timidly venture the guess that frontages on Main Street, from Third to Sixth, are probably of highest value. This reluctant guess breaks the ice. It starts the ball rolling. But since the judgment of only one citizen, even though it were positive, which this one probably is not, would be inconclusive, the Assessor, of course, asks for further opinions.

"I agree in general with the suggestion of my neighbor," let us assume another in the group to respond, "but with a reservation. In my opinion the first block around the corner of Main Street on Third, the one south of Main, is as good as any block on Main Street."

Suppose, then, that this second committee or community member ventures an opinion, advancing reasons for it, and that a general discussion follows. As this discussion progresses it may be that few if any doubts will be expressed as to the superiority of Third Street.

The opinion of the meeting may thus be unanimous that this is the most valuable street frontage in the city. But as to the relative value of the near-by street frontages on the first block south of Main and fronting eastward on Third, there may be decided and justifiable differences of opinion.

Arguments evoke counter-arguments, and of these the Assessor makes mental or written note, weighing the conflicting judgments. Some of the arguments as well as some of the disputants will undoubtedly impress him more than others. Similarly impressed also will other members of the group be. And since the discussion emphasizes conditions which some of them had never known before or had forgotten or thoughtlessly ignored, these citizens may alter their original opinions and a noticeable tendency towards a general agreement will set in as to the most favorable locations. This has been found to be the case wherever Somers System methods of obtaining community opinion as to relative street values have been employed.

A diplomatic Assessor might think it best under these circumstances to divert the attention of the committee or the public meeting temporarily from further discussion of the block on Third Street. He might, for instance, draw the attention to the fact that there are frontages on other blocks and other streets with which to compare this frontage, and that it may be more satisfactorily considered after such comparisons have been made. Consequently he might propose leaving the question of Third Street values open to controversy for a time, suggesting that it may be revived later when this frontage may not only be compared with frontages on other streets, but when the benefit of intervening newspaper discussion may have added to the available information and to the validity of various suggestions. A definite result will have been accomplished thus far, if the committee or the community meeting tentatively agrees upon the superior value of Main Street.

In consequence of this tentative agreement the Assessor would be equipped with a basic fact for use in the further development of his preliminary proceedings. He would know that in this off-hand, but general and probably correct judgment of representative citizens the highest frontage values attach to a designated and quite definite street. Temporarily, at any rate, he could assume that Main Street, from Third to Sixth, offers the most useful, and consequently the most valuable of all the street frontages outlined on the map he is using.

Continuing, the Assessor might ask whether Main Street is of equal value on both sides of the street. It is highly probable that all will reply in chorus and with considerable emphasis: "No! the south side of Main Street is better than the north side."

"That appears to be unanimous," the Assessor may remark; but as he is anxious to obtain the best opinion available and wishes to avoid misapprehension, he asks if any one dissents. Some discussion may follow, concluding with unanimity, or there might be assurances of unanimity without discussion. In either case the question would be settled temporarily, and nothing more conclusive is necessary at this stage of the proceedings. It has been tentatively established that the two sides of Main Street, between Third and Sixth Streets, are of unequal value, the north side being worth less than the south side.

If he has not yet done so, the Assessor shall now note on his displayed outline map (Diagram VIII) the basic facts which tentatively have thus far been established, that of all street frontages outlined upon it those on the south side of Main Street, between Third and Sixth, are the most valuable. He does this by placing the letter "X," or "100 per cent." or any other convenient symbol in the street space of the map on the south side of Main Street and near the fronts of each block from Third to Sixth Street. This notation will mean that these block frontages have been tentatively agreed upon as of equal value, and the most valuable locations on the map. The relative value of every other street frontage must, therefore, be a certain percentage of "X." If "X" is designated as 100 per cent. all the other street frontages can be expressed as a fractional part of 100 per cent.

Since, then, there is a marked agreement at the first committee meeting or the first community meeting (depending upon the method of ascertaining relative land values adopted by the Assessor) that the values on the north side of Main Street between Third and Sixth are less than on the south side, the Assessor should next ask his meeting to assist him in ascertaining how much less valuable, relatively, the north side of Main Street is at that point than the south side.

By this time the meeting, whether as a committee or otherwise, will very likely have found itself fully, and prompt and intelligent responses may be anticipated.

"I think," one individual may remark, "that there is a difference of not more than 10 per cent. between the north side and the south side of Main Street."

Another may suggest that it is probably as high as 20 per cent., citing as a reason for his contention that travel on the south side is very much greater than on the north side, making the south side more valuable for retail trade.

"True enough," the first speaker may reply, "but even for the traffic there, the buildings on the north side are inadequate. Were we to take actual rentals as our basis for estimating site values, we might very likely find a great difference in the values of the two sides of this street; but the difference would be overcome, in part anyway, with better buildings on the north side—buildings as good as those on the south side."

In similar manner the discussion of that interesting comparison—a comparison which, by the way, is quite common—of the relative importance of those opposite street frontages, and therefore of their relative values, and the reasons for differences in relative values, continues. Not only are such comparisons intensely interesting subjects of public discussion, but they are also of such obvious importance to taxpayers that a large part of the time may well be devoted to the discussion of this single topic.

Since, however, supplementary public meetings are to be held at which the subject may be discussed more fully, and with the advantage of more complete information, a tentative agreement as to the relative values of the two sides of Main Street will probably save time and promote progress. For the purpose of proceeding, and with the understanding that every one shall be free to change his opinion without criticism, the Assessor may be assumed to accept as a tentative agreement of his first committee or community meeting that street frontage values on the north side of Main Street, between Third and Sixth Streets, are, say, 90 per cent. of those on the south side. Accordingly he will write "90 per cent." (of X) in the street spaces before each of the three blocks fronting southward on Main Street.

He may then suggest similar comparisons along Main Street westward from Sixth, asking how the frontages on Main Street between Sixth and Seventh compare in value with those on Main Street between Third and Sixth.

"They must of course be worth less," he will remind the citizens, "for we have already agreed that frontages on the south side of Main Street between Third and Sixth Streets are the most valuable. The letter 'X' which I have written in the street space before those frontages symbolizes the highest level of local land values.

Some one may here suggest that values decrease, perhaps 25 per cent., in the block on Main Street immediately west of Sixth. Others may think the decrease as great as 40 per cent., while still others may be of the opinion that things are "looking up" in that block. Let us assume for illustrative purposes that the committee or the citizens decide to adopt tentatively a valuation for Main Street between Sixth and Seventh Streets of 70 per cent. of "X" for the south side, and 65 per cent. of "X" for the north side.

These notations having been made on the Assessor's unit-value map, the block on Main Street between Seventh and Eighth is next considered in like manner. Assuming that both sides of Main Street are here tentatively agreed upon to be of the same value, let us say 50 per cent. of "X," the Assessor will make the corresponding notation on the outline map.

Similar comparisons and notations should be continued along Main Street to the western margin of the map, and then along the streets eastward from that margin paralleling Main Street, but to the west of Third Street. Then the comparisons should continue eastward from Third Street, paralleling Main Street.

As this work continues, it will be discovered that each further tentative estimate will be easier to make than the preceding one. Every community opinion adopted tentatively and noted on the Assessor's outline map multiplies the data for further comparison, and every additional comparison tends to create keener interest in the work. As the checking up of relative values proceeds, all participants, even those who merely listen, will become better and better qualified to assist in making dependable comparisons of frontage values.

When all the blocks outlined on the Assessor's map have been compared with the street frontage tentatively agreed upon as the most valuable, and so identified by the letter "X" for purposes of comparison, and these comparisons have been noted on the map as percentages of "X," the committee meetings or preliminary public meetings should be temporarily discontinued in order to afford all the people of the community who are interested an opportunity to reflect upon and to discuss what has thus far been done by giving full newspaper publicity to all proceedings to date. It will also give the Assessor an opportunity to calculate the actual unit-foot values of street frontages as explained in the next chapter, to be used for discussion at a later series of public meetings or at the first series of public meetings if the preliminary work has been done by committees. At the time of adjournment of the preliminary meetings the outline map (Diagram VIII) will have been supplemented with various data gathered at these meetings, and will appear approximately as shown in Diagram IX.

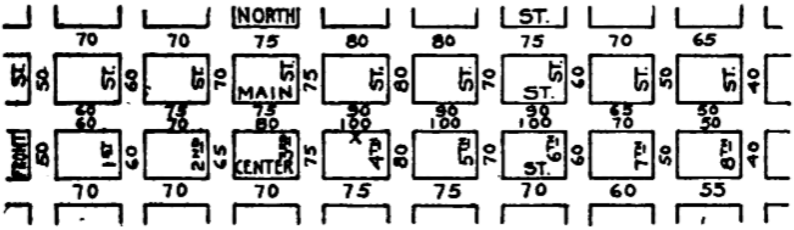


DIAGRAM IX

Central Business District Map, Illustrating Method of Recording Relative Street Values by Assessors, by Local Committees or at Citizens' Meetings.

The effectiveness of this method of obtaining accurate expressions of opinion as to relative land values, through representative citizens' committees and public meetings, has been illustrated many times. That the knowledge of comparative street values is not confined to one person or class of persons in a community is proved by the practically unanimous agreement of groups of business men, of women and of high school students, who in the same city, at separate meetings, have given identical answers to the questions asked without preliminary coaching: (a) Which is the most valuable or "best" block frontage in the business center? (b) What are the percentage values of block frontages on the main and cross streets in the district adjacent to the best frontage?

In many cities tests have been made of the citizens' views on these points; and the result of such inquiries has been the development of a body of public opinion that has had the force of law. The consensus of opinion has been so conclusive and the objections have been grounded upon such insufficient and unsound reasoning, that it has been impossible for those whose interests may be adversely affected by the community decision to change the comparative valuations to any substantial degree. In any city, from 1,000 to 500,000 population, the members of any audience of reasonably intelligent persons over 16 years of age will agree within close limits upon the block of highest usefulness, and will express intelligent views in their comparisons of other blocks with the best one. They may neither own nor rent, they may be unable to explain why they prefer one frontage to another, and yet they will be able to express opinions worthy of respect because they correspond to the opinions of those who can tell why one block is the best, and why others bear definite relations to the best.

There have been many skeptics who have denied the possibility of obtaining from the community at large the opinion-data upon which a fair assessment can be made. "The people," the skeptics aver, "don't know and cannot be trained to know real estate values. This knowledge can be obtained only from active real estate agents and brokers, who are engaged continually in the business of buying, selling and renting of real estate."

The answer to this assertion is that the real estate man gains all his competence from his constant touch with the community's likes and dislikes in the use of land. The most successful real estate man is the one who most intelligently studies and translates the community opinion. He cannot fail in the real estate business if his power of interpretation is accurate. He is likely to fail if he does not interpret the community opinion correctly.

The community could not reach the necessary consensus of opinion if it did not have the Somers System methods, or methods based on similarly sound principles, of expression of that opinion. Individuals will agree upon the comparative values of street and highway locations, because when they say one street or block is better than another they are comparing one element of value with another identical element. Individuals will not agree upon the valuation of a high-valued lot in the business center because such a lot contains several value-elements; and lot-valuation, in the absence of a scientific method of expressing opinion, and using such opinion as the basis for computation, is merely a guess.

CHAPTER XII

FIXING FINAL UNIT LAND VALUES

CONVERSION OF RELATIVE VALUES INTO UNIT-FOOT VALUES—ASCERTAINING UNIT-FOOT VALUE AS BASIS FOR COMPUTATION—BEST OPINION AS TO FAIR SELLING PRICE OF AN URBAN SITE ASCERTAINED—DERIVING THE VALUE OF A UNIT-FOOT FROM THE FAIR VALUE OF A SITE, OF ANY DIMENSIONS—UNIT-FEET COMPUTED FOR DIFFERENT STREETS GIVE ACCURATE RELATIVE OR COMPARATIVE VALUES OF URBAN LAND—OVERVALUING ONE UNIT-FOOT RESULTS IN OVERVALUING OF ALL OTHER UNIT-FEET CORRESPONDINGLY—IMPORTANCE OF EXPLAINING CAREFULLY WHAT IS BEING APPRAISED, AND THE BASIC QUANTITY UNIT IN TERMS OF WHICH VALUE COMPARISONS ARE BEING MADE—WHEN UNIT-FOOT VALUES ARE FINALLY APPROVED BY THE COMMUNITY, ASSESSOR PROCEEDS TO MAKE SITE VALUE COMPUTATIONS.

WHEN tentative values have been agreed upon for all the streets in the area shown on the central business district in one of the several manners outlined, how may these relative values be converted into actual monetary values of unit-foot quantity?

It is obvious that if the money value of a single unit-foot on any street frontage on the outline map has been established, the actual relative values of all the other frontages can be expressed in terms of price of the unit-foot. For example, let us assume that it has been found, in the manner to be explained subsequently, that the unit-foot on the south side of Main Street, between Sixth and Seventh Streets, is worth $75. The tentative value of this frontage was 70 per cent. of the highest-valued street. Translated into monetary terms the unit-foot in the highest-valued location would be worth $107.14, computed very easily as follows:

$$\begin{aligned} 70 \text{ per cent.} &= \$75.00 \\ 1 \text{ per cent.} &= \frac{75}{70}, \text{ or } \$1.0714 \\ 100 \text{ per cent.} &= 100 \text{ times } \$1.0714 \text{ or } \$107.14 \end{aligned}$$

In like manner the unit-foot values for every street frontage on the outline map can be computed from the relative values. Since, however, these unit-foot values have been derived from agreed tentative values, they are likewise but tentative, and should be made the basis of discussion at one or more public meetings for the purpose of establishing final unit-foot values.

How, then, can the unit-foot value in monetary terms of a single street frontage be ascertained? It is here that expert opinions regarding fair monetary values of certain sites should be sought at all times by the Assessor. It is by no means improbable that the Assessor has found at one of the committee meetings or at a public meeting a general agreement as to the actual fair value of a particular interior site, and has heard sound arguments advanced for accepting such a valuation. Of this he has made careful note. But whether or not he invited an expression of opinion as to actual site values, he will find it extremely useful to seek the assistance of citizens especially familiar with site values in the central business district, either collectively as committees, or individually. He may consult trust company officials, real estate dealers, land owners, and all others who in his judgment are qualified to express competent opinions as to actual site values. Supplementing all the information obtained from these sources concerning actual fair values of certain specific lots with his own judgment after personal inspection of the properties under consideration, he may in checking the street frontage percentages decide tentatively upon the total monetary value of certain interior lots in this central business section. Thus in the diagram employed for illustrative purposes (Diagram VII) he might decide, after thorough investigation, the fair total value of certain interior lots on the South Side of Main Street, between Third and Sixth Streets, affected by one street influence only, and make the actual unit-foot values derived from these lot values his tentative standards of comparison.

If, for example, the Assessor were to discover that there was very general agreement that $4,600 represented the fair value of a regular lot 20x150 feet in size in the middle of the block on the south side of Main Street, between Third and Fourth Streets (Diagram VII), he could easily determine the value of one foot front and 150 feet deep by dividing $4,600 by 20 feet. This he would find to be $230. But as we shall see in the next chapter, the Somers depth curve ascribes 115 per cent. of the unit-foot value (1 foot wide, 100 feet deep) to the first 150 feet.

$$115 \text{ per cent.} = \$230$$

$$1 \text{ per cent.} = \frac{230}{115}, \text{ or } \$2.00$$

$\therefore$ 100 per cent. = $200, the value of a unit-foot on south side of Main Street between Third and Fourth Streets.

These unit-foot values may not be accurate absolutely, but they are accurate relatively to the basic unit-foot adopted. If this unit-foot is over-valued, all the other unit-feet will be over-valued proportionally; if it is under-valued, all the other unit-feet will be under-valued proportionally.

After unit-foot appraisal has been completed on all street frontages under consideration by any one of the previously outlined methods, the Assessor will proceed to call another public meeting (if relative values have been established at preliminary public meetings) for the purpose of discussion of the tentative unit-foot values, with a view if possible to obtaining unanimity as to their fairness and correctness for all street frontages.

Several points cannot be over-emphasized by the Assessor. They are points which have been touched on previously, but which will bear repetition to prevent possible misunderstanding. In the first place, it is essential that he should once more explain clearly and concisely the nature of the unit-foot and the precise reasons for its adoption. Unless the unit-foot is carefully explained there will always be a number of responsible citizens who will continue expressing their opinions in terms of front-foot values, regardless of depth. This will be found to be the case particularly if lots are not equal in depth to the unit-foot. It is frequently discovered that lots in certain retail business centers are less than 100 feet deep. At times they are bounded in the rear by a body of water or by another natural barrier, and because of their shallowness some persons find difficulty in expressing the values of such streets in terms of unit-feet. Nevertheless, unless the unit-foot is applied uniformly, we cannot hope for uniformity in expressing actual land values. In other words, the citizens must be impressed with the fact that they are to express their opinions of the values of streets and parts of streets, using the unit-foot as a means of expressing their opinions. To argue that such a unit-foot cannot be appraised as a unit of quantity when a unit-foot in depth does not actually exist, is just as illogical as to contend that the value of a yard of a certain grade of cloth cannot be expressed because only a part of a yard of that particular grade of cloth exists.

Secondly, the fact must be impressed upon the citizens that they are to express opinions with reference to a single physical, external factor of value—a single street. There are always some who will be ready to argue that the land is more valuable as one approaches a street corner, particularly in the retail business district of a city, and that therefore higher unit-foot valuations should be given for those lots within the corner influence, as compared with the unit-foot valuations at the center of a block. It is difficult at first to show that by a mathematical system of appraisal of the single-street value, the effect of near-corner and actual-corner location can be computed, and that the act of land value judgment with reference to one street accessibility is complete under such a system when the effect of the single street has been appraised for the quantity-unit of one foot frontage, 100 feet deep. Corner influence is, as we shall see later, a matter for computation rather than for the expression of opinion; and it is therefore important at the outset to impress upon the citizens that they are asked to express opinions as to the comparative usefulness of a unit of land with reference to a single factor of value only.

Thirdly, there will always be some who will experience difficulty in separating street values from the values of improvements on land. They will place a relatively high unit-foot value on a certain location because the improvements on the land are very well suited to the location, and a relatively low valuation on land because the improvements are not so well adapted. In order to avoid this confusion in the minds of the citizens, and because streets constitute the basic physical factor of site values, the Somers System expresses site values in terms of street usefulness and of street values, which in reality impart values to specific sites because they make them accessible. In this manner it has been found possible to avoid much of the misunderstanding and confusion resulting from trying to place unit-foot values on individual specific sites.

Finally, the Assessor should make clear the distinction drawn in Chapter I between improvements on land and improvements to land. The former are appraised separately, while the latter are evaluated as identified with, and constituting a part of, land. Although the original value of such improvements to land can be estimated on a cost basis, the fact that this cost cannot always be apportioned equitably over all the sites benefited by the improvements, and that the value of land is usually enhanced in excess of the actual costs of improvements to the land, has made it difficult in practice to evaluate the two separately. The Assessor should experience no difficulty in explaining this distinction clearly to his constituents.

After these preliminary explanations and precautions the Assessor reaches a point where he is ready to proceed with the discussion of the unit-foot values which have been established tentatively, either by computations based on relative values adopted or by unit values adopted by citizens' committees as previously explained. He will display a land valuation map (Diagram X) containing the tentative unit-foot prices where it can be clearly seen by the members of the audience.

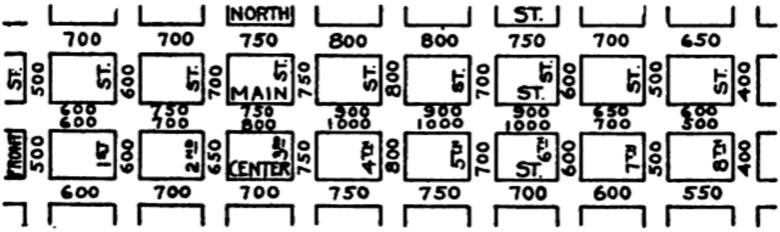


DIAGRAM X

Central Business District Map, Illustrating the Transformation of Street Percentage Values into Dollar Prices.

"These unit-foot prices," he will explain, "have been determined by first fixing a unit-foot valuation in the business center for the highest-valued street frontages, and deducing all the other unit-foot values from the relative values adopted previously." He will make clear the manner in which the unit-foot for the highest-valued frontage was determined, and how by comparison of opinion of usefulness the values of the streets to frontages of lesser value were determined.

It will be found that many citizens, seeing the actual monetary values placed on street units, will desire to modify the opinions of relative values previously expressed in good faith.

This will be true particularly of those citizens who have a degree of familiarity with actual land values, and who will advance reasons for modification of the tentative unit-foot values. The Assessor's duty is to pass final judgment on the soundness of the arguments advanced for changing the tentative unit-foot valuations, and will adopt those final unit-foot values that in his opinion and in the best opinion of the citizens are fair. It will be a relatively easy matter to obtain practical unanimity of opinion as to final unit-foot valuations among the members attending the public meeting after a certain amount of preliminary discussion.

The final unit-foot valuations placed on all street frontages and adopted by the Assessor after public discussion are recorded on the land valuation maps, and copies are posted in various public places for review and criticism. If sound reasons can be advanced why certain of the valuations adopted by his voluntary assistants should be modified, the Assessor as the final judge may make such modifications. He may arbitrarily set a certain date after which citizens will no longer have the opportunity to have unit-foot valuations modified for the particular appraisal in progress, and in the meantime will invite individual comment by taxpayers at his office.

In concluding the process of placing unit-foot prices on all street frontages by consulting public opinion, the first step in the appraisal process has been completed. From these unit-foot values when thus determined the values of all sites derived from street accessibility, no matter what their location, shape or dimensions, can be computed in the manner to be outlined subsequently. The Assessor will do well to emphasize the significance of changing a single unit-foot price. Each unit-foot value bears a definite relationship to all other unit-foot values, and raising or lowering a single one will change the value-relationship to all sites affected thereby. This fact is a powerful weapon in the hands of any Assessor who may be accused subsequently of having placed an unfair valuation on a particular site. He can defend himself by asserting that all site values have been computed uniformly, accurately and with mathematical precision from the actual unit-foot values adopted by the community after due criticism, deliberation and discussion.

The burden of proof that valuations of specific sites are unfair will rest with those who are dissatisfied with uniform and systematic assessments based upon a careful analysis and the recording of community opinion.

The foregoing process as applied to the central business district may be continued throughout an entire city, calling into conference the taxpayers interested in each district in succession. Maps of numerous districts may be prepared and distributed to local committees for public discussion. It should be borne in mind that as the monetary valuations have already been fixed in the high-valued business center in every direction, as far as the streets bordering and approaching the adjoining areas, the work in the outlying districts will omit the initial process of determining the "X" frontage and the discussing of other frontages in mere percentage form. If proper publicity has been given to the discussion of the central district, the entire community should be ready to talk within their districts in terms of unit-foot values.

The following chapters exemplify the Somers methods of calculating the precise comparative values of city sites, based on the unit-foot prices adopted in the manner outlined. This constitutes what has been commonly called the mechanical or mathematical phase of the appraisal or valuation process. The Somers System methods of mathematical computation are based essentially on the principles laid down in the first part of this work. As stated before, these principles are reiterated from time to time in order to emphasize their practical application.

CHAPTER XIII

THE SOMERS DEPTH CURVE

BASIC PRINCIPLES OF SOMERS DEPTH CURVE DESCRIBED—ILLUSTRATIVE DEPTH CURVE AND METHOD OF CONSTRUCTION—INVESTIGATION INTO RELATIVE VALUES OF REGULAR LOTS IN ST. PAUL, MINN.—TESTING THE TENTATIVE SOMERS DEPTH CURVE—RELATIONSHIP BETWEEN DEPTH AND VALUATION IN THE FINAL SOMERS DEPTH CURVE—EXPLANATION OF THE SOMERS DEPTH CURVE—THE SOMERS DEPTH TABLE—METHOD OF USING DEPTH PERCENTAGES FOR COMPUTING REGULAR SITE VALUES—METHOD OF COMPUTING VALUE OF IRREGULAR INTERIOR SITES—THE SOMERS ZONE TABLES ILLUSTRATED—REASONS FOR USING ONLY ONE DEPTH CURVE BY MR. SOMERS.

THE effect of depth upon the comparative usefulness, and hence the value, of an urban site is measured by the comparative usefulness that each square foot of area, counting from the street frontage, adds to the usefulness of the entire site. The usefulness of each additional foot added to the depth of a site varies with the depth of the site, decreasing as the depth of the site increases. This principle is applied in the construction of the Somers depth curve.

Let us assume a rectangular lot, 50 feet front and 100 feet deep, divided by a series of parallels to the front into 100 equal parts. Each of these parts will be one foot deep with reference to the street frontage. The only access to the life and business of the community that any one of these plots of ground, except the one on the street line, has, is over the plots towards the street front. The farther from the street line any such plot lies, the less available will it be for use, and its value will, in consequence, tend to be less than that of the plot immediately preceding it.

This falling off in value from the street frontage may be graphically represented by a curve, such as was first devised by Mr. Somers, but afterwards modified, and is illustrated in Diagram XI, page 86.

Such a depth curve establishes a mathematical relationship between any two parts of sites affected by a single-street influence, and makes possible the systematic treatment of varying depths for purposes of valuation.

The investigation into the relative values of regular lots of varying depths was begun many years ago by Mr. Somers in the city of St. Paul, Minn., where the business section of the city was laid out in a series of blocks, 300 feet square, divided into twelve regular lots each with 50-foot frontage and 100 feet of depth. After a careful study of many hundreds of lots in actual use, and of many hundreds of transfers of lots of different dimensions in the section under consideration, a tentative scale of values was adopted. Approximately 70 per cent. of the value of a 100-foot depth was found to have been absorbed by the 50 feet nearest the street front, giving 30 per cent. of the value to the rear 50 feet. Fifteen per cent. increase in value over the 100-foot depth was assigned to the third 50 feet. These percentages were represented graphically and a regular curved line drawn from the zero point, representing the street line, through a 50-foot point, representing a lot 50 feet deep, at an elevation to indicate 70 per cent., thence through a 100-foot point at an elevation indicating 100 per cent., and finally to a 150-foot point at an elevation to indicate 115 per cent.

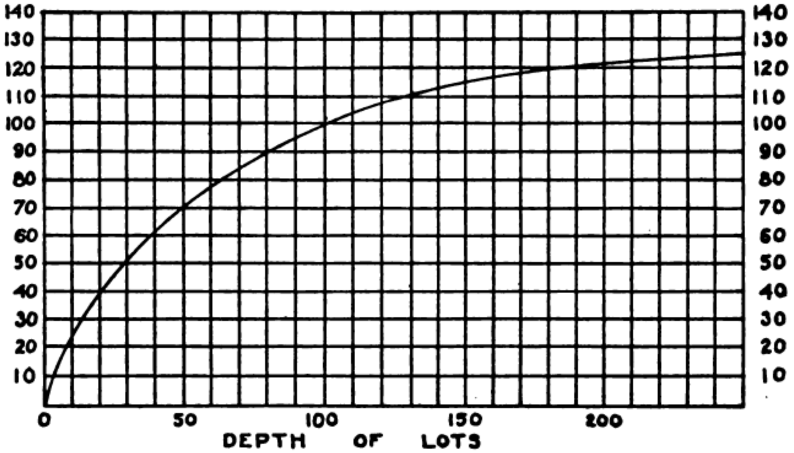


DIAGRAM XI

Original Somers Depth Curve, Showing Decreasing Values at Receding Lot Depths.

This tentative curve was then tested by applying it to many lots in several cities, and by submitting it to numerous authorities on land valuation for examination and criticism. As a result of this survey it was finally determined that for land in retail business districts the first 50 feet absorbed a little more of the value of a 100-foot depth than the tentative curve indicated, namely, 70 per cent. It was therefore changed to 72½ per cent.

The relationship between depth and valuation at four definite points was thus finally established as follows:

0 feet of depth = 0 per cent. of the value of 100 feet of depth
50 " " " = 72½" " " " " " 100 " " "
100 " " " = 100 " " " " " " 100 " " "
150 " " " = 115 " " " " " " 100 " " "

The base line of Diagram XI represents depth, from which it appears that 100 feet would require twice as much of the line to represent it as would 50 feet. Each vertical division line from the 0 point represents 10 feet in depth. Depth is indicated on the horizontal line, percentage of valuation of different depths on the perpendicular line.

The perpendicular line through the 0 point represents the percentage of the value of 100 feet, each horizontal line above the base line expressing an additional 10 per cent. Plotting the four points indicated on this diagram, a regular falling curve was obtained which could be extended as far as deemed necessary. The resultant curve made possible the mathematical computation of the additional value derived from each additional square foot in the depth of a lot. The depth tables thus deduced and tested in many thousands of cases in many cities by Mr. Somers represent approximately the consensus of opinion as to the proper proportions of valuation to be assigned to separate parts of any "inside" lot used for retail business purposes up to 100 feet in depth. It has been found that for land in residential and wholesale business districts the Somers depth tables and their extensions fairly represent a proper proportional distribution of valuation up to 250 feet in depth.

It is true that Mr. Somers in constructing his depth curve did not hesitate to employ empirical methods along with his mathematical analysis to make them conform more closely to actual observations. The curve of value for the first 100 feet (except close to the street) is approximately accurate, following a logarithmic scale. From 100 feet on the percentages are slightly scaled, while between 200 and 600 feet the mathematical ratios have been changed and at least 25 per cent. added to make the depth influence extend farther than would be obtained by continuing the logarithmic scale adopted for the first 100 feet. The resultant Somers curve is, strictly speaking, not mathematically accurate beyond depths of approximately 150 feet, but has been modified to conform to actual observations made by its inventor. The result is a depth curve which although not constructed on the same logarithmic scale throughout, nevertheless expresses a definite mathematical relationship between areas located at different depths from the street front.

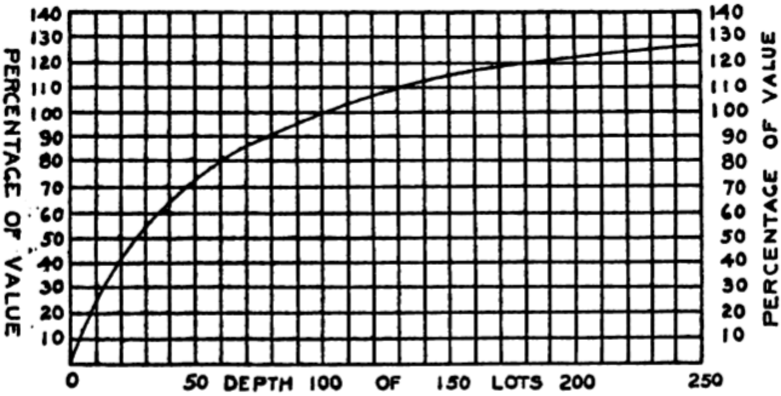


DIAGRAM XII

The Somers Curve of Value, Based on the Investigations of Mr. William A. Somers as to the Effect of Depth upon the Values of Lots with Single-Street Usefulness.

The method of analyzing and deducing the percentages of valuation of various depths with the aid of the depth curve is illustrated in Diagram XII, showing the Somers curve, from which the percentages for computing the value of varying depths were obtained. The depth table thus deduced is shown on page 89.

The first column in this depth table indicates the depth of the lot in feet; the second column indicates the percentage of the unit-foot price to be applied to that depth. This table, it should be remembered, is employed to compute the value of a lot having but a single street advantage.

To obtain the value of any one foot merely subtract from the valuation allocated to that particular number of feet the relative value of the immediately preceding number of feet in the table. The difference will indicate the relative value to be allocated to any specific foot. Such a computation will

SOMERS CURVE OF VALUE

SHOWING PERCENTAGE OF UNIT-FOOT VALUE FOR LOTS FROM 1 FOOT DEEP TO 700 FEET DEEP

DEPTH		50	72.50	100	100.00	150	115.00	200	122.00
1	3.10	1	73.25	1	100.41	1	115.19	1	122.10
2	6.10	2	74.00	2	100.85	2	115.38	2	122.20
3	9.08	3	74.75	3	101.27	3	115.57	3	122.30
4	11.75	4	75.50	4	101.70	4	115.76	4	122.40
5	14.35	5	76.20	5	102.08	5	115.95	5	122.50
6	16.75	6	76.90	6	102.48	6	116.12	210	122.95
7	19.05	7	77.55	7	102.88	7	116.29	15	123.38
8	21.20	8	78.20	8	103.25	8	116.46	20	123.80
9	23.20	9	78.85	9	103.62	9	116.62	30	124.60
10	25.00	60	79.50	110	104.00	160	116.80	240	125.35
1	26.70	1	80.11	1	104.36	1	116.96	50	126.05
2	28.36	2	80.77	2	104.72	2	117.13	60	126.75
3	29.99	3	81,38	3	105.08	3	117.30	70	127.40
4	31.61	4	82.00	4	105.43	4	117.47	80	128.05
5	33.22	5	82.61	5	105.78	5	117.64	90	128.65
6	34.92	6	83.21	6	106.13	6	117.79	300	129.25
7	36.41	7	83.82	7	106.47	7	117.94	10	129.80
8	37.97	8	84.42	8	106.81	8	118.09	20	130.35
9	39.50	9	85.01	9	107.15	9	118.24	30	130.90
20	41.00	70	85.60	120	107.50	170	118.40	340	131.40
1	42.50	1	86.15	1	107.80	1	118.54	50	131.90
2	43.86	2	86.70	2	108.11	2	118.70	60	132.40
3	45.30	3	87.24	3	108.43	3	118.85	70	132.85
4	46.61	4	87.78	4	108.75	4	119.00	80	133.30
5	47.90	5	88.30	5	109.05	5	119.14	90	133.75
6	49.17	6	88.82	6	109.35	6	119.28	400	134.20
7	50.40	7	89.35	7	109.65	7	119.41	10	134.60
8	51.61	8	89.87	8	109.93	8	119.54	20	135.00
9	52.81	9	90.38	9	110.21	9	119.67	30	135.40
30	54.00	80	90.90	130	110.50	180	119.80	440	135.80
1	55.05	1	91.39	1	110.76	1	119.92	50	136.15
2	56.10	2	91.89	2	111.02	2	120.05	60	136.50
3	57.15	3	92.38	3	111.28	3	120.18	70	136.85
4	58.20	4	92.86	4	111.55	4	120.31	80	137.20
5	59.20	5	93.33	5	111.80	5	120.43	90	137.55
6	60.30	6	93.80	6	112.05	6	120.55	500	137.85
7	61.25	7	94.27	7	112.28	7	120.66	10	138.15
8	62.20	8	94.73	8	112.52	8	120.77	20	138.45
9	63.10	9	95.17	9	112.76	9	120.88	30	138.75
40	64.00	90	95.60	140	113.00	190	121.00	540	139.05
1	64.95	1	96.04	1	113.20	1	121.10	50	139.30
2	65.90	2	96.50	2	113.43	2	121.21	60	139.55
3	66.75	3	96.95	3	113.64	3	121.32	70	139.80
4	67.60	4	97.40	4	113.85	4	121.43	80	140.05
5	68.45	5	97.85	5	114.05	5	121.53	600	140.55
6	69.30	6	98.30	6	114.25	6	121.62	20	140.95
7	70.10	7	98.74	7	114.45	7	121.71	40	141.35
8	70.90	8	99.17	8	114.64	8	121.80	60	141.75
9	71.70	9	99.58	9	114.82	9	121.90	80	142.05
50	72.50	100	100.00	150	115.00	200	122.00	700	142.35

show that each square foot following the one fronting on the street has a lower valuation than the preceding square foot.

It has been pointed out by critics that there are slight irregularities in the Somers depth curve, as indicated by the progressive percentages at receding depths. If these irregularities were to be eliminated and a perfectly regular falling

THE SOMERS CURVE OF VALUE—ORIGINAL AND REVISED

Depth Percentages from 1 to 100 Feet

Depths	*Original Somers Percentages*	*Revised Somers Percentages*	*Depths*	*Original Somers Percentages*	*Revised Somers Percentages*
1	3.10	3.10	51	73.25	73.23
2	6.10	5.80	52	74.00	73.95
3	9.00	8.35	53	74.75	74.66
4	11.75	10.75	54	75.50	75.36
5	14.35	13.05	55	76.20	76.05
6	16.75	15.27	56	76.90	76.74
7	19.05	17.41	57	77.55	77.42
8	21.20	19.48	58	78.20	78.09
9	23.20	21.49	59	78.85	78.75
10	25.00	23.45	60	79.50	79.40
11	26.70	25.36	61	80.11	80.04
12	28.36	27.22	62	80.77	80.67
13	29.99	29.03	63	81.38	81.29
14	31.61	30.79	64	82.00	81.90
15	33.22	32.50	65	82.61	82.51
16	34.92	34.17	66	83.21	83.11
17	36.41	35.80	67	83.82	83.70
18	37.97	37.39	68	84.42	84.28
19	39.50	38.94	69	85.01	84.86
20	41.00	40.45	70	85.60	85.43
21	42.50	41.92	71	86.15	85.99
22	43.96	43.35	72	86.70	86.55
23	45.30	44.75	73	87.24	87.11
24	46.61	46.12	74	87.78	87.66
25	47.90	47.46	75	88.30	88.21
26	49.17	48.77	76	88.82	88.75
27	50.40	50.05	77	89.35	89.28
28	51.61	51.30	78	89.87	89.81
29	52.81	52.52	79	90.39	90.33
30	54.00	53.71	80	90.90	90.85
31	55.05	54.87	81	91.39	91.36
32	56.10	56.01	82	91.89	91.86
33	57.15	57.12	83	92.38	92.36
34	58.20	58.20	84	92.86	92.85
35	59.20	59.25	85	93.33	93.34
36	60.30	60.28	86	93.80	93.82
37	61.25	61.28	87	94.27	94.29
38	62.20	62.26	88	94.73	94.76
39	63.10	63.22	89	95.17	95.22
40	64.00	64.16	90	95.60	95.68
41	64.95	65.08	91	96.04	96.14
42	65.90	65.98	92	96.50	96.59
43	66.75	66.86	93	96.95	97.04
44	67.60	67.72	94	97.40	97.48
45	68.45	68.56	95	97.85	97.91
46	69.30	69.38	96	98.30	98.34
47	70.10	70.19	97	98.74	98.76
48	70.90	70.98	98	99.17	99.18
49	71.70	71.75	99	99.58	99.59
50	72.50	72.50	100	100.00	100 00

curve were to be passed through the three points—0 per cent., 72½ per cent., and 100 per cent., corresponding to 0 feet, 50 feet and 100 feet in depth, respectively, the differences in the percentages as shown in the Somers depth curve, and those of the revised Somers depth curve would be practically negligible, and would affect computed valuations of individual lots to an infinitesimal extent except for very shallow lots. This is indicated in the comparative table on page 90, showing the percentages from 1 to 100 feet of depth as published by Mr. Somers in one column, together with the revised percentages.

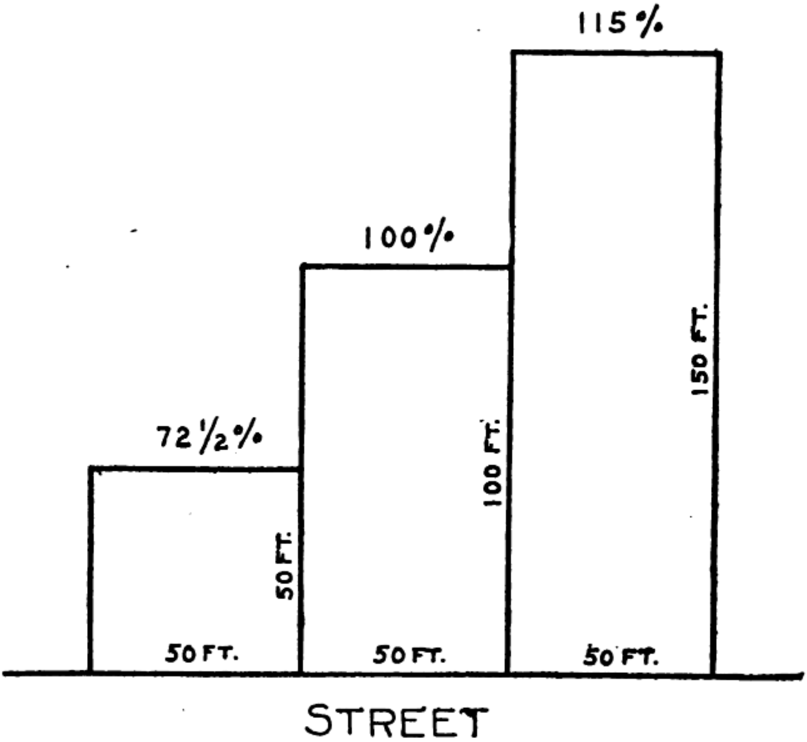


DIAGRAM XIII

Unit-Value Percentages of Somers Curve of Value at Three Basic Depths, Illustrating the Principle of Decreasing Values with Increments in Depth.

Diagram XIII represents three inside lots, each 50 feet wide. The first is 50 feet deep, the second 100 feet deep, and the third 150 feet deep. The value of the second lot will be equal to fifty times the value of the unit-foot for that particular street. The value of the first lot will be equal to 50 times 72½ per cent. of the value of the unit-foot for that street, the 72½ per cent. being obtained from the depth table. The value of the third lot will be 50 times 115 per cent. of the value of the unit-foot for that street, the 115 per cent. being obtained from the depth table.

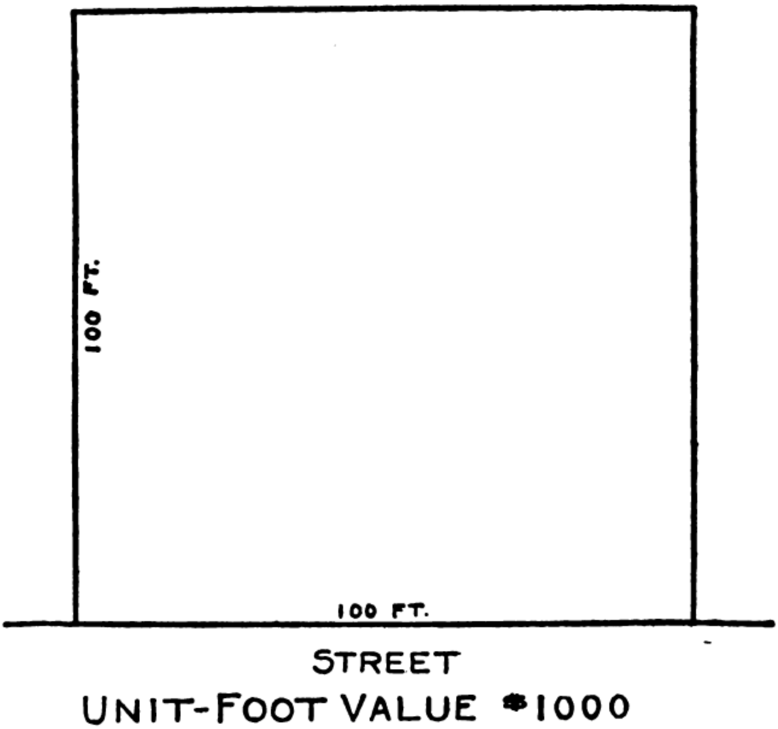


DIAGRAM XIV

Computation of Interior Lot Values, Illustrating the Simplest Type of Site of Regular Form, Affected by Single-Street Influence.

Whatever the depth of a lot may be, the percentage of value of the unit-foot for that depth may be obtained from the depth table. Knowing the monetary value of the unit-foot, it is merely a question of multiplying the unit-foot value by the depth percentage to obtain the valuation per front foot of an actual lot for any depth. Thus the effect of a single-street influence upon site values can be accurately apportioned over regular interior lots of varying depths.

Sometimes, however, the side lines of lots do not run at right angles to the street lines. To begin with, an area may front 100 feet on a street and have a depth of 100 feet as in Diagram XIV, page 92.

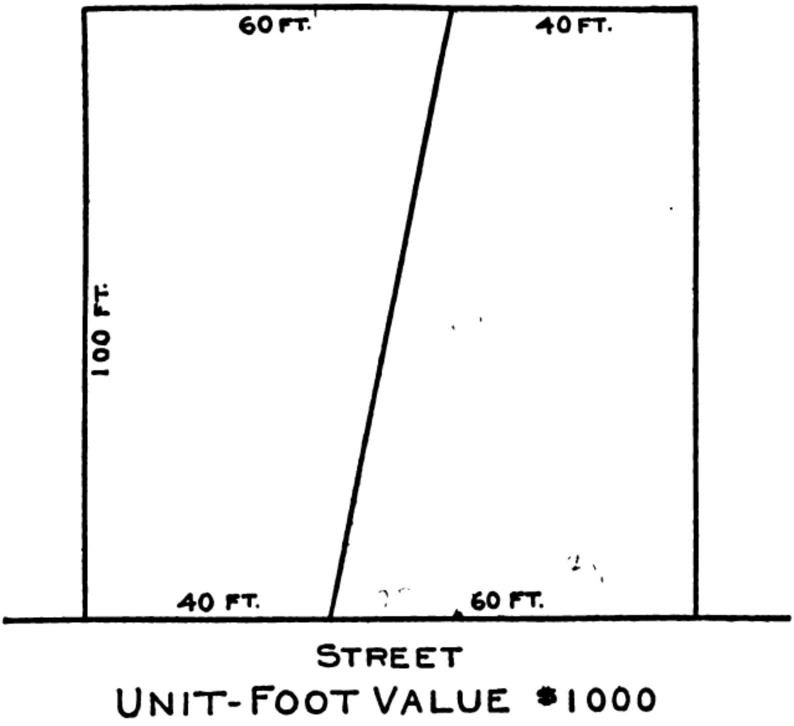
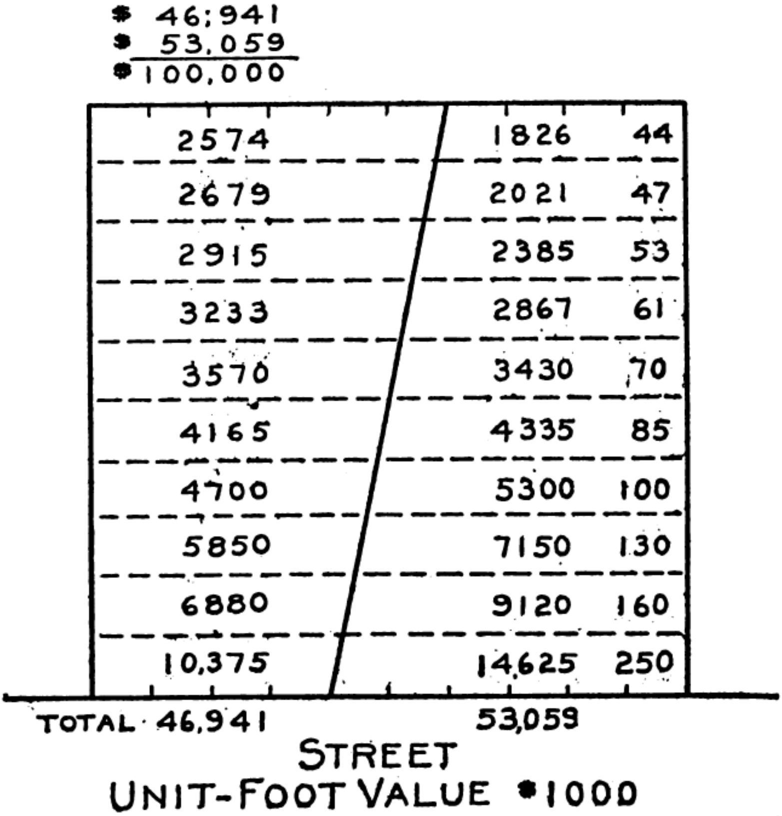


DIAGRAM XV

Illustrating Differences in Value of Two Sites of Identical Area, Fronting upon the Same Street, but with Different Frontages.

If the unit-foot on this street is valued $1,000 the computed value of this plot will be $100,000. Any division of this area would fail to affect the usefulness of the street or change the effect of that usefulness upon the plot as a whole, so long as the shape and dimensions comprise a commercially usable lot. Consequently, if any division, either regular or irregular, were to be made, the total of the valuations of the parts ought to equal $100,000. A diagonal line may now be run from the street, producing two lots fronting on the same street, and containing exactly the same number of square feet, but differing in shape with reference to the street, which may be illustrated in Diagram XV, page 93.



2574	1826	44
2679	2021	47
2915	2385	53
3233	2867	61
3570	3430	70
4165	4335	85
4700	5300	100
5850	7150	130
6880	9120	160
10,375	14,625	250
TOTAL 46,941	53,059	

DIAGRAM XVI

Method of Computing Values of Irregular Sites as Shown in Diagram XV, Illustrating Division into Zones Ten Feet Wide, with the Computed Value of Each Zone.

It is apparent that the comparative usefulness of these two lots differs. The one having the greater street frontage will generally be regarded as more valuable than the one with the smaller frontage. Under the Somers System of computation these irregular lots are divided for computation purposes into zones, as illustrated in Diagram XVI, each 10 feet deep, and the value of each zone is computed separately.

The value of the first zone is computed on the basis of the street unit-foot valuation for a depth of 10 feet, and a width equal to the median of the trapezoid thus formed, i.e., a line parallel to the street and 5 feet from the street and lot-line. The second zone is computed at the same unit-price, but for a piece of land 10 feet from the street and 10 feet deep, using for the width the median of the corresponding trapezoid. In like manner the value of each zone is computed, and the resultant totals will express the total value of each of the two irregular plots. In the case illustrated in Diagram XVI, the lot having a 40-foot frontage will be found to be worth $46,941, and the lot having a 60-foot frontage will be found to be worth $53,059, making a total of $100,000.

This rule is followed for any irregularity, the zone tables of the Somers System, derived from the depth tables, furnishing the computations for zones of any size and any distance from the street front. The Somers Zone Tables will be found in Appendix II.

It should always be borne in mind, however, that where lots have been platted in such irregular or distorted shapes and sizes as to be economically lacking in usefulness, separate individual judgment must be employed in making proper allowance for this factor.

Without a system of computation similar to that here described it would be impossible to compute with any degree of mathematical accuracy the value of a large portion of the highly valued lands of any city, since many sites are irregular in shape. The Somers System is peculiarly suited for the purpose of land valuation in older cities, where at times as high as 50 per cent. of the lots are irregular in shape and dimensions.

Some students of the Somers depth curve and depth percentages have contended that the uses to which city land is put in retail, wholesale, manufacturing and residential districts respectively, require more than one depth curve of valuation to represent the comparative usefulness of land derived from street accessibility under different conditions and for different purposes. In response to inquiries as to the reasonableness and the soundness of this criticism Mr. Somers personally described the evolution from theory to practice which finally resulted in his adoption of a single depth curve. Theoretically it is no doubt sound to contend that at least three depth curves, for retail, wholesale, and residential districts respectively, should be employed, but Mr. Somers stated the practical reasons for combining these curves into one, as follows:

"In my original investigations into the principles underlying the differences in value of the use of different parts of city lots, I found that in retail business property the lots were frequently used at very shallow depths, 50 feet being a very common depth, and in many cases 25 feet; there are cases of lots used having a depth of but three feet. In residential territory it very seldom occurred that lots were less than 75 feet deep, and more frequently ran to 100 or 150 feet in depth. In business districts where property was exclusively used for wholesale purposes, very few lots were used at less than 75 feet to 100 feet, and a large percentage would run over 125 feet in depth.

"In the western cities where I first made this study the boundaries of different properties are generally quite distinct —that is, there will be a retail district and a wholesale district, blending more or less along boundaries, but not generally very much mixed. These facts led me to work out two curves of value, one for the strictly retail property on the basis of 70 per cent. for the first 50 feet, 100 per cent. for the first 100 feet, 118 per cent. for the first 150 feet; and a residence curve based upon 150 feet in depth in place of 100 feet.

"I very soon discovered that it was impracticable to use two unit-foot depths, and determined that 100 feet in depth was the best depth for valuation units, and that all deductions could be made from this as a unit more conveniently than any other.

"On continuing the study in eastern cities I found that the divisions of the different uses of property were not so well-defined as in the west. On looking the matter over I found that practically shallow lots only are used for retail purposes. In the case of sites more than 100 feet in depth the percentages of valuation of different depths on a basis of a 100-foot unit is practically the same for all kinds of landed property. Therefore one curve would answer, the only exception being that in the case of strictly residence or wholesale sites where lots are very shallow, say, less than 50 feet in depth, an adjustment must be made. As a matter of fact cases of this kind occur very seldom. I do not recall more than half a dozen cases in all my experience.

"Of course in all rules to be used in this business we can only claim those which will fit the largest number of cases. There will always be exceptions, but the Somers curve of value I think will fit at least 95 per cent. of all situations, and it is much better to use only one curve, and to make special adjustments for the special cases, than to confuse the issue with a number of curves."

It is for these reasons, stated by the inventor, that under the Somers System only one depth curve is employed to compute the value of an urban lot derived from a single street accessibility.

CHAPTER XIV

COMPUTING INTERIOR SITE VALUES AFFECTED BY SINGLE STREET INFLUENCE

WITH UNIT-FOOT VALUATION AND DEPTH TABLE INTERIOR SITE VALUES CAN BE COMPUTED—SOMERS METHOD OF CHECKING UP COMPUTED VALUATION OF SITES IN A BLOCK—THE ILLUSTRATIVE LOT AND BLOCK MAP—A SIMPLE FORMULA FOR COMPUTING INTERIOR SITE VALUES AFFECTED BY A SINGLE STREET—FURTHER ILLUSTRATIONS OF COMPUTING IRREGULAR INTERIOR SITE VALUES—SOMERS SYSTEM METHODS OF GRADING UNITS IN A LONG CITY BLOCK ILLUSTRATED—DEPRECIATION OF GRADED UNITS.

WITH the aid of the unit-foot valuation and the depth table, the money value of each and every interior city lot affected by a single street influence, can now be computed. The actual method of making such computation, according to the Somers System, will be illustrated in this chapter. As a rule, when computations of urban site values are made, the value of an entire block is computed regardless of lot boundaries, and the valuation thus obtained is subsequently used to check the total value of all the lots in the block. If accurately made, the two results should be the same, since the value of the lots constituting a block—unless their usefulness is destroyed by uneconomic division—is merely a reallocation of the value of the block as a whole. Here, however, this usual method of procedure employed in making Somers System computations will be reversed, and the value of a series of lots in a typical urban block will first be computed, as the methods of computation are developed, and the final result compared with the total computed value of the block.

To begin with, the Assessor should provide himself with a series of lot and block maps, showing clearly the exact location, shape and dimensions of each individual site to be appraised. Let us revert to the Diagram employed in Chapter XII, Part II, indicating the unit-foot values established for a block in the central business section, let us say the block bounded by Main Street on the north, Third Street on the east, Center Street on the south and Fourth Street on the west.

This block is rectangular in shape, with 400 feet frontage on Main and Center Streets and 300 feet frontage on Third and Fourth Streets respectively. The unit-foot values finally adopted for the four streets are as illustrated in Diagram XVII.

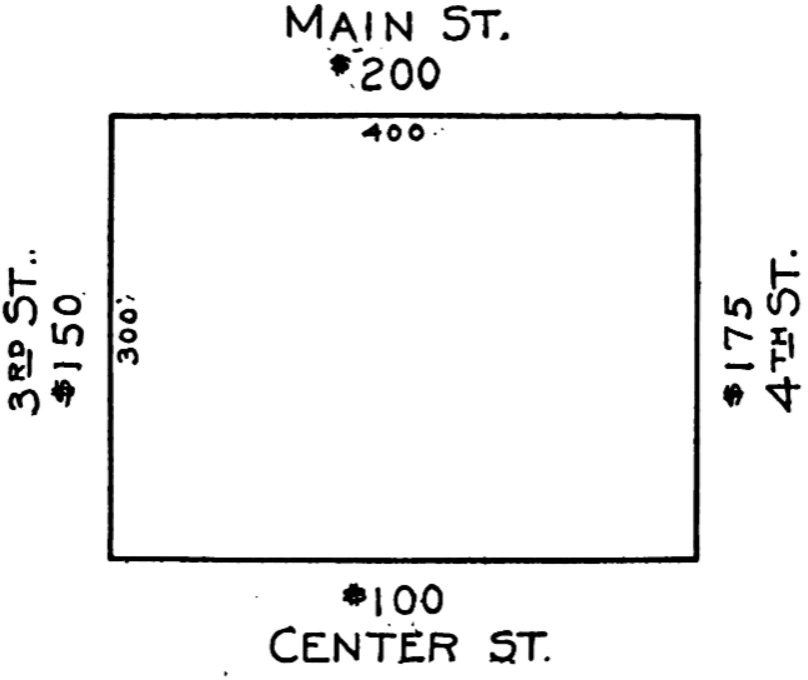


DIAGRAM XVII

Illustrative City Block with Unit-foot Values on Four Boundary Streets for Computing Actual Site Values.

Let us assume the various lots in this block situated as illustrated in the diagram which follows. A block has been chosen for illustrative purposes with a series of individual sites, none of which extends through from one street to another. If a lot were to front at either end on a street, as for example in the following illustration, on Main and Center

Streets, or on Third and Fourth Streets respectively, its value would be affected by two street influences overlapping each other. The method of computing the value of such "overlap" influence under the Somers Unit System will be discussed in a later chapter. Furthermore, the value of a corner lot is the result of two or more intersecting street influences acting simultaneously, which requires separate computation. The method of computing "corner" influence will likewise be discussed subsequently. Finally, the increment in site values due to alley influences must be made the subject for separate computation. For the present we shall merely illustrate the method of computing the values of interior lots, assuming but a single-street influence.

Referring to Diagram XVIII, we shall show the method of computing the values of interior lots A, B, C, D, E and G with the aid of the unit-foot and the Somers depth table—as these lots have but a single-street accessibility.

Begin with Lot A on Main Street, and assume that its value is affected by but one street influence, namely that of Main Street. Lot A is a regular lot with dimensions 50′ x 110′. The unit-foot on Main Street has been valued at $200, which valuation, as we have previously explained, has been placed on a unit quantity of land by the community in this particular location. Referring to the depth table we note that a regular lot 110 feet in depth absorbs 104 per cent. of the value of the unit-foot. Consequently a front foot on Main Street 110 feet deep would be worth $208, if the value of the unit-foot is $200. The entire Lot A, with a frontage of 50 feet on Main Street, would thus be worth 50 × $208, or $10,400, always assuming but a single factor of street value, namely Main Street.

We can express the method of computing the value of any regular site fronting on a street and affected by a single-street influence, having given the unit-foot value and the depth percentage, by a very simple formula, as illustrated below.

Let $X =$ value of site to be computed.
" $U =$ value of the unit-foot.
" $D =$ depth of lot.
" $DV =$ relative value of unit absorbed by depth (depth percentage).
" $F =$ number of feet front.
Then $X = U\ (DV \times F)$.

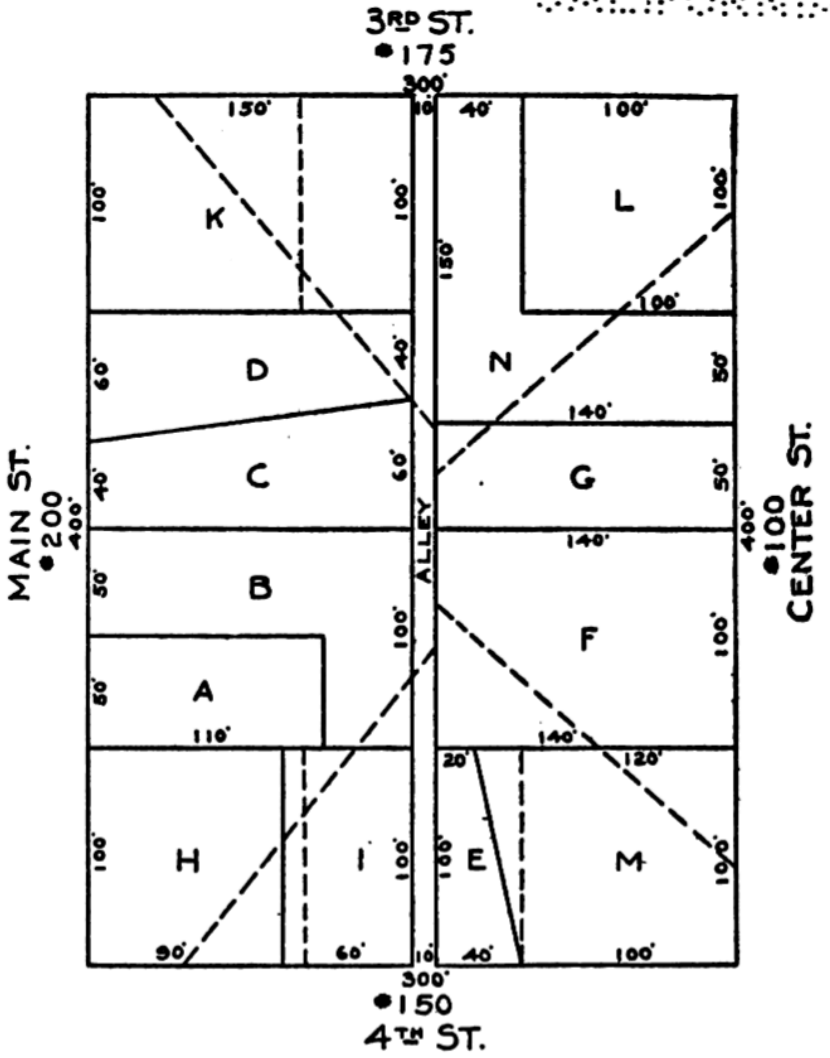


DIAGRAM XVIII

Division of City Block (Diagram XVII) into Lot Areas, Illustrating Various Shapes and Relations to Streets and Alley. Dotted Lines Show Direction of Overlap Influence.

In this example (Lot A):

U = $200.
D = $110.
DV = 1.04.
F = 50 ft.
Then X = 200 (1.04 × 50) = 200 × 52 = $10,400.

This formula can be employed to compute the value of any regular interior lot fronting on a street affected by a single-street influence, knowing the unit-foot value and the depth percentage.

Lot B (Diagram XVIII) is irregular, having a frontage on Main Street of 50 feet, and extending in depth at right angles 150 feet to a 10-foot alley, with a strip to the rear of Lot A 50′ x 40′ as is indicated in the diagram. This site can be resolved into two regular areas, one fronting on Main Street, 50′ x 150′, the other to the rear of Lot A, 50′ x 40′. The value of the first of these two areas can be computed by reverting to the formula:

U = $200.
D = 150.
DV = 1.15.
F = 50.
X = 200 (1.15 × 50) = 200 × 57.50 = $11,500.

How can we compute the value of the strip of land to the rear of Lot A? It is obvious that if this strip were a part of Lot A, the entire Lot A would have precisely the same value as Lot B, without this strip. In other words, this strip, as well as any other urban site, derives its value from its location primarily with reference to street frontage. It is this single-street frontage value that we are computing. Consequently the area in question would have a value of $11,500 (part value of Lot B computed above) minus $10,400 (value of Lot A computed above) or 1,100, making the combined total value of Lot B equal to $12,600, without taking into consideration the effect upon its value of the 10-foot rear alley.

Lots C and D are irregular in shape, but together form a regular area. The value of this entire area can be computed with the aid of the formula X = U (DV × F) where X = 200 (1.15 × 100) = $23,000. This value is apportioned between

Lots C and D with the aid of the Somers zone tables as follows:

Lot C—Computed Values of Zones

Zone 1—40.67′	$2,034
" 2—42′	1,344
" 3—43.33′	1,127
" 4—44.67′	893
" 5—16′	782
" 6—47.33′	663
" 7—48.67′	594
" 8—50′	530
" 9—51.33′	483
" 10—52.67′	463
" 11—54′	432
" 12—55.33′	387
" 13—56.67′	340
" 14—58′	290
" 15—59.33′	237
Totals	$10,599

Lot D—Computed Values of Zones

59.33′	$2,966
58′	1,856
56.67′	1,473
55.33′	1,107
54′	918
52.67′	737
51.33′	626
50′	530
48.67′	457
47.33′	417
46′	368
44.67′	313
43.33′	260
42′	210
40.67′	163
Totals	$12,401

It will thus be noted that the combined value of Lots C and D is equal to $23,000, as it should be.

Lot E is likewise irregular. Its value is computed with the aid of the Somers zone tables, as was the value of Lots C and D respectively, by dividing it into a series of zones as follows:

Lot E—Computed Values of Zones

Zone 1—39′	$1,463
" 2—37′	888
" 3—35′	683
" 4—33′	495
" 5—31′	395
" 6—29′	305
" 7—27′	247
" 8—25′	199
" 9—23′	162
" 10—21′	139
Total value, Lot E	$4,976

Lot G is regular in shape, and its value with reference to Center Street can be readily computed with the aid of the formula $C = U\ (DV \times F)$:

Lot G—Computed Value

$U = 100.$

$D = 140.$

$DV = 1.13.$

$F = 50.$

$X = 100\ (1.13 \times 50) = 100 \times 56.50 = \$5,650.$

The extent of the overlap value (to be explained later) affecting these interior lots, as shown by the dotted diagonal lines in Diagram XVIII is relatively unimportant with reference to the unit-foot values assumed. It amounts to only a fractional part of one per cent., and so may be ignored in this computation. When, however, the unit-foot values are higher, this overlap value affecting interior sites becomes significant, and must be taken into consideration.

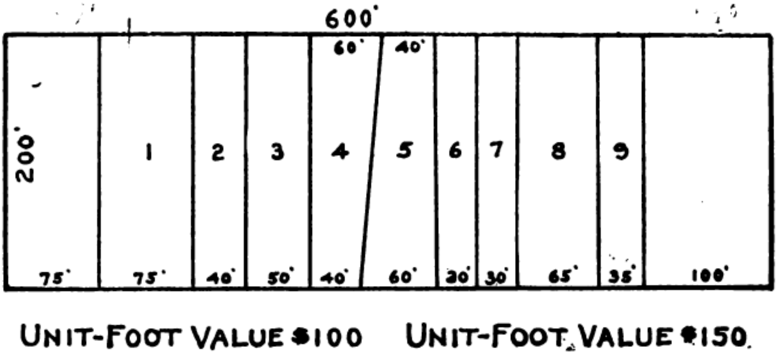


DIAGRAM XIX

Graded Unit-Foot Values on Long City Block Frontage, Illustrating Method of Expressing Changes in Unit-Foot Values for Each Lot in the Block.

The remaining lots in the block are affected by more than one street influence, and so their values cannot be computed with the data available thus far. Moreover, the values of the sites will be enhanced by their proportionate shares of the value of the alley accessibility, the Somers System method of computing which will be developed in a later chapter.

The foregoing illustration has assumed a single unit-foot value for each of the four streets. In some of the older towns and cities, business and residential blocks are frequently found which are so long, and the values of intersecting streets show such variations in value, that two or more unit-foot values must be appraised for different parts of the same block along one street. The process of apportioning such different unit-foot values proportionally over every foot fronting on the street, and not affected by corner influence, is known as grading unit-foot values.

In Diagram XIX, page 104, a city block, 600 feet long, has different unit-foot values, graded from $100 to $150.

In this diagram two unit-foot values have been adopted for the block, the one pertaining to the land approaching the one corner, the other to the land approaching the other corner. Assuming 100 feet in either direction for the extent of corner influence, the intervening 400 feet would vary in unit-foot values from $100 to $150. The assumed extent of corner influence will be discussed in a later chapter. The difference between the two unit-feet here adopted is $50. Dividing this amount by 400 feet, it is found that each unit-foot increases in value by 12½ cents, as we proceed from the $100 unit-foot value area to the $150 unit-foot value.

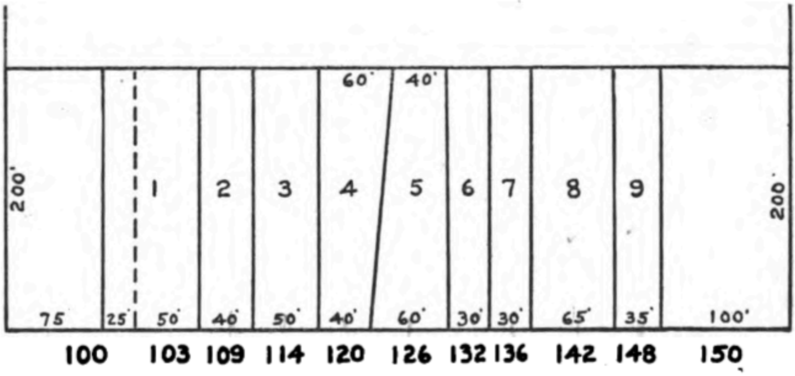


DIAGRAM XX

Distribution of Graded Unit-Foot Values over Long City Block, Showing the Effect of Graded Unit-Foot Values as Applied to Individual Lots.

To apportion this increase in unit-foot values over each lot, one-half the frontage of Lot 1 beyond the point where corner influence is assumed to cease, is multiplied by the increase in unit-foot value (12½¢) and the amount added to the unit-foot value (\$100). Thus the unit-foot value employed in computing the value of Lot 1 will be 25′ × 12½¢ + \$100, or \$103.12½. For Lot 2 one-half the frontage of Lots 1 and 2 is taken, ½ (50′ 103 + 40′), multiplied by 12½¢, and this total is added to \$100. In this manner the unit-foot value for Lot 2 is found to be 45′ × 12½¢ + \$100, or \$108.75. For Lot 3, one-half the frontage of Lots 2 and 3 is taken, ½ (40′ + 50′), multiplied by 12½¢, and the totals added to \$108.75, giving a unit-foot value for Lot 3 of \$114.37½. The fractional parts of a dollar may be rounded off in accordance with accepted usage. Thus the increase in unit-foot values for each of the nine interior lots is computed from the two unit-foot values as appraised. The results of such a computation are illustrated in Diagram XX.

The unit-feet thus computed can then be employed to determine the values of interior sites in the manner previously illustrated.

While the practical method of applying the unit-grading plan is to apply the unit-foot values at the ends of a block frontage to the land lying 100 feet from the corners, grading the unit-foot values for the intervening areas, the strict theory is that when one appraises the street at \$100 for the unit-foot at one end of a block and \$150 at the other end, the gradation begins and ends at the street intersections. It will be found more practicable, however, to make the actual computations in the manner here described.

CHAPTER XV

OVERLAP OR REFLECTED VALUE

PURPOSE OF SCIENTIFIC URBAN LAND VALUATION TO DETERMINE MAXIMUM RELATIVE VALUES OF SITES—MR. SOMERS' OWN STATEMENT—OVERLAP VALUE ILLUSTRATED AND DEFINED—OVERLAP VALUE SOMETIMES REFERRED TO AS REFLECTED VALUE—FURTHER COMMON USE OF THE TERM REFLECTED VALUE—DETERMINING THE POINT WHERE OVERLAP INFLUENCE OF PARALLEL STREETS BEGINS—DETERMINING THE POINT OF OVERLAP INFLUENCE FOR INTERSECTING STREETS—THE DIRECTION OF OVERLAP INFLUENCE DUE TO INTERSECTING STREETS—THE LINE OF COINCIDENCE OF VALUES—OVERLAP TABLES WITH REFERENCE TO STREET CORNERS—COMPUTING THE VALUE OF INTERIOR SITES SUBJECT TO OVERLAP INFLUENCE—ALLEYS INTERRUPT THE EFFECT OF OVERLAP VALUE.

SINCE the purpose of scientific urban land valuation is to ascertain the relative importance, and consequently the comparative values, of different locations to the life and activities of the community, it is essential that any value-relationship of urban sites should represent the maximum importance or usefulness of such sites. In other words, a value-relationship of, let us say, 5 to 2 may be established between two interior city lots, having the same shapes and dimensions, and situated on two opposite frontages or sides of a block, with unit-foot values in the ratio of 5 to 2. If, now, it is discovered that the value-relationship of the two lots, computed with reference to the values of the unit-feet established for the streets on which the lots front, in reality does not express the maximum importance of the one or the other lot to the community, but that the correct relationship should be, let us say, 5 to 3, it becomes clear that unless the maximum relative importance of each lot is ascertained, the computations of site values will be relatively worthless as accurate expressions of comparative urban land values.

The Somers Unit System is employed to ascertain the maximum usefulness of every city block as derived from the relative importance of the streets surrounding it, regardless of location of boundary lines of the individual lots comprising the blocks. In actual computation the maximum value for each block is ascertained and subsequently distributed among the individual sites.

It may be well to quote Mr. Somers on this subject:

"Speaking of a block as a tract of land wholly surrounded by streets, it is fair to say that the block has a value in proportion to the importance of the streets surrounding it, and no matter how many lots it may be divided into, or what shapes they may be given, the value of the block as a whole is not changed. It may occur that some of the lots are so oddly shaped that it would be difficult or impossible to produce a return value in proportion to their area, and to the position which they occupy with reference to the street, but as the subdivision of a block is a matter entirely within the control of the owners, it does not seem reasonable that the work of the Assessor should be complicated by requiring him to adjust and allow for the mistake that may be made by the owners in the use of their own property.

"If an owner should build a solid wall along the sides of the streets and entirely around his block, making the interior entirely inaccessible, he might, by renting the street face as a billboard, get a small return for the use of the property. Such an owner might come before the Board of Review and show that he is receiving only a very small rent on his lot when compared with the amount received by his neighbor, who has a block of the same size and on streets of equal importance, but which is so improved that every part is useful, and is producing a profitable rent. Upon such showing he might ask that the value of his block for the purpose of taxation be reduced in accordance with the income received. The attention of the owner, in such a case, would undoubtedly be called to the fact that, inasmuch as the opportunity which he has with his block to reach the life and trade of the city is the same as with the neighboring block, it would be unfair to reduce his tax and thereby increase the tax on his neighbor, and that it would not only be unfair, but impossible, for the tax authorities to adjust satisfactorily the amount of taxes on city lands in proportion to the profitable or unprofitable use made of the land by the owners."

It is therefore the maximum relative importance of urban sites that must be ascertained, and this cannot always be done by merely employing in the computation of interior site values the unit-foot values of the streets on which the sites in question front.

Not infrequently it is found that the unit-foot values placed on two streets running parallel and but one block apart differ very considerably. If the value of a lot located on the lower-valued street is computed with reference to the lower unit-foot value, it may be found that in reality its value would be greater if it were divided and a portion of the site were added to the site on the higher-valued street. The site on the lower-valued street has absorbed a portion of the value of the higher-valued street by reason of its proximity to it, although it is without frontage on the higher-valued street.

Likewise, when a given value-relationship has been established between a main street and a side street, a point can be discovered in every corner lot where the site becomes more valuable if computed as fronting on the main street rather than on the side street, and vice versa. The value of a site becomes relatively greater or less, depending upon the point from which it is viewed: i.e., the street unit-foot value or combination of street unit-feet values with reference to which its value is computed. This greater value of a lot, if viewed with reference to the higher-valued street unit, is commonly referred to as reflected or "overlap" value. It is due to the fact that certain vantage points radiate their influences, as it were, in all directions. This influence tends to vary inversely with the distance. In retail business districts main streets usually reflect values on side streets, enhancing their values in consequence.

The term reflected value is at times also employed to express value-enhancement derived from certain improvements on land. A large, attractive apartment house or hotel may make adjacent sites more attractive to prospective buyers and thus enhance their values. Any such enhancement in site values due to greater importance of location should be reflected in the unit-foot values adopted for specific street frontages. It is only when certain areas are more valuable if viewed from different street frontages that overlap or reflected value requires computation.

The significance of overlap value may be illustrated with the aid of Diagram XXI, page 110.

In Diagram XXI Lots A and B are assumed to be 100 feet in depth, Lot A fronting on a $1,000 unit-foot-value street and Lot B on a $250 unit-foot-value street. Turning to the Somers depth table, we ascertain the actual money value of every foot in depth of Lots A and B respectively. If Lot A were 150 feet in depth, the value of the additional 50 feet would be 15 per cent. of $1,000, times 100 feet, or $150 additional for each front foot. But viewed from Low Street the second 50 foot strip of Lot B absorbs a total of but 27.50 per cent. of the value of the unit-foot on this street ($250) times the frontage, or $68.75 per foot in width. In other words, the value of Lot B is enhanced by virtue of the higher unit-foot value on High Street, and this enhancement must be taken into consideration in computing its value.

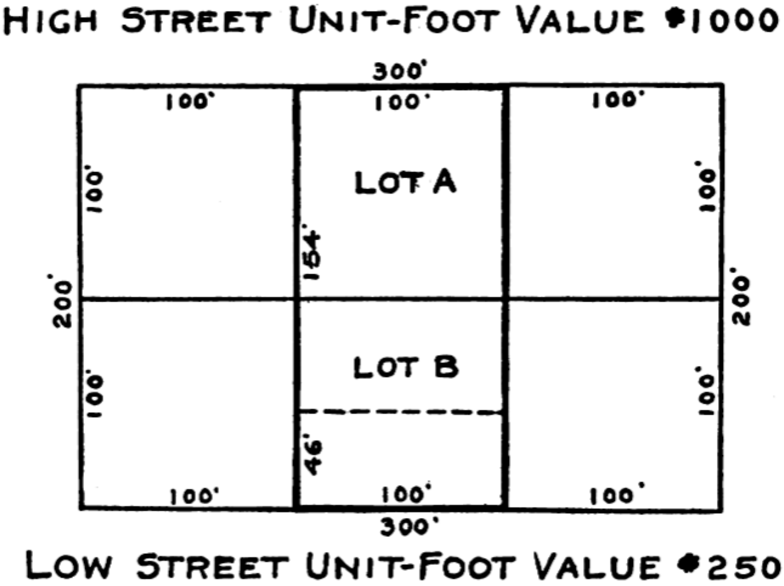


DIAGRAM XXI

Computation of Overlap Influence with Reference to Interior Sites. (The Dotted Line Shows the Point at Which Lot B is as Valuable, Viewed with Reference to High Street, as from Its Frontage on Low Street.)

Where does such overlap value begin, or with reference to which frontage must the value of the lots be computed? Overlap begins at a point where the value of an additional foot in depth, viewed with reference to each of the street unit-foot valuations separately, coincides.

Mr. Luther Gulick, Director of the Bureau of Municipal Research in New York City, has developed a simple mechanical device for determining at what point between two parallel

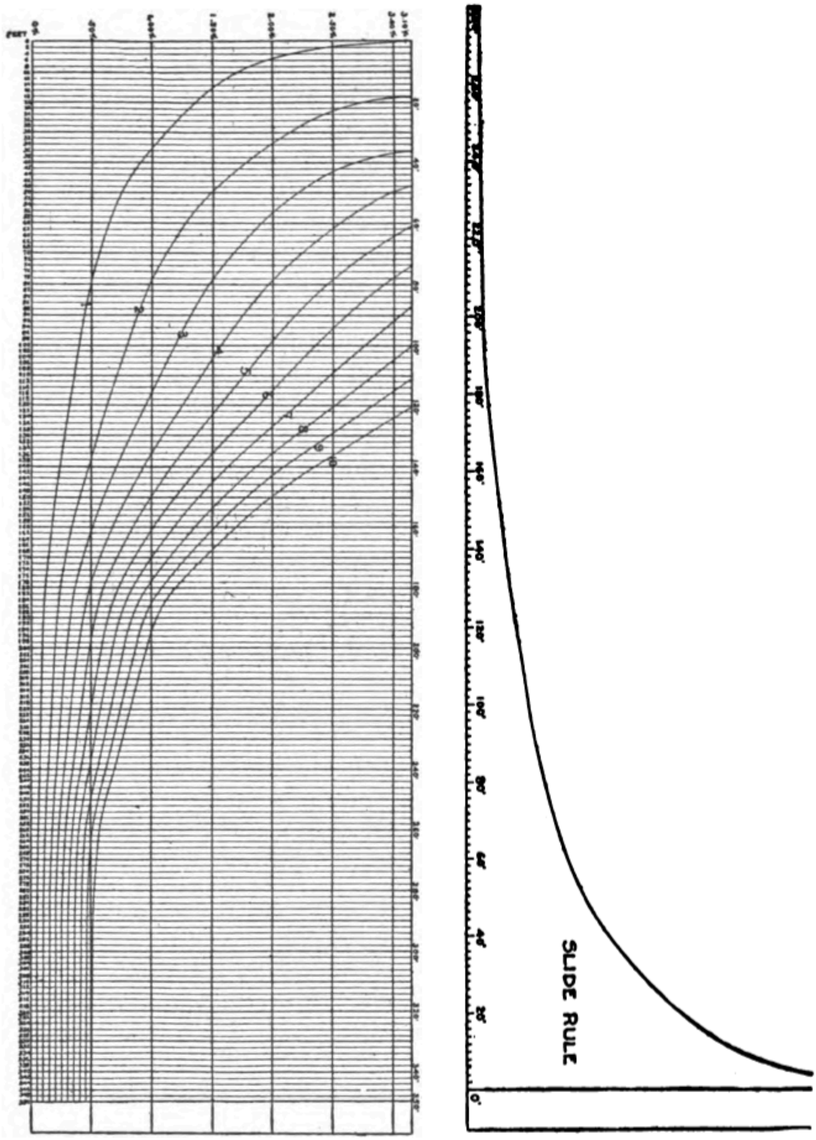


DIAGRAM XXII

Determination of Point Where Overlap Influence of Parallel Streets Begins. This Illustrates a Practical Method of Finding the Location Where Land from Two Parallel Streets, with Different Unit-Foot Values, Is of Equal Value from Both Streets.

streets, one block apart, the value of a square foot of land is the same from whichever street the value is computed. The "overlap calculator," as he calls it, is composed of two parts—a chart and a movable slide. The chart is rectangular and contains a series of curves as shown in Diagram XXII, page 111. The lowest curve (No. 1) shows the descending values of successive square feet of land from the street front, using the Somers depth percentages. The curves above No. 1 are multiples of it, so that No. 2 is twice as high as No. 1 at corresponding points, No. 3 three times as high as No. 1 at corresponding points, No. 4 four times as high, and so on. If ten such curves are drawn on the chart they will correspond to unit-foot values of 100, 200, 300 and so on up to 1,000 per cent. For intermediate unit-foot values other lightly interpolated curves may be drawn between the main curves.

The movable slide (Diagram XXII) is a cut-out right triangle, the hypothenuse of which is a curve exactly representing curve No. 1, on the chart, except for the fact that it ascends from left to right, while the curves on the chart ascend in the opposite direction. The base lines in both cases represent feet from the street front, and the vertical scales represent values per square foot from the street front. The calculator is constructed so that the slide can be moved to the right or to the left over the surface of the chart with the base lines continually coinciding.

To ascertain the point of coincidence of values proceed as follows: Assume that the problem is to find the overlap point between two streets, 210 feet apart, having unit-foot values of $700 and $100 respectively. The slide is moved until its right hand vertical scale is over the 210-foot mark on the base line scale of the chart. Follow the curve of the slide to the point where it intersects curve No. 7 (for a $700 unit-foot street). This is the point of overlap. With reference to the Somers depth curve, this point is found to be 174 feet from the high-valued street.

In this case the low-valued street was taken as $100. Where other values than 100 or multiples thereof appear, it is necessary to reduce these values to the $100 base. This is done by dividing the high unit-foot value by the low unit-foot value and multiplying the quotient by ten. If, for example, the values of the two unit-feet are $450 and $150 respectively, they can be changed to $300 and $100 without affecting the ratio or relationship of the two unit-feet to one another. The intersection of the slide curve and curve No. 3 on the chart would thus indicate the point of overlap for any particular distance.

If high-valued unit-feet, after proper reduction of the low unit-foot values to $100 appear as figures such as 350 or 470, for which there is no main curve, an interpolated curve between 300 and 400, or 400 and 500, as the case may be, must be employed. For convenience, the top portions of the curves toward the left-hand side of the chart may be omitted because they lie so far above the highest part of the slide that they are never needed.

As the two unit-foot values of the parallel streets become nearer alike, the point of overlap value will recede farther and farther from the lower-valued street. Thus if the unit-foot value of Low Street were assumed to be $600 instead of $250, the unit-foot value of High Street remaining unchanged, a square-foot at a depth of 51 feet from Low Street on Lot B would be worth $4.50 with reference to the lower-valued unit-foot (Low Street), and $1.80 with reference to the higher-valued unit-foot (High Street). The point of coincidence of values would be farther from Low Street, and the amount of overlap value accruing to Lot B from High Street would be relatively less. Not until a depth of approximately 70 feet from Low Street were reached would overlap value enter into the computation. But whenever a decided difference between the unit-foot values of two parallel streets, one block apart, does exist, it is important that overlap value should be carefully computed.

Overlap may also occur with reference to intersecting streets, determined by the relationship of the intersecting street unit-foot

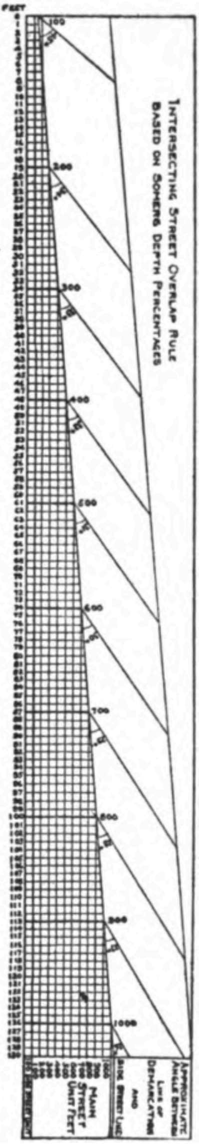


DIAGRAM XXIII

Determining Point Where Overlap Influence of Intersecting Streets Begins, and Angle Formed Between Side Street Line and Line of Coincidence of Values

values. The location of the point of coincidence of unit-foot values with reference to two intersecting streets, meeting at right angles, may be determined with the aid of Diagram XXIII.

With the side street unit-foot value $100 and the main street unit-foot values ranging from $100 to $1,000, the point of overlap can be found by following out the Main Street line from the right to the left until it meets the diagonal side street line. For example, if the Side Street unit-foot value is $100 and the Main Street unit-foot value is $600, the point of overlap will be 74 feet from the street intersection, measured along the side street. The angle made between this point of intersection and the line of overlap or coincidence of values is indicated on the rule. In the foregoing illustration it will be an angle of 30 degrees. For intermediary unit-foot values interpolation is necessary, as in the case of determining the point of overlap of two parallel street unit-foot values.

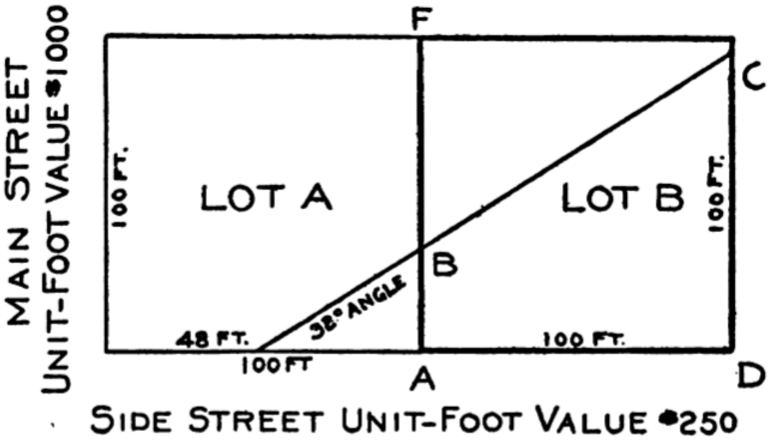


DIAGRAM XXIV

Point of Overlap Influence for Intersecting Streets and Direction of Line of Coincidence of Values. (The Value of Land in Lot B to the Left of the Line of Coincidence Is Computed with Reference to the Unit-Foot Value on Main Street, and the Land to the Right of the Line, with Reference to the Unit-Foot Value on Side Street.)

But the Somers corner tables, to be explained in a later chapter, are computed to allow for any corner overlap value to a depth of 100 feet in either direction from the Main Street intersection. It thus remains to ascertain the extent of the reflected or overlap value beyond a depth of 100 feet on the side street, and the method of computing it.

In the assumed relationship between Main Street and the Side Street units of 4 to 1 we have noted that the overlap influence begins at a depth from Main Street, measured along the Side Street, of about 48 feet.

The valuation of Lot B would thus be computed, partly with reference to the lower unit-foot value, and partly with reference to the higher unit-foot value. The area ABCD will derive a greater value from the $250 unit-foot valuation than from the $1,000 unit-foot valuation, while the area BFC will derive a greater value from the $1,000 unit-foot street than from the $250 unit-foot street.

Assuming a series of relationships between the main and side streets, we can ascertain the point where overlap value commences, and the slopes of the hypothenuse of the right triangles, which indicate the direction of the overlap values. This may be represented in the form of a table:

OVERLAP TABLES WITH REFERENCE TO STREET CORNERS

Assumed Relationship of Main Street to Side Street	*Distance from Main Street Along Side Street Where Overlap Value Begins*	*Degree of Angle Between Side Street Line and Line of Coincidence of Values*
4 to 1	48′	32°
5 " 1	61′	31°
6 " 1	74′	30°
7 " 1	87′	29°

In like manner the distance from Main Street of the point where overlap influence begins can be ascertained for any value-relationship between the intersecting streets, and the degree of the angle formed by the line of demarcation and the Side Street line determined. The values of the resultant irregular areas are then computed as previously explained, by employing the Somers zone tables.

It will be noted by referring to the overlap table that as the relative importance of Main Street to Side Street increases—i.e., where the value of the lot fronting on Side Street is greater when computed with reference to the Main Street unit-foot value than with reference to the Side Street unit-foot value—the point where overlap influence begins moves further and further from Main Street, and vice versa. In other words, the influence of Main Street extends to ever-increasing distances along Side Street as its relative importance increases. On the other hand, the angle of coincidence grows less with the increasing importance of Main Street to Side Street. This is as it should be if the maximum comparative value of each block and of each plot of urban land is to be ascertained.

We are now in a position to compute the value of the interior lots F and N in Diagram XVIII, Chapter XIV, page 101, used for the purpose of illustration, affected by overlap influence sufficiently important to give it any practical significance.

Lot F is divided into three areas. The first is rectangular in shape, extending 65 feet at right angles from Center Street to the point where the line of demarcation of overlap crosses the boundary line of the lot. The line drawn through this point, parallel to Center Street, to the opposite boundary line of Lot F will give the first area, the value of which is computed as a regular inside lot with the aid of the formula $X = U\ (DV \times F)$:

$$X = 100\ \ (.8261 \times 100) = \$8,261.$$

The remainder of Lot F is divided into two areas, one triangular, the other irregular, and each of these areas is laid out in zones, the values of which are computed with reference to the \$100 and \$150 street unit-foot values respectively, as previously explained. The results are as follows:

Triangular area, computed value	$1,266
Irregular area, computed value	2,381
Value of rectangle	8,261
Total value of Lot F with reference to two street unit-foot values	$11,908

Lot N fronts on two streets, deriving a part of its value from Center Street and a part from Third Street. The line of demarcation of overlap is determined, and the values with reference to either unit-foot computed. The area fronting on Center Street can be resolved into a rectangle and a triangle, while the area fronting on Third Street can be resolved into a rectangle and an irregular quadrilateral. The computed values of these four parts are as follows:

Rectangle facing Center Street, 50′ x 55′	$3,810
Triangular area, zoned	1,180
Triangular area, facing Third Street, 40′ x 100′	7,000
Irregular area, zoned	1,660
Total value of lot N with reference to two street values	$13,650

The effect of overlap value is interrupted by alleys, which affect site-values independently of street frontage values. In some systems of computation of urban site values alleys are actually regarded as streets, and definite unit-foot values are placed on them for purposes of computation of site values abutting on alleys. But the fact that there is a marked difference between alleys and public thoroughfares, and because the benefits derived from alleys cannot be ascribed to community patronage of the abutting sites, but are derived primarily from their main use on the part of the occupants, the Somers System method of computing the value of alley influence differs from most other methods of computation. The actual method of computing the value of alley influence under the Somers System will be explained in a later chapter.

CHAPTER XVI

OBSERVATIONS ON CORNER INFLUENCE

REASONS FOR VALUE ENHANCEMENT OF CORNER SITES OVER INTERIOR SITES PARTICULARLY IN BUSINESS DISTRICTS—COMMON METHODS OF EXPRESSING CORNER VALUE ENHANCEMENT—CRITICISM OF THESE METHODS—DIRECTION AND EXTENT OF CORNER INFLUENCE—VALUE ENHANCEMENT OF CORNER SITES ANALYZED—PRACTICAL MEANS OF APPORTIONING STREET UNIT VALUES TO LOTS LOCATED AT OR NEAR STREET CORNERS—CORNER INFLUENCE THE RESULTANT OF THE SIMULTANEOUS ACTION OF TWO STREET UNIT-FOOT VALUES—THREE CONTROVERSIAL QUESTIONS DISCUSSED—THE DIRECTION OF CORNER INFLUENCE—THE DIFFERENCE BETWEEN CORNER INFLUENCE IN DIFFERENT URBAN DISTRICTS—THE EXTENT OF CORNER INFLUENCE—THE NECESSITY FOR SOUND JUDGMENT BASED ON ACCURATE OBSERVATION.

THE enhancement in usefulness, and hence in value, of sites located at and near street corners is generally recognized. The value of lots at corners in business centers is affected by accessibility to two or more streams of people, by accessibility to more light and air than interior lots, and often by possibility of better fire protection to improvements on land. These and similar factors tend to make sites located at intersecting streets, particularly in retail business districts, more desirable, and so enhance their values over inside lots of similar shapes and dimensions. Since urban sites are usually most valuable in retail business districts, and corner influence is most pronounced there, the following discussion applies primarily to retail business districts.

Hitherto it has been difficult to ascertain with any degree of mathematical accuracy just what the amount of the enhancement in value, due to so-called "corner influence" actually is. Many critics have expressed their opinions that such increment in value cannot be computed, but must remain a matter of individual judgment based on sound observation. Others have employed percentage tables for purposes of computation, but most of these tables have been found defective, for they do not appear to be based on the mathematical relationship existing between two forces, two unit-foot values, interacting at right or oblique angles to each other, as the case may be. The Somers System corner tables represent an attempt to calculate the valuations produced by the simultaneous influence of the unit-foot values of the intersecting streets.

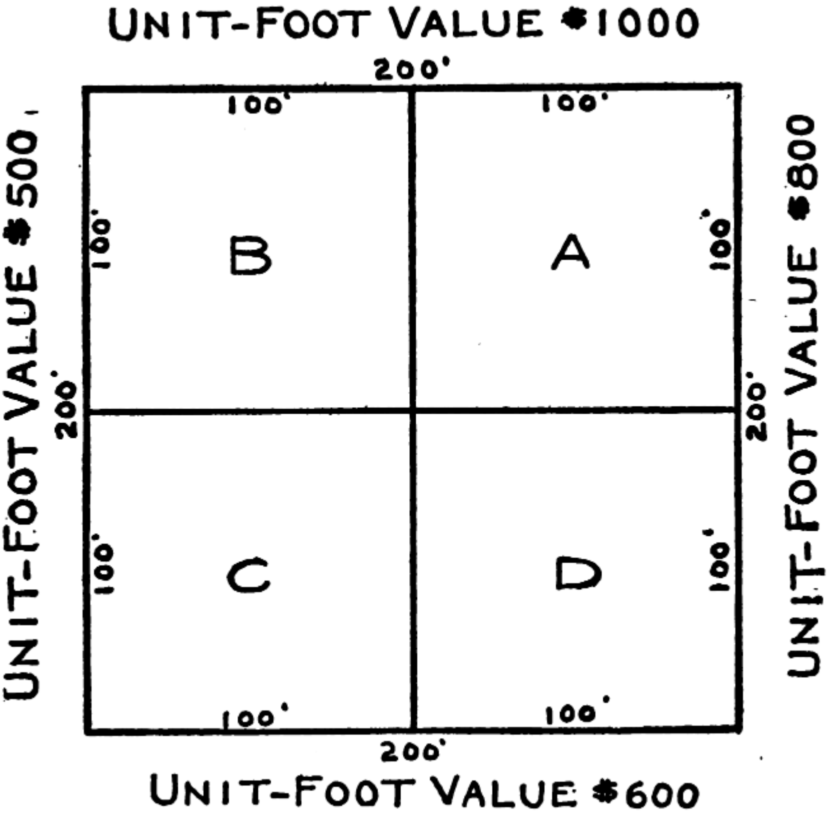


DIAGRAM XXV

Study of Corner Influence, Illustrating Four Corner Plots, Affected by Different Intersecting Street Unit-Foot Values.

It is common knowledge that corner influence in business districts extends in either direction from the street corner, gradually decreasing until it finally vanishes at a point at a greater or less distance from the street corner. At any point before the point of disappearance has been reached the extent of the corner influence will bear a direct relationship to the effect, in combination, of the two contributing street unit-foot values forming the corner.

Many formulæ and equations might be employed to express a value-relationship resulting from employing two interacting sets of forces or quantities. But that particular formula and equation must be employed which expresses most nearly the actual effect of corner influence upon site values, as shown by careful observation and experience.

In this study of the effect of two streets affecting the same area, let us assume the simplest possible case, that of a business block with its four corners as shown in Diagram XXV.

Each one of the four lots is 100 feet square. The unit-foot values have been appraised at $1,000, $800, $600 and $500 respectively, as indicated on the diagram. It will no doubt be agreed that, with reference to street usefulness, particularly for retail business purposes, any one of these four lots is more valuable than a similar area in either direction on the inside frontage of a block at a definite distance from a corner. Furthermore, it will be conceded that Lot A is at the most valuable corner of the four in the diagram. The reason for this is clear—Lot A is at the intersection of the two highest-valued streets. Lot A has the same street advantage on the $1,000 street as Lot B, and has 100 feet of additional frontage on an $800 street front, while the corresponding additional frontage of Lot B, notwithstanding that it is of similar dimensions and area as Lot A, is derived from a street only slightly more than half as valuable as the $800 street.

For the same reasons it is apparent that Lot B is more valuable than Lot C, and Lot A is worth more than Lot D, but it is not so apparent which is worth more—Lot B or Lot D. The sizes and shapes of the two lots are identical, but Lot B has a combination of $1,000 and $500 unit-foot-value streets, while Lot D has a combination of $800 and $600 unit-foot-value streets. With reference to the $1,000 and $800 unit-foot values there is a difference of $200 per unit-foot in favor of Lot B, while with reference to the $600 and $500 unit-foot values there is a difference of $100 per unit-foot in favor of Lot D. It would thus appear that Lot B is more valuable than Lot D.

We have thus been able to establish a value-relationship among these four lots. Lot A is most valuable, next in order

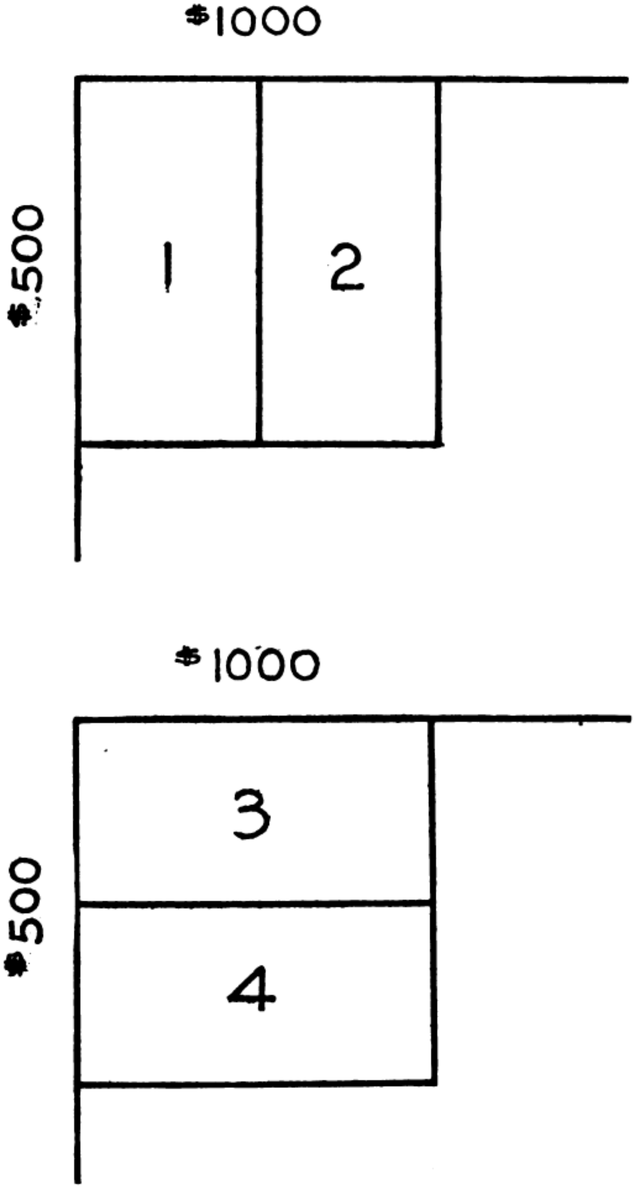


DIAGRAM XXVI

Analysis of Values of Corner Lots, Showing the Method of Determining the Comparative Values of the Four Sites at or Near Corners, Having Given the Unit-Foot Values.

is Lot B, then Lot D and finally Lot C. But we have not as yet computed actual money values for these four lots based on the interaction of the intersecting street unit-foot values.

Let us now divide Lot B equally in two different ways, one with the lot line perpendicular to the $1,000 unit-foot-value street, and one with the lot line parallel. (Diagram XXVI.)

It is apparent from Diagram XXVI that No. 1 lot is more valuable than No. 2 lot, and that No. 3 lot is worth more than No. 4 lot. It also appears obvious that No. 3 lot is more valuable than No. 1 lot, because it has 100 feet frontage on the $1,000 unit-foot-value street, while Lot 1 has only 50 feet of frontage on that street. It is true that Lot 1 has 100 feet frontage on the $500 street, while Lot 3 has only 50 feet, but that is apparently not enough to overbalance the long frontage of Lot 3 on the higher-valued street.

It is furthermore apparent from the diagram that Lot 2 is more valuable than Lot 4, because it has 50 feet of frontage on the $1,000 unit-foot-value street, while Lot 4 has 50 feet of frontage on a $500 unit-foot-value street. We have thus established a value-relationship among these four lots: Lot 3 is most valuable, Lot 1 is second, Lot 2 is third, and Lot 4 is least valuable. But we have not yet fixed any money values for these four sites. We have merely indicated the value-relationship, which is obvious from the combination of the street unit-foot values assumed. It would appear from the foregoing analysis that a value-relationship of street corners to the street unit-foot values of the intersecting streets does exist, and can be expressed as such.

We must next find some practical way of apportioning the street unit-foot values, in combination, to the lots located at or near street corners, as for example to Lots A, B, C and D, based on sound observation and experience. Furthermore, in order to attain any practical importance, any method of apportionment of corner influence must be applicable to other unit-foot values than those assumed in our illustration, and must be adaptable to all sizes and shapes of lots, in every conceivable relation to the street frontages.

Three controversial questions in connection with computing corner influence may here be discussed. The first is the question of whether or not the value of corner sites recedes proportionally with increasing distance from the street intersection. If we assume that it does, it may be represented by a series of straight lines. If we assume that it does not, but that the value-decrease from the street corner, due to corner influence, is not inversely proportional to depth, but irregular, moving in leaps and bounds, as it were, it would still be possible to analyze such an irregular curve, and devise a formula to express the valuation at any distance from the corner, having determined the street unit-foot values. But it would be impossible to employ such a complex equation for practical purposes of computation of corner influence. That which is sacrificed in possible scientific precision by assuming a regular decrease in value from the street corner, due to corner influence, is relatively unimportant.

The significance of corner influence varies in retail, wholesale and residential districts, and no uniform rule can be adopted for computing corner influence, applicable in all cases. No one who has studied urban land values would deny the validity of this assertion. Nevertheless it would seem equally true that a value-relationship exists, due to the interaction of two unit-foot values, no matter for what purpose the land in question may be used. But as has been stated previously, the practical significance of corner influence pertains primarily to retail business districts.

We may make an assumption regarding the degree of regressivity in the distribution of corner influence over a corner lot in a particular business district, and the apportionment of corner influence, no matter what our assumption may be, can then be made with mathematical precision. It is necessary, however, that the assumption should be based on accurate observation, and that it should be constantly reviewed as new facts are made available. If, for example, it were discovered that in the majority of cases a disproportionately high value is placed on the first ten square feet of land at a street corner in a retail business district, as compared with greater depths, because of the greater value of this area for advertising or display purposes, this fact should be reflected in any computation of corner influence. No matter what our assumption may be as to the distribution of corner influence, it must bear an approximate mathematical relationship to the intersecting street unit-foot values, which are based on the primary physical factors of urban land values, and this relationship in turn can be expressed with mathematical accuracy.

There are no doubt many exceptions to this generalization, of which the Assessor or Appraiser must take note before passing final judgment on actual site values. Any modifications of computed valuations of corner sites, however, are made by allowing for secondary external factors of value affecting specific sites, and do not alter the basic principle that the value-relationship due to intersecting street influence, having given the street unit-foot values, can be computed with approximate mathematical accuracy in all cases.

Finally, it has been contended that it is impossible to assume corner influence always to extend the same distance in either direction from the street corner. It is argued, and validly so, that corner influence may extend anywhere from 10 to 100 feet or more from a street corner, and that the influence of the lower-valued street frontage extends to a lesser distance from the corner in the direction of the higher-valued street than the influence of the higher-valued street frontage extends in the other direction. Here again it is necessary to establish a mean, and to make special allowance for those cases which do not conform to this mean. If, for example, it is found that in the majority of cases street corner influence upon site values appears to extend in either direction from the street intersection a distance of 50 feet, this fact can be made the basis of computation of corner influence. If on the other hand it is discovered that corner influence in the majority of cases does not extend more than 100 feet, this observation can be accepted as a basic fact in connection with computation of corner influence.

It is thus clear that the computation of any corner influence table designating the values of specific areas receding from the street corners, and based on the interaction of two street unit-foot values must make two assumptions: first, an expression of the decrement of corner influence over the area affected with increasing distances from the corner, and secondly, an estimate of the point of disappearance of corner influence. These constitute two variable quantities, but observation and experience has shown that in the majority of cases the former varies fairly regularly and bears a direct relationship to the depth curve for interior sites, while the latter is fairly constant, particularly in business districts. The Somers corner tables, to be explained in the next chapter, are based on the assumption, made after years of careful observation by their inventor, that even as the value of interior sites recedes regularly, so also does corner influence, until it vanishes, at a point assumed for purposes of computation to be constant, and included within the distance of not more than 100 feet from the street intersection.

As previously noted, the increased accessibiilty due to two intersecting streets is in reality the resultant of the simultaneous operation of two forces, two unit-foot values. If these two forces intersect at right angles the resultant force will be represented by the diagonal of the rectangle, having the unit-foot values of the intersecting streets as sides. If the two unit-foot values are equal, the resultant force will be the diagonal of a square. The value of the diagonal will be equal to the square root of the sum of the squares of the intersecting street unit-foot values.

But, as indicated in Chapter XIII, the values of successive feet in the unit-foot adopted by Mr. Somers, except near the street, follow a definite logarithmic scale up to 100 feet in depth. In his analysis of corner influence, Mr. Somers, therefore, took the logarithmic value of the diagonal of the square as the value of the regular corner site in a retail business district 100 x 100 feet with equal unit-foot values on the intersecting streets. This value he found to conform closely to his actual observations on corner-site value enhancements. It thus confirmed his theory that corner values are the resultant of the simultaneous operation of two unit-foot values. The analysis of computed corner-site values for different unit-foot values of intersecting streets will be made in the next chapter.

CHAPTER XVII

MR. SOMERS' STUDY OF CORNER INFLUENCE AND THE BASIS OF THE CORNER TABLES

FIRST ATTEMPT TO STUDY THE PROBLEM OF CORNER INFLUENCE SYSTEMATICALLY MADE BY MR. SOMERS IN ST. PAUL—THE DEPRECIATION OF THE SOMERS CORNER SCALE—THE INTERPRETATION OF THE SOMERS CORNER SCALE—THE MODIFICATION OF SOMERS CORNER SCALE—THE ENHANCEMENT IN VALUE DUE TO INTERSECTING STREETS OVER INTERIOR SITES ON MAIN STREET—THE EVOLUTION OF THE SOMERS CORNER TABLES—THE MODIFICATION OF THE THEORY TO MAKE IT APPLICABLE—THE SOMERS CORNER SQUARE DIAGRAM—THE COMPONENTS OF THE SOMERS CORNER TABLES ANALYZED—LIGHT AND VENTILATION FACTORS—ITS DISTRIBUTION ACCORDING TO THE LAW OF LIGHT—ACCESSIBLE ENHANCEMENT COEFFICIENT—BUILDING UP THE SOMERS CORNER TABLES—THE USES OF THE SOMERS CORNER TABLES ILLUSTRATED—COMPUTATION OF THE VALUE OF REGULAR CORNER SITES—COMPUTATION OF IRREGULAR CORNER SITES.

HOW were the value-relationships and the actual values resulting from the interaction of two street unit-foot values determined by Mr. Somers?

In the investigations concerning corner influence in retail business districts, which Mr. Somers began in 1886, the lot illustrations employed in the preceding chapter (Diagram XXV) were actually used, because in that city there were many sets or pairs of 50′ x 100′ lots at street corners, some of which faced the higher-valued streets, as Lots 1 and 2 (Diagram XXVI), and some of which faced the lower-valued street, as Lots 3 and 4. It was thus possible for Mr. Somers to gather much practical information from landowners.

This was the first attempt ever made to study the problem of corner influence methodically and systematically, out of which study the Somers corner tables ultimately grew. The study and the taking and recording of testimony as to corner values occupied the time of many citizens of St. Paul and of Mr. Somers himself for some months, and constituted the basis of the corner lot "scales" first devised by Mr. Somers. These scales, as will be noted in Diagram XXVII, are built upon the principle that regular corner site values are the resultant of two interacting forces, the intersecting street unit-

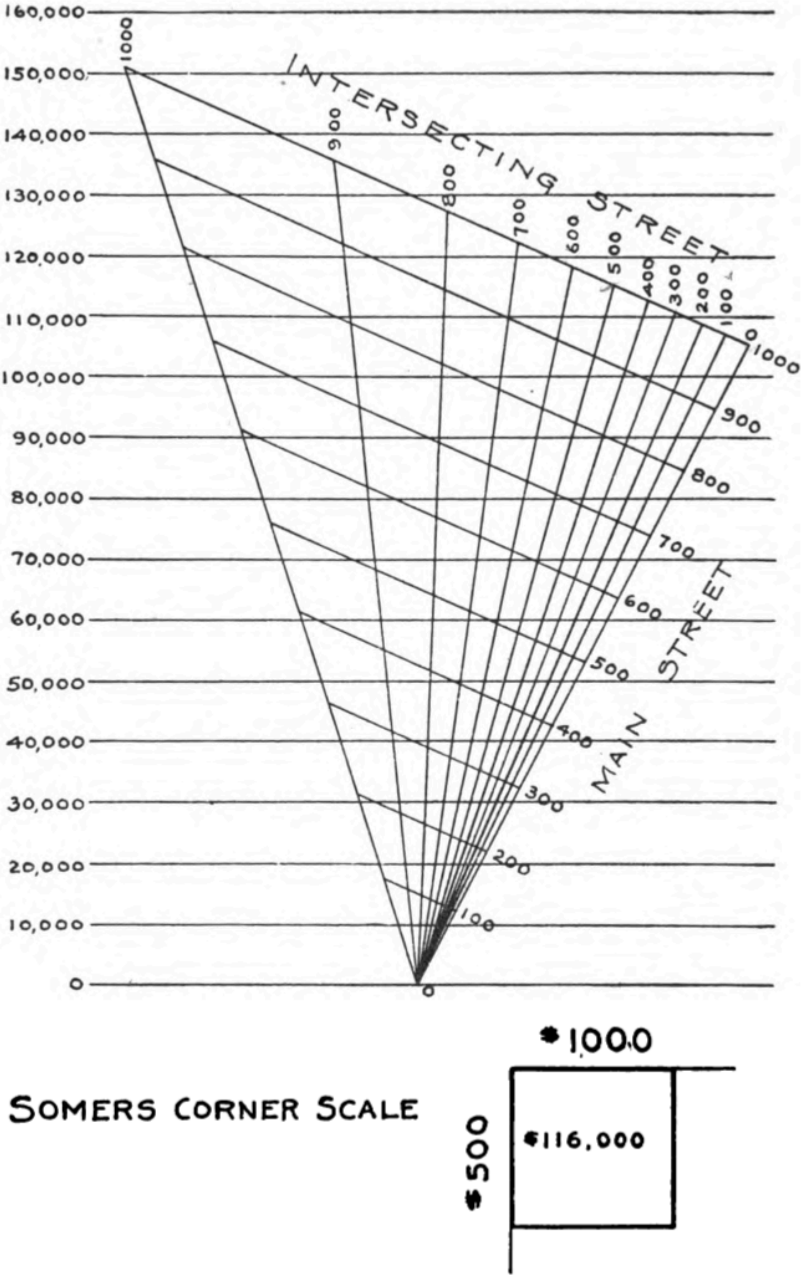


DIAGRAM XXVII

Somers' Original Corner Scale, Showing the Method of Determining the Values Regular Corner Lots in Business Districts.

foot values, measured along the logarithm of the diagonal.

The first scale was made to show the value of any 100-foot-square corner lot in the retail business section for any combination of street unit-foot values up to $1,000. Any value in excess of $1,000 could be computed from these scales. Diagram XXVII, page 127, illustrates the scale used for such a lot.

To interpret this scale it is merely necessary to follow the right-hand line of the triangle to the valuation placed on the Main Street unit-foot, let us say $1,000, and then along the line running from that point to the left, to the valuation placed on the side street unit-foot, let us say $500. The valuation of the lot will then be found exactly opposite this point in the column of figures to the left. Thus the value of a lot 100′ x 100′, with main and side street unit-foot values $1,000 and $500 respectively, is found to be approximately $116,000, and the value of a lot with $1,000 unit-foot values on the intersecting streets, $151,000.

Upon further investigation Mr. Somers found that although the valuation placed on a corner lot 100′ x 100′ in a retail business district by taking the logarithm of the diagonal, with $1,000 unit-foot values for both intersecting streets, was approximately correct, the valuation ascribed to other street unit-foot combinations by this corner scale was too low. He therefore modified his corner scales to conform more closely to actual observation, and arrived at the following approximate enhancements in relative values for a 100′ x 100′ lot at a corner due to two unit-foot values operating simultaneously as compared with a corresponding interior lot, with the main street unit-foot values $1,000:

Main Street Unit-foot Value	*Intersecting Street Unit-foot Value*	*Ratio of the Two Unit-foot Values to Each Other*	*Relative Enhancement Due to Intersecting Streets Over Interior Site on Main Street, 100′ x 100′*
$1,000	$ 0	10:0	6.5 %
$1,000	$ 100	10:1	9 "
$1,000	$ 200	5:1	12 "
$1,000	$ 300	10:3	15 "
$1,000	$ 400	5:2	18 "
$1,000	$ 500	2:1	21 "
$1,000	$ 600	5:3	26 "
$1,000	$ 700	10:7	31 "
$1,000	$ 800	5:4	37 "
$1,000	$ 900	10:9	44 "
$1,000	$1,000	1:1	51 "

If these values were represented on a scale similar to Diagram XXVII it would be found that the upper line and the parallels to it would be curved rather than straight, and would make a fan-shaped design as in Diagram XXVIII.

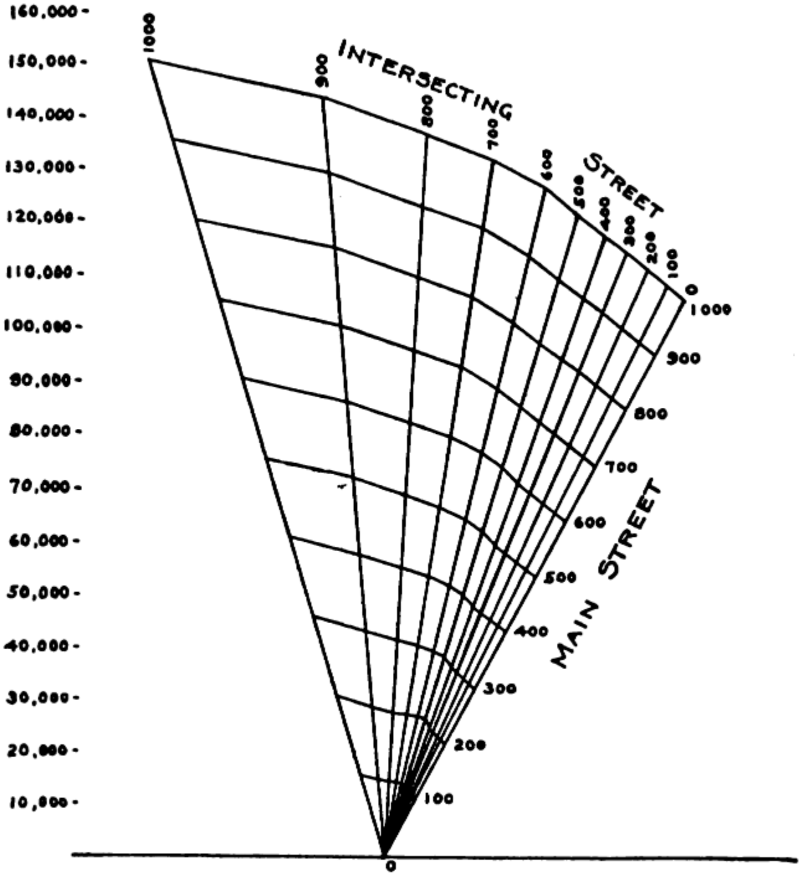


DIAGRAM XXVIII

Modified Somers Corner Scale, Illustrating the Corner Tables as Finally Developed by the Inventor of the Somers System.

All intervening combinations of unit-foot values would vary directly with these relative values.

If every city were laid out as was a large part of St. Paul, and if that original layout were continued in the use of lots perpetually, the foregoing scales could be employed for accurate apportionment of corner influence to each of the corner lots, and no further analysis of corner valuation derived from street accessibility in retail business districts would be required for practical appraisal purposes. The result would represent a relative distribution of value-judgment based on the unit-foot values, not only between interior and corner and near-corner lots, but likewise between all the corner lots in the retail business district of a city. But as a rule this regularity of lot lines does not pertain in cities, particularly not in high-valued retail business districts. Even in St. Paul there were many exceptions, and the growth of the city, together with private ownership of land, has resulted in redivision of regular areas into plots other than those originally deemed necessary for the business life of the community.

The different uses to which urban land has been put has necessitated innumerable variations in lot boundaries. Town sites are, as a rule, originally laid out regularly as to block and lot lines, and this regularity is maintained as long as the urban land is relatively abundant. As desirable urban locations become relatively scarce their values tend to rise. Tracts are broken up into smaller areas and lot lines begin to change, particularly in centrally located congested business districts. Sometimes streets are laid out, intended for main streets, and the development of the city alters the design of the original plan, making side streets of those designed to be main thoroughfares. A notable example of this can be found in Denver, Colorado, where Sixteenth Street was laid out to be a cross street. The long sides of the lots ran parallel to Sixteenth Street, and the short sides or "fronts" of the lots were on streets intersecting Sixteenth Street. But Sixteenth Street has come to be the principal street of Denver, and the streets intersecting it have become secondary streets.

Not only does the actual street usefulness change, but also the utility of certain parts of a street will so change as to require new lot lines, which are sometimes irregular and sometimes represent a combination of two or more originally regular lots. The demands of owners, the requirements of merchants, the effect of trading by different classes of people, with varying customs, result in developing variations in the sizes and shapes of lots in business districts of a city. These irregularities usually appear first at street corners in a retail business district because of the greater business activities at such corners and the resultant more intensive utilization of land.

Whatever the causes may be, the fact remains that lot lines, particularly in those sections of cities where the highest land values pertain, are irregular, and consequently create complex problems of valuation.

If one were to take the actual lot lines of two hundred of the best corner lots in any city having a population of 500,000 or more, and superimpose them upon one diagram, one would find that these lots are so varied in shape and size that the resulting diagram could be resolved into a large number of small squares and rectangles. The average area in each of the resulting squares and rectangles could be approximated at, let us say, 10 feet square. In other words, if it were possible to apportion the enhancement in site value due to corner influence at any corner so as to distribute it over regular areas of 100 square feet, a practical means of applying the theory of value-enhancement at street corners could be devised. In strict theory the enhancement in value is greatest at the street intersection, and in accordance with the rule of the effect of receding depth upon increments in site values, each point from the street corner is worth less than the point nearer the corner. In other words, value-enhancement due to corner influence varies inversely with increasing distances from the corner. Theoretically there is a different value for every point receding from the street corner. This decreasing value of additional increments at increasing depths from street corners could be represented by an infinite series of straight lines or curves radiating in all directions over the corner area with the street intersection as the common origin. These straight lines or curves would represent graphically the resultant of the combined usefulness of the two streets forming the corner. The theory must be modified somewhat to make it practically useful, even as the theory pertaining to the circumference of a circle is modified when used to obtain the area of a circle. In theory the circumference of a circle is composed of an infinite number of points, and changes its direction at every point, but in calculating the area of a circle this theory is modified to the extent of assuming that the circumference of the circle is composed of an infinite number of straight lines, each one of which with the two radii, forms a triangle. In calculating the area of a circle, we therefore modify the theory to make it applicable in practice. In this manner we obtain a means of approximating the actual theory so closely as to answer all practical purposes.

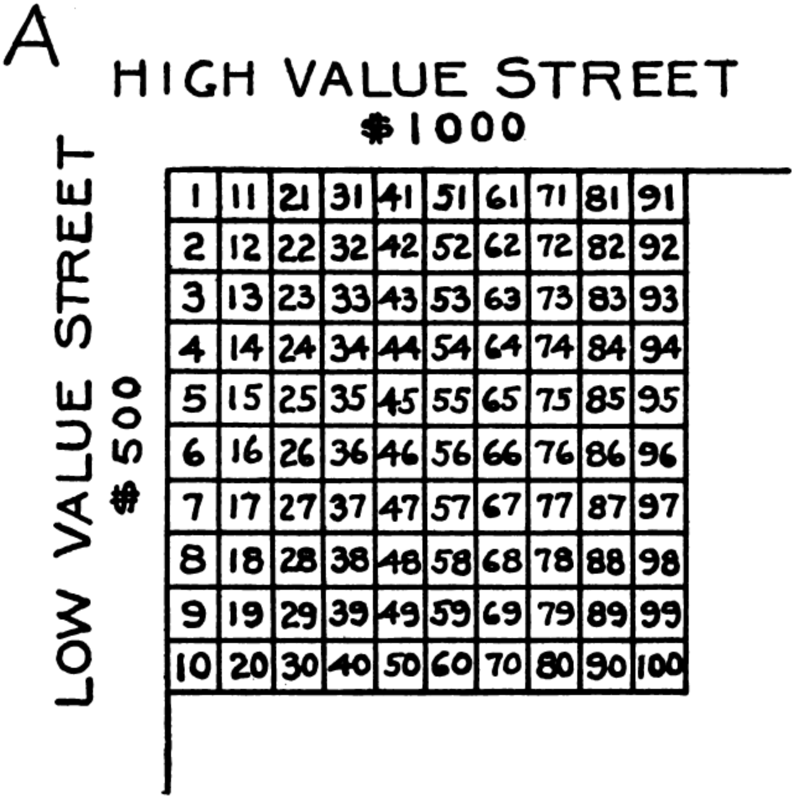
So also with the theory pertaining to site-value-enhancement due to corner influence. Having ascertained what it is in the aggregate for a 100′ x 100′ regular corner site it is necessary to devise means of distributing it over relatively small corner areas.

With reference to sciences supposedly based on observation, we frequently hear the statement made: "That's all right in theory, but it won't work in practice," or "The theory is good enough, but it won't work." How is it possible to test the "goodness" or the "correctness" of a theory except by applying it in practice? If no means for its practical application can be discovered, how can we call it "right" or "good"? To speak of a "good" theory which "won't work in practice" is about as illogical as to speak of a good automobile which won't run. A theory is but a generalization based on a body of observed facts. If "correct" or "good" it must be practically applicable to testing the facts upon which it is based. Mr. Somers repeatedly tested his theories on corner enhancement before accepting them as sound.

The diagram obtained by Mr. Somers by the superimposed lot lines indicated that a small area like a 10-foot square could be employed as a quantity-unit with reference to which the decrease in site values from street corners could be measured.

Mr. Somers divided the regular corner area, extending 100 feet in either direction from the street intersection, into 100 equal squares, each square therefore containing 100 square feet, and he numbered these squares as illustrated in Diagram XXIX, page 133.

He then proceeded to distribute the corner value-enhancement as compared with a corresponding interior site 100′ x 100′, on the main street over the corner squares, first separating the total valuation of a regular corner site, determined, as previously explained, into three contributing factors as is shown on page 133.



1	11	21	31	41	51	61	71	81	91
2	12	22	32	42	52	62	72	82	92
3	13	23	33	43	53	63	73	83	93
4	14	24	34	44	54	64	74	84	94
5	15	25	35	45	55	65	75	85	95
6	16	26	36	46	56	66	76	86	96
7	17	27	37	47	57	67	77	87	97
8	18	28	38	48	58	68	78	88	98
9	19	29	39	49	59	69	79	89	99
10	20	30	40	50	60	70	80	90	100

DIAGRAM XXIX

Somers Corner Square Diagram, Showing the Practical Device for Recording the Computed Values of Corner Site Areas.

Unit-foot Value Relationship of the Two Intersecting Streets	*Light and Ventilation Factor*	*Accessibility Factor Derived from Intersecting Street Unit-foot Value*	*Inside Lot Value, Main Street, 100′ x 100′*	*Total Value of Corner Lot, 100′ x 100′*
$1,000 : 0	6.5%	0%	100%	106.5 %
1,000 : 100	6.5 "	2.629 "	100 "	109.129 "
1,000 : 200	6.5 "	5.354 "	100 "	111.854 "
1,000 : 300	6.5 "	8.178 "	100 "	114.678 "
1,000 : 400	6.5 "	11.285 "	100 "	117.785 "
1,000 : 500	6.5 "	14.829 "	100 "	121.329 "
1,000 : 600	6.5 "	19.154 "	100 "	125.654 "
1,000 : 700	6.5 "	24.075 "	100 "	130.575 "
1,000 : 800	6.5 "	30.430 "	100 "	136.930 "
1,000 : 900	6.5 "	37.324 "	100 "	143.824 "
1,000 : 1,000	6.5 "	44.500 "	100 "	151.000 "

In other words, Mr. Somers proceeded on the assumption that a corner site absorbed 100 per cent. of the value of a corresponding interior site on the higher-valued street, and an additional amount, varying with the relative importance of the intersecting street. When both streets are of equal importance, either the one or the other of the intersecting streets may, for practical purposes, be regarded the higher-valued street, and an additional percentage of increment in value allowed for the intersecting street accessibility factor as indicated above.

This assumption does not destroy the validity of the principle that corner influence is the resultant of two intersecting street unit-foot values, but merely serves as an explanation of the component factors making up computed corner values.

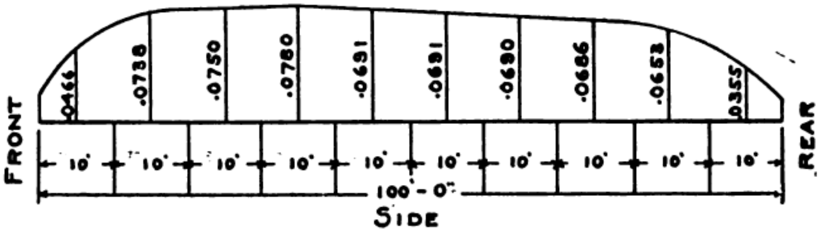


DIAGRAM XXX

Sectional Distribution of Light and Ventilation Influence Due to Intersecting Street, Illustrating the Method of Distributing Light and Ventilation Values Over Areas 10 Feet Wide Fronting on the Intersecting Street.

The light and ventilation factor noted in the table is more or less in accordance with the general observation that a site, located on a main street in a retail business district, intersected at right angles to the main street by a small side street, is as a rule more valuable than a similar site without this advantage. The site so situated is favored by the possibility of obtaining a certain amount of light due to the open space, by the possibility of better ventilation and air circulation, and by the possibility of more adequate fire protection. This value-enhancement exists even though the site derives no measurable additional value by virtue of the intersecting street accessibility. The street may be so narrow that it will not permit the transit of vehicles for the purpose of either loading or unloading of merchandise or for any other commercial purpose.

A site favored by such an advantage Mr. Somers found to be worth about six and one-half per cent. more than a cor-

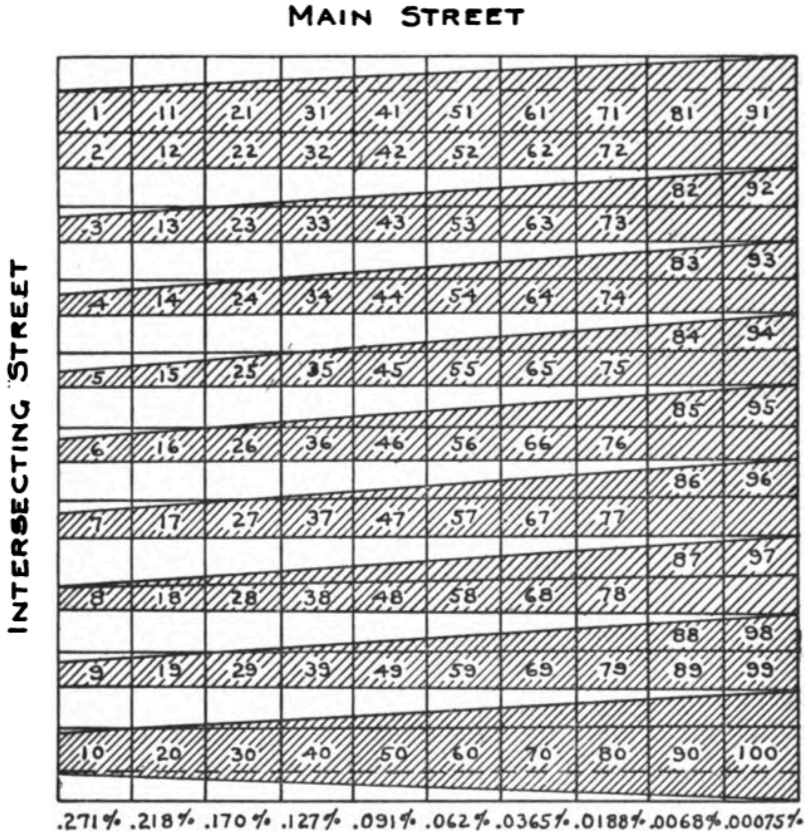


DIAGRAM XXXI

Diffusion of Light and Ventilation Influence of Intersecting Street Over Corner Lot, Showing the Spread of Light Over the Corner Area, Due to Increased Facility Derived from the Intersecting Street. (White Areas Represent the Spread of the Light.)

responding interior site 100′ x 100′ on a main street. This value-influence he added to all corner lots 100′ x 100′ regardless of the intersecting street unit-foot values. In strict theory the side street space, having no accessibility value, is no street at all. It is a hypothetical space, permitting light and ventilation to reach the side of a lot. It was in this sense in which Mr. Somers construed the so-called corner or intersection of two "streets," one of which had no unit-foot value, and computed light and ventilation factors for such sites.

How was this value distributed over every 10-foot square of the corner diagram? It appears that Mr. Somers proceeded on the assumption based to a certain extent on observation that more of the benefit derived from the light and ventilation influence accrued to the middle portion of the corner site along the intersecting street, than to the front and the rear portions of the corner plot. He distributed it approximately as illustrated in Diagram XXX, page 134.

Next he proceeded to divide the amounts allocated to each 10-foot wide strip 100 feet deep, over each 10-foot square of the corner diagram, in a decreasing scale. His method in this distribution follows no definite mathematical sequence.

Since, however, it appears that the light factor was the important factor in this constant added to all regular corner sites 100′ x 100′, regardless of street unit-foot values, the Somers corner tables have been slightly modified. The light and ventilation factor has been redistributed in accordance with the law of light (i.e., the intensity of light varies inversely with the square of the distance from the source). The diffusion of this factor is illustrated in Diagram XXXI.

The totals allocated by Mr. Somers to each of the ten strips as illustrated in Diagram XXX have thus been distributed as follows: The distance from the middle point of one 10-foot square to the middle point of the next 10-foot square was squared, giving the following total series and percentages:

Series	*Series Expanded*	*Percentage of Total*
5^2	25	.075 Per Cent.
15^2	225	.590 " "
25^2	625	1.880 " "
35^2	1,225	3.550 " "
45^2	2,025	6.200 " "
55^2	3,025	9.100 " "
65^2	4,225	12.700 " "
75^2	5,625	17.000 " "
85^2	7,225	21.800 " "
95^2	9,025	27.100 " "
Totals	33,250	100.000 " "

This series was then multiplied by each of the amounts allocated to the ten strips in the diagram and added to the computed values of the corresponding squares on an inside lot on the higher-valued street, giving corner table for a regular site in a retail business district 100′ x 100′ with main street unit-foot value $1,000 and intersecting street unit-foot value 0 as illustrated in Diagram XXXII.

HIGH VALUED STREET $1000 UNIT-FOOT VALUE

100'

INTERSECTING STREET $0 UNIT-FOOT VALUE

100

LV.0125 IN.2500 2625	0100 2500 2600	0078 2500 2578	0058 2500 2558	0042 2500 2542	0029 2500 2542	0016 2500 2516	0009 2500 2509	0003 2500 2503	0000 2500 2500
0197 1600 1797	0158 1600 1758	0123 1600 1723	0092 1600 1692	0065 1600 1665	0044 1600 1644	0026 1600 1626	0013 1600 1613	0004 1600 1604	0001 1600 1601
0201 1300 1501	0162 1300 1462	0126 1300 1426	0094 1300 1394	0067 1300 1367	0046 1300 1346	0027 1300 1327	0014 1300 1314	0004 1300 1304	0001 1300 1301
0210 1000 1210	0168 1000 1168	0131 1000 1131	0098 1000 1098	0078 1000 1070	0048 1000 1048	0027 1000 1027	0015 1000 1015	0004 1000 1004	0001 1000 1001
0184 0850 1034	0148 0850 0998	0116 0850 0966	0087 0850 0937	0062 0850 0912	0042 0850 0892	0024 0850 0874	0013 0850 0863	0004 0850 0854	0001 0850 0851
0184 0700 0884	0148 0700 0848	0116 0700 0816	0086 0700 0786	0062 0700 0762	0042 0700 0742	0024 0700 0724	0013 0700 0713	0004 0700 0704	0001 0700 0701
0184 0610 0794	0148 0610 0758	0116 0610 0726	0086 0610 0676	0062 0610 0672	0042 0610 0652	0024 0610 0634	0013 0610 0623	0004 0610 0614	0001 0610 0611
0182 0530 0712	0147 0530 0677	0114 0530 0644	0085 0530 0615	0061 0530 0591	0041 0530 0571	0023 0530 0555	0012 0530 0542	0004 0530 0534	0001 0530 0531
0175 0470 0645	0141 0470 0611	0110 0470 0580	0082 0470 0552	0059 0470 0529	0040 0470 0510	0023 0470 0492	0012 0470 0482	0004 0470 0474	0001 0470 0471
0120 0440 0560	0100 0440 0540	0075 0440 0515	0056 0440 0496	0040 0440 0480	0027 0440 0467	0016 0440 0456	0008 0440 0448	0003 0440 0443	0000 0440 0440

EXPLANATORY NOTE:

L.V. = LIGHT & VENTILATION INFLUENCES DERIVED FROM SIDE STREET

IN = INSIDE VALUES. HIGH VALUED STREET

DIAGRAM XXXII

Computed Corner Square Values for $1,000:0 Unit-Foot Value Combinations, with Enhancement of Single-Street Values Due Only to Light and Ventilation.

As the intersecting street attains importance by virtue of the greater accessibility it imparts to the corner site, this accessibility factor will be reflected in the unit-foot value placed on the intersecting street. Observation showed that the importance of the intersecting street unit-foot value is not directly proportional to the value of the main street unit-foot value. In other words, as the value of the intersecting street unit-foot in relation to the main street unit-foot increases, the percentage of the intersecting street unit-foot value to be added to the inside lot on the main street to express the value of a corresponding corner lot derived from the intersecting street accessibility, likewise increases.

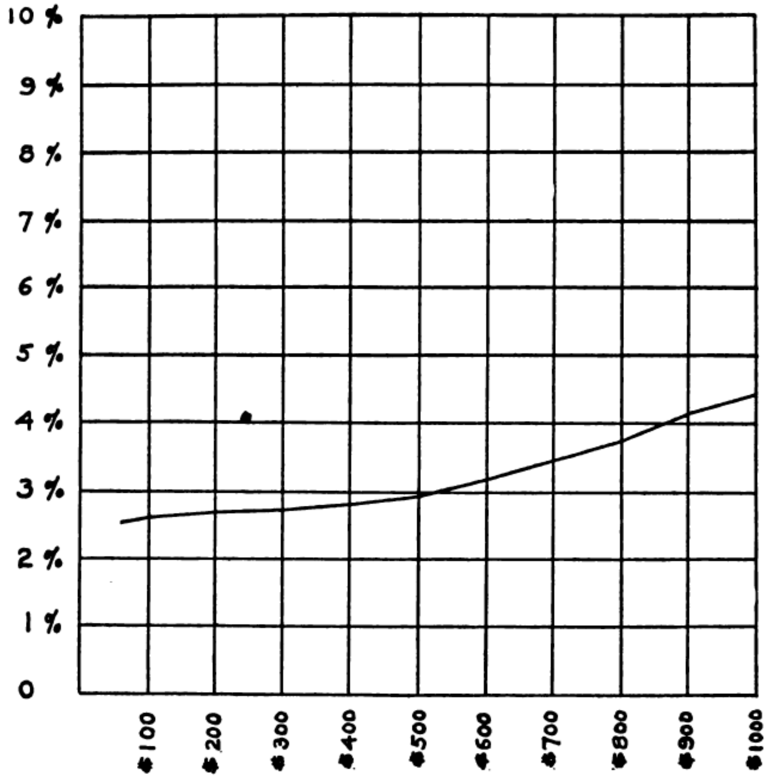


DIAGRAM XXXIII

Curve of Accessibility Enhancement Coefficient, Illustrating How an Increasing Amount of Value Is Derived from Intersecting Streets as Their Relative Importance Increases.

This increasing percentage, with increasing relative importance of the intersecting street unit-foot value, has been called the accessibility enhancement coefficient. It can be graphically represented for different unit-foot-value combinations from $100:1,000 to $1,000:1,000 as a regular ascending curve:

Street Unit-foot Relationship	*Accessibility Enhancement Coefficient*
$1,000:100	2.629%
1,000:200	2.677 "
1,000:300	2.726 "
1,000:400	2.821 "
1,000:500	2.966 "
1,000:600	3.170 "
1,000:700	3.450 "
1,000:800	3.750 "
1,000:900	4.140 "
1,000:1,000	4.450 "

The value-enhancement derived from the intersecting street is distributed over every 10-foot square, regressively from the street intersection, radiating in every direction. For the $1,000:1,000 unit-foot values it is distributed equally on either side of the diagonal drawn from the street intersection to the opposite corner. A slight modification was here made by Mr. Somers, so as to make the totals on either side of the diagonal, when the light and ventilation factor was added, exactly equal. As the relative importance of the intersecting street unit-foot decreases, the percentage of the intersecting street unit-foot added for additional street accessibility likewise decreases, and is thus spread more thinly over each receding 10-foot square from the main street until it vanishes when the intersecting street unit-foot value becomes zero. On this principle Mr. Somers built up his corner tables, more or less empirically, but always with the one purpose in view, to distribute corner-enhancement due to side street influence upon the main street values in a descending series from the corner, making his totals correspond to the total value-enhancement of corner sites over similar interior sites, based on careful study and observation. The ten corner tables, published in Appendix I (pages 271-280), thus constructed for street unit-foot value relationships from $100:1,000 to $1,000:1,000 will serve to illustrate the method Mr. Somers employed in distributing corner influence over each 10-foot square of the corner diagram. It should be borne in mind that these values are the aggregate of three separate value-influences, namely, the light and ventilation factor, the main street accessibility factor, and the percentage of the intersecting street accessibility factor.

Similar tables to those used for illustration have been constructed for street unit-foot values applicable primarily to valuation work in retail business districts from $10:1,000, $20:1,000, $30:1,000, etc., in $10 increments for intersecting street unit-foot values, to $1,000:1,000.

An examination of the Somers corner tables in Appendix I will reveal a number of slight irregularities and inconsistencies in these computations. The computed values do not always recede regularly from the street frontages. These defects in the Somers tables, however, do not destroy either their validity or their usefulness for corner computation. They are reproduced as originally developed by Mr. Somers, to show, in a general way, how corner influence was distributed over corner areas by their inventor. If the irregularities were to be eliminated by dropping a series of regular parabolic curves from the street fronts, and these curves were interpolated at ten foot intervals, a more regular distribution of "corner influence" would be obtained than is to be found in the Somers corner tables.

REVISED SOMERS CORNER TABLE, $1,000:500 UNIT-FOOT VALUES

	TEN FEET INTERVALS, PARALLELING MAIN STREET										*Totals*
TEN FEET INTERVALS, PARALLELING INTERSECTING STREET	2,930	2,815	2,725	2,670	2,635	2,607	2,584	2,564	2,545	2,527	26,602
	2,352	1,952	1,810	1,740	1,705	1,680	1,663	1,648	1,635	1,625	17,810
	2,097	1,697	1,510	1,423	1,383	1,363	1,348	1,337	1,327	1,318	14,803
	1,905	1,505	1,305	1,180	1,115	1,180	1,054	1,036	1,025	1,016	12,321
	1,755	1,355	1,130	1,024	962	922	902	885	874	865	10,674
	1,635	1,235	1,015	896	820	785	758	739	726	714	9,323
	1,535	1,135	920	800	730	700	670	650	635	623	8,398
	1,435	1,053	843	733	668	628	598	570	554	542	7,642
	1,383	983	783	678	615	570	535	508	493	480	7,028
	1,320	920	730	630	570	527	499	477	462	450	6,585
T't'ls	18,365	14,650	12,771	11,774	11,203	10,962	10,611	10,414	10,276	10,160	121.186

For experimental purposes, the $1,000:500 Somers corner table was taken and the value enhancement due to corner influence was redistributed, according to a regular descending series of values measured from the street frontages. The resultant revised corner table indicates how closely the valuations thus obtaind correspond to the $1,000 : 500 Somers totals contained in Appendix I.

The differences, both absolute and relative, between these revised valuations and those in the corresponding Somers computations are shown in the following two tables. The first table contains the valuations of 100 foot front areas for depths of 10′, 20′, 30′, etc., from the main street, as computed both with the aid of the Somers corner tables, and with the aid of the revised tables. The second table shows corresponding valuations of areas at varying depths from the intersecting street. The relative differences in computed valuations are so small that they scarcely warrant the labor required to revise the one hundred Somers corner tables, in spite of their slight irregularities.

TABLE I, READING ACROSS

(*100 Feet Frontage on Main Street*)

Depth	*Somers Totals*	*Revised Table*	*Somers Totals as Per Cent. of Revised Totals*
10′	26,798	26,602	100.74
20′	44,689	44,412	100.62
30′	59,413	59,215	100.33
40′	71,629	71,536	100.13
50′	82,166	82,210	99.95
60′	91,510	91,533	99.97
70′	99,953	99,931	100.02
80′	107,646	107,573	100.07
90′	114,706	114,601	100.09
100′	121,329	121,186	100.12

TABLE II, READING DOWN

(*100 Feet Frontage on Intersecting Street*)

Depth	*Somers Totals*	*Revised Table*	*Somers Totals as Per Cent. of Revised Totals*
10′	18,166	18,365	98.92
20′	35,272	33,015	99.34
30′	45,482	45,786	99.33
40′	57,607	57,560	100.08
50′	68,997	68,763	100.34
60′	79,997	79,725	100.34
70′	90,679	90,336	100.38
80′	101,072	100,750	100.32
90′	111,265	111,026	100.22
100′	121,329	121,186	100.12

Only one set of corner tables was developed by Mr. Somers, since he believed that the same principles of computing corner or near-corner site values pertained, no matter whether such sites were located in retail or semi-retail business districts, wholesale districts or residential districts. Corner influence, if due to two intersecting streets, is always the resultant of two forces operating simultaneously. When computations have been made, therefore, for values of corner or near-corner sites in wholesale, industrial or residential districts with the aid of the Somers corner tables, the result will express the mathematical relationship derived from the two intersecting street unit-foot values. Having obtained this valuation the appraiser must exercise his judgment, based on careful observation, as to the percentage he should deduct from the computed value of corner sites in wholesale or residential districts to make such values conform to sound judgment. Such a percentage, when subtracted uniformly for residential, wholesale, and industrial corners, respectively, will in no way detract from the accuracy of the computation, based on the principles analyzed in the preceding pages.

We shall next illustrate the method of using the Somers corner tables for computing the values of both regular and irregular corner sites in retail business districts where the streets intersect at right angles.

As will have been observed, the Somers corner tables are based on the assumption that, as a rule, the corner influence extends approximately 100 feet from the street corner. This assumption in turn is based on actual observations made by Mr. Somers, and represents an average, assumed to be constant for purposes of computation.

When it is found upon careful observation that the corner influence does not extend 100 feet from the street intersection, the Assessor or Appraiser, as final judge, can make a correction by deducting a certain percentage from the computed value of the corner site which will not destroy the mathematical relationship existing between the values of separate unit-foot areas of the corner diagram.

Where, however, the corner influence is found to extend 100 feet in either street direction from the street intersection, the enhancement due to corner influence may be measured with the aid of the 100-foot corner lot diagram (page 133) and the corner tables illustrated in the Appendix. The corner tables show the valuation of each of these squares for every combination of unit-foot values—a separate table pertaining to each combination.

Thus in Diagram XXIX, page 133, where the unit-foot valuations are $1,000 on the best street and $500 on the intersecting street—

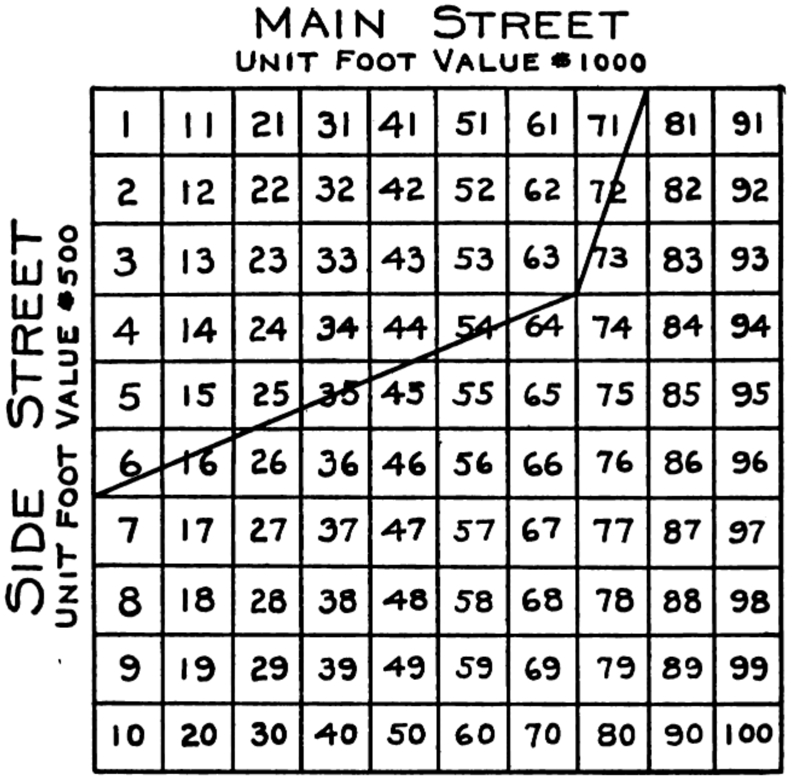
Square No.	1	is found to be worth	$2,930
" "	11	" " " " "	2,820
" "	21	" " " " "	2,760
" "	2	" " " " "	2,373
" "	3	" " " " "	2,127
" "	4	" " " " "	1,930

and so on for each of the squares in the corner area—the values decrease from Square No. 1 in every direction, but always in direct proportion to the simultaneous effect of the two street unit-foot values upon each 10-foot square. By diagramming any actual lot on this 100-foot corner lot, and adding up the values as shown by the corner tables for all the squares and parts of squares inside the lot lines, the value of the actual lot is computed.

If, for example, we have a regular lot extending 30 feet on the higher-valued street and having a frontage of 70 feet on the lower-valued street, we find in this lot the following squares included: 1 to 7, inclusive; 11 to 17, inclusive; and 21 to 27, inclusive. The combined value of these 21 squares represents the computed value of the lot, and represents that part of the total corner usefulness produced by the intersection of a $500 unit-foot value street and a $1,000 unit-foot value street assignable to the corner lot, 30 x 70 feet. The remainder of the corner influence, however far it may be assumed to extend, is left to be apportioned among the adjacent sites.

When a corner lot is irregular in shape, its actual lines are diagrammed to scale, and the values of the areas included within the lot lines are computed in the manner described above. For example, let us assume (Diagram XXXIV) the irregular site located at a street corner.

To the total computed value of all the whole squares within the actual lot lines must be added the values of the fractional parts of Squares Nos. 6, 16, 25, 26, 35, 45, 54, 64, 71, 72 and 73. The combined value of the squares and parts of squares thus obtained will represent the computed value of the irregular lot in question. The actual computation may be illustrated as shown on page 145.



MAIN STREET

UNIT FOOT VALUE $1000

SIDE STREET

UNIT FOOT VALUE $500

1	11	21	31	41	51	61	71	81	91
2	12	22	32	42	52	62	72	82	92
3	13	23	33	43	53	63	73	83	93
4	14	24	34	44	54	64	74	84	94
5	15	25	35	45	55	65	75	85	95
6	16	26	36	46	56	66	76	86	96
7	17	27	37	47	57	67	77	87	97
8	18	28	38	48	58	68	78	88	98
9	19	29	39	49	59	69	79	89	99
10	20	30	40	50	60	70	80	90	100

DIAGRAM XXXIV

Computing the Value of an Irregularly-Shaped Corner Lot, Illustrating How Somers Corner Tables Are Employed to Compute the Values of Both Regular and Irregular Corner Sites.

The Somers corner tables are computed for $1,000 unit-foot value in its relation to other unit-feet, ranging from $0 to $1,000. The foregoing computation was made with reference to the $1,000: 500 unit-foot values, which bear the same relationship to each other as the $200 and $100 unit-foot values. If the unit-foot values were $200: 100 we would take two-tenths of the value as computed from the $1,000: 500

corner tables. This would give a combined value of the irregular corner lot equal to $12,043.80, or considering the fractional part of a dollar in excess of 50 cents equivalent to a dollar, $12,044.

Computed Value of Whole Squares on Basis of $1,000:500 Unit-Foot Value Relationship

Squares No. 1- 5	$11,120
" " 11-15	9,143
" " 21-24	7,297
" " 31-34	7,077
" " 41-44	6,926
" " 51-53	5,733
" " 61-63	5,653
Whole Squares	$52,949
Fractional "	7,270
Total	$60,219

Computed Value of Fractional Parts of Squares on Basis of $1,000:500 Unit-Foot Value Relationship

8/10 of No. 6	$478
2/10 " " 16	609
1/10 " " 26	104
9/10 " " 25	1,008
4/10 " " 35	423
8/10 " " 45	280
7/10 " " 54	782
4/10 " " 64	429
2/10 " " 73	268
5/10 " " 72	827
8/10 " " 71	2,062
Fractional Squares	$7,270

Thus, with the aid of the Somers corner tables, the value of any corner site, no matter what its shape or size, can be computed, always bearing in mind that this result is not obtained by applying some magic formula, but simply by employing the result obtained by computing and distributing the effect of the simultaneous operation of two street unit-foot values.

We shall now revert to the diagram employed in Chapter XIV illustrating a typical city block, with a series of regular and irregular sites. The method of computing the value of interior lots affected either by a single-street influence or by overlap effect, has been previously illustrated. We may now compute, with the aid of the Somers corner tables, the values of Lots H, I, K, L and M, located at or near the street intersections. Lot H is regular, composed of the squares indicated on page 146, numbered as previously explained, the computed value of which is found by referring to the Somers corner tables.

In like manner the value of Lot L is computed to be $21,735. This lot absorbs the full corner value in both directions from the street intersection as indicated in the Somers corner tables.

Computed Value for Unit-foot Values $1,000:750

Squares	1– 9,	inclusive	$21,096
"	11–19,	"	15,593
"	21–29,	"	13,567
"	31–39,	"	12,547
"	41–49,	"	11,454
"	51–59,	"	10,982
"	61–69,	"	10,508
"	71–79,	"	10,177
"	81–89,	"	9,882
"	91–99,	"	9,664
Computed value for $1,000:750 street units			$125,470
Street unit-foot values on Main and Fourth Streets are $200 and $150 respectively ∴ .2 of $1,000:750 units			.2
Total computed value of Lot H			$25,094

Lot K does not merely absorb all the corner influence due to the intersecting streets (Main and Third Streets) but a portion of its value must also be computed as an interior site:

The corner square, 100′ x 100′, has a computed value of	$28,460
The rectangular area, 50′ x 100′, has a computed value of	8,750
Giving the total computed value of Lot K, with reference to the two street influences	$37,210

Lot M likewise absorbs the entire corner influence, and in addition the value of a triangular interior area, the value of which is computed by zoning it, as previously illustrated:

Computed value of corner area of Lot M	$19,342
Computed value of zoned triangular area	1,027
Total computed value of Lot M	$20,369

Finally, Lot I has 10 feet fronting on Fourth Street and extending the full depth of the lot (100 feet) subject to corner influence, according to the Somers corner tables. This area includes Squares No. 10, 20, 30, etc., to 100 of the Somers corner diagram. Their computed value is $1,619. To this is added the value of 50 feet fronting on Fourth Street, 100 feet in depth, the value of which is $7,500. This gives a combined value of Lot I equal to $9,119.

We have now computed the values of all the sites in our assumed city block, derived from the street frontages. To these values the values derived from the alley must be added. The Somers System method of computing alley value and its distribution among the lots fronting on the alley, will be explained in Chapter XIX.

CHAPTER XVIII

COMPUTATION OF SITE VALUES LOCATED AT OBLIQUE-ANGLED CORNERS

SOMERS SYSTEM METHOD OF COMPUTING VALUES OF CORNER SITES AT OBLIQUE ANGLED CORNERS—THE DISTORTION OF THE SOMERS CORNER SQUARE DIAGRAM —THE RESULTANT PARALLELOGRAM—ALLOWANCE FOR LOSS OF UTILITY— COMPUTATION OF CORNER SITES AT OR NEAR OBLIQUE ANGLES ILLUSTRATED —COMPUTATION OF VALUE OF IRREGULAR LOT FRONTING ON THREE STREETS.

THE Somers System methods of computing the values of corner sites, or of sites affected by corner influence where the street intersection forms either an obtuse or an acute angle are practically the same as those which pertain when the street intersection forms a right angle.

The street valuation diagram of 10-foot squares used for illustrative purposes in computing the values of right-angled corners is changed to one made up of a series of diamond-shaped areas, as though the square diagram were elastic and could be moved diagonally on the base to form a series of parallelograms, two of whose angles would correspond to the angles formed by the intersecting streets. In this manner the parallelograms can be made to fit either the acute or the obtuse angle formed by the street intersection as illustrated in Diagrams XXXV and XXXVI, page 149.

It will be observed that the areas thus formed will not be equal to 100 x 100 feet. The sides of the parallelograms are measured along the sides of the intersecting streets to a depth of 100 feet from the street corner. The area of the parallelogram thus formed is less than 10,000 square feet, because the altitude is no longer equal to 100 feet. This is in accordance with the observation that in acute-angled corners the value in combination imparted by the intersecting streets is compressed to fall upon a smaller area than would be the case if the streets intersected at right angles. But there is a point beyond which this will not hold true, for if the angle formed by the intersecting streets becomes too acute the lot will become so shallow that its utility will be materially decreased. This is particularly true of the small parallelogram at the street intersection, measuring 10 feet in either direction from the corner along the intersecting streets. This area,

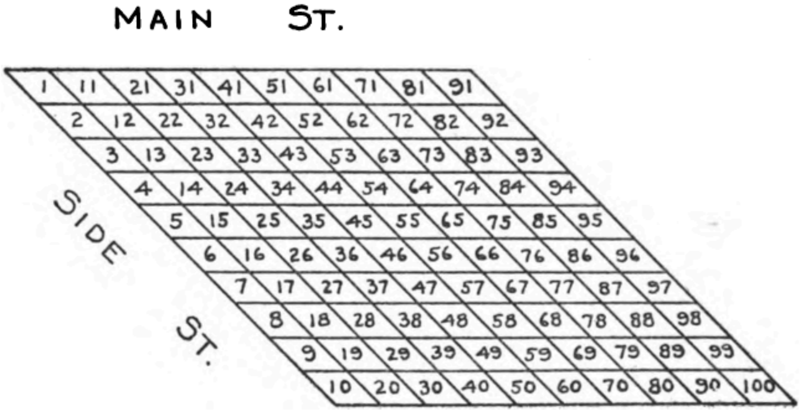


DIAGRAM XXXV

Distortion of Somers Corner Square Diagram for Purposes of Computing Values at Acute-Angle Corners.

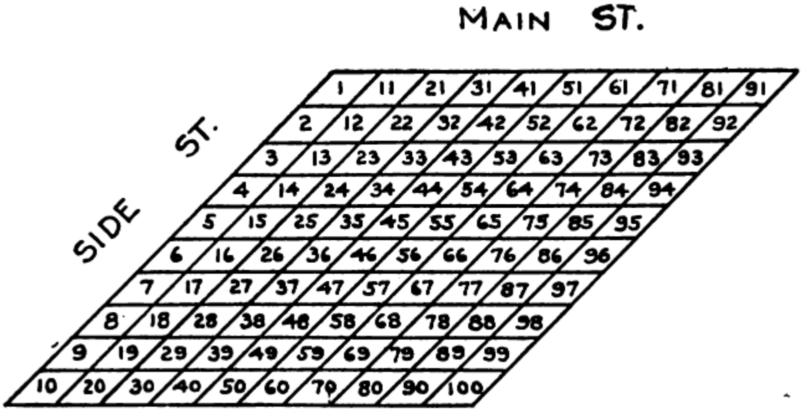


DIAGRAM XXXVI

Distortion of Somers Corner Square Diagram for Purposes of Computing Values at Obtuse-Angle Corners.

when the streets intersect at right angles, absorbs a larger part of the value of the two street units than any other corresponding area subject to corner influence. But when the angle formed by the street intersection becomes smaller, this area tends to decrease in value. In general, it may be stated that its value decreases in direct proportion with the decrease in the angle made by the street intersection. Thus, if the corner angle is 45 degrees instead of 90 degrees, we may assume the value of the immediate street corner parallelogram to have diminished 50 per cent., and so on until the angle grows so small that the value of the area becomes insignificant. In very shallow lots formed by intersecting streets the decrease in value may extend even to other parallelograms, other than the one at the street intersection. In such cases judgment must supersede computation.

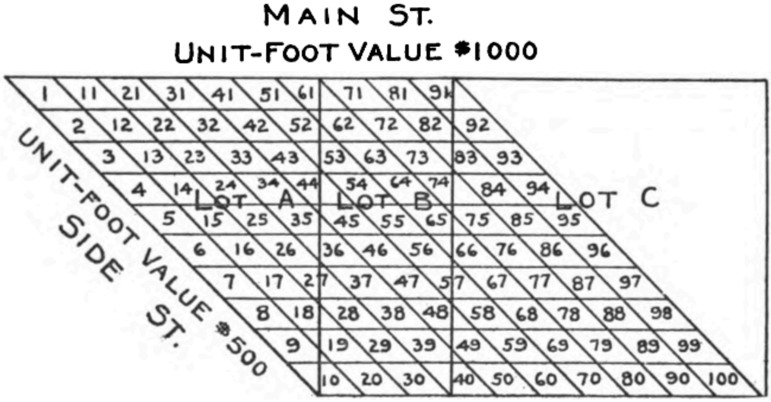


DIAGRAM XXXVII

Method of Apportioning Corner Influence Among Lots at or Near an Acute-Angle Corner.

In the case of obtuse angles the values imparted by the intersecting street units to the street corner will likewise be spread over an area less than 10,000 square feet. But the area will be shallow, measured from the street corner, and at times it may be found that the computed values for such corners with the aid of the Somers corner tables do not express the fair values of the corner lots, and that a certain percentage must be added to correct the computed values.

The corner tables are employed to distribute corner influence proportionately over the corner areas. If, subsequently, it is discovered that the angle of intersection of the two streets is not conducive to attaining the maximum utility of the areas included between the sides of the angle, or perhaps even serves to enhance their usefulness, the Assessor or Appraiser must use judgment for the effect of such secondary factors of value which cannot be computed.

Let us now illustrate the actual method of computing corner site values, when the street intersection is oblique. A separate diagram to fit each corner must be employed.

The parallelograms in the above diagram are numbered consecutively from 1 to 100, as were the squares in the diagram.

Area A is triangular in shape, and derives its value from the combination of the two street units, whose values are assumed to be $1,000 and $500 respectively. It is composed of the following parallelograms and fractional parts of parallelograms, whose values are computed with the aid of the Somers corner tables. The results may thus be tabulated:

COMPUTATION OF VALUE OF LOT A, DIAGRAM XXXVII

Whole Parallelograms	*Computed Values*
No. 1 ($2,930) less 50% deduction	$1,465
" 2–8	12,673
" 11–17	11,480
" 21–25	8,417
" 31–34	7,077
" 41–43	5,776
" 51	2,647
Total	$49,535

Fractional Part of Parallelograms	*Computed Values*
No. 9—8/10 of $1,313	$1,050
" 10—3/10 " 1,250	375
" 18—7/10 " 1,043	730
" 19—1/10 " 970	97
" 26—9/10 " 1,037	933
" 27—4/10 " 963	385
" 35—8/10 " 1,057	846
" 36—2/10 " 967	193
" 44—6/10 " 1,150	690
" 52—8/10 " 1,713	1,370
" 53—3/10 " 1,373	412
" 61—6/10 " 2,617	1,570
" 62—1/10 " 1,680	168
Total	$8,819

The combined value of all the parallelograms and fractional parts of the parallelograms is thus found to be $58,354.

Area B is rectangular in shape, composed of the following whole and fractional parts of parallelograms, with corresponding values computed by the Somers corner tables:

COMPUTATION OF VALUE OF LOT B, DIAGRAM XXXVII

Whole Parallelograms	*Computed Values*
No. 20	$913
“ 28–30	2,493
“ 37–38	1,644
“ 45–47	2,537
“ 54–56	2,807
“ 63–64	2,429
“ 71–73	5,570
“ 81	2,540
Total	$20,933

Fractional Part of Parallelograms	*Computed Values*
No. 9—2/10 of $1,313	$263
“ 10—7/10 “ 1,250	875
“ 18—3/10 “ 1,043	313
“ 19—9/10 “ 970	873
“ 26—1/10 “ 1,037	104
“ 27—6/10 “ 963	578
“ 35—2/10 “ 1,057	211
“ 36—8/10 “ 967	774
“ 39—9/10 “ 717	645
“ 40—4/10 “ 663	265
“ 44—4/10 “ 1,150	460
“ 48—7/10 “ 693	485
“ 49—2/10 “ 637	127
“ 52—2/10 “ 1,713	343
“ 53—7/10 “ 1,373	961
“ 57—5/10 “ 700	350
“ 61—4/10 “ 2,617	1,047
“ 62—9/10 “ 1,580	1,512
“ 65—7/10 “ 877	614
“ 66—3/10 “ 756	227
“ 74—5/10 “ 1,033	517
“ 75—1/10 “ 860	86
“ 82—8/10 “ 1,630	1,304
“ 83—4/10 “ 1,317	527
“ 91—5/10 “ 2,517	1,259
“ 92—1/10 “ 1,613	161
Total	$14,881

The total value computed for Area B is thus found to be $20,933 plus $14,881, or $35,814.

Area C, although regular in shape, has a portion of its value computed as an interior site, and a portion computed as subject to corner influence. The parallelograms and parts of parallelograms in Area C subject to corner influence, and their computed values, are as follows:

COMPUTATION OF VALUE OF AREA C, DIAGRAM XXXVII

Whole parallelograms	*Computed Values*
No. 50	$597
“ 58–60	1,760
“ 67–70	1,263
“ 76–80	1,370
“ 84–90	2,593
“ 93–100	2,310
Total	$9,893

Fractional Parts of Parallelograms	*Computed Values*
No. 40—6/10 of $663	$398
“ 48—3/10 “ 693	208
“ 49—8/10 “ 637	510
“ 57—5/10 “ 700	350
“ 65—3/10 “ 877	263
“ 66—7/10 “ 756	529
“ 74—5/10 “ 1,033	517
“ 75—9/10 “ 860	774
“ 82—2/10 “ 1,630	326
“ 83—4/10 “ 1,317	527
“ 91—5/10 “ 2,517	1,259
“ 92—9/10 “ 1,613	1,452
Total	$7,113

The value of the part of Area C computed as an interior site is found to be $9,300, making the total value of Area C equal to $9,300 plus $17,006, or $26,306.

The method of computing the values of lots at or near obtuse-angled corners is similar. For illustrative purposes the value of Lot A in the Diagram XXXVIII is computed, the values of Lots B and C being ascertained in practically the same manner as previously explained.

Lot A contains a number of parallelograms and parts of parallelograms, whose values are found with the aid of the

Somers corner tables, for the $500 and $1,000 street unit-foot combination, as follows:

COMPUTATION OF VALUE OF LOT A, DIAGRAM XXXVIII

Whole Parallelograms	*Computed Values*
No. 1–30	$45,482
" 33–40	7,645
" 44–50	5,614
" 56–60	3,237
" 67–70	2,323
" 78–80	1,560
" 90	450
Total	$66,311

Fractional Parts of Parallelograms	*Computed Values*
No. 31—4/10 of $2,717	$1,087
" 32—9/10 " 1,763	1,587
" 42—2/10 " 1,723	345
" 43—6/10 " 1,380	828
" 54—5/10 " 1,117	559
" 55—9/10 " 903	822
" 65—2/10 " 877	175
" 66—8/10 " 756	605
" 76—1/10 " 730	73
" 77—5/10 " 640	320
" 88—4/10 " 553	221
" 89—8/10 " 487	390
" 99—2/10 " 470	94
" 100—6/10 " 440	264
Total	$7,370

The combined value of the parts of Lot A is thus found to be equal to $73,681. In the diagrams on pages 150 and 155 it will be noted that the areas of Lots A and B in Diagram XXXVII are equal to the area of Lot A in Diagram XXXVIII. But the lots in Diagram XXXVII have a larger frontage on the higher-valued street than Lot A in Diagram XXXVIII, although both areas have the same frontage on the lower-valued street. The combined values of Lots A and B, because of their location, is therefore found to be considerably greater than the value of the corresponding area in Diagram XXXVIII. The former is $93,891 and the latter is $73,861. This shows how the Somers corner tables reflect the depression in value at acute-angled street intersections as compared with values of similar areas at obtuse-angled corners.

Greater accuracy could possibly be attained with the use of the Somers corner tables, when computing the values of fractional parts of either squares or parallelograms, if a correspondingly larger portion of the value of each 10-foot rectangle were taken for the half nearest the street. This can be done by applying the depth percentages to the corner squares. The front half of area 15, for illustration, would thus be valued at 72½ per cent. of the value of the entire rectangle, and so on.

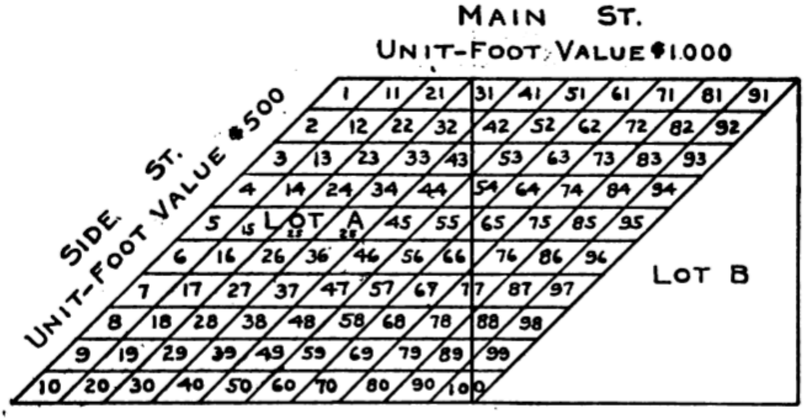


DIAGRAM XXXVIII

Method of Computing Value of Lot at or Near Obtuse-Angle Street Intersection.

The foregoing serves to illustrate the methods of computing corner or near-corner lot values when the streets intersect at oblique angles. The Somers corner tables can be employed to make the computations for any angle formed by the intersecting streets, although, as was previously noted, at times certain value-influences affecting a specific site cannot be computed, but must be judged by the Assessor or Appraiser. Whatever factors can possibly be subjected to mathematical rule, may be computed by the Somers Unit System methods. Those factors of value affecting specific sites which cannot be ascertained by mathematical computation must be borne in mind and separately appraised by the exercise of sound judgment.

In most cities oblique-angled corners are the exception rather than the rule, particularly in retail business districts. The Assessor may not be called upon to make computations of the values of oblique-angled corner sites as complex as those here illustrated. But for the sake of completeness these illustrations have been included, to indicate just how the corner tables are applicable to computing corner influence, regardless of the effect of the angle formed by the intersecting streets.

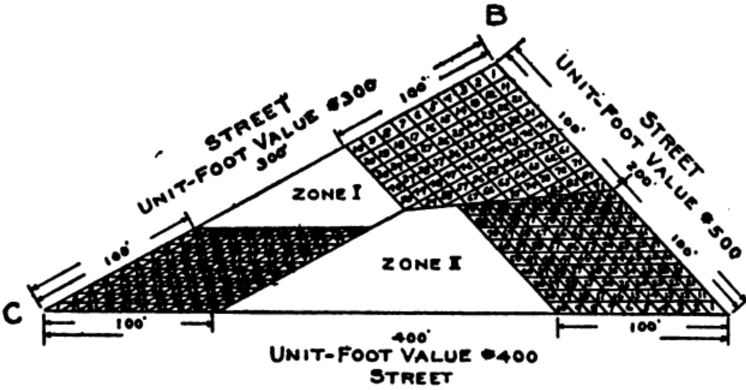


DIAGRAM XXXIX

Computing Value of Lot Bounded by Three Intersecting Streets, Illustrating the Method of Zoning Triangular Corner Sites.

At times a block in a central business district will be found to front on three streets, intersecting at oblique angles. To compute the value of such a block, or the value of the individual sites which make up the block, it becomes necessary to determine the exact direction and extent of overlap influence. This is done with the aid of the Somers zone tables, as previously explained.

Let us assume a triangular lot, fronting on three streets, with unit-foot values as indicated on Diagram XXXIX.

The areas subject to corner influence are laid off on the diagram and their values computed with the aid of the Somers corner tables. Then the exact direction of the line of demarcation of overlap influence is located as previously explained. The values of the interior areas are computed by zoning these areas and determining the value of each zone.

Thus the total value of this triangular corner lot would be composed of the computed values of the following areas:

COMPUTED VALUES OF CORNER AREAS

Corner A.	
Parallelograms 1–88, value	$62,920
Fractional parts of parallelograms 89–96, value	3,008
Total	$65,928
Less 50% deduction of acute angled parallelogram at A	793
Computed value, corner A	$65,135
Corner B.	
Whole parallelograms 1–58, value	$41,407
" " 61–66, "	4,222
" " 71–74, "	3,328
" " 81–82, "	2,096
Fractional parts of parallelograms Nos. 59, 60, 67, 75, 76, 83, 84, 91, 92	2,781
Computed value of corner B	$53,834
Corner C.	
Whole parallelograms, value	$53,426
Less deduction 75% of value of parallelogram No. 1	936
Computed value of corner B	$52,490

Referring to the foregoing diagram it will be noted that the corner influence derived from the intersecting streets at A overlaps the corner influence derived from the intersecting streets at B. The point of overlap and the direction of the line of demarcation is ascertained with the aid of the Somers corner tables, in the same manner that the zone tables are employed to determine the point and direction of overlap with reference to a single street unit-foot value. As has been previously explained, urban land values are always computed to reflect the maximum utility of the land to the community.

The value of the interior zones in Diagram XXXIX are computed as previously explained, and found to be: Zone I, $15,279; Zone II, $43,494. Adding to these the values of the corners A, B and C, we obtain the total computed value of the corner triangular lot, namely $230,232.

CHAPTER XIX

DETERMINING THE VALUE IMPARTED BY SECONDARY FACTORS OF VALUE

THE EFFECT OF ALLEYS UPON ABUTTING SITES—THE SIGNIFICANCE OF ALLEYS TO ADJACENT PROPERTIES—THE SOMERS SYSTEM METHODS OF VALUATION OF LAND OCCUPIED BY ALLEYS—THE DISTRIBUTION OF THE COMPUTED VALUE OF ALLEYS AMONG ABUTTING SITES—EXCEPTIONS TO THE GENERAL RULE—ILLUSTRATION OF COMPUTATIONS OF ALLEY INFLUENCE AND DISTRIBUTION OF THIS INFLUENCE AMONG ABUTTING SITES—THE VALUATION OF LAND OCCUPIED BY RAILROADS—RESTRICTIONS ON THE USE OF LAND—ITS EFFECT UPON URBAN LAND VALUES—THE APPRAISAL OF THESE RESTRICTIONS—PLOTTAGE DEFINED—THE SIGNIFICANCE OF PLOTTAGE—THE EFFECT OF PLOTTAGE UPON URBAN SITES—THE IMPORTANCE OF PLOTTAGE IN THE LOOP DISTRICT OF CHICAGO—PLOTTAGE NOT A FACTOR IN LAND VALUATION FOR TAXATION PURPOSES.

A. *Alleys.*

THE effect of alleys upon abutting sites is, as a rule, to enhance their usefulness, and therefore their value, by adding a secondary factor of accessibility. The land comprising alleys is in most instances dedicated to public use; but the actual use of alleys as thoroughfares is ordinarily limited, as the principal beneficiaries from alleys are the owners or occupants of the abutting lots in the particular blocks to which they give rearward or lateral accessibility.

It is possible and in some instances practicable to appraise unit-foot values upon alleys in the same manner as streets are appraised; but because of their relative unimportance as compared with streets, the Somers plan of appraising alleys has been found to distribute more easily the alley benefit to the sites which are enhanced by alleys.

In most instances the value of the alley land derived from the street unit-foot appraised would be greater, even at a considerable depth, than the corresponding value if the alley frontage were to be appraised on the unit-foot plan. The principle of overlap value discussed in Chapter XV would thus have to be applied.

It was the opinion of Mr. Somers that the lots abutting on alleys were benefited by alleys in proportion to the amount of accessibility gained from alleys, and that this benefit could be uniformly computed in terms of prices of foot-abutment on the alleys, without special consideration of lot depth or whether or not the total street-frontage should correspond with total alley-abutment. If in actual appraisal work it should be found that the operation of the Somers alley rule does not apply fairly in a specific instance, it may become necessary to make allowances to cover the variations from the computed apportionment of alley influence. However, it may be set down as a general rule that the value of land in an alley of average width, running through a block containing lots of such sizes and shapes as will make possible deriving their maximum utility, if apportioned among the abutting lots in proportion to the amount of such abutment, will closely approximate the additional usefulness accruing to such lots due to alley influence.

The value of the land used for alley purposes should therefore be added to the value of the lots benefited by the additional accessibility afforded by the alleys. The Somers System method employed to ascertain the value of the land used as alleys is to compute its value according to street frontage and depth explained in Chapter XIV, and to distribute the amount so ascertained among the several lots in the block which are accessible to the alley in proportion to their frontages on the alley land.

From the very nature of the case the value of alleys in each block must be computed separately, for it will tend to vary as the street unit-foot values vary. It would be manifestly unfair to add the same amount to the values of all sites, similar in shape and size, bounded in the rear by alleys having the same width. If there is but one alley of uniform width running through a block, abutting on the rear of each lot, and if the lots are all of the same width, the case is simple, as the benefits to the lots derived from the alley will tend to be the same. A division of the total value of the land used for the alley by the number of lots bounded in the rear by the alley will give the amount to be added to the value of each lot, whether an interior lot, or a lot affected by corner influence.

There are, however, exceptions to this rule, and cases have been found where the alleys in a block include so much ground that the value of the alley land computed with reference to street frontage and depth amount to more than the benefits accruing to the abutting lots. This might be true of an alley 20 feet wide running through a block, where the only use for the alley would be to serve as a rear entrance to the lots, and where a 10-foot or 12-foot strip would have afforded ample alley accommodations. It is evident that there is a loss resulting from maintaining a 20-foot alley, and it may be found that the amount of benefit to the lots is less than the computed value of the land thus used. Sometimes 20-foot alleys develop into streets, and then they should be appraised as streets.

When there is more than one alley in a block, or when the widths of the alleys in the block are not uniform, the advantages or benefits to the lots must be adjusted in accordance with facts, but always with relationship to the total value of the land set aside in the block for alley purposes.

As a rule increasing the width of an alley will tend to increase the benefit derived from it up to a certain point. Therefore, if a narrow alley is located in one part of a block, the benefit derived from it should not be measured at the same rate per front foot as for an alley that is wider. The exercising of judgment in adjusting the effect of varying conditions is necessary. It is difficult to establish a general rule which will apply in all cases to cover abnormal conditions, although few if any modifications are required under normal conditions.

A lot fronting on a street with an alley running along its side obtains, under Somers computation methods, no greater benefit per foot of alley advantage than a lot where the same alley advantage is at a certain distance from the street front. In the computation of the value of all of the land in the area of an alley, consideration is of course given to the additional land value near the street frontage, but the distribution of enhancement to the lots abutting on the alley is usually an equal division of the value of all the land in the alley by the number of feet abutting on the alley.

The objection has been raised to the Somers method of computing value-enhancement due to alleys that this method ascribes a much greater value to a 12-foot alley located 30 feet from a street front than an alley of the same width located, let us say, 90 feet from a street front having the same unit-foot value. This appears to be contrary to fact, since a lot only 30 feet deep would be but slightly benefited by a rear alley, while for a 90-feet-deep lot the alley would be of considerable importance, and thus decidedly more valuable.

The Somers method of computing alley effect is based on the observation that in general the benefits derived from alleys accrue with comparative equality to every foot of a lot fronting on an alley. If at times it is found that a greater benefit accrues to a deep lot than to a shallow lot similarly located, a special adjustment is made by the appraiser. In all such cases of abnormal conditions the sound judgment of the Appraiser, based on careful observation, must be the deciding factor as to the effect of any abnormal condition upon valuation.

By way of illustration of the Somers System methods of computing alley influence, and its allocation to abutting sites, we will again refer to Diagram XVIII on page 101. It will be found that in this diagram:

The value of the alley with reference to Third Street to the line of overlap is	$2,013
The value of the alley with reference to Main Street to the line of overlap is	378
The value of the alley with reference to Fourth Street to the line of overlap is	1,710
The maximum value of the area occupied by the alley (cf. Diagram XVIII) derived from street accessibility is ..	$4,101

The total number of feet of sites touching the alley is 800, therefore $5.13 is allocated to every frontage foot of each lot touching the alley.

We have now computed the value of all the assumed physical factors affecting the separate sites in the illustrative city block. Let us recapitulate. With the unit-foot valuations established by accurately gauging community opinion, the values of individual sites were computed. Each external factor of valuation was separately considered in making these computations. The total values of the individual lots derived from street accessibility and alley influence may be recorded as follows:

Lots	*Values Derived from Street Accessibility*	*Values Derived from Alley*	*Combined Computed Values*
A	$10,400	...	$10,400
B	12,600	$513	13,113
C	10,599	308	10,907
D	12,401	205	12,606
E	4,976	513	5,489
F	11,908	513	12,421
G	5,650	257	5,907
H	25,094	...	25,094
I	9,119	513	9,632
K	37,210	513	37,723
L	21,735	...	21,735
M	20,369	...	20,369
N	13,650	770	14,420
Total block	$195,711	$4,105	$199,816

How does this total computed valuation of the individual sites in the block compare with the computed valuation of the block, based on the assumed street unit-foot values, regardless of any lot or site boundaries? If the two sets of computations are accurate the results should be identical.

The computed values of the four corner areas, each 100′ x 100′, in the illustrative block, is found with the aid of the Somers corner tables to be $96,000 in round numbers. The value of the remainder of the lots in the block, computed as interior sites, always with reference to maximum utility, is found to be $104,000, giving a combined total value of the land in the block equal to $200,000. The slight difference between this computed value and the total value of the individual sites in the block is due to the omission of computation of overlap value where it is relatively unimportant, as in the case of Lots B and G.

B. *Railroads and Kindred Factors.*

Railroads, usually, but not always, enhance the value of contiguous sites. But not only contiguous sites are often enhanced in value by railroads. The land throughout an entire community tends to increase in value by virtue of the development of a system of transportation. This value-enhancement derived from railroad facilities will be reflected in higher unit-foot values of urban lands because of this facilitated accessibility. In general, trunk line railroad connections tend to enhance the value of contiguous sites more than short-line roads. When in the opinion of the Appraiser any enhancement of value due to railroads obtains, it should be estimated for the effect of each railroad in the district, and expressed in terms of monetary value per front foot. Since railroads may or may not enhance the value of contiguous land, it is highly essential that the influence of railroads as a separate factor of value should be carefully observed and uniformly distributed.

On the other hand, the land occupied by railroads should be appraised in a manner similar to that employed in appraising urban or rural site values in general.

If the railroad runs between two parallel streets, into the center of the city, as does a portion of the Pennsylvania Railroad in Philadelphia, and the New York Central and the New York, New Haven and Hartford Railroads in New York, the unit-foot values placed on the streets paralleling the railroads may be employed in computing the value of the land occupied by the roadbeds. If an additional factor of value is added to this computed value for every foot of land along the roadbed, it is analogous to plottage, discussed later. If, on the other hand, a railroad runs underground into a city, and the space above is utilized for building construction, the location value of the space jointly used can be computed on the basis of the unit-foot values adopted, and allocated according to the relative benefits derived from the location.

A front-foot valuation, placed on land occupied by railroads, when the only means of access to the land is at the railroad terminal, can be made the basis of computing such railroad land values. Thus if a front-foot value of, say $10, were placed on a roadbed of a definite width, this could be employed to compute the value of all the land occupied by the railroad having such a front-foot value.

The same observations hold true for water frontage. A water-front property made accessible by means of streets, may be appraised so as to show the value which the street accessibility and other normal influences impart to the land; and to this value should be added such an amount per front foot as in the opinion of the Appraiser represents the enhancement due to water frontage. Sites facing parks may also have an enhancement in value, not always reflected in the street unit-foot adopted, particularly if the park extends to the rear of the building sites, as is sometimes the case. In such cases a front-foot value should be ascertained and distributed in proportion to frontage among affected areas.

C. *Restrictions to Use of Land.*

Restrictions as to the use of certain areas in some cities should not affect the appraisal process. If the land over a considerable area is made more valuable by virtue of the restrictions, this may sometimes be reflected in the unit-foot values adopted. If on the other hand the restrictions favor the individual owners to the detriment of the community; if, in other words, the land would have a definitely greater value to the community if the restrictions did not exist, this detriment might also be reflected in the unit-foot values adopted.

It may be argued that a restriction upon the use of land is equivalent to an encumbrance, even as a mortgage is an encumbrance. If encumbrances were deductible from land values in order to arrive at their fair or normal values for taxation purposes, it would but require mortgaging one's land to some fictitious person to 100 per cent. of its fair value to keep it from the assessment rolls entirely. Land should be assessed regardless of restrictions, if the maximum relative values of all urban sites are to be ascertained; and if the restriction is one that enhances the value of land within a block, the enhancing effect of the restriction will be reflected in the unit-foot values. The ignoring of restrictions appears sound in spite of the Massachusetts Court decision to the contrary (cf. Lodge et. al. vs. Inhabitants of Swampscott, 216, Mass., 260). This decision holds that appraisals must be made on the basis of the authorized use of land and not on its unencumbered use. The court's argument ran as follows:

"To assess this property without regard to the restriction would be to assess it for an amount in excess of its fair cash value and in violation of the statute."

The unsoundness of such an argument is obvious, for if this principle were made the basis for land valuation, it would be necessary merely to provide in a deed that a tract of land in the center of a city should remain idle for a long period of time, and thus escape all taxes on such land during the interval, regardless of its importance to the community.

D. *Plottage—General Observations.*

A well-established practice has arisen in some of the larger cities of taking into consideration an additional physical factor of land value which is known as "plottage."

Where street unit-foot values are considered at high prices, as in the congested districts of the larger cities, this factor often attains importance. It is contended, for example, that a lot fronting 40 feet on Chestnut Street near a low-valued street in the city of Philadelphia is worth more than twice as much as a lot 20 feet wide beside it and having the same depth, both lots being without corner or alley influence. The reason for this claim is that along this particular street a 40-foot-front lot can be more advantageously used for retail business purposes than is reflected by the difference in the widths of the two lots.

Plottage, therefore, is a physical factor of value, arising from the fact that a site is peculiarly adapted in size and shape to the economic requirements in a particular location at a certain date. If all sites were thus adapted there would be no such special factor of valuation, and the unit-foot valuation and the resulting computation would show the fair value.

Plottage is comparable to the extra bonus that a site owner may be obliged to pay to secure possession of the particular site adjoining his present land holdings. When a person is required to pay more for a certain site than an amount, which, in the opinion of the community represents a fair price, there is little or no dispute over the fairness in omitting such a bonus when making a full appraisal of the entire site. The purchaser has paid an amount over and above the fair or normal value of the land, compared with other land in the neighborhood, for the purpose of owning a site possessing special economic importance to him.

This plottage factor plays an important rôle in most land transfers in the Loop District of Chicago. The opportunities for real estate dealers in this district at this time consist largely in replotting smaller areas that have existed for years under separate ownership into larger plots. The history of lot lines in this district illustrates trends in both directions. The lots were originally laid out on the scale of 80 feet front. As this district of Chicago grew as a retail business center, these lots were found to be too large for the best usage at that time. Owners cut them into 40-foot and later into 20-foot frontages as business intensified its demand. Population continued to increase rapidly, and the economic necessities, superinduced by the effect of the elevated railroad loop later on required larger tracts than those afforded by either 20-foot or 40-foot frontages. Gradually, therefore, the smaller sites were combined into larger areas, often larger than the original lots. In some instances whole blocks have been combined into single areas. This has been the trend for a number of years until at present the principal effort of the real estate brokers trading in that district is towards replotting small areas into areas that are now, in the year 1926, best suited to the economic requirements of the millions of people doing their retail and wholesale trading and having their business offices in this Loop District. In connection with the contention that selling prices are an accurate index of fair value, it is interesting to note that in the transactions arising from this process of replotting into larger sites, there is often a very wide difference in the prices paid for adjoining sites having similar dimensions.

Whether a percentage is to be added or deducted, the normal values of the sites which are to serve as standard commercial areas must be accurately appraised before any allowance for plottage can be made. The Somers method is to judge the single-street value, then to compute the value of each site uniformly, with the aid of the street unit-foot valuations; and subsequently to add a certain percentage to the computed site values, if in the opinion of the Appraiser this should be done to properly represent the additional value imparted to sites by plottage.

For taxation purposes, however, Mr. Somers contended that enhancing plottage-factors should not be applied after land sites had been normally appraised by Somers System methods. To do so, he said, would be to appraise as land value the special value of the use of a particular property for a particular purpose. While this special value may exist, Mr. Somers maintained that it should not be considered in valuing a site for taxation purposes. If a particular person could utilize a particular site to special advantage, he argued, that should be credited to his enterprise and not charged against the value of the site after the fair comparative value should have been determined.

CHAPTER XX

COMMUNITY APPROVAL OF COMPUTED SITE VALUES—RURAL LAND VALUATION—VALUATION OF IMPROVEMENTS ON LAND

COMPUTATION AND RECORDING OF ALL SITE VALUES POSSIBLE WITH FOREGOING DATA—ENTERING THE COMPUTED VALUES ON CARD RECORDS AND ON LOT AND BLOCK MAPS—A FINAL PUBLIC MEETING TO APPROVE OF THE WORK OF THE ASSESSOR—DISPLAY OF THE COMPUTED VALUE ON LOT AND BLOCK MAPS—METHODS OF PRESENTING THE COMPUTATION TO HIS AUDIENCE—AN APPEAL TO REASON—POSSIBLE OMISSION OF SECONDARY FACTORS OF VALUE—FINAL RATIFICATION BY THE COMMUNITY OF COMPUTED VALUATIONS OF LAND—SIMPLICITY IN DESCRIBING LOCATION OF SITES POSSIBLE—A MUCH-TO-BE-DESIRED REFORM—THE PRACTICAL SUCCESS OF THE SOMERS SYSTEM—ITS APPLICATION TO RURAL LAND VALUATION—THE UNIT-FOOT INCONVENIENT FOR RURAL LAND VALUATION—THE ACRE A MORE CONVENIENT UNIT—OBSERVATIONS ON VALUATION OF IMPROVEMENTS ON LAND.

IN the preceding chapters the Somers methods of computing the chief external value-factors affecting city land values have been developed and illustrated. With the aid of the foregoing data the Assessor is now in a position to compute or appraise accurately and precisely the value of each lot derived from these factors, and to record these values on the card records and the lot and block maps prepared for the purpose. While making his computations it should be clearly understood that the property owners are always at liberty to consult the Assessor as to the probable computed valuations of specific properties, based upon the unit-valuations as determined. The more active the interest of the community in this phase of the work, the more certain will the Assessor be that in his computations no external factors of value affecting a specific site will have been overlooked. But conditions may prevent a citizen from availing himself of the opportunity to examine and criticise his land assessment while the actual calculations are being made. Therefore, having completed his calculations, the Assessor may deem it advisable to call other public meetings for the purpose of final ratification by the community of the computed lot values, to form the basis of taxation. In small communities in Connecticut the citizens' committees have checked the values of every lot and every building before finally accepting them as a basis for levying taxes.

Prior to the final meeting the Assessor should place the lot and block maps, as well as the unit-valuation maps, where they can be clearly seen by every one. The lot and block maps, with the computed value of every site, will appear approximately as illustrated in Diagram XL. When possible, the building values should also appear on the several lots.

By way of final explanation the Assessor may proceed approximately as follows:

"The purpose of this meeting is to present to you, for your final approval, the comparative values computed for each individual site in this district of our city. Since our last meeting, when we reached final conclusions as to the unit-foot values of the streets, I have busied myself with an effort to reduce these unit-foot values to site values."

He may then proceed to point out the method he has employed in computing the separate site values. His explanatory remarks should begin by showing how the value of a regular interior lot was computed. Because of the relative ease with which such a computation is made, the average Assessor should experience no difficulty in explaining his method clearly.

"It may interest you," he may proceed, "to know by what principles and processes I have arrived at the conclusions as to site values recorded on this map. I have not done it arbitrarily. I have done it by employing careful measurements and calculations. I have tried with the assistance of the community to arrive as nearly as possible at the fair or normal value of each site by ascertaining with all possible accuracy the fair value of a unit-foot of land, from which the values of the other street units were computed. To the extent that the basic unit-foot as determined by me with your assistance was either above or below the fair or normal value of the land in the particular location for which it was computed, to the same extent all the other unit-feet are either over-valued or under-valued. The values thus ascertained all bear a definite relation to each other, which relationship you yourselves have assisted in establishing."

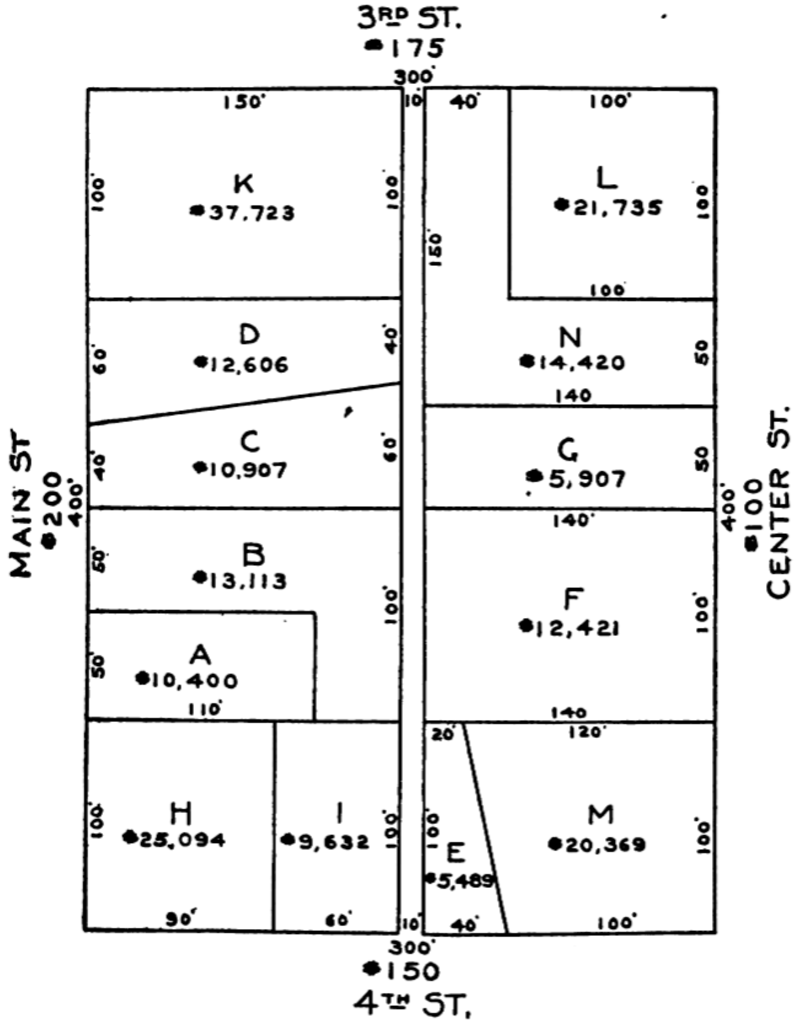


DIAGRAM XL

Illustrative City Block (Diagram XVIII), Showing Computed Values of Individual Lots After Consideration of the Value-Effect of Each External Value-Factor.

After this explanatory remark the Assessor may proceed to show the methods employed in computing the separate external factors of value, always stating clearly and concisely the reasons for his methods of computation. Nothing is more convincing to an audience than to give valid reasons for every assertion made. Merely to say, "This is the way it is done," without good reasons for doing so, will convey the impression that the methods are arbitrary and dictatorial. It is therefore highly important that the Assessor should have grasped the underlying principles of urban land valuation clearly. Not until he has done so is he in a position to present convincingly to his meeting the reasons for his computations.

When the Assessor has completed his explanations there may be some members of the meeting who will take exception to some of the computed valuations. It may happen that a secondary external factor of value has been overlooked by the Assessor and a definite correction will have to be made to allow for this factor. But in general the Assessor will discover that the taxpayers will try to argue that the valuations placed on their respective tracts of land are too high. Against such a claim the Assessor has his strongest weapon in the definite and uniform methods used both in unit-foot valuation and in the computation of the values of individual sites.

It will require relatively little effort to convince even the most obstreperous taxpayer that the valuation of his property bears an exact relationship to the valuation of all the other properties. The change of one taxpayer's computed land valuation would mean injustice to all the others, and community disapproval, rather than community approval, would soon manifest itself. It thus becomes clear that the Assessor should find little difficulty in convincing his constituents of the equity and justice of the final computed valuations of the sites for taxation purposes.

When this has been done the final meeting of the community for the purpose of adopting land values for tax purposes is adjourned. The process of site valuation has been completed. Every one should feel that he has been treated justly and impartially, without any favoritism. Of course, in some communities habitual complainants can be found, and they usually make themselves known when their own economic interests appear to be involved. To them justice implies letting the other man carry the burden. Such individuals may cause a certain amount of annoyance to an Assessor, but if he has done his work faithfully and accurately in accordance with the methods outlined in this work, he certainly has reason on his side. In the long run reason will and must triumph over ignorance and prejudice; and the former tax-dodger is converted to sympathy with the effort to establish both reason and justice.

The site valuations recorded on the card records and lot and block maps should always be open to public inspection and examination. In some communities it has been found advisable and expedient to publish the assessment rolls in the local newspapers, or in pamphlet form.

When the assessments thus made are entered on the maps, blueprints may be supplied to real estate dealers, banks and others, who may at a glance discover the analyzed valuations of all sites within a city. These maps in the hands of the public greatly facilitate transactions in real estate. The process of valuation is so clearly shown that sales prices are more readily agreed upon than under other conditions. It is interesting to note how nearly the sales prices compare in Somers-assessed cities with the Assessor's valuations.

In order to simplify the method of designating specific lots it has furthermore been found advisable to number assessment districts, blocks and lots as illustrated in Diagram XLI, page 172.

The numbering of lots in this manner facilitates the description of lot locations, and eliminates the necessity of describing lots in the cumbersome manner commonly employed. It would be simpler to describe the location of John Brown's site as "Section 1, Block 3, Lot 5," than "situate on the northeast corner of Third and Main Streets, extending along said Main Street in a northerly direction 43′ 7″ to an alley; thence in an easterly direction along said street at right angles to said Main Street to a depth of 100 feet," and so on around the entire lot. Simplicity of description of site locations cannot be too highly commended, and the designation of lots and blocks as here suggested would facilitate the work of the Assessor, particularly in his preparation of final assessment rolls.

We have traced step by step the practical methods employed by Mr. W. A. Somers in ascertaining an expression of

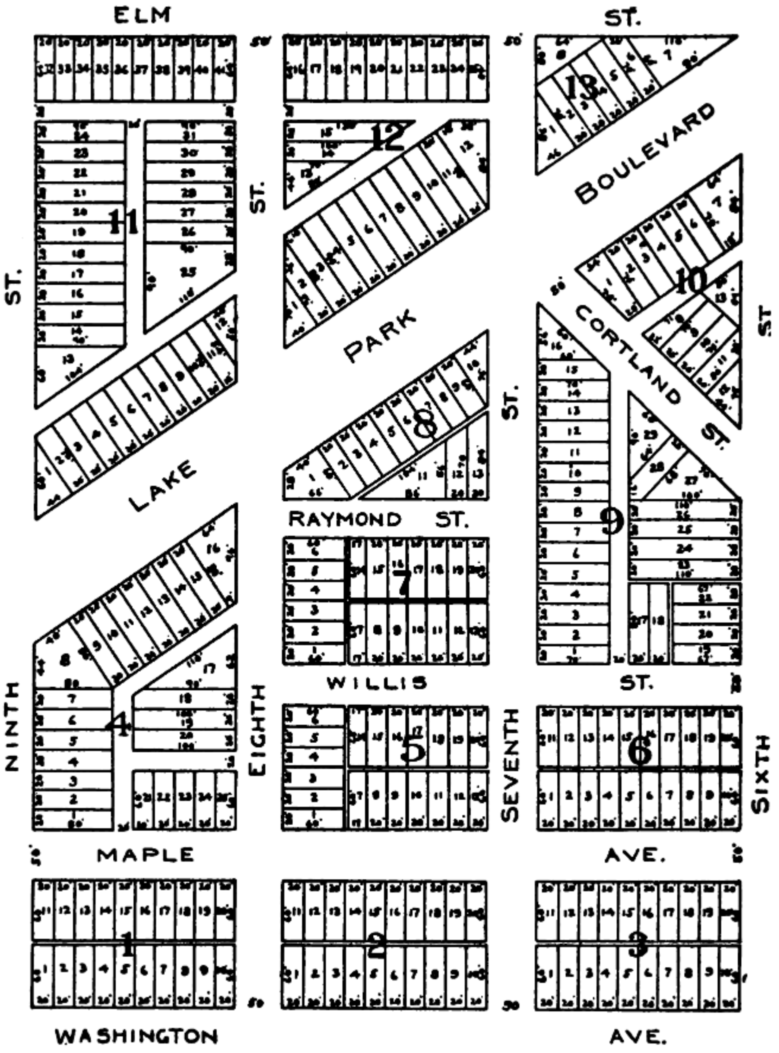


DIAGRAM XLI

Illustrating a Sectional Map of a City with Lots and Blocks Comprehensively Numbered.

community opinion as to relative city land values, and the computation of actual site values based on this community judgment. That these methods can be successfully employed, particularly for assessment purposes, has been amply demonstrated during the past fifteen years. About seventy cities and towns in the United States have successfully adopted the Somers System for assessment purposes. When all is said and done the invariable query is: "How does it work?" The fact that the System does work for all kinds of land valuation is in itself the strongest reply to the criticism sometimes voiced that it is inapplicable to all cases of land valuation.

Mr. Somers has also applied his methods to compute the valuation of rural lands, used for agricultural rather than for building site purposes. Practical experience, however, has demonstrated that the unit-foot, although in fact applicable to unit-valuation of rural lands, is an inconvenient unit. Consequently a larger unit has been selected in accordance with customary practice, namely the acre, and relative rural land values have been expressed in terms of this valuation unit. In general, the principle that each factor of value must be appraised separately, pertains equally to urban and to rural land.

Soil fertility is the chief characteristic of rural land which makes it valuable to man. Location, accessibility to markets, also enters as an important factor into the problem of rural land valuation. Both of these characteristics must be separately studied and appraised. After this has been done it is possible to express the combined values of the fertility-location factors of a unit quantity, an acre, and employ this as the basis for comparing and appraising rural land values. The practical methods of applying such value-opinion of unit areas of rural lands, based on careful analysis, to the problem of accurately computing rural land values has yet to be developed into a complete valuation-system. The solution is suggested in the Somers System methods of procedure of sounding out community opinion and using such opinion as a basis for making accurate comparisons.

Photographs of typical buildings and ground-space or floor-space unit-prices for appraisal at costs of new reproduction have been published from time to time in explanation of building-valuation methods. Such information is incomplete, and one who undertakes to use it should be advised of the limitations upon such use. A schedule of costs of new reproduction of buildings per square foot of floor space in Portland, Oregon, would differ greatly from a similar schedule for New York City or any city in New York State. In each city where an effort is made to establish costs of new reproduction of buildings on the square-foot-of-floor-space-unit basis, local schedules should be worked out to cover typical buildings, with variations in unit costs of new reproduction to cover variations from type. The basis of such price-lists should be the actual local costs of materials, labor, overhead and profit. Unclassifiable or special buildings should be separately and specifically appraised.

When the routine of ascertaining cost of new reproduction has been accomplished, the more difficult problem of applying depreciation-factors remains to be solved. Land sites appraised by Somers System methods may be subject to depreciation for topographical irregularities or for unmarketable area shapes, and the depreciation causes are so variable as to require a special judgment for each. This is true also as to depreciation of buildings. A depreciation-schedule based upon considerations of accrued mechanical deterioration, obsolescence and lack of utility would mean a separate judgment applied to every building. In making a valuation for purposes of taxation it has been found feasible and practical to prepare local depreciation schedules for typical buildings based upon age and condition, with separate judgment for lack of utility, where there has been a marked change in the normal usefulness of a site, which land-usefulness change particularly affects a building. The appraisal of buildings for assessment purposes is partially subject to rule, but is largely a specific appraisal task, which can be most accurately performed by experts in building appraisal work. Unless such expert training and knowledge is applied, valuation of buildings will be inaccurate and largely a matter of guesswork, as is usually the case to-day.

CHAPTER XXI

EVOLUTION OF THE SOMERS SYSTEM AND SOME OF ITS PRACTICAL MODIFICATIONS

SOMERS SYSTEM FIRST DEVELOPED IN ST. PAUL—MR. SOMERS' WORK IN NEW YORK AND CHICAGO—ANALYSIS OF THE CHICAGO PLAN OF ASSESSMENT—CHIEF DIFFERENCES BETWEEN THE CHICAGO PLAN AND THE SOMERS SYSTEM—MR. SOMERS' WORK IN CLEVELAND—INVESTIGATION OF ASSESSORS' VALUATIONS IN PHILADELPHIA IN 1910 UNDER THE SUPERVISION OF MR. SOMERS—THE CAMBRIDGE PLAN OF LAND VALUATION CRITICISED.

THE first announcement of the Somers System was made in a pamphlet issued by Mr. Somers after the completion of the reassessment of the real estate of the City of St. Paul, which was directed by him. This announcement created widespread interest among taxation officials and real estate operators. It is interesting to know that Mr. Somers was assisted in the development of his original computation methods by Mr. Homer A. Pace, who in recent years has established a large school of accountancy in New York City.

At that time the only recognized attempt to use mathematical formulæ for computing land values was the crude "Hoffman Rule," deduced from a court decision in a litigation over a certain New York city lot, 100 feet deep. The rule laid down the generalization that two-thirds of the value of the whole 100-foot lot pertained to the 50 feet nearest the street frontage. The Hoffman Rule was amplified by the Neill curve, which assigned percentages to each foot from the street frontage.

Mr. Somers' study of comparative land valuation soon took him to Chicago, then to New York City. In both of these cities he was employed by the assessing authorities, and left the impress of his genius as a land valuation actuary in the adoption in those cities of modifications of his system. He participated in the investigation of Philadelphia valuations for taxation purposes, and in agitation for the installation of his system in Baltimore, Boston, Buffalo, Milwaukee and other cities.

In Chicago the Assessors, while approving the Somers unit-valuation plan, devised a depth percentage which varied widely from that proposed by Mr. Somers, and from all other modifications of the Somers Curve of Value. The Chicago Assessors also promulgated a percentage plan for computing corner lots in the Loop District.

In New York City, under employment by the Department of Taxes and Assessments, Mr. Somers in 1909 prepared the first of the series of land value maps which have since been revised annually, on which maps the unit-foot values were deduced from land valuations determined by the District Assessors without coördination of effort or systematic comparisons of street frontages. New York still uses the Hoffman-Neill rule for computing the values of inside lots, and a percentage plan for computing the values of corner lots. It issues its land value maps after the assessments have been determined each year.

In Baltimore the Assessors worked out two depth percentages, one for business lots 100 feet deep, the other for residential lots 150 feet deep, thus requiring two yardsticks instead of one. The variation in actual percentages at different depths was negligible as compared with the Somers curve. The Baltimore Assessors proposed a percentage scheme for corner valuation, showing higher corner values in business districts than under the Somers corner tables.

An analysis of the Chicago Plan was contained in a report made at the request of the City Club of Chicago in 1911 by The Manufacturers' Appraisal Company. A careful comparison of the Chicago plan with the Somers System was contained in that report.

Values under the Chicago Plan were stated as of a unit-foot, so located that it is subject to only one factor or influence of value. A table showing the values of lots of various depths as compared with the unit depth of 100 feet was constructed. The table and chart on page 177 contain a comparison of the Chicago and the Somers depth percentages employed for interior site computation.

With the aid of the Chicago depth table the relative values of regular interior lots may be computed in the same manner as by Somers System methods. A lot 100 feet square at a business corner is figured on the basis of the higher unit-foot, to which value is added 60 per cent. of the value of the

DEPTH PERCENTAGES

Feet Depths	*Percentages of Unit Values Chicago Plan*	*Percentages of Unit Values Somers System*
1	10.99	3.10
5	14.95	14.35
10	19.90	25.00
25	34.35	47.90
40	48.80	64.00
50	57.50	72.50
75	79.35	88.30
100	100.00	100.00
125	119.35	109.05
150	137.50	115.00
175	154.35	119.14
200	170.00	122.00

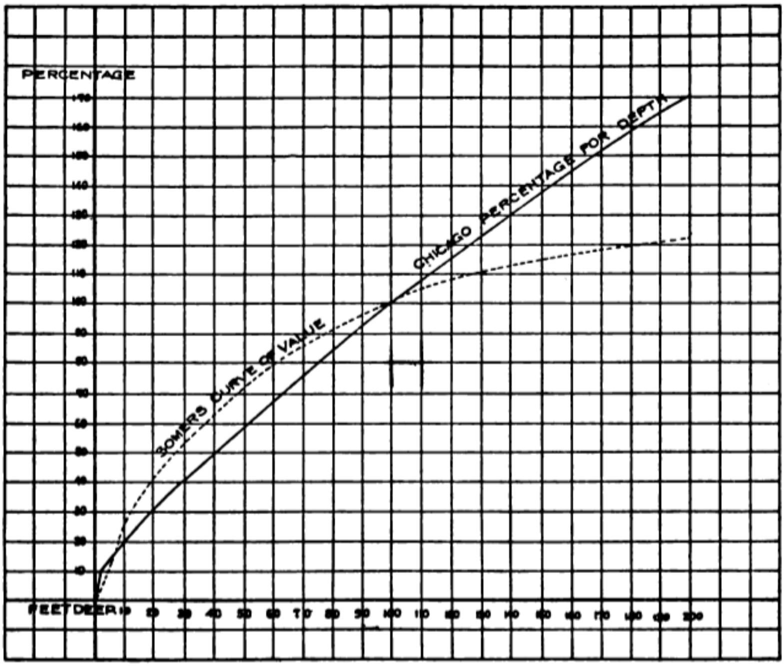


DIAGRAM XLII

Chart, Comparing Somers Depth Curve with Chicago Depth Curve.

lot as it may be computed with reference to the lower-valued unit-foot value. Where a lot is 50 feet wide on a higher-valued street, five-sixths of the added value of the 100-foot lot is added to its value as computed with reference to the higher unit-foot value. A table constructed on this basis shows the value of each front foot from the corner either way. In the case of an alley, five feet are added to the side or depth of the lot so abutting, as the case may be, and the resulting size of the lot is figured as a regular inside lot.

The chief differences between the Chicago Plan and the Somers System are as follows:

1. The Chicago Plan places a higher relative value on the rear portion of a lot than does the Somers System.
2. The Chicago Plan places a higher relative value on the first few feet from the street front than does the Somers System.
3. The Chicago Plan places a lower value on the first half of a lot 100 feet deep than does the Somers System.
4. The Chicago Plan includes in its depth percentage some of the plottage factors; the Somers System does not. If a small lot is to be valued lower than its proportionate share of a large plot, under the Somers System that difference would have to be computed separately, and is not mixed with a proportional valuing of the various sizes and shapes. Under the Somers System it is therefore easier to account for differences in the valuations of parcels affected by the same influences, which differences are usually traceable to varying sizes, shapes, alley or corner influences.
5. The Chicago Plan assumes that corner enhancement extends always exactly 100 feet either way from the corner, and makes no allowance for the higher value which may be derived beyond that point on the side street from the high valued street. The Somers System, on the other hand, in addition to computing corner enhancement within a hundred feet of the street intersection with the aid of the Somers corner tables, computes higher values derived from the main street than from the side street beyond 100 feet from the street corner with the aid of the overlap tables.
6. The Chicago Corner Plan is based upon the assumption that the lower unit-foot value exerts 60 per cent. of its influence upon the higher unit-value. There is nothing in the

plan to show why 60 per cent. is used. The Somers System corner plan is based upon the mathematical effect of the simultaneous operation of two unit-foot values, and the tables that made this method workable are actual valuation tables for specific pieces of land, each in its relationship to corner location as well as distance and direction from the corner.

7. The Chicago Plan has no method for computing irregularly shaped sites. The Somers System has a method for such computation.

8. The Chicago Plan has no means of showing the effect of two unit-foot values applied from opposite directions. By the Somers System the exact point where two unit-foot values overlap can be found.

9. The Chicago Alley Plan is defective and must work hardship upon some properties if carried out as described. The Somers method is more exact, and treats every alley property in proportion to its alley frontage.

The basic difference between the Chicago Plan and the Somers System of computing land values is found in the variations of the two depth tables reproduced above. It is conceded that the Chicago percentage for depth is applicable only to inside lots in what is known as the Loop District of Chicago, and is not applicable to the residence or manufacturing districts of either that or any other city.

The Somers System recognizes that there is more difference in the mathematical relation of the value of the rear part of a residence lot exceeding 100 feet in depth, when compared with its front portion, than exists in the mathematical relation of the value of the two portions of an ordinary-sized lot used for retail purposes. An accurate system of computation ought to take into consideration the computation of all kinds of properties.

By putting the Chicago percentage of depth table and the Somers curve of value upon a scale of value as is illustrated in Diagram XLII, page 177, the difference in principle is more easily seen. The Chicago line of value-judgments varies sharply for the first foot, and from that to a depth of 200 feet the value runs in almost a straight line. The general knowledge of disproportionately decreasing value with receding depth indicates the fallacy of this straight-line treatment. It is difficult to see why there should be a sharp deflection of values at a depth of one foot, when it is usually conceded that such an abrupt variation in land values does not exist in our cities. The direction of the whole Chicago line depends upon the point where one locates the percentage of value at 50 feet in depth. If it is located at a point practically in a straight line between one foot deep and 100 feet deep, the line would produce disproportionately high values for the rear of very deep lots.

The two methods of estimating corner values are likewise very different, and this difference is fundamental. The Chicago Plan presupposes that the enhancement of value at a corner, as we have noted before, always extends 100 feet. The Somers System recognizes that this enhancement varies in its extent. Furthermore, the Chicago method for adding for corner enhancement is arbitrary. It is not the mathematical resultant of the simultaneous operation of two forces.

The question naturally arises, Why is 60 per cent. added in one case and why 50 per cent. in another case? How were these percentages discovered to be used in these two situations? In the Chicago percentage tables differences are noted to the 100th part of one per cent. Even in the application of the Chicago corner plan to plots of very small size we find this 60 per cent. distribution divided into percentages beginning with three one-hundredths of 1 per cent. It is difficult to understand why the enhancement at corners should be exactly 60 per cent. of the value of the parcel of land figured with reference to the lower street unit-foot value, plus the value with reference to the higher-valued street unit-foot.

The Chicago Plan of adding for alleys is to add 5 feet to the width or depth of the lot as the case may be, and to figure the 5 feet as if they were a part of the lot. This plan may work a gross injustice to the owners of the lots next to that part of the alley where the land value of the alley is highest. An alley foot, in Mr. Somers' opinion, is approximately of the same value in one part of the same alley as in another, and the whole land value of the alley should be prorated among all of the property that derives this alley benefit, each in proportion to the number of feet that abut on the alley.

The Chicago Assessors did not accept the Somers plan to publicly discuss frontage values on streets, and they did not invite advance criticism of unit-foot values.

Mr. George C. Olcott, of Chicago, as a result of his study of the Somers theories, about 1910 began the annual publication of a book containing frontage values throughout the entire city of Chicago. These values are largely deduced from sales records, and from Mr. Olcott's study of Chicago's development. His book, revised annually, affords a valuable guide to Chicago real estate operators, loan agents and appraisers interested in the purchase and sale of real estate in that city. Mr. Olcott does not profess any special theories concerning depth or corner influences, but contents himself with recording in unit-foot figures the value-trends in all parts of the city. His familiarity with real estate values, gained by his use of the Somers method of street appraisal, gives him a particularly high standing in the practice of his profession of land appraiser, and his services for specific land appraisals are in constant demand by appraisal companies, loan companies and banks.

The New York City Department of Taxes and Assessments next engaged the services of Mr. Somers, and in 1909 he instituted the New York plan which has been continued in each subsequent year, for the publication of "Land Value Maps." In the first instance, Mr. Somers deduced unit-foot values for every New York city block, from the actual assessments of inside lots, made by District Assessors without the use of a system. The values on these maps have been modified and republished each year, after the valuations have been determined. They are not used for tentative public discussion, in advance of valuation, but rather for discussion of appeals. A part of Mr. Somers' duties in New York consisted in checking up complaints to help the Tax Commissioners to determine the merit of appeals from the Assessors' valuations.

While in New York Mr. Somers completed his scheme of distribution of values to 10-foot squares within the corner influence area, and when he was invited to Cleveland in the autumn of 1909 to assist the Assessors in the revaluation of the real estate of that city, he took with him in manuscript form the 100 business corner tables, ten of which are printed in diagrammatic form in the Appendix of this book.

Mr. Somers went to Cleveland on leave of absence from the New York Department of Taxes and Assessments, but he did not return to employment in New York. In Cleveland he found the first opportunity to install his System in a large city, under a sympathetic Board of Assessors, and in a community in which the minds of the taxpayers had been greatly stimulated by the Tax School instituted by Tom Johnson during his mayoralty. This "school" was an unsuccessful attempt by Mr. Johnson to substitute for the valuations of the official Assessors a new set of valuations determined by community meetings. In charge of Peter Witt, who was counselled by Mr. Somers, this "school" was the occasion of wide publicity both in Cleveland and elsewhere. The fact that the courts refused for technical reasons to permit a substitution of the "school" valuations for the inequitable and out-of-date assessments did not lessen the importance of the "school" as an educational institution, and the taxpayers of Cleveland were, upon the return of Mr. Somers in 1910, well informed in the fundamentals of the Somers System.

The Ohio laws at that time called for decennial revaluations of real estate, and in 1909 the City of Cleveland elected five temporary Assessors to the position with only six months' time to revise the assessments of the city, then having half a million population. The Board of Assessors was under the law charged only with the responsibility of reappraising, and was to turn over the valuations when completed to the County Auditor, who thereafter acted as the permanent assessing official. Under Mr. Somers' guidance the city was districted, and the new Assessors soon had hundreds of the taxpayers, in committees in all sections of the city, participating in the work of appraising single-street unit-foot values. Several hundred building measurers, land computers and appraisers were employed, and the immense task was completed on time, with tremendous satisfaction to the community. In the haste that was necessary to completion within six months there were many clerical errors, but these were corrected by the Board of Review, and since that time—from 1910 to 1926—the Somers System methods have been firmly established in Cleveland. Mr. John A. Zangerle, the Chairman of the Board of Assessors in 1910, was two years later elected County Auditor, and has held this office continuously until 1926. As the years have passed, Mr. Zangerle has revised the unit-foot values to keep pace with changing conditions. He has adopted the Somers depth percentage as the "Cleveland" depth percentage, and has developed certain short cuts for corner computation purposes.

Since 1910 the installation of the Somers System has extended to more than seventy cities, under the promotion of The Manufacturers' Appraisal Company. The first important engagement was in Columbus, Ohio, where the first real assessment the city had ever enjoyed was successfully accomplished. Thence the work was extended to various parts of the West and South, and in smaller degree to the Eastern States.

The investigation of the Assessors' valuations in the central business district of Philadelphia, under the auspices of the Philadelphia City Councils, personally supervised by Mr. Somers, is outlined in Chapter XXII. Mr. Somers, while associated with The Manufacturers' Appraisal Company, responded to many invitations to demonstrate the merits of his System. In some of these cities reforms in valuation methods for purposes of taxation were undertaken and permanently installed. In others, the local Assessors, or others in their cities, with the Somers principles as a basis, devised systems of valuations which they put forth as "just as good" as the Somers System. None of these Systems provides for adequate public discussion of unit-foot values and final assessments. The Milwaukee, Buffalo and Baltimore systems differed from the Somers System principally in slight variations in the percentages assigned to the receding depth-points, and in the amounts of enhancement at business corners.

The most important contribution made by Mr. Somers to the science of land site valuation lies in the principle, first enunciated by him, that it is possible by analytical methods to segregate the several elements which affect land values and to give due and proper weight to each element. It is due Mr. Somers' memory to insist that all of the attempts of recent years in the United States at value-analysis of land are the result of his initiative. His depth percentage was determined with a full knowledge on his part of the conditions in many cities, including an intimate familiarity with Chicago, New York, Philadelphia, Baltimore, Cleveland, and other cities. Many years were spent, and thousands of tests were made, before he determined the curve upon which his depth percentage for inside lots was based. In like manner the enhancements at business corners under different relative values of intersecting streets were determined by Mr. Somers only after careful and painstaking investigation.

In Cambridge, Mass., a system was devised by a committee of citizens and members of the Harvard University staff under which the judgment of the Assessors was expressed upon street frontages in terms of price of a square-foot unit-foot. This plan, it was believed, would be more appropriate in Cambridge because it is the custom to appraise sites in Massachusetts on the square-foot unit basis. The square-foot unit-foot is in fact a statement of one one-hundredth of the price of a Somers unit-foot,—100 feet in depth.

The report of the Special Tax Committee for the City of Cambridge, Mass., published in 1920, begins with a summary of the methods of valuation of real estate for tax purposes employed in the cities of New York, Newark and Buffalo. Each one of these cities was said to have developed a unit system of land valuation, together with depth curves and percentages for corner computation. None of them, however, appears to base its corner percentages on an analysis of the mathematical relationship existing between two street unit-foot values, as does the Somers System.

As a result of this investigation the Cambridge Tax Committee made a series of specific recommendations, including:

1. The construction of equalization maps and lot and block maps.
2. The adoption of a standard land unit in terms of which to express land values.
3. The employment of long and short lot rules, both for business districts and for residence districts.
4. A corner influence rule.
5. An alley influence rule.
6. Recommendations for valuing such secondary factors as plottage, topography and the like.

Instead of adopting a frontage unit-foot as its standard, the Cambridge plan adopted the square-foot unit-foot as the unit of land valuation. Nevertheless, the report admits that "it is self-evident that the deeper the lot up to a certain point, the more valuable it is, and it is likewise evident that the value of a lot does not increase proportionately with its depth." The data for the Cambridge depth percentages appear in the form of the following table:

RESIDENTIAL		BUSINESS	
Feet Depth	*Per Cent. of Unit-foot Value*	*Feet Depth*	*Per Cent. of Unit-foot Value*
5	180	5	300
10	166	10	254
15	156	15	224
20	151	20	198
25	146	25	176
30	142	30	164
35	138	35	154
40	134	40	149
45	130	45	144
50	126	50	139
55	123	55	134
60	120	60	129
65	117	65	125
70	114	70	121
75	111	75	117
80	108	80	113
85	106	85	109
90	104	90	106
95	102	95	103
100	100	100	100
105	98	105	97
110	96	110	94
115	94	115	92
120	92	120	90
125	90	125	88
130	88	130	86
135	86	135	84
140	84	140	82
145	82	145	80
150	80	150	78
155	79	155	76
160	78	160	75
165	77	165	74
170	76	170	73
175	75	175	72
180	74	180	71
185	73	185	70
190	72	190	69
195	71	195	68
200	70	200	67
205	69	205	66

RESIDENTIAL		BUSINESS	
Feet Depth	*Per Cent. of Unit-foot Value*	*Feet Depth*	*Per Cent. of Unit-foot Value*
210	68	210	65
215	67	215	64
220	66	220	63
225	65	225	62
230	64	230	61
235	63	235	60
240	62	240	59
250	61	245	58
260	60	250	57
270	59	255	56
280	58	260	55
290	57	265	54
300	56	270	53
310	55	280	52
320	54	290	51
330	53	300	50
340	52	310	49
350	52	320	48
360	51	330	47
370	51	340	46
380	50	350	45
390	50	360	40
400	50	370	43
		380	42
		390	41
		400	40

For comparison the Cambridge depth curves were plotted on the same diagram with the depth curves already in use in other cities as shown in Diagram XLIII, page 187.

The close similarity between these depth curves and the Somers depth curve will be noted. There are in reality only slight and unimportant variations from the Somers depth curve.

The Cambridge plan is faulty in that it places a valuation on a square foot at the street frontage equal to ¹⁄₁₀₀ of the 100-foot depth. For example, in an illustrative appraisal contained in the report a street frontage valuation of $6.00 is recorded as the unit-foot value. Since 100 feet in depth, according to the Cambridge tables, both for business and residential sites, absorbs 100 per cent. of this square-foot unit-foot value, this would give a value of $600 for an area corresponding to the Somers unit-foot. It is sufficiently clear from the analysis in the preceding chapters that the first square foot, adjacent to the street front, contains more than $1/100$ of the unit-foot value. This is admitted in the Cambridge report, and still a unit for valuation is used which is neither the value of the square foot fronting on the street nor an arithmetic mean of the unit-foot. There is, moreover, no explanation contained in the report concerning the manner in which the square-foot unit-foot values are obtained except the statement, "Unit values were placed upon this map by the Assessors after public hearings which were largely attended by members of the Cambridge Real Estate Exchange, various real estate dealers and taxpayers."

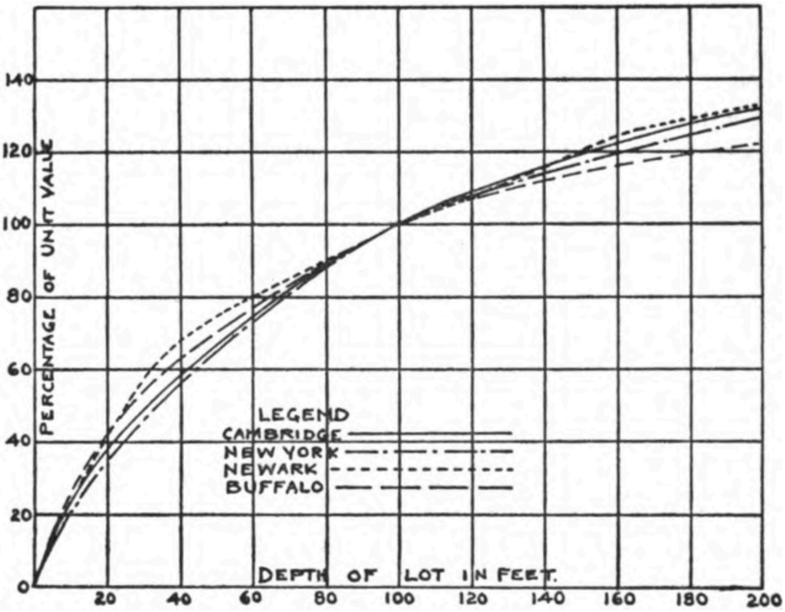


DIAGRAM XLIII

Comparison of Cambridge Depth Curve with Other Depth Curves for Business Districts.

With reference to corner influence, the Cambridge Committee recommends the adoption of a modification of the Lindsey-Bernard method of corner valuation. According to this method, the corner lot is first computed as an inside lot, using the Main Street unit for 100 feet of its depth. The lot is then computed as an inside lot, using the side street unit. Twenty-five to fifty per cent. of the side street value of a lot as figured is taken as the total corner influence, and is added to the value of the lot as figured on the main street. It is apparent that no cognizance was taken of the underlying principles pertaining to corner influence as enunciated by Mr. Somers.

With reference to alley influence, the Cambridge report states that there was not enough data available upon which to base a definite rule, and it was recommended that the Assessors use their judgment in the determination of alley influence.

The foregoing plans reveal interestingly the attempts that have been made to develop systematic land valuation in some of our cities. Their chief weakness seems to be incompleteness. This incompleteness in turn arises from the failure to grasp the significance of some of the basic principles of valuation as well as their practical application.

CHAPTER XXII

COMPARATIVE STUDY OF LAND VALUE-TRENDS IN THE CENTRAL BUSINESS DISTRICT OF PHILADELPHIA BETWEEN 1910 AND 1925

STUDY OF REAL ESTATE ASSESSMENTS IN THE CENTRAL BUSINESS DISTRICT OF PHILADELPHIA IN 1910—REVALUATION OF THE LAND IN THE SAME AREA IN 1925—SOMERS SYSTEM METHODS EMPLOYED IN BOTH INSTANCES—COMPARISON BETWEEN 1910 AND 1925 VALUATIONS—COMPARISONS OF LAND VALUATIONS IN THE CENTRAL BUSINESS DISTRICT OF PHILADELPHIA, 1910 AND 1925, WITH REAL ESTATE ASSESSMENTS—WHAT THE INVESTIGATION REVEALED—CRITICISM OF OTHER METHODS OF DETERMINING CHANGES IN LAND VALUES OVER A PERIOD OF YEARS.

IN 1910 the Philadelphia City Councils investigated the assessments in the central business section of that city, employing The Manufacturers' Appraisal Company to make appraisals of land and buildings in the territory bounded on the east by the Delaware River, on the west by the Schuylkill River, on the north by Vine Street and on the south by South Street—the original town site as laid out by William Penn. Mr. Somers personally assisted in the technical work of applying his system to the valuation of the land.

This investigation was promoted by the desire of Councils to discover specific inequities in valuation and to point out if possible the way to cure inequitable assessment practices throughout the city. The work was halted when nearing completion by a taxpayers' suit brought by real estate speculators and by property owners, who made no effort to prove inaccuracies in the appraisals, but who sought and succeeded in their effort to have the courts declare the Councils without power to spend public funds to investigate the valuations made by the Assessors and the Board of Revision of Taxes.

"The Report of the Joint Special Committee of City Councils to Investigate the Valuation of Taxable Real Estate in the City of Philadelphia," subsequently published, contained partial results accomplished by the investigation. Land and building values in a number of blocks comprising areas in different localities within the district were printed. One of these blocks was that bounded by Chestnut, Broad, Sansom and Fifteenth Streets, in which the results were as follows:

Street and Number	*Lot Size*	*Land Value*	*Building Value*	*Total Appraisal*	*1910 Assessment*
Northwest Cor. Broad to Sansom Sts.	141x120	$1,661,694	$2,255,633	$3,917,327	$3,500,000
1400-08 Chestnut St. .	89x100	1,594,350	781,851	2,376,201	2,000,000
1410 Chestnut St. ...	20x89	237,925	4,671	242,596	200,000
1412-14 Chestnut St. .	54x230	842,454	42,471	884,925	750,000
1416-18 Chestnut St. .	54x230	829,386	6,771	836,157	650,000
1420-22 Chestnut St. .	46x230	687,033	426,574	1,113,607	850,000
1424-26 Chestnut St. .	50x230	742,415	240,577	982,992	700,000
1428-32 Chestnut St. .	72x230	1,542,216	128,785	1,671,001	950,000
Totals		$8,137,473	$3,887,333	$12,024,806	$9,600,000

The Councilmanic Committee disclaimed the thought that this investigation was designed as a legal substitution for assessments under existing laws, and stated that the Committee was actuated solely by the desire to make a proper investigation in a subject of vital importance to the interests of the municipality and for the benefit and welfare of the citizens, to the end that the taxes exacted from the people should be equitably, impartially and justly laid.

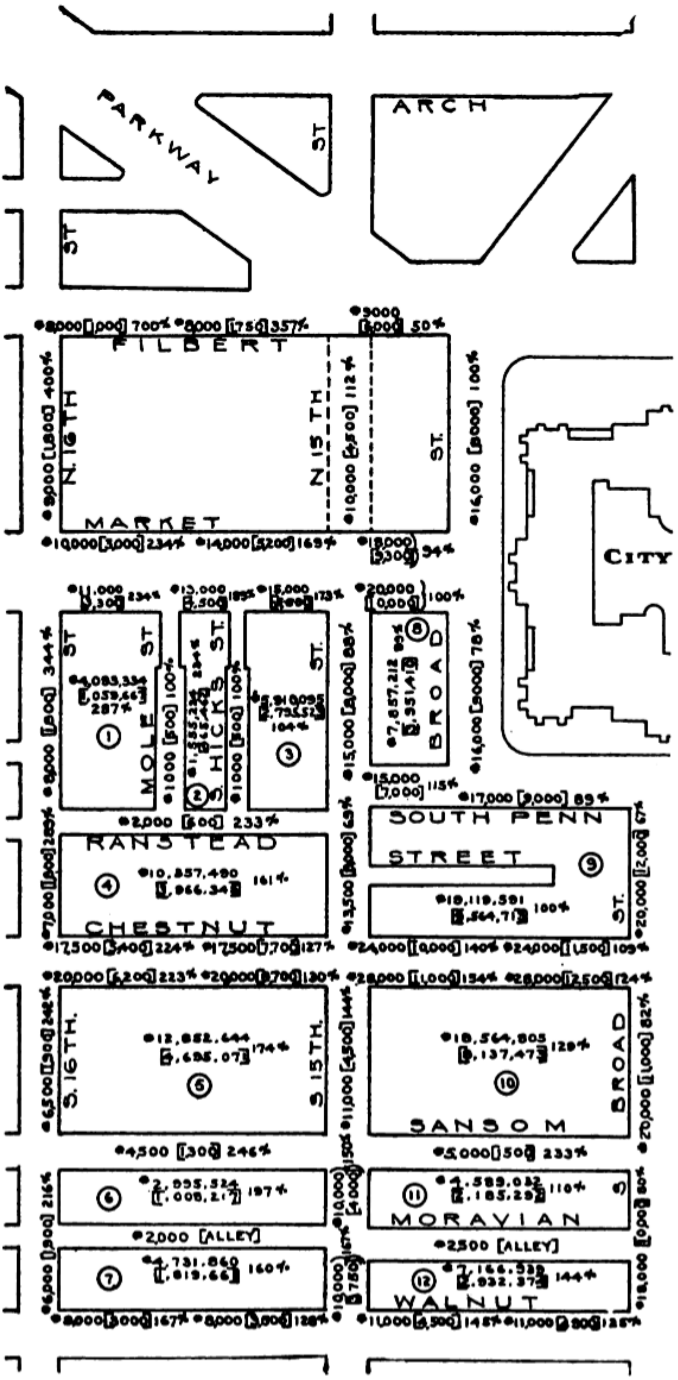
The greater part of the data collected by this 1910 survey has never been published. Part of it is the basis of the 1910 valuations by block totals, printed herewith, of the taxable land in the highest-valued district in the neighborhood of the Philadelphia City Hall, showing the trend of land values from 1910 to 1925.

An analysis of changes in land values in that area over a period of fifteen years is the subject matter of this chapter. The area under consideration is bounded on the north by Arch Street, on the east by Twelfth Street, on the south by Walnut Street and on the west by Sixteenth Street. It includes thirty-four blocks of varying dimensions as indicated in the accompanying map. Only the taxable land in the area described has been considered in this survey. No appraisal has been made of the site occupied by the City Hall, nor of the lands forming the Parkway approach to the center of the city, nor of the land of the Pennsylvania Railroad terminals.

The methods followed in the valuation of the land in both 1910 and 1925 were identical, and were in conformity with the Somers System as described in this book. Unit-foot values in 1910 were determined for each separate street frontage with the advice and assistance of many persons then familiar with land values. Full publicity was given to the valuation processes in that year, and the property owners gave their aid and criticism. The final unit-foot values established in 1910 expressed a consensus of opinion of the comparative and actual values of street locations. The unit-foot appraisals were the basis of computations of the individual land holdings by the Somers System methods, the valuations for each lot being allocated with mathematical precision.

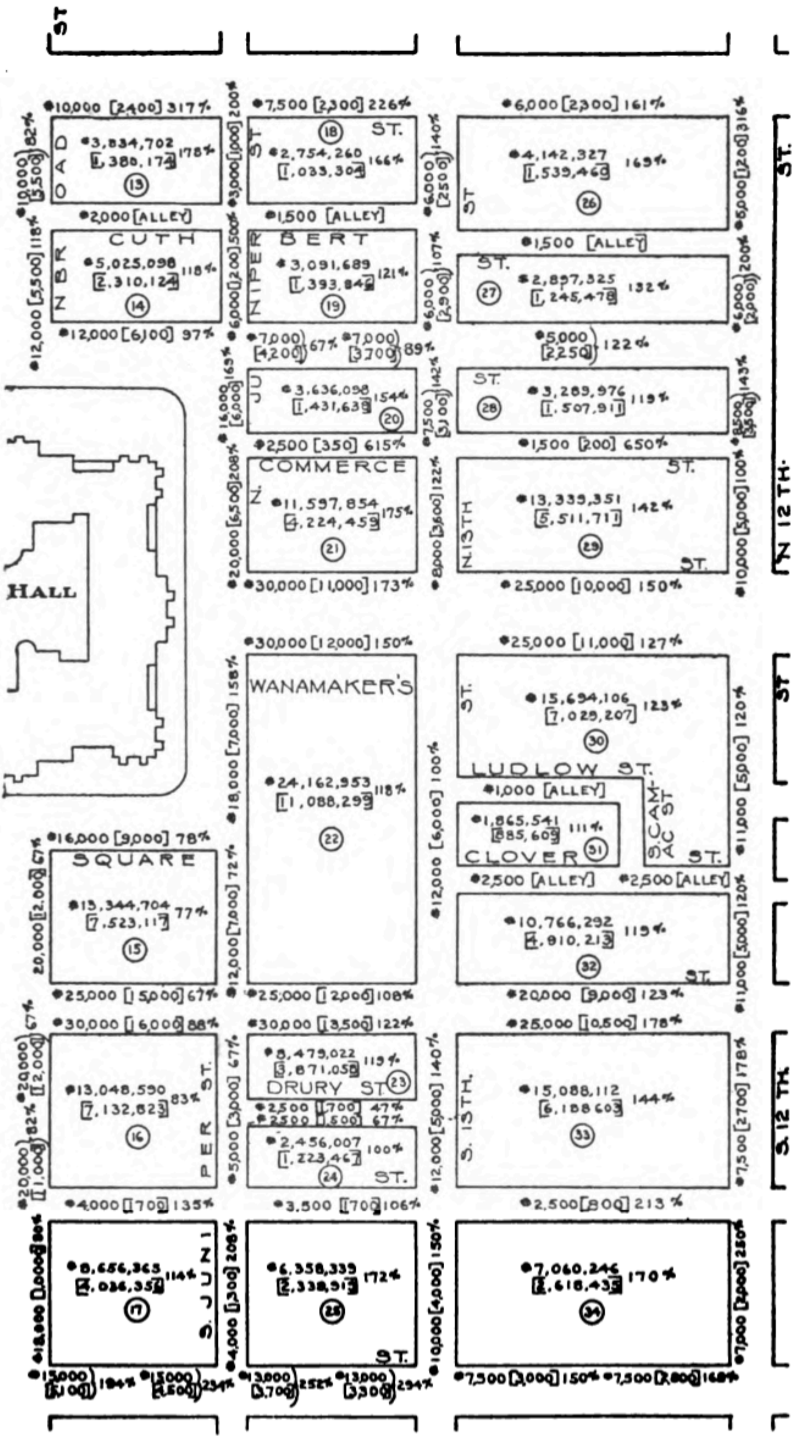
In determining the 1925 valuations for comparative purposes it was deemed expedient to omit the computation of individual sites. The comparisons therefore are in totals for the several blocks, both for 1910 and 1925. The only exception is in cases where an entire block is held as a single ownership. The unit-foot values were appraised in 1925 without public discussion. They would probably have been slightly modified if they had been published and discussed as in 1910. But the changes resulting from such discussions would probably have been unimportant and would have had a limited effect upon the results shown in this tabulation, for the unit-foot values were reviewed carefully by a number of real estate operators.

The investigation of unit-foot values in 1925 was first made by four seniors in the Wharton School of Finance and Commerce of the University of Pennsylvania, who had specialized in courses in real estate. Each student was assigned a particular section of the district and proceeded to interview men familiar with land values. In some instances professional real estate men declared they were unable to express opinions of land values in terms of unit-foot prices. They were unfamiliar with the concept of the unit-foot, and had not cultivated the habit of thinking of land values apart from real estate values. But when asked to give their opinions as to



DIAGRAM

Showing Changes in Land Values in the Central



XLIV

Business District of Philadelphia from 1910 to 1925.

the relative importance of the streets in the central business district they appeared to have more decided opinions. It is interesting to note that when final comparisons were made of the opinions of many real estate men and others familiar with land values in this district, the maximum deviations in opinion on the relative basis were not more than 10 per cent., and in most instances were less than 5 per cent.

The students, after determining the highest-valued frontages and the relative values of other street frontages, again submitted these tentative conclusions to those familiar with real estate values, as well as to those who had previously expressed their opinions. After thorough review, discussion and criticism final relative values were decided upon. The 100 per cent. or highest-valued frontage was determined to be worth $30,000 per unit-foot. The adoption of $30,000 as the 100 per cent. unit-foot value made it possible to compute lesser unit-foot values, and these unit-foot values in dollars were again submitted for consideration, criticism, modification and final agreement. The unit-foot values thus adopted were then employed to compute the block values, using the same methods of computation as were employed in 1910. The double-page diagram, No. XLIV, pages 192 and 193, shows the 1910 and 1925 unit-foot values and the computed values for each block for both years. It will be noted that in 1925 there were four unit-foot valuations of $30,000, the highest unit-foot price for street frontages. These 100 per cent. locations are: Both sides of Market Street between Thirteenth and Juniper Streets; the south side of Chestnut Street between Thirteenth and Juniper; and the south side of Chestnut Street between Juniper and Broad Streets. The last-named frontage was the 100 per cent. location in 1910 with a unit-foot value of $16,000.

The fact that additional frontages are now of equal value with the highest-valued frontage of 1910 would seem to indicate that with the increasing population of Philadelphia sites are used not merely more intensively, but also more extensively, as a result of which land contiguous to the former highest-valued land has now reached a 100 per cent. valuation.

Comparisons of street unit-foot valuations for 1910 and 1925, with percentages of increase, are as follows:

EAST AND WEST STREETS

	1925 Appraisal		*1910 Appraisal*		*Per Cent. Increase*	
	North Side	*South Side*	*North Side*	*South Side*	*North Side*	*South Side*
Arch Street						
12th to 13th	....	$6,000	....	$2,300	....	161
13th to Juniper	....	7,500	....	2,300	....	226
Juniper to Broad	....	10,000	....	2,300	....	335
Cuthbert Street						
12th to 13th	$1,500	$1,500	Alley Value		Nominal	
13th to Juniper	1,500	1,500	"	"	"	
Juniper to Broad	2,000	2,000	"	"	"	
Filbert Street						
12th to 13th	$5,000	$5,000	$2,250	$2,250	122	122
13th to Juniper	7,000	7,000	$3,700–4,200	3,700–4,200	89–67	89–67
Juniper to Broad	12,000	....	6,100	....	97	....
Broad to 15th	....	9,000	....	6,000	....	50
15th to 16th	....	8,000	....	1,750–1,000	....	357–700
Commerce Street						
12th to 13th	$1,500	$1,500	$200	$200	650	650
13th to Juniper	2,500	2,500	350	350	615	615
Market Street						
12th to 13th	$25,000	$25,000	$10,000	$11,000	150	127
13th to Juniper	30,000	30,000	11,000	12,000	173	150
Broad to 15th	18,000	20,000	9,300	10,000	94	100
15th to 16th	14,000–10,000	15,000–11,000	$5,200-3,000	5,500–3,300	169–234	173–234
Ludlow Street						
Camac to 13th	$1,000	$1,000	Alley Value		Nominal	

EAST AND WEST STREETS (*Continued*)

	1925 Appraisal		*1910 Appraisal*		*Per Cent. Increase*	
	North Side	*South Side*	*North Side*	*South Side*	*North Side*	*South Side*
Clover Street						
12th to Camac	$2,500	$2,500	Alley Value		Nominal	
Camac to 13th	2,500	2,500	“	“	“	
South Penn Square						
Juniper to South Broad	....	$16,000	....	$9,000	....	78
South Broad to Broad	....	17,000	....	9,000	....	89
Broad to 15th	15,000	15,000	$7,000	7,000	115	115
Ranstead Street						
15th to 16th	$2,000	$2,000	$600	$600	233	233
Chestnut Street						
12th to 13th	$20,000	$25,000	$9,000	$10,500	123	138
13th to Juniper	25,000	30,000	12,000	13,500	108	122
Juniper to Broad	25,000	30,000	15,000	16,000	67	88
Broad to 15th	24,000	28,000	$11,500–10,000	12,500–11,000	109–140	124–154
15th to 16th	17,500	20,000	7,700–5,400	8,700–6,200	127–224	130–223
Drury Street						
13th to Juniper	$2,500	$2,500	$1,700	$1,500	47	67
Moravian Street						
Broad to 15th	$2,500	$2,500	Alley Value		Nominal	
15th to 16th	2,000	2,000	“	“	“	
Walnut Street						
12th to 13th	$7,500	....	$2,800–3,700	....	168–103	....
13th to Juniper	13,000	....	3,300–5,100	....	194–155	....
Juniper to Broad	15,000	....	4,500–4,500	....	233–233	....
Broad to 15th	11,000	....	4,900–3,000	....	125–267	....
15th to 16th	8,000	....	3,500–3,000	....	129–167	....

NORTH AND SOUTH STREETS

	1925 Appraisal		*1910 Appraisal*		*Per Cent. Increase*	
	East Side	*West Side*	*East Side*	*West Side*	*East Side*	*West Side*
Twelfth Street						
Walnut to Sansom	$7,000	....	$2,000	....	250	...
Sansom to Chestnut	7,500	....	2,700	....	178	...
Chestnut to Clover	11,000	....	5,000	....	120	...
Clover to Market	11,000	....	5,000	....	120	...
Market to Commerce	10,000	....	5,000	....	100	...
Commerce to Filbert	8,500	....	3,500	....	143	...
Filbert to Cuthbert	6,000	....	2,000	....	200	...
Cuthbert to Arch	5,000	....	1,200	....	316	...
Thirteenth Street						
Walnut to Sansom	$10,000	$10,000	$4,000	$4,000	150	150
Sansom to Drury	12,000	12,000	5,000	5,000	140	140
Drury to Chestnut	12,000	12,000	5,000	5,000	140	140
Chestnut to Clover	12,000	12,000	6,000	6,000	100	100
Clover to Ludlow	12,000	12,000	6,000	6,000	100	100
Ludlow to Market	12,000	12,000	6,000	6,000	100	100
Market to Commerce	8,000	8,000	3,600	3,600	122	122
Commerce to Filbert	7,500	7,500	3,100	3,100	142	142
Filbert to Cuthbert	6,000	6,000	2,900	2,900	107	107
Cuthbert to Arch	6,000	6,000	2,100	2,100	186	186
Juniper Street						
Walnut to Sansom	$4,000	$4,000	$1,300	$1,300	208	208
Sansom to Drury	5,000	5,000	3,000	3,000	67	67
Drury to Chestnut	5,000	5,000	3,000	3,000	67	67
Chestnut to South Penn Square	12,000	12,000	7,000	7,000	72	72
South Penn Square to Market	....	18,000	....	7,000	...	158

NORTH AND SOUTH STREETS (*Continued*)

	1925 Appraisal		*1910 Appraisal*		*Per Cent. Increase*	
	East Side	*West Side*	*East Side*	*West Side*	*East Side*	*West Side*
Market to Commerce	....	20,000	....	6,500	...	208
Commerce to Filbert	....	16,000	....	6,000	...	169
Filbert to Cuthbert	6,000	6,000	1,200	1,200	500	500
Cuthbert to Arch	3,000	3,000	1,000	1,000	200	200
Broad Street						
Walnut to Moravian	$18,000	$18,000	$10,000	$10,000	80	80
Moravian to Sansom	18,000	18,000	10,000	10,000	80	80
Sansom to Chestnut	20,000	20,000	11,000	11,000–12,000	82	82–67
Chestnut to South Penn Square	20,000	20,000	12,000	12,000	67	67
South Penn Square to Market	16,000	....	9,000	....	78	...
Market to Filbert	16,000	....	8,000	....	100	...
Filbert to Cuthbert	....	12,000	....	5,500	...	118
Cuthbert to Arch	....	10,000	....	5,500	...	82
Fifteenth Street						
Walnut to Moravian	$10,000	$10,000	$3,750	$3,750	167	167
Moravian to Sansom	10,000	10,000	4,000	4,000	150	150
Sansom to Chestnut	11,000	11,000	4,500	4,500	144	144
Chestnut to Ranstead	13,500	....	8,000	....	69	...
Chestnut to South Penn Square	....	13,500	....	8,000	...	69
Ranstead to Market	15,000	....	8,000	....	88	...
South Penn Square to Market	....	15,000	....	8,000	...	88
Market to Filbert	10,000	10,000	4,500	4,500	112	112
Sixteenth Street						
Walnut to Moravian	....	$6,000	....	$1,900	...	216
Moravian to Sansom	....	6,000	....	1,900	...	216

NORTH AND SOUTH STREETS (*Continued*)

	1925 Appraisal		*1910 Appraisal*		*Per Cent. Increase*	
	East Side	*West Side*	*East Side*	*West Side*	*East Side*	*West Side*
Sansom to Chestnut	....	6,500	....	1,900	...	242
Chestnut to Ranstead	....	7,000	....	1,800	...	289
Ranstead to Market	....	8,000	....	1,800	...	344
Market to Filbert	....	9,000	....	1,800	...	400
Mole Street						
Ranstead to Market	$1,000	$1,000	$500	$500	100	100
Hicks Street						
Ranstead to Market	$1,000	$1,000	$500	$500	100	100

ANALYSIS OF THE INCREASE OF LAND VALUES FROM 1910 TO 1925 IN THE CENTRAL BUSINESS DISTRICT OF PHILADELPHIA

		1910		*1925*					
Streets Bounding Blocks	*Block Number*	*Somers Land Values*	*Assessments, Land and Buildings*	*Assessments, Land and Buildings*	*Somers Land Values*	*Per Cent. Increase in Land Values, 1910-1925*	*Per Cent. Increase in Assessments, 1910-1925*	*Per Cent. of Assessments to Land Values, 1910*	*Per Cent. of Assessments to Land Values, 1925*
Market Ranstead 16th Mole...	1	$1,059,667	$844,900	$2,059,000	$4,095,334	287	142	80	50
Market Ranstead Mole Hicks...	2	465,462	346,200	830,000	1,555,224	234	140	74	53
Market Ranstead Hicks 15th...	3	2,795,523	1,970,800	4,005,000	5,910,095	104	103	71	86
Ranstead Chestnut 16th 15th..	4	3,966,345	3,670,000	7,930,000	10,357,490	161	116	93	77
Chestnut Sansom 16th 15th...	5	4,695,071	4,019,000	10,287,000	12,852,644	174	156	86	80
Sansom Moravian 16th 15th..	6	1,008,217	783,000	1,767,000	2,995,524	197	126	78	38
Moravian Walnut 16th 15th..	7	1,819,661	1,510,000	3,560,000	4,731,860	160	136	83	75
Market S. Penn Sq. 15th Broad	8	3,951,410	2,815,000	5,550,000	7,857,212	99	97	71	71
S. Penn Sq. Chestnut 15th Broad	9	9,564,713	7,922,000	16,820,000	19,119,591	100	112	83	88
Chestnut Sansom 15th Broad...	10	8,137,473	9,600,000	18,920,000	18,564,805	128	97	118	102
Sansom Moravian 15th Broad..	11	2,185,292	2,000,000	3,350,000	4,589,032	110	68	92	73
Moravian Walnut 15th Broad..	12	2,932,374	2,316,000	6,920,000	7,166,939	144	199	79	97
Arch Cuthbert Broad Juniper....	13	1,380,174	1,015,000	2,700,000	3,834,702	178	166	73	70
Cuthbert Filbert Broad N. Penn Sq... S. Penn Sq. Chestnut	14	2,310,124	2,000,000	1,800,000	5,025,098	118	10	87	36

Broad Juniper	15	7,523,117	5,050,000	11,500,000	13,344,704	77	128	67	86
Chestnut Sansom Broad Juniper..	16	7,132,823	7,075,000	7,980,000	13,048,590	83	13	99	61
Sansom Walnut Broad Juniper...	17	4,036,356	3,260,000	5,150,000	8,656,365	114	58	81	60
Arch Cuthbert Juniper 13th.....	18	1,033,304	910,000	1,715,000	2,754,260	166	89	99	62
Cuthbert Filbert Juniper 13th....	19	1,393,846	1,312,000	2,520,500	3,091,689	121	92	94	82
Filbert Commerce Juniper 13th..	20	1,431,638	1,217,000	1,920,000	3,636,098	154	58	85	53
Commerce Market Juniper 13th..	21	4,224,459	3,855,000	5,730,000	11,597,854	175	49	91	49
Market Chestnut Juniper 13th...	22	11,088,299	9,250,000	18,000,000	24,162,953	118	95	84	75
Chestnut Drury Juniper 13th....	23	3,871,058	2,730,000	5,960,000	8,479,022	119	118	71	70
Drury Sansom Juniper 13th.....	24	1,223,467	851,500	989,000	2,456,007	100	16	70	40
Sansom Walnut Juniper 13th....	25	2,338,919	1,661,000	5,085,000	6,358,339	172	206	71	80
Arch Cuthbert 13th 12th......	26	1,539,460	1,634,000	2,625,000	4,142,327	169	61	106	63
Cuthbert Filbert 13th 12th....	27	1,245,478	1,388,500	1,980,500	2,897,325	132	43	111	68
Filbert Commerce 13th 12th...	28	1,507,911	920,500	1,848,000	3,289,976	119	101	61	56
Commerce Market 13th 12th..	29	5,511,711	4,700,000	7,580,000	13,339,351	142	61	85	57
Market Ludlow 13th 12th.....	30	7,029,207	6,010,000	8,843,000	15,694,106	123	47	86	56
Ludlow Clover 13th Camac.....	31	885,609	610,000	775,000	1,865,541	111	27	69	42
Clover Chestnut 13th 12th....	32	4,910,213	4,070,000	8,520,000	10,766,292	119	109	83	79
Chestnut Sansom 13th 12th...	33	6,188,603	4,534,000	7,655,000	15,088,112	144	69	73	51
Sansom Walnut 13th 12th....	34	2,618,435	2,363,000	4,260,000	7,060,246	170	80	90	60
Totals		$123,005,419	$104,213,400	$197,134,000	$280,384,707	127	89	85	71

An analysis of these unit-foot values reveals the fact that in general the relative importance of side or intersecting streets has increased in relationship to the main streets. This is particularly noticeable on Sixteenth Street, where unit-foot values increased as high as 400 per cent. from 1910 to 1925. The maximum increase in unit-foot values on Broad Street, on the other hand, is only 118 per cent. and the average increase for land values fronting on Broad Street between Arch and Walnut Streets is only about 80 per cent.

The increasing importance of intersecting streets in the central business district of the city reflects the more intensive utilization of land and the growing importance of accessibility from different angles with increasing intensity of utilization. When land is less intensively used, intersecting streets will tend to be relatively unimportant in relation to main streets, but with increasing population and improved methods of transportation, the intersecting streets become increasingly important. Such main thoroughfares as Market Street, Chestnut Street and Broad Street in no case show an increase in unit-foot values exceeding 250 per cent. On the other hand, one of the intersecting or side streets shows an increase in unit-foot value as high as 700 per cent. It will be noted in an examination of the preceding tables that in the majority of cases the intersecting or side streets show a relatively greater increase in unit-foot values than the main streets for the period of 1910 to 1925.

The double-page chart, pages 200 and 201, gives the land values in 1910 and 1925 for individual blocks, based on the unit-foot values. It also shows the total assessment of real estate, land and buildings, in each block for 1910 and 1925, and the percentual relationship as indicated in the table.

It will be seen that the total increase in land valuation in 1925 as compared with 1910, in the thirty-four blocks was 127 per cent., but the increases in values of land in individual blocks range from 77 per cent. to 287 per cent. The Assessors' valuations of both land and buildings (there is no separation of land and building assessments in the City of Philadelphia) for the area under consideration totalled $104,213,400 in 1910, or 89 per cent. of the valuation of the land without buildings as computed that year by Somers System methods. In 1925, on the other hand, the total Assessors' valuation of land and of buildings amounted to

$197,134,000, or 71 per cent. of the Somers System 1925 appraisal of land alone. Taxable land values in the district under consideration have increased 127 per cent., while assessments have increased only 89 per cent. from 1910 to 1925.

Whereas in 1910 there were three blocks in which land values were greater than the valuations fixed by the Assessors, in 1925 there was only one such block. On the other hand, the divergence in the ratio of land values to assessments in individual blocks in 1925 is far greater than in 1910, ranging from 36 to 102 per cent. This analysis indicates that central real estate in Philadelphia (including both land and buildings) is assessed in 1925 in the aggregate at about 70 per cent. of the actual fair value of the land, regardless of existing buildings. The so-called real estate tax thus appears to fall on land values alone in this area. Assessments might even be raised 30 per cent. without actually involving a levy on improvements on land.

In the chart on pages 200-201 the blocks are numbered consecutively, their location being indicated on the map on pages 192-193. In Block 14 it will be noticed that although the land value has increased 110 per cent. from 1910 to 1925, the assessment in 1925 was actually 10 per cent. less than the assessment in 1910. Are we to conclude that since the assessment of a site to-day is less than it was in 1910, the depreciation of the buildings on the site has been greater than the increase in the value of the land? It is doubtful whether any one would accept such a conclusion. In actuality this is but another instance of the lack of sound methods of assessment.

The fact that land valuations in the central business district of Philadelphia have risen 127 per cent. from 1910 to 1925, while assessments have increased but 89 per cent., furnishes ample evidence of under-valuation of real estate for tax purposes. It does not appear that the computed land values contained in this study are excessive for 1925, but rather conservative. This may be shown by a somewhat questionable but often made comparison. Experts recently testified in condemnation proceedings that land in sites opposite the City Hall to the northeast was worth $250 per square foot. The Wanamaker store site (Block No. 22) is commonly regarded as more valuable than land in that district. According to the computation of land values made by Somers System methods a value of only $210 per square foot is ascribed to the land occupied by the Wanamaker store. This would seem to indicate that the computed land values are conservative rather than excessive, and if allowances were made for speculative factors and for possible exaggerated statements of real estate men in their partisan evidence, the computed land values would actually be higher.

There have apparently been relatively larger increases in land values in the direction of Market and Sixteenth Streets than along Walnut Street between Twelfth and Thirteenth Streets. Because of the many counteracting influences operating in this district, changes in relative land values in different locations may develop rapidly and modify any general observations concerning actual trends. The district under consideration, furthermore, is so small that the results here shown are not necessarily indicative of trends in land values from 1910 to 1925 in different locations. If Somers System methods were continuously applied to Philadelphia or any other entire city, it would be possible to measure from time to time not only changes in the value of specific sites, but also comparative changes of land values in different locations. A decided step forward in the science of land valuation will have been taken when uniform methods of analysis and of reporting land valuations, as here illustrated, are employed. Only in this way will it be possible to secure accurate data for measuring changes in land values.

The foregoing data on changes in land values in the central business district of Philadelphia from 1910 to 1925 have not been corrected to allow for the changes in the value of money during the period in question. Any such corrections would not alter the general conclusions drawn as to inequitable real estate assessments prevailing in the central business district of Philadelphia.

Numerous studies have been made in the past which attempt to show temporal and geographic trends in city land values, based on changes in selling prices of real estate, on mortgage considerations, on capitalized incomes or on other inadequate evidences.

Announcement was recently made by the Institute for Research in Land Economics of the University of Wisconsin of a statistical study of land value trends in thirty-seven

Wisconsin cities over a period of twenty-one years, from 1902 to 1922. According to this announcement the evidence which is to be employed in the investigation is to be in the nature of an index number of the estimated true land values. This index number is to be obtained by correcting the assessed values of the land by means of the selling prices of all land sales reported to the Wisconsin Tax Commission for each city for every year. By dividing the assessed values into the selling values, the ratio of assessed to selling value is obtained, which ratio is to be used to determine the estimated true value of all the land in a particular city, by applying it to the total assessed valuation of the land as of a particular year.

It is evident that the results of such an investigation will be incomplete and unsatisfactory, because of the attempt to measure values with irregular and unscientific tools. To be sound evidence of true value, this index number should be based on uniform standardized assessments on the one hand, and on the sales of land under competitive conditions, with the exact selling price given at all times, on the other hand. Such ideal data, unfortunately, are not available either in Wisconsin, where sales prices are given special consideration in judging valuation for tax purposes, or in other States.

The proposed study by the Institute of Land Economics, and other similar studies, are open to the criticism that the facts on which the conclusions are based are not comparable, and consequently the margin of error is so great as to destroy the validity of the conclusions. When, however, the same methods of approach and the same standardized means of analysis based on sound underlying principles are employed, it is obvious that comparisons thus made attain a degree of validity and correctness hitherto not attained by the other methods of comparing trends in land values.

CHAPTER XXIII

SCIENTIFIC APPRAISAL OF LAND FOR PURPOSE OF CONDEMNATION

CUSTOMARY METHODS OF PROCEDURE IN DETERMINING LAND VALUES FOR CONDEMNATION PURPOSES—CRITICAL REVIEW OF THESE METHODS—USE OF SOMERS SYSTEM METHODS FOR REAL ESTATE APPRAISAL IN CLEVELAND IN 1913—SUMMARY OF REPORT OF APPRAISERS—POWER OF EXCESS CONDEMNATION TO EXTEND OR WIDEN STREETS—IMPORTANCE OF CAREFUL ANALYSIS OF LAND VALUES IN THIS CONNECTION—ILLUSTRATED WITH REFERENCE TO LAND AT THE CORNER OF FIFTEENTH AND CHESTNUT STREETS, PHILADELPHIA—RESULTS OF SOMERS SYSTEM APPRAISAL ANALYZED—THE TAXPAYERS' SUIT IN CHICAGO—REASONABLE FEES FOR APPRAISAL SERVICES.

PRACTICES relating to the appraisal of land for public purposes, and the character of testimony required for condemnation of land, are open to the same comment that has been made concerning the statutes and appraisal methods for determining real estate assessments for taxation. The settled legal rule as to the measure of damages is the difference in "market value" of the whole property immediately before, and immediately after the taking of land, to be used for widening a street or highway, for projecting a new street or highway through a district which was previously without community accessibility, or to be appropriated for any other public purpose. But the usual methods of determining market valuation are indefinite because they are not based on analysis, and because greater stress is laid upon the formality of establishing the qualifications of the experts than upon the accuracy of their evidence. If a supposed expert can prove that he is familiar with the property appraised, and that he has bought and sold property in the vicinity, his evidence should be received, but not accepted as a matter of course because of such particular experience. If this evidence is in the form of an opinion expressed in lump-valuation, the validity of such an opinion should be tested by a requirement that the expert should state the separate amount due to each value-element or factor comprised in the property under appraisal.

Determination of value in condemnation cases under prevailing practice is regarded as a judicial prerogative; but the partisanship of appraisers for either plaintiff or defendant often gives to presiding judicial officers and juries information that is unreliable and unacceptable. If the initial appraisal should be made in advance of the trial under judicial direction and authority, without prejudice to either party, and if the partisan appraisers should then give their testimony with knowledge and after examination of the appraisal made for the court, the divergence of opinion in condemnation cases would not be so wide. Especially would this be true if the appraisers for the court should be required to analyze their valuations by systematic methods, expressing judgment for street frontages on the unit-foot basis, with uniform computation methods for the effects of the normal factors of frontages, depth, alley, corner and other enhancing influences, and separate statement of the value-effect of each abnormal factor in enhancing or reducing values.

Many professional appraisers of land for condemnation declare that expert opinion based upon experience as real estate brokers is the only form in which condemnation evidence should be presented, and that, while they are accustomed to the consideration of all factors comprising the value of every lot or parcel of land appraised, it is impossible to state the value-effect of these factors separately. This viewpoint tends to becloud rather than clarify the practice of land valuation. There is nothing mysterious about the science of land appraisal. It may at first be difficult for appraisers to segregate the elements of opinion and computation as to their effect upon normal valuation, and to recognize and separately judge the effect of abnormal factors. Lump-sum opinions, no matter by whom expressed, may and should be tried out in the crucible of analysis; and until such practice shall receive general recognition in the courts, reform of the existing cumbersome procedure will be delayed.

The fact of his employment makes each expert appraiser a partisan. "Do you want a 'high' or a 'low' valuation?" is the first question usually propounded to a client by the expert. If the client's interest favors a "high" appraisal, the expert is expected to express a "high" opinion, and if the client requires a "low" appraisal, he will ignore the effect of certain enhancing elements; and the combination of opinion and computation in one judgment makes it possible to offer testimony in forms that may cover inaccuracies that would be readily discernible upon analysis. The unreliability of the evidence given in condemnation hearings in courts is comparable with that of expert medical testimony, in which the employment of experts as "friends of the court" to give unbiased evidence has recently been suggested. Non-partisan evidence by expert land appraisers, if systematically expressed, would lessen the cost of court trials, save the time of judges and juries, and should furnish a fair starting point for settlement of all questions affecting land damages brought before a court.

In some States any person who has knowledge of the location of the land, its area, quality and productiveness, the extent and condition of the improvements, or the manner in which streets or highways pass through or in the neighborhood of the premises, and of the value of the other land in the neighborhood at or about the time of the appropriation of the land, can be qualified as a legal witness, whether he has bought and sold real estate or not. In other States experience in buying and selling property is insisted upon as a qualification for an expert witness as to the value of land. The courts should not be limited to either expert or non-expert witnesses, but should be open to receive all testimony bearing upon the subject of value. Representatives of appraisal organizations in the practice of their profession have acquired expert knowledge of land-value trends in many cities, and their appraisals of land have been accepted in commercial appraisals for many purposes other than condemnation; yet it would be difficult to induce a New England court to listen to testimony in a land condemnation suit from an appraisal engineer, no matter how wide his experience in many cities might have been, whose home might happen to be in Chicago or St. Louis.

However, it is possible for a trained investigator to go into any American city and quickly ascertain the fair value of any land site. Such an investigator would rely principally upon the collection of opinions of persons locally familiar with the use and usefulness of land in each community, based upon sales, asking and bid prices. Asking and sales prices would be given proper consideration, and the nature of the interest in land values of the members of the community whose opinions were obtained would be considered. The opinion of the man with land to sell, whether expressed as to the valuation of a lot or parcel of land in lump-price form or on the unit-foot basis, will naturally be above the normal price, while the opinion of the banker or other money-lender upon real estate mortgage will be below normal price, and the opinions of persons who are actually using land will usually be somewhere between the two extremes.

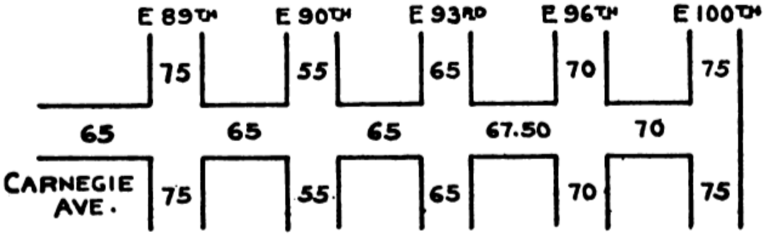


DIAGRAM XLV

Illustrating the Relation of the Values of the New Street to the Values of the Cross Streets and the Eastern End of Carnegie Avenue.

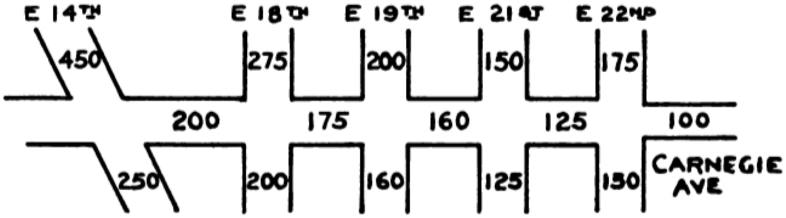


DIAGRAM XLVI

Illustrating the Relation of the Values of the New Street to the New Values Established for the Cross Streets.

An excellent illustration of the use of Somers System methods for the appraisal of land and buildings required for the extension of a city street was presented in a preliminary study made for the City of Cleveland, Ohio, in 1913. (See Diagrams XLV and XLVI, above.) Carnegie Avenue, paralleling Euclid Avenue, started from its western terminus at East Twenty-second Street and extended eastward as far as East Eighty-ninth Street. This avenue accommodated local traffic between its termini, but could not be used advantageously for through traffic. Under the Ohio constitutional excess condemnation power the city could take over more land than was actually required for the street, and could in fact appropriate all the enhancement in valuation of land due to the street opening.

The appraisal covered an 80-foot strip running in a straight line easterly from the Eighty-ninth Street terminus of Carnegie Avenue through the four blocks intervening between Eighty-ninth and One Hundredth Streets, intersecting Ninetieth, Ninety-third and Ninety-sixth Streets; also an 80-foot strip from Twenty-second to Fourteenth Streets, intersecting Twenty-first, Nineteenth and Eighteenth Streets. The report undertook to show:

1. The contiguous and neighboring areas of land affected as to value of the proposed improvement, together with an appraisal of each lot or parcel within the affected areas and the improvements thereon, upon the basis of existing usefulness before the improvement.
2. An appraisal of each lot or parcel actually taken for the proposed street, together with an appraisal of the improvements thereon.
3. An appraisal of the land within the affected areas not actually used for the street, upon the basis of the proposed street having been opened with all the necessary pavements, sewers, sidewalks, etc., necessary for a complete street.
4. An estimate of the loss in the value of the improvements upon the areas not actually used for street purposes, by reason of the new arrangement of the lot lines made necessary by the opening of the proposed street.

The basis of the land valuation was:

1. The relation of the values of the various streets, obtained largely from the property owners themselves.
2. The widest opinion of street and lot values that could be obtained.
3. Expert real estate opinion.
4. Criticism from property owners during the time the actual lot computations and valuations were made, and afterwards.

The report of valuations of buildings and other improvements upon the land was based upon:

1. An accurate inventory of each improvement, in detail as to all structures, such as residences, warehouses, etc.

2. An estimate of the cost of new reproduction of each structure, first upon a square foot basis, and then in terms of total price.

3. An estimate of the depreciation for mechanical deterioration, age, obsolescence, or other causes, in terms of percentage and price for each structure and improvement.

Before any valuations were determined the owners of the properties were invited to meetings at which there was opportunity for full discussion of the values of land properties to be taken for the street, and of land, the value of which it was believed would be affected by the street opening. More than one hundred persons attended these meetings. They were invited to make comparisons of the streets one with another, and the various parts of each street with other parts of the same street, and with parts of the other streets. Every possible viewpoint was gone into and the freest discussion was invited and participated in.

The property owners were told that their opinions of street values, relative values, specific lot values, or any information or opinions concerning the property values on the streets involved would be welcomed and considered. It was not promised that the opinions of land valuation expressed by those whose property was likely to be taken would be accepted as final, and as a matter of fact the final judgment of land values showed some of the lot values from 20 to 25 per cent. lower than the opinions expressed by the lot owners in the public meetings. There were many expressions made to the appraisers after the lot valuations were tentatively announced to the effect that the appraisals of their lots were about right; while many other owners whose property was finally found not to be involved, and from whose minds any prejudice so far as they were concerned was therefore removed, reached the same conclusion. The lot values were appraised somewhat lower than the property owners' publicly made appraisal.

The important contribution that the property owners made to the appraisal was the relation that they practically agreed upon between the streets involved. The relative values of streets as agreed upon at the property owners' meetings were closely followed in the final valuations. The values of streets were all expressed as of a Somers unit-foot, one foot frontage, 100 feet deep. The Somers System formulæ, by which the assessment of Cleveland land was made in the previous year, was used for all lot computations.

In addition to the public meetings of property owners the best expert real estate advice was obtained for the purpose of combining information of the real estate market with the opinions obtained from the property owners. Not only was this done, but the valuations and calculations as they were being made were subject to inspection at all times, and many of the property owners called upon the appraisers to inspect the computations of their own and their neighbors' properties. Probably no section of a city had ever been subjected to a more careful examination as to lot and street values for any purpose, than the territory involved in this improvement. Every possible opportunity was given for the exchange, expression and criticism of opinions that would assist in a fair and equitable valuation, and without exception the property owners—at least all who could be reached by post-office notices and by advice in the newspapers—responded and cheerfully contributed their knowledge to the solution of all the valuation problems involved.

The estimate of the value of the new street effect was based upon the probable effect of the extension of Carnegie Avenue upon the remaining cross streets, and an attempt to compare the new street frontages with the estimate of that effect. It was decided that the opening from East Eighty-ninth to East One Hundredth Street would not increase the usefulness of the four cross streets as such. It was also decided that the opening of the new street would not decrease the usefulness of these cross streets. This, therefore, would leave the values of each of the streets exactly as before, the only enhancement by reason of the street opening arising from accessibility to new frontage, and from new corner effects.

The value of the land taken, with the improvements thereon, in the eastern or residential section, including whole or partial lots and the buildings thereon, was $171,135, of which $50,668 was land and $120,467 improvements. In the western section the total value was $298,820, of which $106,532 was for land and $192,288 for improvements. In the eastern section there was a land-value enhancement amounting to $126,989, and in the western section the enhancement was $437,609. In the eastern section the value of property destroyed ($171,135) and the damage due to "land distortion"

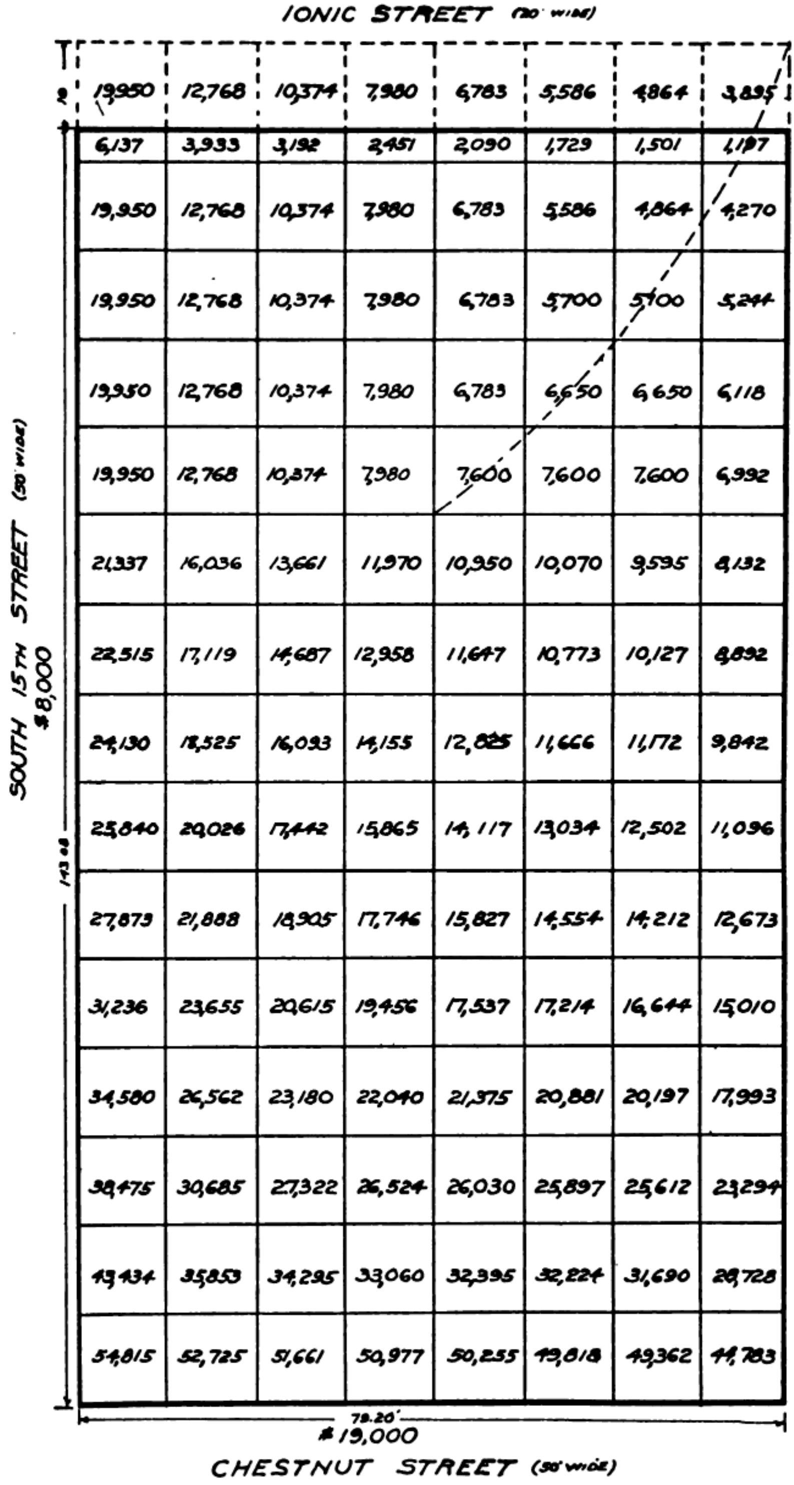
($33,775), or a total of $204,910, exceeded the land value enhancement ($126,989) by $77,921. To this loss there would be added the cost of building the street, selling real estate, and other expenses. In the western section the larger increase in land values gave a net gain of $90,044. In that section the land-value enhancement of $437,609 was only partially offset by the value of the property destroyed ($298,820), and "land distortion" damage of $48,745, the total loss being $347,565, which when subtracted from the land-value enhancement gave the net gain of $90,044.

The item of "land distortion" was made up of the damage to houses because after the projection of the new street, the houses were so located with reference to the remaining portions of lots that they no longer had proper access to streets, the remaining lots being of impracticable sizes and shapes for the proper use of the buildings remaining upon them.

There are many places in the larger cities of the United States where the intersection of long blocks with new streets or the extension of dead-end streets would relieve congested traffic, and at the same time increase the availability and the value of land. It is not difficult to test the question whether a street projection or extension would increase land value, or to determine the amount of such increase. New York City with its long and narrow east-and-west blocks and comparatively few north-and-south streets, could pay the cost of opening several new north-and-south streets many times in the enhanced valuation of the new frontages that would be thus created. In Philadelphia the original city streets, except for occasional wide thoroughfares, are so narrow as to permit one-way traffic only, the blocks being intersected east and west with narrower streets, which now serve the purpose of alleys, without important business frontages or room for street traffic. The widening of these narrow streets would afford an opportunity for increased traffic, which would add to the value of the frontages.

There are many instances where the power of excess condemnation might be employed by cities to extend or widen streets, paying the owners their actual loss or damage, and collecting from the owners of abutting properties the enhancement due to the creation of new frontage.

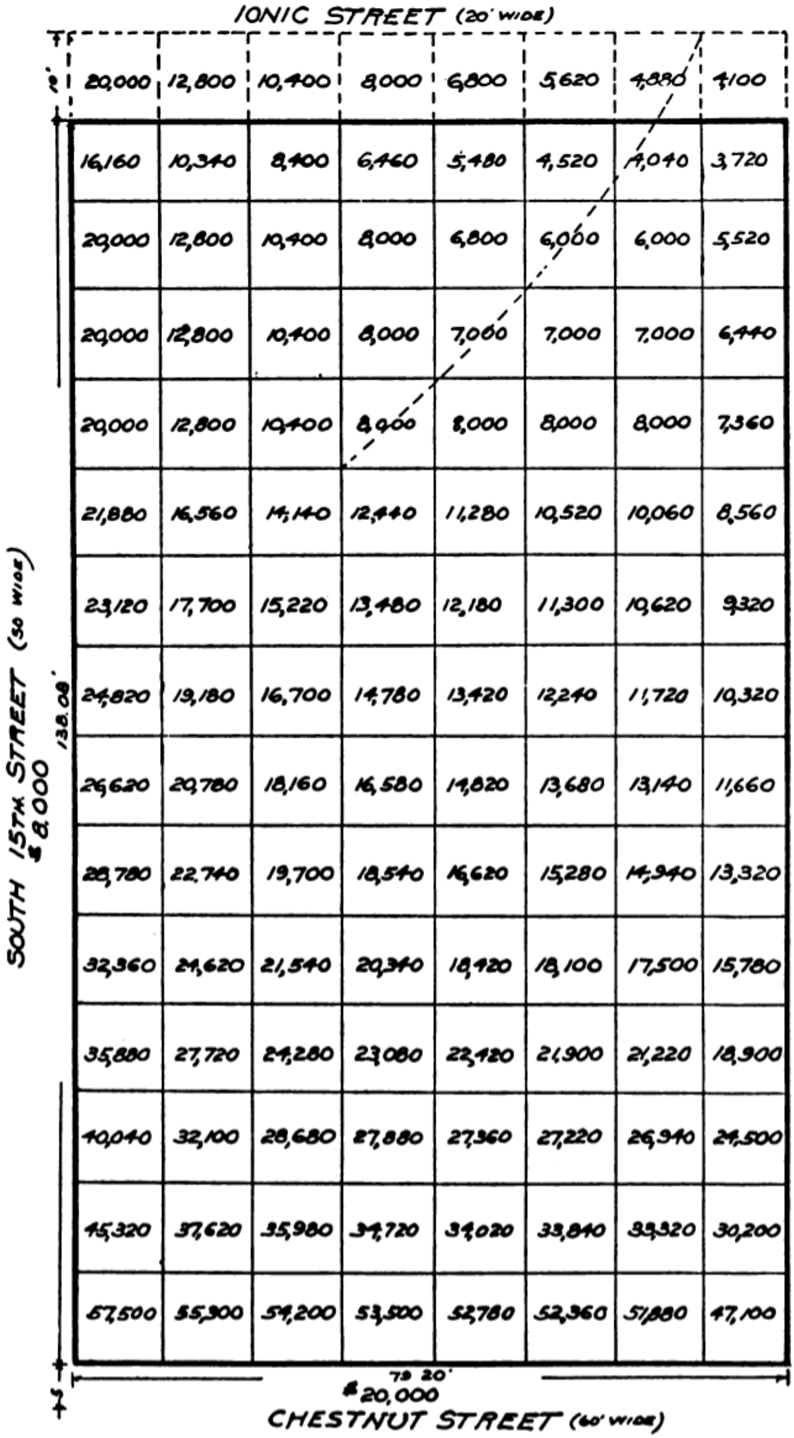
An interesting case in point is one in which the senior



19,950	12,768	10,374	7,980	6,783	5,586	4864	3,895
6,137	3,933	3,192	2,451	2,090	1,729	1,501	1,197
19,950	12,768	10,374	7,980	6,783	5,586	4,864	4,270
19,950	12,768	10,374	7,980	6,783	5,700	5,700	5,244
19,950	12,768	10,374	7,980	6,783	6,650	6,650	6,118
19,950	12,768	10,374	7,980	7,600	7,600	7,600	6,992
21,337	16,036	13,661	11,970	10,950	10,070	9,595	8,132
22,515	17,119	14,687	12,958	11,647	10,773	10,127	8,892
24,130	18,525	16,093	14,155	12,825	11,666	11,172	9,842
25,840	20,026	17,442	15,865	14,117	13,034	12,502	11,096
27,873	21,888	18,905	17,746	15,827	14,554	14,212	12,673
31,236	23,655	20,615	19,456	17,537	17,214	16,644	15,010
34,580	26,562	23,180	22,040	21,375	20,881	20,197	17,993
38,475	30,685	27,322	26,524	26,030	25,897	25,612	23,294
43,434	35,853	34,295	33,060	32,395	32,224	31,690	28,728
54,815	52,725	51,661	50,977	50,255	49,818	49,362	44,783

DIAGRAM XLVII

Showing Valuation of Site at S.W. Corner of Fifteenth and Chestnut Streets, Philadelphia, before Widening Chestnut Street.



20,000	12,800	10,400	8,000	6,800	5,620	4,880	4,100
16,160	10,340	8,400	6,460	5,480	4,520	4,040	3,720
20,000	12,800	10,400	8,000	6,800	6,000	6,000	5,520
20,000	12,800	10,400	8,000	7,000	7,000	7,000	6,440
20,000	12,800	10,400	8,400	8,000	8,000	8,000	7,360
21,880	16,560	14,140	12,440	11,280	10,520	10,060	8,560
23,120	17,700	15,220	13,480	12,180	11,300	10,620	9,320
24,820	19,180	16,700	14,780	13,420	12,240	11,720	10,320
26,620	20,780	18,160	16,580	14,820	13,680	13,140	11,660
28,780	22,740	19,700	18,540	16,620	15,280	14,940	13,320
32,360	24,620	21,540	20,340	18,420	18,100	17,500	15,780
35,880	27,720	24,280	23,080	22,420	21,900	21,220	18,900
40,040	32,100	28,680	27,880	27,360	27,220	26,940	24,500
45,320	37,620	35,980	34,720	34,020	33,840	33,320	30,200
57,500	55,300	54,200	53,500	52,780	52,360	51,880	47,100

DIAGRAM XLVIII

Showing Valuation of Site at S.W. Corner of Fifteenth and Chestnut Streets, Philadelphia, after Widening Chestnut Street.

author of this book testified in behalf of the city authority before the Board of View in the City of Philadelphia. (See Diagrams XLVII and XLVIII, pp. 214 and 215.) Many years ago the City notified all owners of Chestnut Street properties of the purpose to appropriate five feet on each side of the street in order to increase the width of that important thoroughfare; the appropriation to take place when new buildings were erected. The lot occupied by the old Colonnade Hotel had 79.20 feet of Chestnut Street frontage, and the same frontage at its rear on a minor street called Ionic, the total depth on South Fifteenth Street being 193.08 feet. A skyscraper now adorns the site, and the owner in 1924 sought to prove a claim for a large amount of damage by reason of taking off five feet of the Chestnut Street frontage for the widening of the street.

The theory presented by the City Solicitor was that instead of damage to the lot by taking a five-foot strip from the front, there was an actual increase in value due to the appropriation of that strip for widening the street, which increase could be accurately appraised. Under the Pennsylvania practice there is no assessment of benefits for public improvements.

The former width of Chestnut Street was 50 feet; the addition of five feet on each side made a new width of 60 feet. The following schedule of valuation before and after condemnation was presented:

Valuation before taking 5-foot strip	$2,250,207.00
Additional advantage of 10-foot increase in width of street ...	89,673.00
	$2,339,880.00
Deduct disadvantage due to diminution of depth of lot	$36,100.00
Valuation after and as affected by street widening	$2,303,780.00
Valuation before street widening	2,250,207.00
Net benefit due to taking of land for street widening	$53,573.00

The apparent inconsistency of taking land from an owner and at the same time assessing a definite benefit against his property naturally did not appeal to the owner or to the Board of View, which awarded about $40,000 damages, which was nearly one-half of the amount claimed by the owner. Upon appeal, the Common Pleas Court refused the award of damages in any amount.

The sole valuation-judgment exercised was to the effect that before the widening of Chestnut Street the fair unit-foot price (at 100 feet deep) was $19,000, and that the benefit to the land due to the widening of the street was such that after its widening the unit-foot valuation should be increased $1,000, to $20,000. On Fifteenth Street the unit-foot valuation both before and after the street widening was appraised at $8,000. Ionic Street, 20 feet wide, was not given a unit-foot appraisal, but was considered as an alley, and its worth to the lot was considered as identical with one-half of the land value of the alley area, based upon the Fifteenth Street unit-foot appraisal.

After this judgment of street values had been expressed, the mathematical application to the site was computed by the Somers corner tables. In ten-foot squares so far as practicable, and in smaller squares when necessary, the lot area was computed at both $19,000 and $20,000 unit-foot valuations for Chestnut Street, with the results as indicated before and after taking by the city. The lesser unit-foot valuation of $19,000 for Chestnut Street gave a computed total for the lot, comprising 11,331.936 square feet, of $2,250,207, while the higher unit-foot valuation of $20,000 for Chestnut Street, with the five-foot strip off, leaving 10,935.936 square feet, computed for 396 less square feet, gave an increase of $89,673, or a total of $2,339,880. But after taking the five-foot strip, comprising 396 square feet, leaving a total of 10,935.936 square feet, the lot was computed on the basis of the $20,000 unit-foot valuation at $36,100 less, or a total of $2,303,780. This showed a net benefit of $53,573, which might be regarded as theoretical only, but the proof of which is given by the expression of judgment and the accurate computation on the basis of that judgment.

The City of Chicago has within recent years expended large sums of money in widening existing streets and projecting new streets. The Bureau of Local Improvements is a branch of the city government which is charged with the conduct of such improvements. As this book goes to press a taxpayers' suit is on trial in which the Chicago *Tribune* as plaintiff seeks to recover fees paid to three land appraisers in 1919 for services rendered for appraising 7,365 lots or parcels of land affected by proposed improvements in widening or extending Western Avenue, Robey Street, Ashland Avenue, Ogden

Avenue, and South Water Streets. The first three streets named run from the northern to the southern limits of the city on the West Side. Ogden Avenue is a new extension of a diagonal street from Union Park to Lincoln Park, and South Water Street borders the south side of the Chicago River, this improvement comprising a beautiful new avenue to be called Wacker Drive, to include the area of the former street and a narrow strip of land and buildings between that street and the river.

There were many crudities in the methods of appraisal followed; but the suit of the *Tribune* did not attack those methods. It pertained solely to the question of the method of payment of the appraisal fees, which were so great as to constitute fraud. Whereas appraisers had previously been paid per diem fees, averaging $50 for the time devoted to municipal appraisal work, these three appraisers each collected one per cent. of their established valuations of the land affected by the improvements, the total of which was $57,-700,000. Thus each of the three appraisers within the period of one year collected $577,000 for his services, legitimately worth at a liberal estimate not more than $65,000.

The Real Estate Boards throughout the United States, through their valuation committees, have established percentage rates for individual site valuations, under which $50 is the minimum fee for each land appraisal, and this fee applies to the first $10,000 of valuation, with $2 per $1,000 added up to $30,000, and $1 per $1,000 in excess of $30,000. Under these retail rates for individual lots the Real Estate Board fees for appraising the land of these public improvements would have amounted to less than the fee collected by each of the three appraisers; but the wholesale character of the appraisal, where identical square-foot prices were applied to hundreds of contiguous lots, greatly lessened the amount of actual work. If treated as one appraisal, the Real Estate Board fees would have amounted to about $60,000.

As in a large majority of the lots the parts taken comprised but narrow strips from the street frontages, the established valuations of the condemned portions were small as compared with the valuations of the entire properties, and under the percentage charges applied to the entire lots the appraisal fees in many instances exceeded the valuations of the condemned land.

There can be no possible argument in favor of permitting public appraisers to collect such fabulous fees. The services of competent appraisers in condemnation of land for public use should be liberally compensated. But the percentage-of-valuation plan of payment is wrong in principle, for it may require less effort to determine the fair valuation of a high-priced lot than one of little worth, and a particular lot of small value might require a great deal of effort for its appraisal. The actual time required and fair compensation for that time is the true criterion for appraisal fees in the public as in the private field of professional valuation.

PART III

SIGNIFICANCE OF SCIENTIFIC LAND VALUATION

CHAPTER XXIV

REASONS FOR INEQUALITIES OF REAL ESTATE ASSESSMENT

SIGNIFICANCE OF EQUITABLE VALUATION OF LAND FOR PURPOSES OF TAXATION—FUNDAMENTAL REASONS WHY INEQUALITIES OF ASSESSMENT EXIST—LACK OF COMMON JUDGMENT IN ASCERTAINING LAND VALUE FACTORS—LACK OF COMMON METHOD OF APPLYING VALUATION JUDGMENT—NO ADEQUATE BASIS FOR COMPARING URBAN LAND VALUES—NO APPRECIATION OF THE REASONS FOR LAND USEFULNESS—NO ATTEMPT AT SEPARATE ANALYSIS OF FACTORS AFFECTING URBAN SITE VALUES—NO CLASSIFICATION OF BUILDINGS—NO ACCURATE METHOD OF ASCERTAINING REPRODUCTION COSTS—NO UNIFORM METHOD OF DETERMINING DEPRECIATION—CHANGING PRESENT TAX RATES WILL NOT CREATE GREATER EQUITIES—CHANGES IN SYSTEMS OF TAXATION WILL NOT SOLVE PROBLEM OF INEQUITY—IMPORTANCE OF ADOPTING A UNIFORM BASIS FOR TAXATION—UNIFORM BASIS POSSIBLE ONLY IF VALUATIONS ARE STANDARDIZED AND EQUALIZED—IMPORTANCE OF CONTINUING EDUCATION—UNDERSTANDING OF THE REASONS FOR URBAN LAND VALUES DESIRABLE—NECESSITY FOR ANALYZING THE VARIOUS FACTORS AFFECTING URBAN SITE VALUES—THE VALUATION OF IMPROVEMENTS ON LAND ANALYZED—CLASSIFICATION OF BUILDINGS—PROPER INVENTORY OF BUILDINGS—UNIFORM METHODS OF DETERMINING COSTS OF BUILDINGS—CAREFUL STUDY OF DEPRECIATION MUCH TO BE DESIRED.

THE principles and practice of scientific land valuation developed in the preceding chapters are of particular significance for purposes of taxation. In many of our larger cities real estate values form the major part of the basis of local taxation. The general dissatisfaction prevailing in a number of communities with the customary methods of real estate assessment is a matter of common knowledge. The chief grievance appears to be with inequities of assessments, which often result in deviations of from ten to eighty per cent. or more from what is commonly regarded the full or market value of a parcel of real estate.

Some of the fundamental reasons why inequities of assessment exist among different parcels of real estate in any state or municipality may be summarized as follows, with reference to land:

1. There is lack of common judgment in ascertaining land-value factors.

2. There is lack of a common method of applying valuation-judgment, no matter how obtained.

3. There is no adequate basis for comparing the value of one lot with that of another; the value of one farm with that of another; the value of one city block with that of another; the value of one township with that of another; the value of one city with that of another; the value of one county with that of another; the value of one part of a state with that of another.

4. There is no clear idea of the reasons for the usefulness, and hence the value, of land, especially in towns and cities, either in the minds of Assessors or of the public.

5. There is no attempt made to analyze the physical factors of value affecting city sites separately.

6. There is no general recognition of the law of appraisal, and consequently there is no method, or at least only the very crudest methods, of carrying this law into effect, either by Assessors, Reviewing Boards or State Tax Commissions.

With reference to improvements on land:

1. There is no classification of buildings, either as to use or as to construction.

2. There is no proper or uniform inventory of building construction.

3. There is no proper or uniform method of ascertaining reproduction costs of buildings, which is the accepted standard for appraisals for insurance and commercial purposes.

4. There is no proper or uniform method of depreciating building values.

The failure to take cognizance of any of these observations will tend to inequity in results. In order to obtain equity in valuing real estate it is unnecessary to change existing laws and statutes, except to clarify the statutory theory of valuation and the analysis thereof. At all events, it does not appear necessary to change existing laws until scientific methods of valuation have been employed under present laws. When this has once been done it will be found that statutory changes will be relatively unimportant, and will be made for economic rather than for administrative purposes. If, for example, present laws should be so changed as to provide a system of community taxation based on personal incomes and not on real estate values, such a change would be economic rather than administrative.

Let us analyze the foregoing reasons for inequities in real estate assessments a little more closely, and ascertain, if possible, just how important each one is, in connection with the problem of equitable real estate assessment and its possible solution under present laws.

Strictly speaking, a taxing division and an assessment division ought to be coextensive. This is possible in the smaller taxing divisions, such as the county, but in the absence of central direction of assessments by State Tax Commissions it is impracticable so far as the State as a whole is concerned. For illustration: There are ninety-nine Counties in a given State. Let us assume that one man in each County assesses all the land and buildings of that County. This means that ninety-nine separate and distinct judgments and methods of exercising judgment are used in ascertaining the values of the real estate of the State.

No two of these men can or will make their appraisals in precisely the same way; they will all employ different standards; they will all view their tasks from different angles. They differ in ability and in experience. Eliminating the common effort that each Assessor will probably make to keep the valuation in his County as low as possible, it will be found that there are in reality ninety-nine different methods of assessment employed by the ninety-nine Assessors.

When the assessment has thus been made, the State imposes a uniform tax rate on the value thus ascertained, which, of course, will tend to cause inequalities in taxes between the counties. And when the general clamor for low assessments is heeded by some Assessors and not by others, different levels of assessment seem inevitable.

The same situation is found in a county where a number of Assessors or Deputies are charged with the work, each having assigned to him a district comprising a part of the County, or in a City, divided into a series of specific districts for assessment purposes. A level tax rate levied against property under conditions of unequal assessment can produce but one result, inequitable taxes in the particular taxing division, be it village, city, township or county.

As far as a State is concerned, it is manifestly impossible for one man or for one set of men to exercise a common judgment as to real estate values throughout the State. Some definite method of producing common judgment or approximating it, is therefore essential. A State Tax Commission, possessing mandatory supervisory powers as to uniformity of assessing rules could achieve this result. It could supervise assessments as to methods of analysis of real estate values and could well promulgate definite instructions before the work of the local assessor begins, so that all assessors would be guided as to rules by a common central authority.

There should be a means devised to make possible the interchange of ideas and opinions of valuation in a manner understandable by every one while the assessment is in progress, so that the relative importance, the comparative usefulness of rural as well as of urban land may be accurately assessed. No doubt as this work of uniform assessment progressed many other methods of producing, as nearly as possible, a common judgment would be developed, and put to practical use. But the methods outlined in the preceding chapters may well serve as the starting point for achieving such beneficent results.

The number of methods of applying judgment of real estate values at present almost equals the number of local Assessors working in any one State. This situation could be remedied by a State Tax Commission, possessing proper powers and compelled by law to exercise such powers. Most local Assessors would no doubt welcome such assistance from a central authority. As a rule they are anxious for any possible help which will aid them in their work, no matter whether it comes from official or from unofficial sources.

"We welcome any suggestion you may make, and will give any recommendations for improving our methods of assessment serious consideration," was the statement made by Assessors in one of our large cities recently. The local Assessor is usually a man whose ambition it is to do his work of assessing thoroughly and as accurately as possible, and any one who can tell him something fundamentally useful in connection with his work is a very welcome visitor to his office. How much more influence would a State Tax Commission with complete powers to prescribe rules have with the Assessor, if it were to lay down fundamental rules which he could employ as tools to make his assessments uniform. If the same methods of assessment were employed in every part of a State, it would be far easier for the State Tax Commission to detect the inevitable differences of judgment than is possible under present conditions, where different judgments are applied by using different rules or perhaps by not using any rules at all.

While any Assessor will ordinarily know that ten acres of land of uniform quality are worth $1,000 if one acre of the same land is worth $100, not many of them know how much a parcel of land 10 x 124 feet is worth if they know how much a parcel beside it, 24 x 73 feet, is worth. Not one of them can tell how much a lot at a street corner is worth, when an inside lot of the same size and in the same vicinity is worth $10,000 on one side of the block and $4,540 on the other side. Some Assessors have no concept of the enhancement in land values due to alley effect, and not one in a thousand knows how to compare street valuations. To solve these and many similar problems, uniform rules to be used by all Assessors could be promulgated by the State Tax Commission and their use could be made compulsory. Thus all Assessors in an assessment area would employ common methods of valuation analysis for purposes of taxation.

The lack of a common basis for comparing land values, which is always essential for uniform assessment work, is more or less general. No one Assessor can devise this common basis or work it out in every detail. The assessment of land is one of comparison from beginning to end. If all the land in a taxing district were sold every year at a fair price, and if this price were made known in the transfer instrument, the assessment of land would merely require copying the legal considerations from sales records. But such a situation has never existed and probably never will exist. Therefore some other basis for comparing land values must be found. Unless the Assessor is shown how to make such comparisons he will not make them accurately. The underlying theory of valuation implied in some State laws, which provide that land shall be assessed "on view" is fundamentally wrong. Such a theory is impracticable and has never been carried out, notwithstanding the statutory mandate. Comparisons of land values cannot be made "on view." There are so many conditions that affect the valuation of urban land that a "view" will not disclose them nor make it possible to compare valuations. Mathematical computation must be substituted for the "on view" crudity to aid in the work of land valuation.

Comparisons of land values must begin where the knowledge of such comparative values is most extensive. Knowledge is most general where there is the greatest competition for the use of land on the streets having the greatest usefulness in cities. These comparisons must extend in all directions from such high-valued centers. The usefulness of streets rather than of specific lots must be ascertained, for it is street usefulness which imparts value to city lots. In rural districts both location and soil fertility of land must be ascertained for purposes of valuation, and should always be expressed and recorded separately from improvements on land. In short, in order to secure equity of real estate assessment, there must be analytical study subsequently developed into practical methods to be employed by the Assessor in his assessment work.

Until this has been done there can be no accurate comparison made between separate parcels of real estate, whether on the same street, in the same block, or wherever they may be located. But such comparisons of valuation are absolutely necessary to insure equity and justice in real estate assessment. Boards of Equalization attempt to do this, but never seem to accomplish it adequately, since they often lack a proper understanding of the principles involved in making equitable assessments, and because they have failed to participate in the original valuation procedure. When the assessment is actually made is the time to equalize assessments, and not afterward. The present methods of equalization of assessments are closely analogous to cutting up a piece of cloth according to a large variety of garment patterns, and subsequently asking the tailor to make all the garments appear as though they had been cut from one and the same pattern. It does not require a tailor to tell us that this cannot be done.

Furthermore, there is no clear understanding of the origin of the usefulness of land, particularly in the case of urban land, either in the minds of Assessors or of the public at large. The way out of this difficulty is purely educational. Most Assessors have definite ideas concerning the present usefulness of land, but have never speculated on the origin of such land usefulness, especially of city land. In rural districts it is relatively easy to see why land is useful. It yields up the present necessities of life to many. But urban land is not used for this purpose. The origin of location value, and its enhancement due to competition for specific urban sites, should be clearly explained to every Assessor before he begins his work.

Cities are usually laid out in blocks and streets for the convenience of the inhabitants, who need land for homes, stores, factories, churches, schools and places of amusement to meet their customary requirements. But the original plans of the city founders are not very often followed. The people have their preferences for sites, and business men find themselves obliged to locate their business establishments where the people will patronize them. Streets are the means of access to the sites, and the appraiser must study and analyze the effect of street accessibility upon the valuation of each parcel of land, as outlined in the preceding chapters, if his work is to attain any degree of uniformity and precision.

Most Assessors fail to analyze separately the various factors that enter into the valuation of an urban site. They are in the habit—as indeed are practically all who attempt to appraise land—of looking at a lot in a city as affected by but one physical factor of value. This is reflected in many of our laws, which provide that land and buildings shall be appraised separately for tax purposes, the underlying theory apparently being that in the case of a building and a lot, there are two dissimilar factors of value—one pertaining to the building and the other to the land on which it stands. Such a separation of building and land valuation is of course absolutely essential to an intelligent assessment, but there are a number of physical value-factors affecting both land and buildings, which must be separately appraised. Until Assessors are shown how to separate the physical factors affecting the value of each property, how to appraise each of these factors separately, and how to combine the valuations thus ascertained, there can be no proper comparison of actual monetary values of urban sites. Assessors must know and apply the mathematical principles pertaining to the uniform valuation of land.

Although there appears to be a general recognition of the law of appraisal (stated in Chapter VII), as a rule only crude methods, if any, have been employed by Assessors and reviewing bodies in applying that law to the practical problems of land valuation. Some Assessors are aware of a calculable relationship existing between the valuation of two sites, but because they have themselves been unable to reduce that relationship to a mathematical basis, they express doubts as to the possibility of solving their assessment problems with the aid of mathematical computations. But if a calculable relationship between the valuation of two sites affected by similar factors of value does exist, it should be calculated and not guessed. It is well to bear in mind the two distinct stages in the appraisal process: first, exercising judgment; second, computing site values on the basis of such judgment. Until Assessors are required to differentiate clearly and definitely between these two stages and begin to employ mathematics in computing site values, they will continue their guessing, and the results will be commensurate with the degree of expert guessing ability of the various Assessors.

Inasmuch as the subject matter here discussed pertains to reasons for inequalities in real estate assessments, it may be pertinent to analyze briefly the valuation of improvements on land. Rules for classifying buildings in cities as well as on farms can be devised by assessing officials with comparative ease. Some Assessors make attempts at classification, but usually without regard to the use of the building, and sometimes without regard to construction. In most cases there is no attempt at classification at all. The Assessor walks around a building and looks it over, finds out how much the owner says it cost to build it sometime in the past, perhaps glances at a building across the street which he has just assessed, and makes a rough estimate of the value of the structure. If all the structures in a city of the same character of construction and used for similar purposes, were classified and inventoried accurately, much greater uniformity in building valuation could be attained than prevails at present. No matter what method of classification of buildings may be employed, it would be superior to the complete lack of classification in most towns and cities to-day.

The usual inventory of building construction made by the average Assessor scarcely rises to the dignity of an ordinary laundry list. Any merchant who would take an inventory of stock in a similar manner would be the object of ridicule. An assessment inventory of building items in a city ought to be so complete that any expert builder could take the inventory of any one building and estimate accurately the cost of rebuilding such a structure. Until Assessors are compelled to make such inventories—a separate inventory for each building—there can be no accurate assessment of buildings made. Tangible property, whether real or personal, cannot be appraised until it is accurately listed. How can a non-expert Assessor appraise a building without knowing anything about it except what he can see by walking around it once, and possibly through it once? It is humanly impossible.

There is, moreover, no proper or uniform method employed by Assessors of ascertaining new reproduction costs of buildings. Many Assessors are of the opinion that when they have found out how much it cost to construct a building many years ago, they have ascertained its "reproduction cost." Original cost should not be made the basis of building assessment, but the cost of reproduction at the time the assessment is made. This represents the maximum present value of any building. Until there is some uniform method employed to ascertain new reproduction cost at the time of assessing, buildings will not finally be valued uniformly. New reproduction cost is capable of being reduced to tabular form and applied systematically for a given class of buildings. Workable rules and tables can be devised for describing and valuing buildings, so that there will be uniformity in building assessments in every taxing district and between different districts.

Finally, Assessors employ no uniform method of depreciating buildings. Every completed building in any city is worth somewhat less than it would cost to reproduce it, beginning on the day of assessment. Every Assessor knows this, but employing no exact methods of ascertaining what it would cost new to-day, and no uniform way of determining how much less it is worth to-day because of age, condition, obsolescence and lack of utility, he is forced to do more guessing as to depreciation. Not only can the same Assessor not guess correctly twice in succession, but there appear to be as many schemes for guessing depreciation as there are local Assessors in a State. Most of the difficulty arising on this score could be obviated by the Assessor if he devised uniform rules for depreciating buildings, as well as uniform rules for other phases of building valuation.

Adverse criticism, however, is of little avail, unless it offers a practical way out of the difficulty. There appears to be too much destructive criticism in this old world of ours to-day. More constructive criticism is highly desirable. That is why destructive criticism has been relegated to a place of secondary importance in this work, and primary emphasis has been laid on the principles and practices of land valuation which have proved their practical usefulness in many instances, and which, if applied to the assessments of an entire State, would undoubtedly establish far greater equity in assessments than prevails to-day.

It is possible by applying the principles developed in preceding chapters to combine valuation-judgment with mathematical computation to attain precision in value-expression. With the information which is available and the methods which have been devised for using this information any local Assessor, any local Reviewing Board, any State Tax Commission, should be able to make an intelligent and equitable assessment of real estate.

CHAPTER XXV

IMPORTANCE OF EQUITABLE REAL ESTATE VALUATION

WHAT IS MEANT BY EQUITABLE ASSESSMENT OF REAL ESTATE?—POLITICAL SIGNIFICANCE OF EQUITABLE ASSESSMENT—ELIMINATING POSSIBILITIES OF POLITICAL CORRUPTION—SIGNIFICANCE OF EQUAL DISTRIBUTION OF TAX BURDEN—THE ARGUMENT FOR A HIGHER TAX RATE ON LAND THAN ON IMPROVEMENTS ON LAND—VALIDITY OF THIS ARGUMENT—IMPORTANCE OF UNIFORM VALUATION NO MATTER WHAT SYSTEM OF TAXATION IS ADOPTED—UNIFORM VALUATION OF REAL ESTATE WILL REDUCE SPECULATIVE POSSIBILITIES IN LAND—SOME PRESENT SPECULATIVE TENDENCIES IN LAND—EQUITABLE LAND VALUATION AND CITY PLANNING—AN ACTUAL ILLUSTRATION—NO EFFECTIVE PROJECT OF CITY PLANNING CAN BE DEVISED WHICH IS NOT BASED ON EQUITABLE VALUATIONS OF LAND—ADVISABILITY OF TREATING LAND AS A PUBLIC UTILITY SUBJECT TO THE REGULATION OF PUBLIC SERVICE COMMISSIONS.

IN the preceding chapter the reasons for inequitable real estate assessments were outlined. They may be summarized in a single statement: Lack of uniform and accurate methods of assessment and lack of expert assistance in scientific valuation methods. Yet it appears obvious that uniform and accurate methods may be applied to real estate valuation in general, and to urban land valuation in particular. Equitable assessment of real estate implies judging and computing valuations uniformly and systematically. The political as well as the social desirability of equitable assessments cannot be overemphasized.

Politically it would mean that preferential treatment for assessment purposes of certain parcels of real estate, because of the political affiliations of their owners, would be a thing of the past. It would no longer be possible to say to the Assessor, "Keep down my assessment and you will get my vote." Many conscientious and diligent Assessors who at present find themselves confronted with complaints of inequitable assessments by dissatisfied real estate owners, would be able to protect themselves by proving their use of exact methods in arriving at the valuation of all parcels of real estate within their districts.

"You have had ample opportunity to express your opinion as to the unit-foot values of your land in their relationship to the unit-foot land values in your vicinity," the Assessor could argue. "How, then, can I change the valuation of your tract of land without changing its valuation in relation to all the other tracts of land in your vicinity? Such a procedure would be manifestly unjust."

An argument of this nature should convince the average land owner that the Assessor has meted out justice to all taxpayers. Similarly, in the valuation of improvements on land, the Assessor who definitely classifies buildings and carefully inventories and depreciates them, should have no difficulty in explaining the precise reasons to a dissatisfied real estate owner why a certain valuation had been placed on a specific building.

The possibility of favoritism shown by local Assessors in assessing the properties of their friends would thus become a matter of history if equitable real estate assessments were made along the lines developed in the preceding chapters.

But far more important than the political would be the social and economic significance of equitable real estate assessments. In the first place, it would mean that a level tax rate would fall proportionally on all real estate values, since such values would represent the same percentage of the fair or normal values of real estate. In other words, if all real estate were assessed uniformly at 100 per cent. or any other per cent., of the fair or normal value, a level tax rate on such a valuation would fall proportionally on all real estate values. While it is not within the scope of this work to say whether uniform or progressive tax rates should be levied against uniformly assessed real estate, it is evident that equitable valuations should be made in either event.

Again, it may be contended that separate and higher rates of taxes should be levied on land values than on improvements on land, and particularly in the future, on increments in land values.

Since land values tend to rise, because of the increased demand for land with increasing population and increased production, it becomes obvious that a tax levied against such increasing land values cannot impose a burden on the owner of the land. He has not been instrumental, as an individual, in increasing the value of a tract of land, but only as a member of the community, except to the extent that the community has declared its willingness to give him a profit for developing a certain location. Individual effort may in this manner tend to enhance land values in specific locations. But such value-enhancement will, in the final analysis, be derived from the fact that the community is willing to patronize the location where John Brown establishes himself, and where he has given faithful service, or has attracted patronage by ingenious advertising. The increased importance attached to the location developed by John Brown may also be reflected in rising land values in the vicinity. The relative importance of such locations will likewise tend to increase, their values will rise, and a tax levied against such land values, it is contended, cannot be burdensome to the owner of the land in question. He, in general, has expended no effort, has made no sacrifice to produce such increase in land values, but is reaping that which the community at large has produced.

Not so with improvements on land. They require individual effort, individual sacrifice to produce them. They involve definite costs of production, and a tax levied against such products of human labor in reality resolves itself into a tax imposed on human effort. It may be burdensome. It is therefore contended that a relatively higher tax rate, particularly on future increments in land values, rather than on improvements on land, is in accordance with strict justice and will stimulate rather than retard individual initiative. Some communities, approving the validity of this contention, levy relatively higher tax rates on land values than on the values of improvements on land.

When land is assessed without system, and its value is not established by employing uniform methods of observation and calculation, separate and higher tax rates on land values than on the value of improvements on land will not necessarily mean that buildings will be taxed at a less proportion of value than land. If land is assessed at less than fair or normal value, and improvements are assessed at their reproduction costs less fair depreciation, a higher rate on land values than on the value of improvements on land may still mean a relatively higher tax imposed on the latter than on the former values. This general observation will be illustrated in detail in the following chapter. The problem of scientific methods of land valuation attains even greater significance than heretofore if different tax rates are to be imposed on land values and on improvement values respectively.

Uniformity in methods of real estate valuation for taxation purposes would materially reduce the speculative possibilities in land. If land were uniformly appraised, the resultant valuations would serve as approximate indications of fair values to prospective buyers, who could be more readily induced to buy at the values assessed, and who could not be convinced that normal values were far in excess of the assessments. Under existing conditions assessments in most cities furnish an inaccurate guide to prospective buyers as to the fair or normal value of a parcel of real estate. Many instances could be cited in which an excessive number of Federal revenue stamps have been placed on transfer instruments to create in the minds of prospective buyers the impression of enhanced real estate values. That the Federal revenue stamps, required to be affixed to the transfer instrument—a 50-cent stamp for every $500 of selling price or fraction thereof, exclusive of mortgage consideration—have been affixed in exaggerated amounts to influence buyers, was substantiated in a recent intensive study made by the State Board of Equalization of California. Its conclusions were to the effect that revenue stamps are not a reliable index of the consideration realized in a sale, and in general cannot be accepted as evidence of fair values.

Again, speculators have been known to place fictitious mortgages on parcels of real estate to create the impression of high values. These and similar devices have no doubt proved instrumental in providing lucrative sources of profit to land speculators, who would find their labors far more arduous and their speculative profits materially reduced if assessments could be generally accepted as a reliable index of fair values of land as well as of improvements on land.

It is conceivable that if the margin between opinions as to values could be so clearly defined as to make land valuation more definitely understood, the demand for land as an investment might be materially widened. The average investor desires security for his principal and a regular rate of return on his investment. If he is assured of a uniform rate of return, by virtue of the fact that the community has expressed an opinion as to the value of his investment, and if he can feel reasonably certain from a community study of land values that his land will not depreciate, he will be more willing to invest in land. There is no doubt that land would be more readily salable for investment purposes if its fair or normal value were generally known. Of course there would continue to be land transactions either above or below the fair or normal price, conditioned by the circumstances or requirements of buyers or of sellers; but in general, investment in land would supersede speculation in land if fair values were generally ascertainable to prospective buyers.

The problem of uniform valuation, particularly of urban land, is of decided importance in connection with city development and city planning.

In the month of March, 1916, a full-page advertisement appeared in the New York City newspapers. Signed by the great landlords and financial institutions, by midtown department stores, and by other business firms located in the district of which Forty-second Street roughly forms the east-west center line, the advertisement proclaimed the purpose of the subscribers to put an end to the encroachments of unfashionable business upon the district north of Twenty-third Street. The advertisers declared that the midtown district, then devoted to high-class retail stores and shops, hotels, theaters, churches, libraries and private residences, must be freed from invasion by the garment manufacturing and other undesirable industries; that such industries already located within the boundaries described in the advertisement would be allowed a certain period of time to remove from the district; and that the penalty for non-observance of this mandate would be the withdrawal of the patronage of the New York department stores. This suggested boycott was afterward extended to include as boycotters the buyers of garments for retail trade from other parts of the country.

This notice was followed shortly afterwards by a conspicuous advertisement signed by a large number of garment manufacturers then in the midtown district, in which they expressed their willingness to move, and to remain within a district farther to the south prescribed as their "pale," and they moved!

The observer of developments in the use of land in cities may well wonder as to the ultimate significance of such an incident. Private ownership in land, and the right to use land in any way not injurious to the health and safety of the community, is a part of the American system. The owners of the valuable properties who signed this order of eviction from the land of other owners were representatives of that established system. They assumed the right to say to the owners of land and buildings within the same district that they should not rent their properties to garment manufacturers, not because they were legally a nuisance, but because they interfered with their own business interests. They would have agreed that the garment industry of New York was a valuable asset to that city, but they determined that the value of the industry to the city as a whole could not compensate the department stores and financial institutions for the presence upon the streets, especially at noon-time, of thousands of the garment workers who came out of their shops for fresh air and exercise. These workers filled the streets devoted to fashionable shoppers and made it unpleasant for those shoppers. This lessened the desirability of Fifth Avenue and adjoining thoroughfares for retail business, with the tendency to reduce the value of the district for business of the distinctive character which then applied to it.

The changes in the utility of land sites in large cities are constant. The growth of the New York midtown district as a high-class retail center was a phenomenon of comparatively recent years. From Fourteenth and Twenty-third Streets to the Forty-second Street district was a long jump. The lower district cross-town streets had been deserted by the big retail stores, and lower Sixth Avenue had also lost prestige as a low-priced retail section. The tendency was all toward the northerly direction. Hundreds of small garment manufacturers became dissatisfied with the obsolete buildings of the southerly section, and wanted to be nearer the new center of retail activities, where suitable quarters were offered by enterprising landlords who tore down many of the old-time four-story residence buildings and replaced them with towering lofts.

City growth rather than city planning was the maxim of the builders of the New York which existed fifty years ago. Every observer of urban development knows that cities should be planned, and that they should not be permitted to develop haphazardly. Substantial buildings, erected for a definite utility, built to remain mechanically sound under ordinary conditions for a century, often become a liability within twenty-five years by the shifting of population and the determination of new utilities. These changes come rapidly, and their causes are so definite and their pressure so insistent as to make efforts in opposition from any single group of persons or interests ordinarily without avail. Districts without number in our great cities have changed in utility, and the owners of certain locations have gained by the resulting increase in prices of their land holdings, while the owners of other locations have seen the desirability of their holdings lessened and their money value consequently destroyed.

While decrying the ethics of the midtown interests in serving a notice that had the power of compulsion behind it for the removal of humbler trades from their midst, one can understand and appreciate the business necessity for such action. It is possible that by thus assuming a power not given them by law, they have not only benefited themselves commercially by conserving the values of their real estate, but have benefited the community more than they have injured it by their defiance of the usual rules of the game.

Out of this New York movement a large sentiment has developed throughout the United States, in cities large and small, for establishing zoning tribunals of official character, and granting to such tribunals the right to determine the use to which land may be dedicated. New York City now has such a system, and many other cities have followed the example of the metropolis. Zoning has been approved by the courts in certain States and has been refused approval in others, and the eventual outcome of zoning as a municipal policy is uncertain. The movement has undoubtedly acted as a palliative of undesirable conditions in some instances. It has certainly aided in the maintenance of real estate values where it has been established, but the success or failure of a zoning plan should have a higher purpose than merely to maintain values in a particular locality. Zoning should be incorporated in a general city planning system, established for the benefit of the community as a whole. Where through the operation of a zoning law real estate values are increased, provision might be made for compensation to the municipality from the real estate owners; and where values are taken away from real estate as a result of zoning laws, payment for such losses could be made to the owners. If zoning should be maintained with the sole purpose of community benefit it could be made a permanently valuable feature of government.

City planning laws could be rendered more effective if coupled with the power of excess condemnation of real estate, and the appropriation by the community of the increased land values due to public improvements. Certainly no movement of the character of that which was launched by private interests in New York in 1916, and which is under way in other large cities, should be justified or justifiable from any point of view except the public interest; and the decision that one site is useful for a hotel, another for a theater, another for a drug store, another for a factory, and so on, should not be made on a limited scale or with a limited purpose. To say to one man that he can do nothing with his land except to build a shirtwaist factory upon it; to another that he can no longer make his home in a certain house; and to make other determinations of land utility in a district, without adopting a comprehensive city plan, is sure to work injustice. It is not enough to confine the garment workers in New York within a certain location. That would be merely to use a local remedy for a general disease. There should be a comprehensive study of the whole question of the use and usefulness of land in a city. Many of the long blocks in New York City should be intersected by new streets; and with the power of excess condemnation the municipality could sell the new frontages for money enough to more than pay for the land required for the streets and for the destruction of and damage to buildings. The city with such a power could, after an intelligent study of the whole problem, use funds received for excess valuation due to public improvements to repay those whose property values should be taken in whole or in part. If the present haphazard conditions were replaced by well-ordered plans for the use of land, including limitation of building heights and uniformity in architectural design, the per capita site valuation would probably be increased, because land owners would then be free from the danger of tremendous losses which sometimes occur under the practice of freedom in real estate usage which has heretofore prevailed.

Possibly the next step in the plan for community control of land in great cities may be to declare urban land a public utility, subject to regulation such as is now applied to the activities of public service corporations. This would mean that landlords of land and buildings would be guaranteed a fair return only upon a fair valuation, with possibly a higher rate for buildings than for land, to compensate for the loss of depreciation due to mechanical deterioration, obsolescence and lack of utility. Thus city land would be made a secure investment, but profiteering would be lessened if not stopped altogether, and the community at large, which benefits but indirectly under prevailing zoning plans, would receive a larger benefit from increasing land values.

Will land sites in cities eventually be regulated, not only as to use but also as to the rentals to be charged on the principle now applied to the regulation of corporations performing a public service?

The zoning movement is undoubtedly a step in this direction. In the years of and following the World War the rapacity of landlords brought about attempts in some states to restrain them by law from increasing rentals. Such a law, passed in the City of Washington, recently expired by limitation. President Coolidge has advocated regulation of rentals in Washington as a means of protection to government employees. Such a law in Washington and elsewhere could not be fairly administered unless scientific methods of appraisal should be followed for land and buildings. It would be possible under such a plan to determine what is a fair rental for a room in a hotel, as well as for a store or residence building.

CHAPTER XXVI

EQUITABLE VALUATION IN ITS RELATION TO TAXATION PROGRAMS

THERE IS NO RELATION BETWEEN SCIENTIFIC VALUATION OF REAL ESTATE AND ANY THEORY OF TAXATION—THE LAWS PROVIDE WHAT SHALL AND WHAT SHALL NOT BE TAXED—HENRY GEORGE'S ERROR IN ASSUMING THAT THE FAIR VALUE OF LAND CAN BE EASILY DETERMINED—THIS ERROR STILL PERSISTS TODAY—LACK OF ACCURATE STANDARDS OF VALUATION AND OBSTACLES TO ANY REVISION OF THE REAL ESTATE TAX—RECENT TAX REFORM IN HOUSTON, TEXAS—CLAIMS MADE FOR THIS REFORM—EFFECTS OF PITTSBURGH "GRADED TAX LAW" ANALYSED CRITICALLY—SINGLE TAX OR ANY OTHER TAX REFORM WILL BE INEQUITABLE SO LONG AS THE BASIS OF VALUATION IS NOT ACCURATELY DETERMINED—MOST LAWS OF THE STATES NOW REQUIRE SEPARATE VALUATION OF LAND AND BUILDINGS—ASSESSORS HAVE NO UNIFORM BASIS FOR DETERMINING LAND VALUES—INEQUITIES IN ASSESSMENTS CONTINUE AS A RESULT—ACCURATE VALUATION THE KEY TO REMOVING INEQUALITIES IN REAL ESTATE TAXATION.

TAXATION authorities, in their conference discussions, deplore the inequalities in assessments, but their efforts at the cure of inequity are often ineffectively directed.

One official will declare that better assessments would result if Assessors were directly elected by the people, while another will insist that the only hope for assessment reform is through the work of efficient appointive Assessors. In certain cities great stress is laid upon the compilation of records of real estate transfers to aid the Assessors in determining taxable values. Again, "full value" assessment is advocated as a sure cure for inequitable valuations. Followers of Henry George would cure taxation evils by relieving improvements upon land from taxation and imposing all taxes on the full value of land. Separate assessment of land and of buildings is also urged as a cure of valuation evils.

There are persons who, although unconvinced of the merit of the Single Tax, believe it unfair to tax building values as heavily as they are taxed in proportion to land values. "This new hotel cost a million dollars; if it should be taxed at its full cost it could not exist at the prevailing tax rate," is a recent comment made in a Southern city. "The manufacturing industries are the life of this community, and to tax them at 100 per cent. of the fair value of their land, buildings and machinery would be a blow at civic progress," is a sentiment often expressed, and acted upon by taxing officials in spite of laws forbidding discrimination.

Tests have shown that the equalizing benefits resulting from all these proposed substitutes for systematic valuation are practically negligible. State campaigns have been won on both sides of the elective-appointive issue in Ohio without noticeable betterment in valuations of real estate for taxation purposes. Assessors find it impossible to harmonize selling prices of real estate, one with the other, or to use them as a reliable basis for valuation, no matter how strenuously they may try. There are so many projecting angles in the prices paid for real estate that it is impossible to force those prices into the round holes of uniformity as to either system or amount of valuation. "Full" valuation is certainly a correct solution of the problem if "full" value can be accurately ascertained for all properties, but this is impossible under no-system methods. The adoption of the Single Tax on land would bring about a change in the whole taxation structure by violating the theory of taxation of all property on an equal basis. This structure, it is true, is constantly disturbed by inequality of valuation, and many inequities which are alleged to be due to the existing system of taxing buildings on the same basis as land could be lessened by appraising both land and buildings at their "full" respective values. It may not be desirable to legally exempt buildings from taxation in whole or in part, but it is always and everywhere desirable to obey the law of accurate valuation. Accurate and therefore equitable valuation for all taxable property would harm neither the new hotels nor the manufacturing industries, because all property would then be uniformly valued, and could be taxed at lower rates, if such action should be termed advisable.

A question frequently asked is: "What relation, if any, does the Somers System bear to the Single Tax?"

The answer is that neither the Somers System nor any other possible system of accurate comparison of land and building values bears a peculiar relation to any economic theory concerning the propriety of taxing or untaxing specific kinds of property. State constitutions and statutes all attempt to define theories of valuation which appraisers are expected to follow. It has been shown in another chapter that these legal formulæ are merely idealistic statements, which in no degree reach the dignity of practical standards that may be followed in actual valuation work. Henry George assumed that if the Single Tax should be established as the legal rule, there would be no difficulties encountered by Assessors in ascertaining the "selling value" of land, upon which taxes could be levied equitably and proportionally. Mr. George thus fell into an error of opinion which still prevails among legislators and courts, as well as among administrators of taxation laws; namely, that the valuation of real estate for taxation may be equitably and fairly accomplished by easy processes, and without adequate analysis of land values aside from securing information concerning prices paid. Some of Mr. George's present-day followers, who hold his faith as zealously as though it were a religion, believe that a legislative direction to the administrators of the tax laws to tax "the full rental value of land," and to discontinue the taxation of improvements on land, is all that would be necessary to institute the Single Tax upon land values. The valuation of land as a basis for taxation they regard as a mere administrative detail to be left to development after the campaign for the adoption of the Single Tax had been won.

There have, however, been prominent followers of Henry George—notably the late Tom Johnson, for many years Mayor of the City of Cleveland; Louis F. Post, an intimate and associate of Henry George, who ably edited "The Public" in the years of its prime as the national Single Tax organ; the late Joseph Fels, the Philadelphia soap manufacturer, who spent a fortune in Single Tax advocacy, and others—who have appreciated the obstacles in the way of inauguration of the Georgean scheme of taxation due to the lack of accurate standards of valuation. The late J. J. Pastoriza, Commissioner of Finance and afterwards Mayor of Houston, Texas, accomplished and proclaimed a modified form of Single Tax in Houston, but he did not do this until after he had employed the Somers System for the revaluation of the real estate—land and buildings—and had taxed land at practically full valuation and buildings at a uniform percentage of reduction from their full valuation as scientifically determined. Another innovation in Mr. Pastoriza's extralegal administration of the tax laws lay in his action in assessing stocks of merchandise at a relatively low percentage, in taxing the franchises of public utilities on the basis of the value of the land occupied by them in the streets, and in practically abolishing personal property taxes of other kinds in a city where personal property had previously been heavily taxed.

The difference between the Pastoriza plan and that usually followed by Assessors was that Mr. Pastoriza applied a definite principle, not only in his real estate valuations, but also in his treatment of other forms of property, in the appraisal of which Assessors usually pursue vacillating policies.

One might consistently hold to an academic conviction favoring the theory of the Single Tax, without favoring the enforcement of laws imposing all taxation upon the full value of land and exempting buildings from taxation in whole or in part. In the State of Maryland a City Council may exempt buildings from taxation by the passage of a city ordinance; but in the City of Easton in that State, a Council composed of men who were all disciples of Henry George decided against discrimination as between land and buildings, and employed Somers System methods for the scientific revaluation of real estate. The result was the doubling of land assessments; and, by the application of uniform depreciation methods, and the further deduction of a uniform percentage of additional depreciation, the building valuations were greatly reduced.

In Pueblo, Colo., a law which imposed a lower tax rate upon buildings than upon land was rendered of no avail by the antagonistic action of the Assessor, who applied a general increase to the valuations of all buildings sufficient to prevent any material change in the taxation of individual properties.

A situation existing many times in practically every taxing district in the United States may be illustrated by three parcels of land, each known to have approximately the same valuation, say, of $100,000. One of these lots may be actually appraised for taxation at that price, while one of the others may be found upon investigation to be assessed at $50,000 and the third at $150,000. These variations may seem incredible, but any one who is familiar with the vagaries of valuations for purposes of taxation throughout the country will know that they are not exaggerations. The slightest investigation of any city tax roll where scientific methods of assessment have not been followed will show many similar variations.

Applying a 6 per cent. rate of taxation to these valuations of the three properties, intended to represent the full annual rental value, the lot appraised at $100,000 would under Single Tax pay $6,000 a year in taxes, and the one appraised at $50,000 would pay $3,000, while the one appraised at $150,000 would pay $9,000—all exclusive of any tax on improvements. Relative appraisals at lesser or higher dollar-figures would create the same inequitable taxation. The quickest way to defeat the Single Tax, once for all, would be to permit that theory of taxation to be pursued under no-system methods of assessment, for existing inequities in taxation would then be seen more clearly than under the prevailing practice of levying taxes against both land and buildings, and taxpayers would, unless given a liberal education in the science of valuation, believe the inequalities so clearly developed to be due to the Single Tax rather than to inaccurate valuation methods.

In most of the United States the laws require land and buildings to be separately assessed, the taxes usually being levied on both elements of real estate at the same rate. The almost universal result of no-system assessment methods is that land is under-valued and buildings over-valued, both in price and relatively. This is due primarily to the fact that Assessors have not generally shown the degree of celerity in measuring the increase in land values necessary to keep pace with market increases as developed by the growth and general prosperity of their communities; and that the tax officials are likewise slow to appreciate and measure the losses due to the circumstances which destroy usefulness, and thus lessen the values, of buildings.

Taxation officials in their associations and conventions are accustomed to hear serious argument to the effect that separate assessment of land and of buildings will go far towards the correction of inequalities, and have argued in States where separate assessment is not already required by law, that such separation would be a panacea for existing inequities. Of course, in order to determine real estate valuations accurately and uniformly, there must be separate valuation of land and buildings. As has been repeatedly noted, the chief determinants of land values are essentially different from the main determinants of building values. But there can never be accurate and equitable taxation of real estate until the principle of separate assessment is applied not only to the total valuation of each land site and each building, but also to each external factor affecting the valuation of each land site, and to each factor of valuation and depreciation affecting buildings.

Even though separate assessments of land and of buildings have been required by law in nearly all of the States for many years, the inequities in assessments are as marked and as numerous in those States as in the States in which Assessors may make lump-sum appraisals, without separation of land-elements from building-elements, and without separation of frontage, depth, corner, alley or other land-valuation factors or new-cost and depreciation factors in building valuation.

Whatever the plan of taxation may be, it can never operate equitably without the use of adequate methods of valuation. The place to begin reform of the taxation system lies in correction of the prevailing inequities in valuation. That is the real present problem—to convey to tax officials and to real estate owners, as well as to non-owners of real estate, an appreciation of the importance of this problem, and to offer sound, logical methods for its solution.

In 1913 the Pennsylvania Legislature passed what has been popularly called the "Graded Tax Law," or "Pittsburgh Plan," applicable only to the second-class cities of Pittsburgh and Scranton. Under this plan the tax rate levied upon buildings was reduced to one-half the rate levied on land. But to avoid a sudden disturbance of existing conditions the law provided that this reduction should be accomplished by gradual stages. The bill creating this system was passed in the year 1913, the law to take effect in 1914. It provided that the tax rate on buildings should be reduced 10 per cent. every three years. This required four periods of reduction, each three years apart, at the end of which time the final 10 per cent. reduction was made. The tax rate for 1914 and 1915 was fixed at 100 per cent. on land and 90 per cent. on buildings. In other words, a property valued at $10,000 for land and $10,000 for buildings was taxed in those years in the proportion of $200 on the land and $180 on the buildings. For the years 1916, 1917 and 1918 the ratio was 100 per cent. on land and 80 per cent. on buildings. For the years 1919, 1920 and 1921 the ratio was 100 per cent. on land and 70 per cent. on buildings, and for the years 1922, 1923 and 1924, 100 per cent. on land and 60 per cent. on buildings. In 1925 the final reduction in the rate of taxation of buildings took place, and thereafter, unless there is a change in the law, the ratio will be 100 per cent. on the assessed valuation of land and 50 per cent. for buildings.

Practically all of the revenue of the City of Pittsburgh is derived from taxes on real estate. The Graded Tax Law calls for no change in the basis of assessing either land or buildings. The legal standard of assessment in Pennsylvania is the opinion of the Assessors as to fair selling value, without requirement of the use of rules for establishing relative values as between individual real estate holdings.

The following table gives the total assessment of Pittsburgh land, both absolute and relative, from 1913 to 1925. For comparative purposes, the estimated population of Pittsburgh as of July 1 in each year, together with relative increases, is included in the table:

PITTSBURGH LAND VALUATIONS FOR ASSESSMENT, AND ESTIMATED POPULATION, 1913-1925

Year	*Land Valuation*	*Per Cent.*	*Estimated Population (July 1st)*	*Per Cent.*
1913	483,849,932	100.	552,266	100.
1914	480,858,940	99.3	557,647	101.3
1915	480,191,010	99.2	563,028	102.
1916	483,316,070	99.9	568,409	103.
1917	482,149,040	99.6	573,790	103.9
1918	482,132,590	99.6	579,171	104.8
1919	480,131,130	99.2	584,552	106.
1920	479,850,740	99.1	591,033	107.
1921	480,461,700	99.3	602,452	109.2
1922	487,939,620	100.8	607,902	110.
1923	532,688,420	110.1	613,442	111.
1924	530,675,130	109.7	626,015	113.3
1925	547,475,280	113.3	......	....

Analysis of the foregoing table shows that from 1913 to 1925 the land assessments increased 13 per cent., and the same percentage of increase was indicated in estimates of population from 1913 to 1924. The singularly close relation between population and land assessments in 1925 is a most interesting phase of the Pittsburgh statistics. It will be noted that for seven years following 1913 the land assessments were slightly less than in the former year—as though land had immediately fallen in taxable value the day the new law was put into operation. The population increase was gradual and continuous, but the increase in land assessments did not begin until 1922, and jumped nearly 10 per cent. in 1923, receding slightly in 1924 and increasing nearly 5 per cent. from 1924 to 1925.

The assessments of buildings increased 61.1 per cent. within the period from 1913 to 1925 inclusive, the figures for each year being as follows:

PITTSBURGH BUILDING VALUATIONS FOR ASSESSMENT, 1913-1925

Year	*Building Valuation*	*Per Cent.*
1913	274,516,978	100.
1914	282,069,870	102.7
1915	290,833,300	105.9
1916	299,247,850	109.1
1917	310,793,800	112.9
1918	320,438,820	116.7
1919	325,889,600	118.6
1920	334,386,420	121.8
1921	349,386,420	127.2
1922	380,238,310	138.6
1923	396,176,380	144.4
1924	420,482,780	153.2
1925	441,354,840	161.1

This table shows that there was an absolute increase in the valuation of buildings in Pittsburgh for purposes of taxation equal to approximately $167,000,000. On the other hand, the total estimated cost of new buildings in the City of Pittsburgh from 1914 to 1923 inclusive was not less than $189,000,000. In other words, it appears that old buildings are to-day assessed at the same prices as in 1913, and new buildings have been assessed at perhaps 70 to 80 per cent. of their cost, without depreciation.

The supporters of the Pittsburgh Law contend that the higher tax rate on land values than on improvements will inevitably result in reducing selling prices of land.. "Selling price" is the legal basis for valuation of land for tax purposes in Pennsylvania. If, therefore, the selling price of land decreases because an ever-larger percentage of the rental value is presumably taken away in taxes, the valuation of such land, based on selling prices, will also decrease. But this lower land assessment, when based on selling prices, will largely counteract the effect of a relatively higher rate of taxes on land values thus established. This is reflected in the results of the operation of this law in Pittsburgh. In 1914, for example, as shown in the following percentage computations, the relative city tax burden borne by land was 65.45 per cent. of the total tax levied against land and improvements on land, while in 1925 it was 71.28 per cent., or an increase of 5.83 per cent., although the official rate of taxation on land values in 1925 was 50 per cent. higher than the rate on buildings.

The following summary shows the basic facts illustrating the effects of the law in Pittsburgh:

RELATIVE TAXATION STATISTICS IN PITTSBURGH—
1914 AND 1925

	Land Taxation		*Taxation of Buildings*	
	1914	*1925*	*1914*	*1925*
Tax rate per $1,000.00 .	**$9.40**	**$19.50**	**$8.46**	**$9.75**
Per cent. increase in tax rate	**107½%**		**15¼%**	
Taxes collected	**$4,520,074**	**$10,695,268**	**$2,386,311**	**$4,309,547**
Per cent. increase in taxes collected	**136.6%**		**80.6%**	
Per cent. increase in assessment	**13.3%**		**61.1%**	
Percentage of total tax burden borne by land and buildings respectively	**65.45%**	**71.28%**	**34.55%**	**28.72%**

We have made some efforts to ascertain whether the operation of the Graded Tax Law in Pittsburgh has actually brought about a noticeable effect upon the prices of real estate, and especially upon the prices of land, in accordance with the accepted theories relating to taxation. These efforts have not been successful. It would not be fair, in the absence of better proof of land market values than the Pittsburgh assessment provides, to assume that the effect of the law has been to reduce the selling prices of land, or that the slight reduction in assessments of buildings as compared to land has stimulated the construction of buildings beyond the stimulation which has been noted in building construction in other American cities within the same period.

In another chapter of this book the reader will find statistics which appear to prove that the 1925 assessments of both land and buildings combined in the high-value business center of another important city amount to less than the fair value of the land alone, thus indicating the practically total exemption of buildings from taxation in that district. It is doubtful whether the exemption of buildings under the Pittsburgh Law is in fact greater (and it is possibly not as great) as in the district referred to in the city of Philadelphia, even though the law may theoretically appear to operate to reduce taxation upon buildings as compared to taxation upon land.

That the law is approved by many people in Pittsburgh is evidenced by the failure of efforts for its repeal, but these facts do not prove that the law is accomplishing the results expected from its passage.. There are many municipalities in which no-method assessments are approved by many taxpayers, but the willingness of taxpayers to continue such methods cannot be considered as constituting an argument against more accurate assessment methods. The verdict as to the effect of the Pittsburgh Law must, at the present time, be one of uncertainty. Theoretically the law should have had some special economic effect in the community. Those citizens who incline to believe in the efficacy of the Single Tax are accustomed to quoting statistics to show that activity in building construction in Pittsburgh has been due to the reduction in taxation on buildings, but this supposed reduction instead of amounting to 50 per cent. is, as previously indicated, less than 6 per cent.

In New Zealand, where a number of towns and cities levied all their local taxes on land values, a comparison made some years ago with towns and cities which were taxing real estate—both land and improvements—showed that the land-value-taxing communities had increased more rapidly in population, in building values and in land values than the towns which taxed both land and improvements. The rate of increase in building values was greater than the increase of population, and the rate of increase in land values was larger than for either population or building values. Evidently the theoretical reduction in land valuation, due to the shifting of taxes from buildings to land, was more than overcome by the stimulating effect of the untaxing of buildings. If the partial untaxing of buildings in Pittsburgh served to bring about similar results, it is apparent that the land values are so largely under-assessed, and therefore untaxed, as to partly neutralize the discrimination the law was intended to confer.

It may be contended by the supporters of the Pittsburgh Graded Tax Law that if the law had not been put into effect, buildings would in 1925 have borne a relatively higher share of the city taxes, and land correspondingly less. This assumption, however, appears to be contrary to fact, for if the ratio of land valuations to building valuations which pertained in 1914 had been the same in 1925, land valuations for tax purposes would be 22 per cent. greater than they actually were. A uniform rate of taxation on land and building valuations under these conditions would have distributed the tax burden in Pittsburgh in 1925 very nearly as it was distributed before the operation of the Graded Tax Law.

The Single Taxers will argue, undoubtedly, that the effect of the law must be a reduction in the selling price of land. If it should be pointed out in reply that there is no evidence that selling and rental prices in Pittsburgh have failed to keep pace with increasing prices in other American cities, the inevitable response of the theorist would be that but for the operation of the law the prices would surely be higher than they are. This contention, in view of the many cross-currents of the twelve years from 1913 to 1925 is purely hypothetical, and cannot be proved.

CHAPTER XXVII

LEGISLATIVE PROCEDURE FOR ESTABLISHING EQUITABLE ASSESSMENT METHODS

PRESENT LAWS DO NOT PROHIBIT THE USE OF ACCURATE TOOLS ON THE PART OF ASSESSORS IN MAKING VALUATIONS—MOST LAWS DO NOT PRESCRIBE WHAT TOOLS SHOULD BE USED—MUCH COULD BE ACCOMPLISHED BY ADOPTING UNIFORM METHODS OF VALUATION BOTH OF LAND AND OF IMPROVEMENTS ON LAND—ATTITUDE OF LEGISLATORS TOWARD SCIENTIFIC ASSESSMENT—NECESSARY PROVISIONS OF A LEGISLATIVE BILL FOR AN EQUITABLE ASSESSMENT—THE IMPORTANCE OF EXPERT KNOWLEDGE IN MAKING VALUATIONS—POSSIBILITY OF RENDERING EXPERT ASSISTANCE TO ASSESSORS —LEGALITY OF SUCH ASSISTANCE CAN SCARCELY BE QUESTIONED—WITH THE COOPERATION OF TAXPAYERS LEGISLATORS MAY FINALLY BE INFLUENCED TO PROVIDE LAWS FOR EQUITABLE ASSESSMENT METHODS.

THE first step towards universal correction of inequality of assessments is to bring home to taxpayers and legislators a sense of the futility of the existing idealistic approaches to the valuation problem as indicated by the prevailing statutory value-definitions. The Assessor cannot possibly comply with a law requiring "fair market value" or "true value in money" as the basis for assessment unless he knows how to find it. If scientific methods are to be adopted by Assessors, they must have scientifically constructed rules and tools. There is nothing in the statutes of any State to prohibit the use of adequate tools if the Assessor can invent or secure them; but in the absence of statutory requirement of analysis, it will be only the occasional Assessor who will undertake scientific valuation work. The problem of equitable assessment is universal, and it calls for universal workable rules, prescribed by law and binding upon all tax administrators. These rules would serve as a guide to the ambitious Assessor, so that he could properly perform his duties. They would give him the opportunity to look every taxpayer in the eye, and with a clear conscience prove that every factor affecting the value of real estate had been given due consideration, and that he could show in practical detail the effect upon valuation of each factor affecting the value of every site. Such a requirement in the law would compel analysis, would protect the Assessor from unfair criticism, and would protect every taxpayer from unfair assessment.

Valuations, made according to Somers System analysis can be shown to be accurate comparisons for each parcel of real property involved. The detailed basis of unit-foot or acre judgments, and the detailed computations, would be recorded for every site. The detailed schedule of building construction factors and of depreciation-judgments applied uniformly so far as possible to all structures would show the same combination of appraisal judgment and mathematical computation for buildings that is shown in the land valuation records. A change in opinion as to the unit-foot valuation for one lot would require a similar change in the basis of computation of the values of other lots affected by the same street frontage influences; and a change in the valuation-factors of one building should affect the appraisal of all other buildings of the same type. Justice to all would be the result of the application of systematic methods of valuation throughout the entire appraisal process.

Several bills have been introduced in State Legislatures for the purpose of setting up standards of analysis similar to the Somers methods, by way of supplementing the statutory ideal of "fair market value" or the "true value in money." Such a bill was recently sponsored before the Joint Committee on Taxation of the two houses of the Massachusetts Legislature. The sponsor of the bill was given a respectful hearing from the committeemen. At the close of the session the Chairman said privately:

"Of course you know that this bill doesn't stand a chance of passing."

The sponsor assented by saying: "Certainly; it is not expected that a plan so little understood can be passed by the first effort."

The Chairman continued with emphasis: "But the bill is a proper measure. We will be obliged to adopt such a plan before long, to correct the existing confusion in assessments, and it should not be difficult eventually to prove the necessity and great importance of such legislation."

A legislative act to exemplify the Somers principles of valuation should seek to amplify the statutory maxim of "fair market value," or whatever phrase may be employed, by a requirement that the Assessor shall—

1. Prepare unit-valuation maps showing the block outlines of each city, and lot and block maps showing the dimensions of all sites within the taxing district.

2. Record upon the unit-valuation maps his judgment of the value of each single street, in terms of a price per unit-foot of land area. There should be provision for the publication of tentative street valuations and public discussion before their final adoption.

3. Prescribe or adopt uniform methods for the conversion of the unit-foot valuations, which are for 100 feet of depth, into front-foot valuations for lots which are so located that they are deemed to have usefulness derived from a single street accessibility. For this purpose the Somers or other depth percentages may be used.

4. Prescribe or adopt uniform methods for computing the value of lots affected by two or more factors of street accessibility or usefulness (at or near corners), with reference to the unit-foot valuations determined by the Assessor, as well as with reference to the size and shape of the lots, and their relation to the street or streets. The Somers corner tables or other tables of uniform character can be adopted for this purpose.

5. Prescribe or adopt uniform methods, so far as may be possible, for appraising and computing the effect upon valuation of secondary value-factors such as alleys, railways, waterways, etc.

6. Apply special judgment to each lot to show the value-effect of abnormal influences; by deducting from the computed valuation the Assessor's opinion of the loss of usefulness due to topographical irregularities, lack of utility, or other influences which may be deemed to lessen the actual usefulness; and adding for special influences the amount which the Assessor may judge such influences to enhance the value of each lot, in addition to the normal valuation as computed.

7. Record upon a card for each lot, the lot and block number, the owner, the dimensions, the unit-foot valuations, the computations, and the special additions or deductions, if any, giving the reasons for such special additions or deductions.

8. Record upon cards the measurements, the architectural characteristics, the factors of valuation at cost of new reproduction and the factors of depreciation of all buildings or structures.

All this may appear to provide a complicated scheme of valuation, and beyond the power of the ordinary Assessor. The answer to this objection is that the assessment problem *is* a complicated one, which requires such a procedure in order to simplify it. Anything less than this procedure will be insufficient to accomplish the desired result, because a less analytical process will fail to give proper consideration to all the elements that must be considered. If the Assessor does not possess the requisite ability to make such an assessment, or if the routine duties of his office are so numerous as to make it impracticable to direct the work himself, he may be able to secure the necessary appropriation for the employment of expert assistance. In this event the collection of data will be managed by employed experts, and the Assessor, relieved of the necessity of giving personal attention to details, can give his best consideration to the determination and checking of the data collected, and the application of specific factors to specific parcels of real estate.

There are some States in which State Tax Commissions have been given power of direction of local Assessors in their methods of determining valuations for purposes of taxation. Some of these States, with authority to prescribe the methods of assessment, have limited the exercise of this power to directing only the forms in which valuations shall be recorded, and have hesitated to undertake the direction of the process by which data regarding values shall be collected and applied. State Tax Commissions are naturally hesitant at undertaking the application of so elaborate a procedure as the Somers Unit System requires. In the States of Wisconsin and Michigan, and in several other Commonwealths, the Tax Commissioners have frequently sent out staffs of their own experts who have completely revalued the real estate of cities in which they deemed the assessments inequitable. Many of these revaluations have been made with the special purpose in view of increasing assessments, the State having an interest in increasing its revenues. These Mid-Western States have in their revaluations depended extensively upon lists of selling prices which they have compiled at large expense, and they have undertaken the impossible task of using such prices for valuation purposes, without public discussion of their applicability. In another chapter we have pointed out the fact that most selling prices are in fact above or below normal exchange values, and usually are influenced more by the necessities than the willingness of buyers and sellers. Much time and money may be ineffectually spent in the undertaking by a State Tax Commission to appraise individual lots and their buildings by attempting to harmonize selling prices in a general city revaluation. Much time and money can be saved by a State Tax Commission with reassessment power by public discussion of unit-foot values, thus securing from the community direct the sound basis for comparative appraisals. A selling price should be regarded as a specific result of certain negotiations, not as adequate evidence of value unless the price, when known (which is seldom), shall be proved an accurate factor of normal value by evidence other than this price.

Under such a statute as is described in this chapter, a Tax Commission could prescribe unit-valuation methods for all city Assessors, and through duplicate unit-foot maps to be furnished the Commission could establish an accurate check upon the work of all Assessors within their jurisdictions. One Commission—in Arizona—some years ago employed Somers System experts to apply the System in the revision of the assessments in a number of the principal population-centers of the State, and other Commissions have recommended the services of Somers System experts to local Assessors with excellent results.

There are a number of States where the statutes specifically provide that the Assessors must be citizens of their taxing districts, and that all valuations must be made by such Assessors, thus apparently precluding the possible employment of outside experts. But that interpretation of the law is not a fair one. Somers System experts have met with several taxpayers' injunctions, and it has been clearly established by court decisions that expert services may be legally employed by way of assistance to the Assessors, if the Assessors so desire, without in any degree impinging upon the Assessors' legal duty to fix final real estate values themselves. They have the clear right to employ experts to collect information and data as a basis for their action in determining valuations. The Interstate Commerce Commission is the legal authority for fixing the valuation of railroads. But the nine members of that Commission do not collect the inventories or the price data upon which the valuations are based, although they in fact possess the power, and are charged with the duty, of fixing the values. This rule applies to the assessing function in general. Experts may legally be employed in any taxing district to assist the Assessors, provided the Assessors desire such assistance and provided the local county or city authorities, having the power to appropriate the money, decide to vote an appropriation to pay the experts' fee. In one city, in fact—Johnstown, Pa.—Somers experts were employed by the City Commission which under its charter possessed the power of reviewing the Assessors' valuations. In that city the Mayor was opposed to the employment of experts, and the Assessors refused to use their services, yet the court refused an injunction on the ground that the Commissioners could legally employ experts to collect information that would aid them in reviewing the Assessors' valuations.

Eventually, through the assistance of taxpayers who will have come to understand the situation, legislators will discover that equality of assessment must come through the application of scientific principles of valuation and uniform methods of computation; and will seek for ways in which the existing inequities can be cured by requiring analysis of valuations instead of appraisal by guesswork.

CHAPTER XXVIII

FIELDS FOR FURTHER RESEARCH IN URBAN LAND ECONOMICS

CONSERVATISM CONCERNING NEW IDEAS—THE SOMERS SYSTEM NOT AN UNTRIED THEORY OF REFORM—REASON MUST FINALLY TRIUMPH OVER IGNORANCE AND PREJUDICE—FURTHER STUDY AND INVESTIGATION OF THE PROBLEM OF URBAN LAND VALUATION MUCH TO BE DESIRED—MANY SUBJECTS WORTHY OF ANALYSIS AND STUDY—A FEW SUBJECTS FOR FURTHER INVESTIGATION ENUMERATED—THEORY OF RELATIONSHIP BETWEEN URBAN LAND VALUES AND POPULATION—REQUISITES FOR AN INVESTIGATION INTO THIS SUBJECT—IMPORTANCE OF STREET AREAS TO IMPROVED AND UNIMPROVED LAND—EFFECT OF IMPROVEMENTS TO LAND UPON SITE VALUES—ANALYSIS OF TRAFFIC COUNTS—FURTHER ANALYSIS OF PLOTTAGE AND OF BUILDING RESTRICTIONS—CAREFUL ANALYSIS OF SALES OF URBAN LAND—FURTHER ANALYSIS OF RENTALS PAID FOR THE USE OF LAND—EFFECT OF SOCIAL PRESTIGE UPON LAND VALUES—CITY PLANNING AND CITY ZONING—THESE CONSTITUTE SOME OF THE QUESTIONS WORTHY OF FURTHER INVESTIGATION—BASIC PRINCIPLES OF A SCIENTIFIC SYSTEM OF LAND VALUATION RESTATED.

THE pure scientist sees no possible finality to his work of research into the chemical and mechanical secrets of Nature, and the civic and social investigator looks upon progress as a continued process of active adaptation. Yet there are in every community many good citizens, intelligent and successful in their special fields of activity, who are out of sympathy with new ideas. They are so well contented with things as they are that they instinctively oppose the introduction of new practices or suggestions of better ways of doing things. The industrial manager will not hesitate to throw into the scrap-pile hundreds of thousands of dollars' worth of useful machinery for a new machine of greater usefulness that insures better quality or larger quantity of production, yet his habit of mind may be firmly set against an improvement in the machinery of government that may be recognized as altogether inefficient; or he may be indifferent to such an improvement.

Particularly is this opposition prevalent in consideration of improvement in the methods of valuation of land, both for commercial and for taxation purposes. Many leading real estate operators are satisfied with rule-of-thumb valuation procedure. They lack full understanding of the fundamentals of their profession, and have resisted all movement towards a scientific attitude as to the exact measurement of land values, even though they may possess general information as to the general influences which cause demand for land. Most important American cities have dodged responsibility for undertaking the task of equalizing the tax burden on a scientific basis, by establishing and maintaining accurate standards of valuation. As this is written, the City of Chicago, through its City Council and Board of Education, is pursuing an investigation which the city officials hope will enable the municipality to meet its current financial obligations. The usual charges of favoritism are made, of overassessing the owners of small properties and of failing to discover all the values in the larger properties; and this naturally develops into a partisan argument. There is doubtless favoritism in Chicago, as elsewhere, but the solution of the assessment problem in that city, as in other municipalities, can never be found by casual investigation and the exchange of missiles. There is no essential antagonism between large and small taxpayers. The only possible solution of their differences lies in the recognition of the basic fact that it is possible, by accurate, scientific appraisal, to measure justice to every taxpayer. The law does not prevent it, for there is sufficient legal warrant in Chicago, and everywhere, to justify analytical methods in the appraisal procedure, although the law-makers may not have gone so far as to require such methods by statutes, except perhaps inferentially.

So long as it is possible to buy and sell real estate without giving attention to refinement in valuation methods, and so long as sufficient taxes may be collected to operate the several governmental units without proportional distribution of taxes on the basis of comparative valuation, there will be a wonderment on the part of the public as to why real estate appraisal may not be scientifically accomplished; and only through impartial study will the true solution of the problem reach a wide appreciation and understanding. Perhaps our economists to whom we look for enlightenment are partially to blame for their failure to extend their investigations far enough to discover and assert the truth. The Somers System has been known for twenty years or more. Its principles have permeated many real estate offices and many tax offices; yet the demonstration of its practicability and greater usefulness has excited little curiosity among economists, while a new discovery in chemistry or mechanics would command the instant attention of scientists in those fields.

Since human judgment is a factor in determining land assessments, taxpayers appear to be contented to leave the exercising of judgment to those who in their opinion seem to be qualified to pass such judgment. Assuming that it is the function of the Assessor to appraise real estate values on the basis of such evidence as he is willing, or is required, to accept, taxpayers often believe it not their business to meddle in his affairs. Still they are conscious of the fact that there are basic differences in the methods followed in the appraisals made by Assessors in different districts as to real estate values. Such differences they are apt to ascribe to carelessness, indifference, or perhaps favoritism on the part of Assessors, and proceed to criticise them accordingly.

But in the final analysis the sound judgment of one or two individuals in a city or town or county as to real estate values, no matter how wide their experience or how extended their range of knowledge, can never alone solve the assessment problem equitably, nor can it settle valuation questions for commercial purposes. As has been noted, the judgment of one or two individuals cannot suffice to determine real estate values with any degree of accuracy until such judgment is reduced to expression in terms of a common unit of quantity.

The exercising of human judgment, however, no matter by whom exercised, even if applied to a common unit of quantity, constitutes, as we have seen, only the first step in the appraisal process. Unless such judgment is subsequently employed as the basis for analysis, with mathematical accuracy, scientific valuation cannot be attained.

It takes time to bring about reform. Old institutions, regardless of the fact that they have become obsolete and antiquated, continue to exist in modern communities. Human beings appear to be afraid of reform and of reformers, because experience has frequently shown that proposed reforms, when finally adopted, have been subverted, and in reality were no improvement upon the existing order. If the Somers System were merely a suggested reform of methods of land valuation for taxation purposes, untried and untested, it might easily share the fate of many other so-called reforms, and be looked upon with skepticism. But the System has been tried, tested and examined in a large number of communities within the past fifteen years, and when properly installed has invariably been declared a pronounced success—a decided step forward in the process of equitable valuation. Even though further investigation and study were to reveal the fact that the standards adopted and the value-relationship of unit-quantities as well as the mathematical computations based on the unit-valuations do not conform precisely to actual observation and are open to modification, it is obvious that the same standards, even though not absolutely accurate, applied to all cases of urban land as well as of real estate valuation in general, will result in a greater degree of uniformity in assessments than now exists. It may be discovered that the Somers standards or quantity-units may not always be strictly applicable for specific purposes, but when better quantity-units shall be required, they can be developed. Eggs are sold by the dozen, yet it is common knowledge that the sizes of eggs vary considerably, so that the actual quantity of egg substance in a particular dozen differs essentially from that in another dozen. Still, for want of a more accurate quantity-unit in terms of which to express the price of eggs, we continue employing the dozen. So also in the valuation of unit-quantities of land. It may be found, upon further investigation, that the accepted unit-quantity—the unit-foot—and the computed value-relationships based on this unit are not applicable in all cases under consideration, and that another unit-quantity may better be employed, or another method of computation be adopted for expressing land values in certain localities. Any such changes, based on further study and analysis, may result in even greater scientific precision in computing city site values than under the Somers System methods as herein outlined.

Nevertheless, until such further improvement and refinement of methods can be devised, it is proper to assert that the best known methods of valuation of urban land, based on sound economic principles, translated into practice, should be employed in appraisal, particularly for purposes of taxation. Unless this is done it is impossible to remedy the inequality in real estate assessments which exist to-day, which impose an unjust burden of taxation on a large number of property owners. The Somers System represents the first step in the right direction, a pioneer attempt to establish the problem of land valuation on a scientific basis. Further study and analysis will in all probability reveal new knowledge, new facts which will serve as aids for exercising sound judgment of land values and for better understanding of the many factors influencing the desirability of urban locations.

There are many special phases of land valuation worthy of further detailed study and investigation, and a few of such research problems may be suggested in conclusion. The topics suggested by no means exhaust the list of subjects concerning which data should be gathered and analyzed with a view to establishing scientific urban land valuation on a sounder basis than heretofore.

The theory has frequently been advanced that a definite relationship can be established between urban land values in general—as well as between specific site values—and population.

One investigator into the determinants of land values, living for many years on the Pacific Coast—Elden W. Pollock of Seattle—believes he has actually discovered the exact mathematical relationship between land values and population, after fifteen years of experimentation and study. He does not fully approve the hypothesis that community expression of opinion of unit-foot values forms the first step in the appraisal process. In his opinion, community expression is the resultant of a series of value-influences, all of which can be definitely measured. He holds that the value of the unit-foot is a matter of measurement, representing the composite effect of a number of external value-factors, such as traffic conditions, transportation facilities, proximity to specific vantage points, topography of sites, as well as population and the general state of well-being of a community. To all such factors he has assigned definite numerical values, and thus, in his opinion, the whole problem of land valuation can be made one of computation rather than of expression of value-opinion, which constitutes the starting point of the Somers System.

Such an interesting theory will undoubtedly invite further speculation and examination. If it were possible to assign definite values to each of the innumerable external factors which influence opinion, it might be conceivable that unit-foot values could actually be computed on the basis of these factors. To the average individual such a task appears insurmountable, since the composite unit-foot valuation is the aggregate of so many variables, many of which bear a functional relationship to each other. Accessibility, in other words, is affected by proximity to different vantage points, width of thoroughfares, transit facilities, habits and customs of the people, and many similar influences.

The theory that a definite coefficient of correlation between land values and population does exist is well worth further investigation. If growth of population is one of the basic determinants of land values it would be a profitable field for research to endeavor to find a number of communities, having approximately the same population and characteristics, and to obtain an expression of opinion of land values in such communities, with a view to discovering a possible correlation between land values and population. Any such study, however, would require a detailed analysis of the topography of the towns or cities to be compared, of the means of communication and transportation, the proximity to other industrial or business centers, the manners, habits and customs of the inhabitants, the extent of their prosperity and thrift, as well as the nature of the institutions developed by them. All these and similar factors would tend to influence the desirability of respective street locations within these communities. Merely comparing land values with population in city areas cannot produce any scientifically valuable results, for unless all the surrounding circumstances—the separate elements affecting demand for urban locations—are carefully analyzed and weighed, such a comparison is of but minor significance. Furthermore, desirability alone does not determine the value of an urban site any more than it determines the value of any other article. We may desire a great many things and still not be able to get them. The desires must be made effective by ability to pay, and this paying ability in turn depends upon the incomes of the members of the community desiring locations.

The degree of enterprise, the extent of productive activity in any community, thus becomes an important consideration in connection with the analysis of land values. It is likely that decided differences in the highest valued land in two towns having actually the same population may be found to exist. To conclude that in consequence there is no possible correlation to be discovered between population and total or highest land values in the community seems hasty. Only continued careful analysis and investigation with a view to determining all the elements affecting land values can ultimately furnish a satisfactory solution to the problem of correlation between land values and population.

Inasmuch as streets constitute the general avenues of approach to city sites, their relative importance to the total improved and unimproved land areas in different districts of cities should be carefully studied. The relationships of land areas occupied by streets in retail business districts, both to improved and unimproved land areas as well as to population, should prove a profitable field for further investigation. City planning could proceed more intelligently if a thorough-going analysis were made of the adequate amount of street space for different purposes and under varying conditions which should be available to derive the maximum utility from sites. As unoccupied or partially improved land grows relatively scarcer in the congested retail business districts of cities, and buildings grow taller, the question of adequate street facilities to accommodate ever-increasing numbers of persons occupying such limited areas of land is becoming increasingly important.

The effect of improvements to land upon urban site values likewise requires further careful observation, not only for purposes of equitable assessment of such improved land, but also to provide a source of information for prospective investors in both unimproved and improved land. Again, the question of the profitability of investing in unimproved city lands with a view to realizing a possible gain due to increase in land values in growing communities, and with increased prosperity, should offer an interesting field for continued research. The few studies which have been made along this line thus far are inconclusive, and not until considerable additional data have been made available can any satisfactory generalization be made.

Traffic counts have been employed from time to time to ascertain the patronage of certain street locations to determine their approximate importance for different types of business. Careful analyses of traffic counts should prove invaluable to prospective business enterprises desiring to establish in desirable locations. Such analyses should be made not merely for different hours of the day and days of the week; but perhaps even more important, for the nature or constituency of the traffic. Traffic opposite a railway terminal of a large city, or adjacent to a large industrial plant, may be considerably greater than traffic in another section of the city, but this fact alone would not determine the greater importance of the former as compared with the latter location for retail business purposes.

The analysis of plottage or the re-allocation of urban lot lines, particularly in high-valued retail business districts, in order to realize the maximum benefits of such areas, is a subject of decided practical interest, and worthy of continued study. Again, the effect of building restrictions of various kinds as a factor tending either to increase or decrease site values, is likewise of practical significance, particularly for the purpose of equitable assessment of land.

A careful record of all the ascertainable circumstances surrounding the sale of city lands, in order to determine if possible which sales actually reflect normal competitive conditions among buyers and sellers, should prove highly valuable data for testing the depth percentages adopted by land valuation authorities in different cities, as well as for proving or disproving the reliability of sales prices as evidence of fair values. An analysis of the average dimensions of sites in different cities should prove practically useful for determining an appropriate unit of land area with reference to which unit land values could be actually expressed and utilised for purposes of computation.

A study of the ratio of rentals to gross sales and total costs in a number of lines of retail business should throw some light on the relative importance of sites to different types of industrial establishments, and thus serve as a possible index for determining localization of industries. Furthermore, the location of sources of labor power, the relative mobility or immobility of labor as reflected in ownership of individual homes, all in relation to the available sites for industries in the neighborhood, should be found to be a subject well worth investigating.

Social prestige, race, religious affiliations and similar factors as influences affecting the desirability of urban locations are other interesting subjects intimately connected with land valuation. The results of an investigation into this subject might prove of practical value to present or prospective investors.

With the rapid development of large industrial centers and the many resultant problems of economic utilization of urban lands for the manifold purposes for which they may be employed, the question of city planning and city zoning has attracted considerable attention in recent years. Further systematic study of this fascinating subject will no doubt prove highly profitable.

Finally, the problem of equitable taxation of land values, either at present or in the future, cannot be solved if, as has been previously pointed out, assessments are not based on the application of uniform standards of judgment and computation. Human judgment cannot be sound if there are no rules, no principles, no facts, to guide such judgment to uniform expression. The analysis of the factors affecting urban site values and an estimate of their relative importance should therefore be invaluable information to any one desiring to pass sound judgment based on reason, and supported by facts, rather than on guessing.

The suggestions here made by no means exhaust the possible subjects related to urban land valuation which will bear continued investigation and study. This field for investigation is practically virgin soil, and it will require continued vigorous pioneer work on the part of those who are imbued with a thirst for knowledge and a love for truth to produce results which will ultimately accrue to the benefit of mankind.

In conclusion, it may be well to reiterate once more the basic principles upon which a system of scientific land valuation must be established:

In the first place, the fact that land values are community values, created by society at large, and not by the individual owners of land, must be clearly comprehended and appreciated.

Secondly, accepting this basic fact as true, methods must be devised of expressing and recording community opinion as to relative land values, and the Somers System makes possible the practical use of such opinion for computing individual site values.

Thirdly, mathematical formulæ must be employed for translating community opinion into actual site valuation, based on sound observation and careful analysis of available facts, and the Somers formulæ have served this purpose successfully in many cities.

Finally, each single external value-influence or physical factor of value must be separately appraised by opinion or judgment, or by rule if possible, and allocated to each individual site.

The validity and soundness of these basic principles cannot be denied. The fact that it is difficult at times to apply them in actual practice makes the problem of scientific land valuation all the more attractive. If this exposition of the Somers System of Land Valuation, based on these principles, will serve as an aid to those who buy and sell and use land, or to those who are interested in the study of the uses of city land, or to public-spirited Assessors, who, realizing the inequities of prevailing methods of real estate assessments, are desirous of adopting uniform methods of land valuation for purposes of taxation, it will have accomplished its purpose.

APPENDICES

The Appendices include two sets of tables:

1. Ten Illustrative Somers Corner Tables;
2. The Somers Zone and Overlap Tables.

The construction of the Somers Corner Tables is described in Chapter XVII. These tables are used to compute the values of sites in retail business sections at or near intersecting streets, no matter at what angle such streets intersect. The methods of making computations with the aid of the Somers Corner Tables is illustrated on pages 142 to 146.

It should be remembered that corner enhancement computed from these Somers Corner Tables is for areas where the highest normal development of city land has been attained. For semi-business and residential areas the enhancement over single-street values is not so great; but percentages of the enhancements computed with the aid of these Corner Tables may be uniformly applied in the less-developed districts.

The Zone and Overlap Tables are derived from the Depth Table as explained on page 95. They are used to compute the values of irregular "inside" lots. The method of employing these tables is explained on page 94. In addition to their use for computing the values of irregular inside lots, the Zone Tables are also employed to determine the point and direction of overlap influence as explained in Chapter XV.

APPENDIX I

Table No. 1—Somers Retail Business District Corner Table

UNIT-FOOT VALUE $1000

UNIT-FOOT VALUE $100

CORNER	10	20'	30'	40'	50'		60'	70	80'	90	100		
10'	1 2741	11 2631	21 2588	31 2572	41 2555	13087	51 2547	61 2537	71 2518	81 2507	91 2503	12612	25699
20	2 2002	12 1804	22 1723	32 1670	42 1647	8846	52 1641	62 1631	72 1613	82 1605	92 1602	8092	16938
30	3 1695	13 1479	23 1377	33 1352	43 1339	7242	53 1333	63 1326	73 1310	83 1303	93 1301	6573	13815
40	4 1462	14 1228	24 1126	34 1074	44 1051	5941	54 1041	64 1029	74 1009	84 1004	94 1001	5084	11025
50	5 1268	15 1054	25 972	35 920	45 889	5103	55 886	65 871	75 852	85 851	95 851	4311	9414
	9168	8196	7786	7588	7481	40219	7448	7394	7302	7270	7258	36672	76891
60	6 1062	16 940	26 859	36 830	46 791	4482	56 734	66 726	76 709	86 702	96 701	3572	8054
70	7 947	17 841	27 772	37 738	47 701	3999	57 646	67 636	77 619	87 612	97 611	3124	7123
80'	8 857	18 754	28 686	38 648	48 616	3561	58 568	68 558	78 540	88 534	98 531	2731	6292
90'	9 775	19 675	29 607	39 572	49 541	3170	59 519	69 499	79 482	89 473	99 470	2443	5613
100'	10 714	20 615	30 549	40 521	50 484	2883	60 475	70 470	80 446	90 442	109 440	2273	5156
	4355	3825	3473	3309	3133	18095	2942	2889	2796	2763	2753	14143	
	13523	12021	11259	10897	10614	58314	10390	10283	10098	10033	10011	109129	GRAND TOTAL

UNIT-FOOT VALUES—$1,000: $100

This table shows the Somers computed values for all 10-foot squares within the area of 100' x 100' from the street intersection in retail business districts of American cities. The unit-foot values in this table bear a relationship of 10 to 1—that is, the unit-foot value of the higher-valued street is ten times that of the other street. To compute the value of any corner or near-corner site in a retail business district, the dimensions of the site should be carefully laid off on a corner diagram, and the volues within the described areas totalled.

In computing semi-business and residential corner or near-corner sites, the appraiser can use a percentage of the computed values for corresponding full-value sites. Any such percentage, chosen to conform to careful observation can be used without violation of the Somers principle of corner valuation.

The same result can also be attained for corner or near-corner site values in semi-business or residential districts in another way. The values of such sites may first be computed as retail business sites with the aid of the corner tables. Then their values may be computed as inside lots with reference to the higher-valued street. The difference between the two computed values will represent the corner influence enhancement, of which a definite percentage may be taken and added to the computed values as inside lots.

Table No. 2—Somers Retail Business District Corner Table

UNIT-FOOT VALUE $1000

UNIT-FOOT VALUE $200

CORNER	10'	20'	30'	40'	50		60'	70'	80	90	100'		
10'	1 2783	11 2673	21 2626	31 2604	41 2582	13268	51 2569	61 2553	71 2531	81 2514	91 2506	12675	25943
20	2 2084	12 1828	22 1747	32 1691	42 1664	9014	52 1657	62 1642	72 1621	82 1611	92 1604	8135	17149
30	3 1792	13 1518	23 1395	33 1365	43 1348	7418	53 1341	63 1332	73 1316	83 1306	93 1302	6597	14015
40'	4 1567	14 1278	24 1154	34 1099	44 1073	6171	54 1058	64 1039	74 1015	84 1008	94 1001	5121	11,292
50'	5 1378	15 1110	25 1005	35 950	45 899	5342	55 892	65 872	75 854	85 852	95 852	4322	9664
	9604	8407	7927	7709	7566	41,213	7517	7440	7337	7291	7265	36,850	78,063
60	6 1182	16 1002	26 898	36 860	46 804	4746	56 743	66 732	76 714	86 704	96 702	3595	8341
70'	7 1068	17 903	27 815	37 769	47 714	4267	57 658	67 642	77 624	87 614	97 612	3150	7417
80'	8 978	18 818	28 733	38 677	48 633	3839	58 582	68 567	78 546	88 538	98 531	2764	6603
90'	9 895	19 741	29 655	39 604	49 562	3457	59 533	69 509	79 590	89 476	99 470	2478	5935
100'	10 845	20 682	30 599	40 553	50 509	3188	60 491	70 480	80 452	90 444	100 440	2307	5495
	4968	4146	3700	3461	3222	19,497	3007	2930	2826	2776	2755	14234	
	14572	12553	11627	11170	10788	60,710	10524	10370	10163	10067	10020	111,854 GRAND TOTAL	

UNIT-FOOT VALUES—$1,000: $200

This table shows the Somers computed values for all 10-foot squares within the area of 100′ x 100′ from the street intersection in retail business districts of American cities. The unit-foot values in this table bear a relationship of 10 to 2—that is, the unit-foot value of the higher-valued street is five times that of the other street. To compute the value of any corner or near-corner site in a retail business district, the dimensions of the site should be carefully laid off on a corner diagram, and the values within the described areas totalled.

In computing semi-business and residential corner or near-corner sites, the appraiser can use a percentage of the computed values for corresponding full-value sites. Any such percentage, chosen to conform to careful observation can be used without violation of the Somers principle of corner valuation.

The same result can also be attained for corner or near-corner site values in semi-business or residential districts in another way. The values of such sites may first be computed as retail business sites with the aid of the corner tables. Then their values may be computed as inside lots with reference to the higher-valued street. The difference between the two computed values will represent the corner influence enhancement, of which a definite percentage may be taken and added to the computed values as inside lots.

Table No. 8—Somers Retail Business District Corner Table

UNIT-FOOT VALUE $1000

UNIT-FOOT VALUE $300

CORNER	10'	20'	30'	40'	50'		60'	70'	80'	90	100'		
10'	1 2827	11 2717	21 2666	31 2638	41 2609	13457	51 2592	61 2573	71 2545	81 2522	91 2509	12741	26198
20'	2 2171	12 1853	22 1772	32 1713	42 1681	9190	52 1674	62 1653	72 1630	82 1617	92 1607	8181	17371
30'	3 1893	13 1560	23 1413	33 1379	43 1358	7603	53 1350	63 1339	73 1323	83 1309	93 1303	6624	14227
40'	4 1676	14 1329	24 1183	34 1125	44 1096	6409	54 1076	64 1050	74 1021	84 1012	94 1002	5161	11570
50	5 1493	15 1168	25 1040	35 982	45 910	5593	55 898	65 873	75 856	85 853	95 853	4333	9926
	10060	8627	8074	7837	7654	42252	7590	7488	7375	7313	7274	37040	79292
60'	6 1304	16 1067	26 940	36 892	46 817	5020	56 753	66 739	76 719	86 707	96 703	3621	8641
70'	7 1194	17 968	27 859	37 797	47 727	4545	57 671	67 649	77 629	87 617	97 613	3179	7724
80'	8 1104	18 885	28 782	38 707	48 651	4129	58 596	68 576	78 553	88 542	98 532	2799	6928
90'	9 1019	19 809	29 705	39 637	49 584	3754	59 548	69 520	79 498	89 479	99 470	2515	6269
100	10 958	20 751	30 651	40 586	50 535	3481	60 508	70 491	80 458	90 446	100 440	2343	5824
	5579	4480	3937	3619	3314	20929	3076	2975	2857	2791	2758	14457	
	15639	13107	12011	11456	10968	63181	10666	10463	10232	10104	10032		114678 GRAND TOTAL

UNIT-FOOT VALUES—$1,000 : $300

This table shows the Somers computed values for all 10-foot squares within the area of 100' x 100' from the street intersection in retail business districts of American cities. The unit-foot values in this table bear a relationship of 10 to 3—that is, the unit-foot value of the higher-valued street is $1,000 and that of the other street is $300. To compute the value of any corner or near-corner site in a retail business district, the dimensions of the site should be carefully laid off on a corner diagram, and the values within the described areas totalled.

In computing semi-business and residential corner or near-corner sites, the appraiser can use a percentage of the computed values for corresponding full-value sites. Any such percentage, chosen to conform to careful observation can be used without violation of the Somers principle of corner valuation.

The same result can also be attained for corner or near-corner site values in semi-business or residential districts in another way. The values of such sites may first be computed as retail business sites with the aid of the corner tables. Then their values may be computed as inside lots with reference to the higher-valued street. The difference between the two computed values will represent the corner influence enhancement, of which a definite percentage may be taken and added to the computed values as inside lots.

Table No. 4—Somers Retail Business District Corner Table

UNIT-FOOT VALUE $1000

UNIT-FOOT VALUE $400

CORNER	10'	20'	30'	40'	50'		60'	70'	80'	90'	100'		
10'	1 2875	11 2765	21 2710	31 2675	41 2639	13664	51 2618	61 2594	71 2560	81 2530	91 2513	12815	26479
20'	2 2266	12 1881	22 1799	32 1736	42 1701	9383	52 1692	62 1666	72 1641	82 1623	92 1610	8232	17615
30'	3 2002	13 1605	23 1434	33 1394	43 1368	7803	53 1361	63 1347	73 1331	83 1313	93 1305	6657	14460
40'	4 1794	14 1386	24 1214	34 1154	44 1121	6669	54 1095	64 1061	74 1027	84 1017	94 1002	5202	11871
50'	5 1618	15 1231	25 1077	35 1017	45 921	5864	55 905	65 875	75 858	85 855	95 855	4348	10212
	10555	8868	8234	7976	7750	43383	7671	7543	7417	7338	7285	37254	80637
60'	6 1439	16 1137	26 985	36 927	46 831	5319	56 764	66 747	76 724	86 710	96 705	3650	8969
70'	7 1331	17 1039	27 908	37 829	47 741	4848	57 684	67 657	77 634	87 620	97 615	3210	8058
80'	8 1241	18 959	28 835	38 739	48 671	4445	58 612	68 586	78 561	88 547	98 532	2838	7283
90'	9 1156	19 885	29 761	39 674	49 609	4085	59 565	69 531	79 507	89 483	99 470	2556	6641
100'	10 1094	20 828	30 707	40 622	50 564	3815	60 526	70 503	80 465	90 448	100 440	2382	6197
	6261	4848	4196	3791	3416	22512	3151	3024	2891	2808	2762	14636	
	16816	13716	12430	11767	11166	65895	10822	10567	10308	10146	10047		117,785 GRAND TOTAL

UNIT-FOOT VALUES—$1,000: $400

This table shows the Somers computed values for all 10-foot squares within the area of 100′ x 100′ from the street intersection in retail business districts of American cities. The unit-foot values in this table bear a relationship of 10 to 4—that is, the unit-foot value of the higher-valued street is $1,000 and that of the other street is $400. To compute the value of any corner or near-corner site in a retail business district, the dimensions of the site should be carefully laid off on a corner diagram, and the values within the described areas totalled.

In computing semi-business and residential corner or near-corner sites, the appraiser can use a percentage of the computed values for corresponding full-value sites. Any such percentage, chosen to conform to careful observation can be used without violation of the Somers principle of corner valuation.

The same result can also be attained for corner or near-corner site values in semi-business or residential districts in another way. The values of such sites may first be computed as retail business sites with the aid of the corner tables. Then their values may be computed as inside lots with reference to the higher-valued street. The difference between the two computed values will represent the corner influence enhancement, of which a definite percentage may be taken and added to the computed values as inside lots.

Table No. 5—Somers Retail Business District Corner Table

UNIT-FOOT VALUE $1000

UNIT-FOOT VALUE $500

CORNER	10'	20'	30'	40'	50'		60'	70'	80'	90'	100'		
10'	1 2930	11 2820	21 2760	31 2717	41 2673	13900	51 2647	61 2617	71 2577	81 2540	91 2517	12898	26798
20	2 2373	12 1913	22 1830	32 1763	42 1723	9602	52 1713	62 1680	72 1653	82 1630	92 1613	8289	17891
30	3 2127	13 1657	23 1457	33 1410	43 1380	8031	53 1373	63 1356	73 1340	83 1317	93 1307	6693	14724
40	4 1930	14 1450	24 1250	34 1187	44 1150	6967	54 1117	64 1073	74 1033	84 1023	94 1003	5249	12216
50'	5 1760	15 1303	25 1120	35 1057	45 933	6173	55 913	65 877	75 860	85 857	95 857	4364	10537
	11120	9143	8417	8134	7859	44673	7763	7603	7463	7367	7297	37493	82166
60'	6 1593	16 1217	26 1037	36 967	46 847	5661	56 777	66 756	76 730	86 713	96 707	3683	9344
70'	7 1490	17 1120	27 967	37 867	47 757	5197	57 700	67 666	77 640	87 623	97 617	3246	8443
80'	8 1400	18 1043	28 897	38 777	48 693	4810	58 630	68 597	78 570	88 553	98 533	2883	7693
90'	9 1313	19 970	29 823	39 717	49 637	4460	59 583	69 543	79 517	89 487	99 470	2600	7060
100	10 1250	20 913	30 773	40 663	50 597	4196	60 547	70 517	80 473	90 450	100 440	2427	6623
	7046	5263	4493	3991	3531	24324	3237	3079	2930	2826	2767	14839	
	18166	14406	12910	12125	11390	68997	11000	10682	10393	10193	10064		121329 GRAND TOTAL

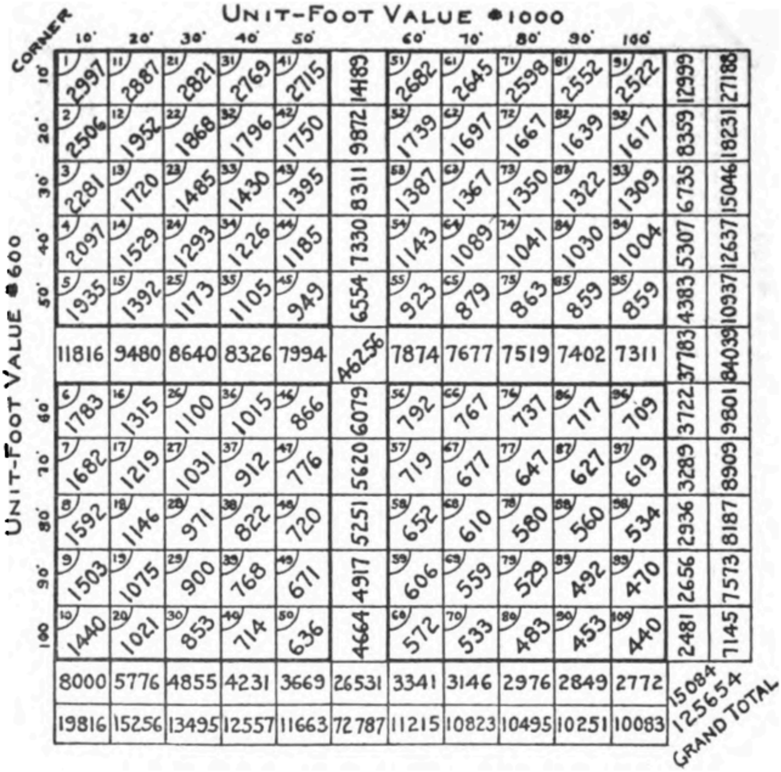
UNIT-FOOT VALUES—$1,000: $500

This table shows the Somers computed values for all 10-foot squares within the area of 100' x 100' from the street intersection in retail business districts of American cities. The unit-foot values in this table bear a relationship of 10 to 5—that is, the unit-foot value of the higher-valued street is twice that of the other street. To compute the value of any corner or near-corner site in a retail business district, the dimensions of the site should be carefully laid off on a corner diagram, and the values within the described areas totalled.

In computing semi-business and residential corner or near-corner sites, the appraiser can use a percentage of the computed values for corresponding full-value sites. Any such percentage, chosen to conform to careful observation can be used without violation of the Somers principle of corner valuation.

The same result can also be attained for corner or near-corner site values in semi-business or residential districts in another way. The values of such sites may first be computed as retail business sites with the aid of the corner tables. Then their values may be computed as inside lots with reference to the higher-valued street. The difference between the two computed values will represent the corner influence enhancement, of which a definite percentage may be taken and added to the computed values as inside lots.

Table No. 6—Somers Retail Business District Corner Table



UNIT-FOOT VALUE $1000

UNIT-FOOT VALUE $600

CORNER	10'	20'	30'	40'	50'		60'	70'	80'	90'	100'		
10'	1 2997	11 2887	21 2821	31 2769	41 2715	14189	51 2682	61 2645	71 2598	81 2552	91 2522	12999	27188
20'	2 2506	12 1952	22 1868	32 1796	42 1750	9872	52 1739	62 1697	72 1661	82 1639	92 1617	8359	18231
30'	3 2281	13 1720	23 1485	33 1430	43 1395	8311	53 1387	63 1367	73 1350	83 1322	93 1309	6735	15046
40'	4 2091	14 1529	24 1293	34 1226	44 1185	7330	54 1143	64 1089	74 1041	84 1030	94 1004	5307	12637
50'	5 1935	15 1392	25 1173	35 1105	45 949	6554	55 923	65 879	75 863	85 859	95 859	4383	10937
	11816	9480	8640	8326	7994	46256	7874	7677	7519	7402	7311	37783	84039
60'	6 1783	16 1315	26 1100	36 1015	46 866	6079	56 792	66 767	76 737	86 717	96 709	3722	9801
70'	7 1682	17 1219	27 1031	37 912	47 776	5620	57 719	67 677	77 647	87 627	97 619	3289	8909
80'	8 1592	18 1146	28 971	38 822	48 720	5251	58 652	68 610	78 580	88 560	98 534	2936	8187
90'	9 1503	19 1075	29 900	39 768	49 671	4917	59 606	69 559	79 529	89 492	99 470	2656	7573
100'	10 1440	20 1021	30 853	40 714	50 636	4664	60 572	70 533	80 483	90 453	100 440	2481	7145
	8000	5776	4855	4231	3669	26531	3341	3146	2976	2849	2772	15084	
	19816	15256	13495	12557	11663	72787	11215	10823	10495	10251	10083		125654 GRAND TOTAL

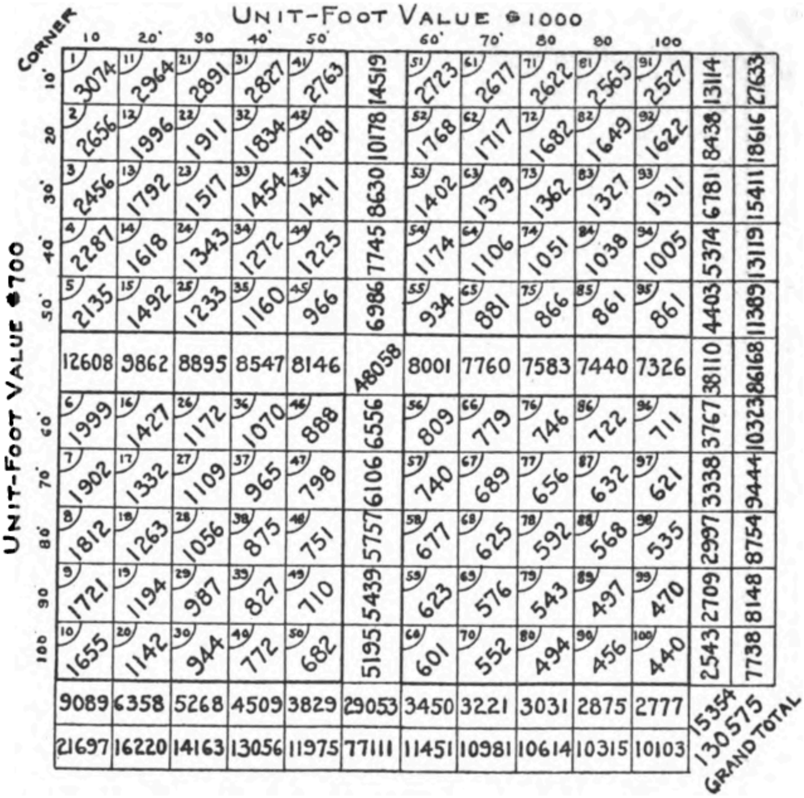
UNIT-FOOT VALUES—$1,000: $600

This table shows the Somers computed values for all 10-foot squares within the area of 100′ x 100′ from the street intersection in retail business districts of American cities. The unit-foot values in this table bear a relationship of 10 to 6—that is, the unit-foot value of the higher-valued street is $1,000 and that of the other street is $600. To compute the value of any corner or near-corner site in a retail business district, the dimensions of the site should be carefully laid off on a corner diagram, and the values within the described areas totalled.

In computing semi-business and residential corner or near-corner sites, the appraiser can use a percentage of the computed values for corresponding full-value sites. Any such percentage, chosen to conform to careful observation can be used without violation of the Somers principle of corner valuation.

The same result can also be attained for corner or near-corner site values in semi-business or residential districts in another way. The values of such sites may first be computed as retail business sites with the aid of the corner tables. Then their values may be computed as inside lots with reference to the higher-valued street. The difference between the two computed values will represent the corner influence enhancement, of which a definite percentage may be taken and added to the computed values as inside lots.

Table No. 7—Somers Retail Business District Corner Table



UNIT-FOOT VALUE $1000

UNIT-FOOT VALUE $700

CORNER	10	20'	30	40'	50'		60'	70'	80	80	100		
10'	1 3074	11 2964	21 2891	31 2827	41 2763	14519	51 2723	61 2677	71 2622	81 2565	91 2527	13114	27633
20	2 2656	12 1996	22 1911	32 1834	42 1781	10178	52 1768	62 1717	72 1682	82 1649	92 1622	8438	18616
30'	3 2456	13 1792	23 1517	33 1454	43 1411	8630	53 1402	63 1379	73 1362	83 1327	93 1311	6781	15411
40'	4 2287	14 1618	24 1343	34 1272	44 1225	7745	54 1174	64 1106	74 1051	84 1038	94 1005	5374	13119
50'	5 2135	15 1492	25 1233	35 1160	45 966	6986	55 934	65 881	75 866	85 861	95 861	4403	11389
	12608	9862	8895	8547	8146	48058	8001	7760	7583	7440	7326	38110	86168
60'	6 1999	16 1427	26 1172	36 1070	46 888	6556	56 809	66 779	76 746	86 722	96 711	3767	10323
70'	7 1902	17 1332	27 1109	37 965	47 798	6106	57 740	67 689	77 656	87 632	97 621	3338	9444
80'	8 1812	18 1263	28 1056	38 875	48 751	5757	58 677	68 625	78 592	88 568	98 535	2997	8754
90	9 1721	19 1194	29 987	39 827	49 710	5439	59 623	69 576	79 543	89 497	99 470	2709	8148
100	10 1655	20 1142	30 944	40 772	50 682	5195	60 601	70 552	80 494	90 456	100 440	2543	7738
	9089	6358	5268	4509	3829	29053	3450	3221	3031	2875	2777	15354 130575 GRAND TOTAL	
	21697	16220	14163	13056	11975	77111	11451	10981	10614	10315	10103		

UNIT-FOOT VALUES—$1,000: $700

This table shows the Somers computed values for all 10-foot squares within the area of 100′ x 100′ from the street intersection in retail business districts of American cities. The unit-foot values in this table bear a relationship of 10 to 7—that is, the unit-foot value of the higher-valued street is $1,000 and that of the other street is $700. To compute the value of any corner or near-corner site in a retail business district, the dimensions of the site should be carefully laid off on a corner diagram, and the values within the described areas totalled.

In computing semi-business and residential corner or near-corner sites, the appraiser can use a percentage of the computed values for corresponding full-value sites. Any such percentage, chosen to conform to careful observation can be used without violation of the Somers principle of corner valuation.

The same result can also be attained for corner or near-corner site values in semi-business or residential districts in another way. The values of such sites may first be computed as retail business sites with the aid of the corner tables. Then their values may be computed as inside lots with reference to the higher-valued street. The difference between the two computed values will represent the corner influence enhancement, of which a definite percentage may be taken and added to the computed values as inside lots.

Table No. 8—Somers Retail Business District Corner Table

UNIT-FOOT VALUE $1000

UNIT-FOOT VALUE $800

CORNER	10'	20'	30'	40'	50'		60'	70'	80'	90'	100'		
10'	1 3171	11 3061	21 2980	31 2903	41 2824	14939	51 2775	61 2718	71 2652	81 2581	91 2533	13259	28198
20'	2 2849	12 2053	22 1966	32 1882	42 1821	10571	52 1806	62 1743	72 1703	82 1662	92 1627	8541	19112
30'	3 2681	13 1884	23 1558	33 1484	43 1433	9040	53 1423	63 1395	73 1377	83 1333	93 1314	6842	15882
40'	4 2529	14 1733	24 1407	34 1330	44 1276	8275	54 1213	64 1129	74 1063	84 1048	34 1006	5459	13734
50'	5 2390	15 1621	25 1309	35 1231	45 989	7540	55 947	65 884	75 870	85 864	95 864	4429	11969
	13620	10352	9220	8830	8343	50365	8164	7869	7665	7488	7344	38530	88895
60'	6 2322	16 1570	26 1264	36 1141	46 917	7214	56 831	66 795	76 756	86 727	96 714	3823	11037
70'	7 2182	17 1477	27 1208	37 1031	47 827	6725	57 768	67 705	77 666	87 637	97 624	3400	10125
80'	8 2092	18 1413	28 1165	38 941	48 791	6402	58 709	68 646	78 607	88 578	98 536	3076	9478
90'	9 1999	19 1347	29 1099	39 902	49 758	6105	59 665	69 599	79 561	89 503	99 470	2798	8903
100'	10 1932	20 1295	30 1060	40 845	50 740	5872	60 638	70 575	80 507	90 460	100 440	2620	8492
	10527	7102	5796	4860	4033	32318	3611	3320	3097	2905	2784	15717	
	24147	17454	15016	13690	12376	82683	11775	11189	10762	10393	10128	136930 GRAND TOTAL	

UNIT-FOOT VALUES—$1,000: $800

This table shows the Somers computed values for all 10-foot squares within the area of 100′ x 100′ from the street intersection in retail business districts of American cities. The unit-foot values in this table bear a relationship of 10 to 8—that is, the unit-foot value of the higher-valued street is $1,000 and that of the other street is $800. To compute the value of any corner or near-corner site in a retail business district, the dimensions of the site should be carefully laid off on a corner diagram, and the values within the described areas totalled.

In computing semi-business and residential corner or near-corner sites, the appraiser can use a percentage of the computed values for corresponding full-value sites. Any such percentage, chosen to conform to careful observation can be used without violation of the Somers principle of corner valuation.

The same result can also be attained for corner or near-corner site values in semi-business or residential districts in another way. The values of such sites may first be computed as retail business sites with the aid of the corner tables. Then their values may be computed as inside lots with reference to the higher-valued street. The difference between the two computed values will represent the corner influence enhancement, of which a definite percentage may be taken and added to the computed values as inside lots.

Table No. 9—Somers Retail Business District Corner Table

UNIT-FOOT VALUE $1000

UNIT-FOOT VALUE $900

CORNER	10'	20'	30	40'	50'		60'	70'	80'	90'	100'		
10'	1 3279	11 3169	21 3079	31 2985	41 2891	15403	51 2831	61 2763	71 2685	81 2600	91 2541	13420	28823
20	2 3061	12 2115	22 2027	32 1935	42 1865	11003	52 1847	62 1771	72 1726	82 1676	92 1633	8653	19656
30'	3 2927	13 1986	23 1603	33 1516	43 1456	9488	53 1446	63 1412	73 1393	83 1341	93 1317	6909	16397
40'	4 2795	14 1860	24 1477	34 1394	44 1332	8858	54 1256	64 1154	74 1076	84 1059	94 1008	5553	14411
50'	5 2670	15 1763	25 1393	35 1310	45 1014	8150	55 963	65 887	75 875	85 867	95 867	4459	12609
	14732	10893	9579	9140	8558	52902	8343	7987	7755	7543	7366	38994	91896
60'	6 2576	16 1727	26 1366	36 1220	46 948	7837	56 855	66 812	76 768	86 733	96 717	3885	11722
70'	7 2492	17 1636	27 1317	37 1104	47 858	7407	57 798	67 722	77 678	87 643	97 627	3468	10875
80'	8 2402	18 1579	28 1286	38 1014	48 835	7116	58 744	68 668	78 623	88 589	98 538	3162	10278
90'	9 2304	19 1516	29 1222	39 984	49 814	6840	59 702	69 624	79 580	89 511	99 470	2887	9727
100'	10 2236	20 1465	30 1187	40 926	50 804	6618	60 678	70 602	80 523	90 465	100 440	2708	9326
	12010	7923	6378	5248	4259	35818	3777	3428	3172	2941	2792	16110	
	26742	18816	15957	14388	12817	88720	12120	11415	10927	10484	10158	143824 GRANDTOTAL	

UNIT-FOOT VALUES—$1,000: $900

This table shows the Somers computed values for all 10-foot squares within the area of 100′ x 100′ from the street intersection in retail business districts of American cities. The unit-foot values in this table bear a relationship of 10 to 9—that is, the unit-foot value of the higher-valued street is $1,000 and that of the other street is $900. To compute the value of any corner or near-corner site in a retail business district, the dimensions of the site should be carefully laid off on a corner diagram, and the values within the described areas totalled.

In computing semi-business and residential corner or near-corner sites, the appraiser can use a percentage of the computed values for corresponding full-value sites. Any such percentage, chosen to conform to careful observation can be used without violation of the Somers principle of corner valuation.

The same result can also be attained for corner or near-corner site values in semi-business or residential districts in another way. The values of such sites may first be computed as retail business sites with the aid of the corner tables. Then their values may be computed as inside lots with reference to the higher-valued street. The difference between the two computed values will represent the corner influence enhancement, of which a definite percentage may be taken and added to the computed values as inside lots.

Table No. 10—Somers Retail Business District Corner Table

UNIT-FOOT VALUE $1000

UNIT-FOOT VALUE $1000

CORNER	10'	20'	30'	40'	50'		60'	70'	80'	90'	100'		
10'	1 3390	11 3280	21 3180	31 3070	41 2960	15880	51 2890	61 2810	71 2720	81 2620	91 2550	13590	29470
20'	2 3280	12 2180	22 2090	32 1990	42 1910	11450	52 1890	62 1800	72 1750	82 1690	92 1640	8770	20220
30'	3 3180	13 2090	23 1650	33 1550	43 1480	9950	53 1470	63 1430	73 1410	83 1350	93 1320	6980	16930
40'	4 3070	14 1990	24 1550	34 1460	44 1390	9460	54 1300	64 1180	74 1090	84 1070	94 1010	5650	15110
50'	5 2960	15 1910	25 1480	35 1390	45 1040	8780	55 980	65 890	75 880	85 870	95 870	4490	13270
	15880	11450	9950	9460	8780	55520	8530	8110	7850	7600	7390	39480	95000
60'	6 2890	16 1890	26 1470	36 1300	46 980	8530	56 880	66 830	76 780	86 740	96 720	3950	12480
70'	7 2810	17 1800	27 1430	37 1180	47 890	8110	57 830	67 740	77 690	87 650	97 630	3540	11650
80'	8 2720	18 1750	28 1410	38 1090	48 880	7850	58 780	68 690	78 640	88 600	98 540	3250	11100
90'	9 2620	19 1690	29 1350	39 1070	49 870	7600	59 740	69 650	79 600	89 520	99 470	2980	10580
100'	10 2550	20 1640	30 1320	40 1010	50 870	7390	60 720	70 630	80 540	90 470	100 440	2800	10190
	13590	8770	6980	5650	4490	39480	3950	3540	3250	2980	2800	16520	
	29470	20220	16930	15110	13270	95000	12480	11650	11100	10580	10190		151000 GRAND TOTAL

UNIT-FOOT VALUES—$1,000: $1,000

This table shows the Somers computed values for all 10-foot squares within the area of 100′ x 100′ from the street intersection in retail business districts of American cities. The unit-foot values in this table bear a relationship of 10 to 10—that is, the unit-foot value of the higher-valued street is equal to that of the other street. To compute the value of any corner or near-corner site in a retail business district, the dimensions of the site should be carefully laid off on a corner diagram, and the values within the described areas totalled.

In computing semi-business and residential corner or near-corner sites, the appraiser can use a percentage of the computed values for corresponding full-value sites. Any such percentage, chosen to conform to careful observation can be used without violation of the Somers principle of corner valuation.

The same result can also be attained for corner or near-corner site values in semi-business or residential districts in another way. The values of such sites may first be computed as retail business sites with the aid of the corner tables. Then their values may be computed as inside lots with reference to the higher-valued street. The difference between the two computed values will represent the corner influence enhancement, of which a definite percentage may be taken and added to the computed values as inside lots.

APPENDIX II

SOMERS ZONE AND OVERLAP TABLES

	UNIT VALUES							Feet in Depth
Zones	10,000	10,500	11,000	11,500	12,000	12,500	13,000	
1	2500	2625	2750	2875	3000	3125	3250	10
2	1600	1680	1760	1840	1920	2000	2080	20
3	1300	1365	1430	1495	1560	1625	1690	30
4	1000	1050	1100	1150	1200	1250	1300	40
5	850	893	935	978	1020	1063	1105	50
6	700	735	770	805	840	875	910	60
7	610	641	671	702	732	763	793	70
8	530	557	583	610	636	663	689	80
9	470	494	517	541	564	588	611	90
10	440	462	484	506	528	550	572	100
11	400	420	440	460	480	500	520	110
12	350	368	385	403	420	438	455	120
13	300	315	330	345	360	375	390	130
14	250	263	275	288	300	313	325	140
15	200	210	220	230	240	250	260	150
16	180	188	198	207	216	225	234	160
17	160	168	176	184	192	200	208	170
18	140	147	154	161	168	175	182	180
19	120	126	132	138	144	150	156	190
20	100	105	110	115	120	125	130	200
21	95	100	105	109	114	119	124	210
22	85	89	94	98	102	106	111	220
23	80	84	88	92	96	100	104	230
24	75	79	83	86	90	94	98	240
25	70	74	77	81	84	88	91	250
26	70	74	77	81	84	88	91	260
27	65	68	72	75	78	81	85	270
28	65	68	72	75	78	81	85	280
29	60	63	66	69	72	75	78	290
30	60	63	66	69	72	75	78	300
31	55	58	61	63	66	69	72	310
32	55	58	61	63	66	69	72	320
33	55	58	61	63	66	69	72	330
34	50	53	55	58	60	63	65	340
35	50	53	55	58	60	63	65	350
36	50	53	55	58	60	63	65	360
37	45	47	50	52	54	56	59	370
38	45	47	50	52	54	56	59	380
39	45	47	50	52	54	56	59	390
40	45	47	50	52	54	56	59	400

SOMERS ZONE AND OVERLAP TABLES

	UNIT VALUES							
Zones	**13,500**	**14,000**	**14,500**	**15,000**	**15,500**	**16,000**	**16,500**	**Feet in Depth**
1	3375	3500	3625	3750	3875	4000	4125	10
2	2160	2240	2320	2400	2480	2560	2640	20
3	1755	1820	1885	1950	2015	2080	2145	30
4	1350	1400	1450	1500	1550	1600	1650	40
5	1148	1190	1233	1275	1318	1360	1403	50
6	945	980	1015	1050	1085	1120	1155	60
7	824	854	885	915	946	976	1007	70
8	716	742	769	795	822	848	875	80
9	635	658	682	705	729	752	776	90
10	594	616	638	660	682	704	726	100
11	540	560	580	600	620	640	660	110
12	473	490	508	525	543	560	578	120
13	405	420	435	450	465	480	495	130
14	338	350	363	375	380	400	413	140
15	270	280	290	300	310	320	330	150
16	243	252	261	270	279	288	297	160
17	216	224	232	240	248	256	264	170
18	189	196	203	210	217	224	231	180
19	162	168	174	180	186	192	198	190
20	135	140	145	150	155	160	165	200
21	128	133	138	143	147	152	157	210
22	115	119	123	128	132	136	140	220
23	108	112	116	120	124	128	132	230
24	101	104	108	112	115	119	123	240
25	95	98	102	105	109	112	116	250
26	95	98	102	105	109	112	116	260
27	88	91	94	98	101	104	107	270
28	88	91	94	98	101	104	107	280
29	81	84	87	90	93	96	99	290
30	81	84	87	90	93	96	99	300
31	74	77	80	83	85	88	91	310
32	74	77	80	83	85	88	91	320
33	74	77	80	83	85	88	91	330
34	68	70	73	75	78	80	83	340
35	68	70	73	75	78	80	83	350
36	68	70	73	75	78	80	83	360
37	61	63	65	68	70	72	74	370
38	61	63	65	68	70	72	74	380
39	61	63	65	68	70	72	74	390
40	61	63	65	68	70	72	74	400

SOMERS ZONE AND OVERLAP TABLES

	UNIT VALUES						Feet in Depth
Zones	17,000	17,500	18,000	18,500	19,000	19,500	
1	4250	4375	4500	4625	4750	4875	10
2	2720	2800	2880	2960	3040	3120	20
3	2210	2275	2340	2405	2470	2535	30
4	1700	1750	1800	1850	1900	1950	40
5	1445	1488	1530	1573	1615	1658	50
6	1190	1225	1260	1295	1330	1365	60
7	1037	1068	1098	1129	1159	1190	70
8	901	928	954	981	1007	1034	80
9	799	823	846	870	893	917	90
10	748	770	792	814	836	858	100
11	680	700	720	740	760	780	110
12	595	613	630	648	665	683	120
13	510	525	540	555	570	585	130
14	425	438	450	463	475	488	140
15	340	350	360	370	380	390	150
16	306	315	324	333	342	351	160
17	272	280	288	296	304	312	170
18	238	245	252	259	266	273	180
19	204	210	216	222	228	234	190
20	170	175	180	185	190	195	200
21	162	166	171	176	181	185	210
22	145	149	153	157	162	166	220
23	136	140	144	148	152	156	230
24	127	130	134	138	142	145	240
25	119	123	126	130	133	137	250
26	119	123	126	130	133	137	260
27	111	114	117	120	124	127	270
28	111	114	117	120	124	127	280
29	102	105	108	111	114	117	290
30	102	105	108	111	114	117	300
31	94	96	100	102	105	108	310
32	94	96	100	102	105	108	320
33	94	96	100	102	105	108	330
34	85	88	90	93	95	98	340
35	85	88	90	93	95	98	350
36	85	88	90	93	95	98	360
37	77	79	81	83	86	88	370
38	77	79	81	83	86	88	380
39	77	79	81	83	86	88	390
40	77	79	81	83	86	88	400

SOMERS ZONE AND OVERLAP TABLES

Zones	UNIT VALUES							Feet in Depth
	20,000	20,500	21,000	21,500	22,000	22,500	23,000	
1	5000	5125	5250	5375	5500	5625	5750	10
2	3200	3280	3360	3440	3520	3600	3680	20
3	2600	2665	2730	2795	2860	2925	2990	30
4	2000	2050	2100	2150	2200	2250	2300	40
5	1700	1743	1785	1828	1870	1913	1955	50
6	1400	1435	1470	1505	1540	1575	1610	60
7	1220	1251	1281	1312	1342	1373	1403	70
8	1060	1087	1113	1140	1166	1293	1219	80
9	940	964	987	1011	1034	1058	1081	90
10	880	902	924	946	968	990	1012	100
11	800	820	840	860	880	900	920	110
12	700	718	735	753	770	788	805	120
13	600	615	630	645	660	675	690	130
14	500	513	525	538	550	563	575	140
15	400	410	420	430	440	450	460	150
16	360	369	378	387	396	405	414	160
17	320	328	336	344	352	360	368	170
18	280	287	294	301	308	315	322	180
19	240	246	252	258	264	270	276	190
20	200	205	210	215	220	225	230	200
21	190	195	200	204	209	214	219	210
22	170	174	179	183	187	191	196	220
23	160	164	168	172	176	180	184	230
24	150	154	158	161	165	169	173	240
25	140	144	147	151	154	158	161	250
26	130	144	147	151	154	158	161	260
27	130	133	137	140	143	146	150	270
28	120	133	137	140	143	146	150	280
29	120	123	126	129	132	135	138	290
30	110	123	126	129	132	135	138	300
31	110	113	116	118	121	124	127	310
32	110	113	116	118	121	124	127	320
33	100	113	116	118	121	124	127	330
34	100	103	105	108	110	113	115	340
35	100	103	105	108	110	113	115	350
36	100	103	105	108	110	113	115	360
37	90	92	95	97	99	101	104	370
38	90	92	95	97	99	101	104	380
39	90	92	95	97	99	101	104	390
40	90	92	95	97	99	101	104	400

SOMERS ZONE AND OVERLAP TABLES

Zones	UNIT VALUES							Feet in Depth
	23,500	24,000	24,500	25,000	25,500	26,000	26,500	
1	5875	6000	6125	6250	6375	6500	6625	10
2	3760	3840	3920	4000	4080	4160	4240	20
3	3055	3120	3185	3250	3315	3380	3445	30
4	2350	2400	2450	2500	2550	2600	2650	40
5	1998	2040	2083	2125	2168	2210	2253	50
6	1645	1680	1715	1750	1785	1820	1855	60
7	1434	1464	1495	1525	1556	1586	1617	70
8	1246	1272	1399	1325	1352	1378	1405	80
9	1105	1128	1152	1175	1199	1222	1246	90
10	1034	1056	1078	1100	1122	1144	1166	100
11	940	960	980	1000	1020	1040	1060	110
12	823	840	858	875	893	910	928	120
13	705	720	735	750	765	780	795	130
14	588	600	613	625	638	650	663	140
15	470	480	490	500	510	520	530	150
16	423	432	441	450	459	468	477	160
17	376	384	392	400	408	416	424	170
18	329	336	343	350	357	364	371	180
19	282	288	294	300	306	312	318	190
20	235	240	245	250	255	260	265	200
21	223	228	233	238	242	247	252	210
22	200	204	208	213	217	221	225	220
23	188	192	196	200	204	208	212	230
24	176	180	184	188	191	195	199	240
25	165	168	172	175	179	182	186	250
26	235	238	242	245	249	252	256	260
27	153	156	159	163	166	169	172	270
28	153	156	159	163	166	169	172	280
29	141	144	147	150	153	156	159	290
30	141	144	147	150	153	156	159	300
31	129	132	135	138	140	143	146	310
32	129	132	135	138	140	143	146	320
33	129	132	135	138	140	143	146	330
34	118	120	123	125	128	130	133	340
35	118	120	123	125	128	130	133	350
36	118	120	123	125	128	130	133	360
37	106	108	110	113	115	117	119	370
38	106	108	110	113	115	117	119	380
39	106	108	110	113	115	117	119	390
40	106	108	110	113	115	117	119	400

SOMERS ZONE AND OVERLAP TABLES

	UNIT VALUES						
Zones	**27,000**	**27,500**	**28,000**	**28,500**	**29,000**	**29,500**	**Feet in Depth**
1	6750	6875	7000	7125	7250	7375	10
2	4320	4400	4480	4560	4640	4720	20
3	3510	3575	3640	3705	3770	3835	30
4	2700	2750	2800	2850	2900	2950	40
5	2295	2338	2380	2423	2465	2508	50
6	1890	1925	1960	1995	2030	2065	60
7	1647	1678	1708	1739	1769	1800	70
8	1431	1458	1484	1511	1537	1564	80
9	1269	1293	1316	1340	1363	1387	90
10	1188	1210	1232	1254	1276	1298	100
11	1080	1100	1120	1140	1160	1180	110
12	945	963	908	998	1015	1033	120
13	810	825	840	855	870	885	130
14	675	688	700	713	725	738	140
15	540	550	560	570	580	590	150
16	486	495	504	513	522	531	160
17	432	440	448	456	464	472	170
18	378	385	392	399	406	413	180
19	324	330	336	342	348	354	190
20	270	275	280	285	290	295	200
21	257	261	266	271	276	280	210
22	230	234	238	242	247	251	220
23	216	220	224	228	232	236	230
24	203	206	210	214	218	221	240
25	189	193	196	200	203	206	250
26	189	193	196	200	203	206	260
27	176	179	182	185	189	192	270
28	176	179	182	185	189	192	280
29	162	165	168	171	174	177	290
30	162	165	168	171	174	177	300
31	149	151	154	157	160	162	310
32	149	151	154	157	160	162	320
33	149	151	154	157	160	162	330
34	135	138	140	143	145	148	340
35	135	138	140	143	145	148	350
36	135	138	140	143	145	148	360
37	122	124	126	128	131	133	370
38	122	124	126	128	131	133	380
39	122	124	126	128	131	133	390
40	122	124	126	128	131	133	400

SOMERS ZONE AND OVERLAP TABLES

	UNIT VALUES							Feet in Depth
Zones	30,000	30,500	31,000	31,500	32,000	32,500	33,000	
1	7500	7625	7750	7875	8000	8125	8250	10
2	4800	4880	4960	5040	5120	5200	5280	20
3	3900	3965	4030	4095	4160	4225	4290	30
4	3000	3050	3100	3150	3200	3250	3300	40
5	2550	2593	2635	2678	2720	2763	2805	50
6	2100	2135	2170	2205	2240	2275	2310	60
7	1830	1861	1891	1922	1952	1983	2013	70
8	1590	1617	1643	1670	1696	1723	1749	80
9	1410	1434	1457	1481	1504	1528	1571	90
10	1320	1342	1364	1386	1408	1430	1452	100
11	1200	1220	1240	1260	1280	1300	1320	110
12	1050	1068	1085	1103	1120	1138	1155	120
13	900	915	930	945	960	975	990	130
14	750	763	775	788	800	813	825	140
15	600	610	620	630	640	650	660	150
16	540	549	558	567	576	585	594	160
17	480	488	496	504	512	520	528	170
18	420	427	434	441	448	455	462	180
19	360	366	372	378	384	390	396	190
20	300	305	310	315	320	325	330	200
21	285	290	295	299	304	309	314	210
22	255	259	264	268	272	276	281	220
23	240	244	248	252	256	260	264	230
24	225	229	233	236	240	244	248	240
25	210	214	217	221	224	228	231	250
26	210	214	217	221	224	228	231	260
27	195	198	202	205	208	211	215	270
28	195	198	202	205	208	211	215	280
29	180	183	186	189	192	195	198	290
30	180	183	186	189	192	195	198	300
31	165	168	171	173	176	179	182	310
32	165	168	171	173	176	179	182	320
33	165	168	171	173	176	179	182	330
34	150	153	155	158	160	163	165	340
35	150	153	155	158	160	163	165	350
36	150	153	155	158	160	163	165	360
37	135	137	140	142	144	146	149	370
38	135	137	140	142	144	146	149	380
39	135	137	140	142	144	146	149	390
40	135	137	140	142	144	146	149	400

SOMERS ZONE AND OVERLAP TABLES

	UNIT VALUES							
Zones	33,500	34,000	34,500	35,000	35,500	36,000	36,500	Feet in Depth
1	8375	8500	8625	8750	8875	9000	9125	10
2	5360	5440	5520	5600	5680	5760	5840	20
3	4355	4420	4485	4550	4615	4680	4745	30
4	3350	3400	3450	3500	3550	3600	3650	40
5	2848	2890	2933	2975	3018	3060	3103	50
6	2345	2380	2415	2450	2485	2520	2555	60
7	2044	2074	2105	2135	2166	2196	2227	70
8	1776	1801	1828	1855	1882	1908	1935	80
9	1585	1608	1632	1655	1679	1702	1726	90
10	1474	1496	1518	1540	1562	1584	1606	100
11	1340	1360	1380	1400	1420	1440	1460	110
12	1173	1190	1208	1225	1243	1260	1278	120
13	1005	1020	1035	1050	1065	1080	1095	130
14	838	850	863	875	888	900	913	140
15	670	680	690	700	710	720	730	150
16	603	612	621	630	639	648	657	160
17	536	544	552	560	568	576	584	170
18	469	476	483	490	497	504	511	180
19	402	468	414	420	426	432	438	190
20	335	340	345	350	355	360	365	200
21	318	323	328	333	337	342	347	210
22	285	289	293	298	302	306	310	220
23	268	272	276	280	284	288	292	230
24	251	255	259	263	266	270	274	240
25	235	238	242	245	249	252	256	250
26	235	238	242	245	249	252	256	260
27	218	221	224	228	231	234	237	270
28	218	221	224	228	231	234	237	280
29	201	204	207	210	213	216	219	290
30	201	204	207	210	213	216	219	300
31	184	187	190	193	195	198	201	310
32	184	187	190	193	195	198	201	320
33	184	187	190	193	195	198	201	330
34	168	170	173	175	178	180	182	340
35	168	170	173	175	178	180	182	350
36	168	170	173	175	178	180	182	360
37	151	153	155	158	160	162	164	370
38	151	153	155	158	160	162	164	380
39	151	153	155	158	160	162	164	390
40	151	153	155	158	160	162	164	400

SOMERS ZONE AND OVERLAP TABLES

Zones	UNIT VALUES						Feet in Depth
	37,000	37,500	38,000	38,500	39,000	39,500	
1	9250	9375	9500	9625	9750	9875	10
2	5920	6000	6080	6160	6240	6320	20
3	4810	4875	4940	5005	5070	5135	30
4	3700	3750	3800	3850	3900	3950	40
5	3145	3188	3230	3273	3315	3358	50
6	2590	2625	2660	2695	2730	2765	60
7	2257	2288	2318	2349	2379	2410	70
8	1961	1988	2014	2041	2067	2094	80
9	1749	1763	1786	1810	1833	1857	90
10	1628	1650	1672	1694	1716	1738	100
11	1480	1500	1520	1540	1560	1580	110
12	1295	1313	1330	1348	1365	1383	120
13	1110	1125	1140	1155	1170	1185	130
14	925	938	950	963	975	988	140
15	740	750	760	770	780	790	150
16	666	675	684	693	702	711	160
17	592	600	608	616	624	632	170
18	518	525	532	539	546	553	180
19	444	450	456	462	468	474	190
20	370	375	380	385	390	395	200
21	352	356	361	366	371	375	210
22	315	319	323	327	332	336	220
23	296	300	304	308	312	316	230
24	278	281	285	289	293	296	240
25	259	263	266	270	273	277	250
26	259	263	266	270	273	277	260
27	241	244	247	250	254	257	270
28	241	244	247	250	254	257	280
29	222	225	228	231	234	237	290
30	222	225	228	231	234	237	300
31	204	206	209	212	215	217	310
32	204	206	209	212	215	217	320
33	204	206	209	212	215	217	330
34	185	188	190	193	195	198	340
35	185	188	190	193	195	198	350
36	185	188	190	193	195	198	360
37	167	169	171	173	176	178	370
38	167	169	171	173	176	178	380
39	167	169	171	173	176	178	390
40	167	169	171	173	176	178	400

SOMERS ZONE AND OVERLAP TABLES

Zones	UNIT VALUES							Feet in Depth
	40,000	40,500	41,000	41,500	42,000	42,500	43,000	
1	10000	10125	10250	10375	10500	10625	10750	10
2	6400	6480	6560	6640	6720	6800	6880	20
3	5200	5625	5330	5395	5460	5525	5590	30
4	4000	4050	4100	4150	4200	4250	4300	40
5	3400	3443	3485	3528	3570	3613	3655	50
6	2800	2835	2870	2905	2940	2975	3010	60
7	2440	2471	2501	2532	2562	2593	2623	70
8	2120	2147	2173	2200	2226	2254	2280	80
9	1880	1904	1927	1951	1974	1998	2021	90
10	1760	1782	1804	1826	1848	1870	1892	100
11	1600	1620	1640	1660	1680	1700	1720	110
12	1400	1418	1435	1453	1470	1488	1505	120
13	1200	1215	1230	1245	1260	1275	1290	130
14	1000	1013	1025	1038	1050	1063	1075	140
15	800	810	820	830	840	850	860	150
16	720	729	738	747	756	765	774	160
17	640	648	656	664	672	680	688	170
18	560	567	574	581	588	595	602	180
19	480	486	492	498	504	510	516	190
20	400	405	410	415	420	425	430	200
21	380	385	390	394	399	404	409	210
22	340	344	349	353	357	361	366	220
23	320	324	328	332	336	340	344	230
24	300	304	308	311	315	319	323	240
25	280	284	287	291	294	298	301	250
26	280	284	287	291	294	298	301	260
27	260	263	267	270	273	276	280	270
28	260	263	267	270	273	276	280	280
29	240	243	246	249	252	255	258	290
30	240	243	246	249	252	255	258	300
31	220	223	226	228	231	234	237	310
32	220	223	226	228	231	234	237	320
33	220	223	226	228	231	234	237	330
34	200	203	205	208	210	213	215	340
35	200	203	205	208	210	213	215	350
36	200	203	205	208	210	213	215	360
37	180	182	185	187	189	191	194	370
38	180	182	185	187	189	191	194	380
39	180	182	185	187	189	191	194	390
40	180	182	185	187	189	191	194	400

SOMERS ZONE AND OVERLAP TABLES

Zones	UNIT VALUES						Feet in Depth
	47,000	47,500	48,000	48,500	49,000	49,500	
1	11750	11875	12000	12125	12250	12375	10
2	7520	7600	7680	7760	7840	7920	20
3	6110	6175	6240	6305	6370	6435	30
4	4700	4750	4800	4850	4900	4950	40
5	3995	4038	4080	4123	4165	4208	50
6	3290	3325	3360	3395	3430	3465	60
7	2867	2898	2928	2959	2989	3020	70
8	2492	2519	2544	2571	2597	2624	80
9	2209	2233	2256	2280	2303	2327	90
10	2068	2090	2112	2134	2156	2178	100
11	1880	1900	1920	1940	1960	1980	110
12	1645	1663	1680	1698	1715	1733	120
13	1410	1425	1440	1455	1470	1485	130
14	1175	1188	1200	1213	1225	1238	140
15	940	950	960	970	980	990	150
16	846	855	864	873	882	891	160
17	752	760	768	776	784	792	170
18	658	665	672	679	686	693	180
19	564	570	576	582	588	594	190
20	470	475	480	485	490	495	200
21	447	451	456	461	466	470	210
22	400	404	408	412	417	421	220
23	376	380	384	388	392	396	230
24	353	356	360	364	368	371	240
25	330	333	336	340	343	347	250
26	330	333	336	340	343	347	260
27	306	309	312	315	319	322	270
28	306	309	312	315	319	322	280
29	282	285	288	291	294	297	290
30	282	285	288	291	294	297	300
31	259	261	264	267	270	272	310
32	259	261	264	267	270	272	320
33	259	261	264	267	270	272	330
34	235	238	240	243	245	248	340
35	235	238	240	243	245	248	350
36	235	238	240	243	245	248	360
37	212	214	216	218	221	223	370
38	212	214	216	218	221	223	380
39	212	214	216	218	221	223	390
40	212	214	216	218	221	223	400

SOMERS ZONE AND OVERLAP TABLES

	UNIT VALUES							Feet in Depth
Zones	43,500	44,000	44,500	45,000	45,500	46,000	46,500	
1	10875	11000	11125	11250	11375	11500	11625	10
2	6960	7040	7120	7200	7280	7360	7440	20
3	5655	5720	5785	5850	5915	5980	6045	30
4	4350	4400	4450	4500	4550	4600	4650	40
5	3698	3740	3783	3825	3868	3910	3953	50
6	3045	3080	3115	3150	3185	3220	3255	60
7	2654	2684	2715	2745	2776	2806	2837	70
8	2307	2333	2360	2386	2413	2439	2466	80
9	2045	2068	2092	2115	2139	2162	2186	90
10	1914	1936	1958	1980	2002	2024	2046	100
11	1740	1760	1780	1800	1820	1840	1860	110
12	1523	1540	1558	1575	1593	1610	1628	120
13	1305	1320	1335	1350	1365	1380	1395	130
14	1088	1100	1113	1125	1138	1150	1163	140
15	870	880	890	900	910	920	930	150
16	783	792	801	810	819	828	837	160
17	696	704	712	720	728	736	744	170
18	609	616	623	630	637	644	651	180
19	522	528	534	540	546	552	558	190
20	435	440	445	450	455	460	465	200
21	413	418	423	428	432	437	442	210
22	370	374	378	383	387	391	395	220
23	348	352	356	360	364	368	372	230
24	326	330	334	338	341	345	349	240
25	305	308	312	315	319	322	326	250
26	305	308	312	315	319	322	326	260
27	283	286	289	293	296	299	302	270
28	283	286	289	293	296	299	302	280
29	261	264	267	270	273	276	279	290
30	261	264	267	270	273	276	279	300
31	239	242	245	248	250	253	256	310
32	239	242	245	248	250	253	256	320
33	239	242	245	248	250	253	256	330
34	218	220	223	225	228	230	233	340
35	218	220	223	225	228	230	233	350
36	218	220	223	225	228	230	233	360
37	196	198	200	203	205	207	209	370
38	196	198	200	203	205	207	209	380
39	196	198	200	203	205	207	209	390
40	196	198	200	203	205	207	209	400

SOMERS ZONE AND OVERLAP TABLES

Zones	UNIT VALUES							Feet in Depth
	50,000	50,500	51,000	51,500	52,000	52,500	53,000	
1	12500	12625	12750	12875	13000	13125	13250	10
2	8000	8080	8160	8240	8320	8400	8480	20
3	6500	6565	6630	6695	6760	6825	6890	30
4	5000	5050	5100	5150	5200	5250	5300	40
5	4250	4293	4335	4378	4420	4463	4505	50
6	3500	3535	3570	3605	3640	3675	3710	60
7	3050	3081	3111	3142	3172	3203	3233	70
8	2650	2677	2703	2730	2756	2783	2809	80
9	2350	2374	2397	2421	2444	2468	2491	90
10	2200	2222	2244	2266	2288	2310	2332	100
11	2000	2020	2040	2060	2080	2100	2120	110
12	1750	1768	1785	1803	1820	1838	1855	120
13	1500	1515	1530	1545	1560	1575	1590	130
14	1250	1263	1275	1288	1300	1313	1325	140
15	1000	1010	1020	1030	1040	1050	1060	150
16	900	909	918	927	936	945	954	160
17	800	808	816	824	833	840	848	170
18	700	707	714	721	728	735	742	180
19	600	606	612	618	624	630	636	190
20	500	505	510	515	520	525	530	200
21	475	480	485	489	494	499	504	210
22	425	429	434	438	442	446	451	220
23	400	404	408	412	416	420	424	230
24	375	379	383	386	390	394	398	240
25	350	354	357	361	364	368	371	250
26	350	354	357	361	364	368	371	260
27	325	328	332	335	338	341	345	270
28	325	328	332	335	338	341	345	280
29	300	303	306	309	312	315	318	290
30	300	303	306	309	312	315	318	300
31	275	278	281	283	286	289	292	310
32	275	278	281	283	286	289	292	320
33	275	278	281	283	286	289	292	330
34	250	253	255	258	260	263	265	340
35	250	253	255	258	260	263	265	350
36	250	253	255	258	260	263	265	360
37	225	227	230	232	234	236	239	370
38	225	227	230	232	234	236	239	380
39	225	227	230	232	234	236	239	390
40	225	227	230	232	234	236	239	400

SOMERS ZONE AND OVERLAP TABLES

Zones	UNIT VALUES							Feet in Depth
	53,500	54,000	54,500	55,000	55,500	56,000	56,500	
1	13375	13500	13625	13750	13875	14000	14125	10
2	8560	8640	8720	8800	8880	8960	9040	20
3	6955	7020	7085	7150	7215	7280	7345	30
4	5350	5400	5450	5500	5550	5600	5650	40
5	4548	4590	4633	4675	4718	4760	4803	50
6	3745	3780	3815	3850	3885	3920	3955	60
7	3264	3294	3325	3355	3386	3416	3447	70
8	2836	2862	2889	2915	2942	2968	2995	80
9	2515	2538	2562	2585	2609	2632	2656	90
10	2354	2376	2398	2420	2442	2464	2486	100
11	2140	2160	2180	2200	2220	2240	2260	110
12	1873	1890	1908	1925	1943	1960	1978	120
13	1605	1620	1635	1650	1665	1680	1695	130
14	1338	1350	1363	1375	1388	1400	1413	140
15	1070	1080	1090	1100	1110	1120	1130	150
16	963	972	988	990	999	1008	1017	160
17	856	864	872	880	888	896	904	170
18	749	756	763	770	777	784	791	180
19	642	648	654	660	666	672	678	190
20	535	540	545	550	555	560	565	200
21	508	513	518	523	527	532	537	210
22	455	459	463	468	472	476	480	220
23	428	432	436	440	441	448	452	230
24	401	405	409	413	416	420	424	240
25	375	378	382	385	389	392	396	250
26	375	378	382	385	389	392	396	260
27	348	351	354	358	361	364	367	270
28	348	351	354	358	361	364	367	280
29	321	324	327	330	333	336	339	290
30	321	324	327	330	333	336	339	300
31	294	297	300	303	305	308	311	310
32	294	297	300	303	305	308	311	320
33	294	297	300	303	305	308	311	330
34	268	270	273	275	278	280	283	340
35	268	270	273	275	278	280	283	350
36	268	270	273	275	278	280	283	360
37	241	243	245	248	250	252	254	370
38	241	243	245	248	250	252	254	380
39	241	243	245	248	250	252	254	390
40	241	243	245	248	250	252	254	400

SOMERS ZONE AND OVERLAP TABLES

Zones	UNIT VALUES						Feet in Depth
	57,000	57,500	58,000	58,500	59,000	59,500	
1	14250	14375	14500	14625	14750	14875	10
2	9120	9200	9280	9360	9440	9520	20
3	7410	7475	7540	7605	7670	7735	30
4	5700	5750	5800	5850	5900	5950	40
5	4845	4888	4930	4973	5015	5058	50
6	3990	4025	4060	4095	4130	4165	60
7	3477	3500	3538	3569	3599	3630	70
8	3021	3048	3074	3101	3127	3154	80
9	2679	2703	2726	2750	2773	2797	90
10	2508	2530	2552	2574	2596	2618	100
11	2280	2300	2320	2340	2360	2380	110
12	1995	2013	2030	2048	2065	2083	120
13	1710	1725	1740	1755	1770	1785	130
14	1425	1438	1450	1463	1475	1488	140
15	1140	1150	1160	1170	1180	1190	150
16	1026	1035	1044	1053	1062	1071	160
17	912	920	928	936	944	952	170
18	798	805	812	819	826	833	180
19	684	690	696	702	708	714	190
20	570	575	580	585	590	595	200
21	542	546	551	556	561	565	210
22	485	489	493	497	502	506	220
23	456	460	464	468	472	476	230
24	428	431	435	439	443	447	240
25	399	403	406	410	413	417	250
26	399	403	406	410	413	417	260
27	371	374	377	380	384	387	270
28	371	374	377	380	384	387	280
29	342	345	348	351	354	357	290
30	342	345	348	351	354	357	300
31	314	316	319	322	325	327	310
32	314	316	319	322	325	327	320
33	314	316	319	322	325	327	330
34	285	288	290	293	295	298	340
35	285	288	290	293	295	298	350
36	285	288	290	293	295	298	360
37	257	259	261	263	266	268	370
38	257	259	261	263	266	268	380
39	257	259	261	263	266	268	390
40	257	259	261	263	266	268	400

SOMERS ZONE AND OVERLAP TABLES

	UNIT VALUES							
Zones	**60,000**	**60,500**	**61,000**	**61,500**	**62,000**	**62,500**	**63,000**	**Feet in Depth**
1	15000	15125	15250	15375	15500	15625	15750	10
2	9600	9680	9760	9840	9920	10000	10080	20
3	7800	7865	7930	7995	8060	8125	8190	30
4	6000	6050	6100	6150	6200	6250	6300	40
5	5100	5143	5185	5228	5270	5313	5355	50
6	4200	4235	4270	4305	4340	4375	4410	60
7	3660	3691	3721	3752	3782	3813	3843	70
8	3180	3207	3233	3260	3286	3313	3339	80
9	2820	2844	2867	2891	2914	2938	2961	90
10	2640	2662	2684	2706	2728	2750	2772	100
11	2400	2420	2440	2460	2480	2500	2520	110
12	2100	2118	2135	2153	2170	2188	2205	120
13	1800	1815	1830	1845	1860	1875	1890	130
14	1500	1513	1525	1538	1550	1568	1575	140
15	1200	1210	1220	1230	1240	1250	1260	150
16	1080	1089	1098	1107	1116	1125	1134	160
17	960	968	976	984	992	1000	1008	170
18	840	847	854	861	868	875	882	180
19	720	726	732	738	744	750	756	190
20	600	605	610	615	620	625	630	200
21	570	575	580	584	589	594	599	210
22	510	514	519	523	527	531	536	220
23	480	484	488	492	496	500	504	230
24	450	454	458	461	465	469	473	240
25	420	424	427	431	434	438	441	250
26	420	424	427	431	434	438	441	260
27	390	393	397	400	403	406	410	270
28	390	393	397	400	403	406	410	280
29	360	363	366	369	372	375	378	290
30	360	363	366	369	372	375	378	300
31	330	333	336	338	341	344	347	310
32	330	333	336	338	341	344	347	320
33	330	333	336	338	341	344	347	330
34	300	303	305	308	310	313	315	340
35	300	303	305	308	310	313	315	350
36	300	303	305	308	310	313	315	360
37	270	272	275	277	279	281	284	370
38	270	272	275	277	279	281	284	380
39	270	272	275	277	279	281	284	390
40	270	272	275	277	279	281	284	400

SOMERS ZONE AND OVERLAP TABLES

	UNIT VALUES							
Zones	**63,500**	**64,000**	**64,500**	**65,000**	**65,500**	**66,000**	**66,500**	**Feet in Depth**
1	15875	16000	16125	16250	16375	16500	16625	10
2	10160	10240	10320	10400	10480	10560	10640	20
3	8255	8320	8385	8450	8515	8580	8645	30
4	6350	6400	6450	6500	6550	6600	6650	40
5	5398	5440	5483	5525	5568	5610	5653	50
6	4445	4480	4515	4550	4585	4620	4655	60
7	3874	3904	3935	3965	3996	4026	4057	70
8	3366	3392	3419	3445	3472	3498	3525	80
9	2985	3008	3032	3055	3079	3102	3126	90
10	2794	2816	2838	2860	2882	2904	2926	100
11	2540	2560	2580	2600	2620	2640	2660	110
12	2223	2240	2258	2275	2293	2310	2328	120
13	1905	1920	1935	1950	1965	1980	1995	130
14	1588	1600	1613	1625	1638	1650	1663	140
15	1270	1280	1290	1300	1310	1320	1330	150
16	1143	1152	1161	1170	1179	1188	1197	160
17	1016	1024	1032	1040	1048	1056	1064	170
18	889	896	903	910	917	924	931	180
19	762	768	774	780	786	792	798	190
20	635	640	645	650	655	660	665	200
21	603	608	613	618	622	627	632	210
22	540	544	548	553	557	561	565	220
23	508	512	516	520	524	528	532	230
24	476	480	484	488	491	495	499	240
25	445	448	452	455	459	462	466	250
26	445	448	452	455	459	462	466	260
27	413	416	419	423	426	429	432	270
28	413	416	419	423	426	429	432	280
29	381	384	387	390	393	396	399	290
30	381	384	387	390	393	396	399	300
31	349	352	355	358	360	363	366	310
32	349	352	355	358	360	363	366	320
33	349	352	355	358	360	363	366	330
34	318	320	323	325	328	330	333	340
35	318	320	323	325	328	330	333	350
36	318	320	323	325	328	330	333	360
37	286	288	290	293	295	297	299	370
38	286	288	290	293	295	297	299	380
39	286	288	290	293	295	297	299	390
40	286	288	290	293	295	297	299	400

SOMERS ZONE AND OVERLAP TABLES

	UNIT VALUES						Feet in Depth
Zones	**67,000**	**67,500**	**68,000**	**68,500**	**69,000**	**69,500**	
1	16750	16875	17000	17125	17250	17375	10
2	10720	10800	10880	10960	11040	11120	20
3	8710	8775	8840	8905	8970	9035	30
4	6700	6750	6800	6850	6900	6950	40
5	5695	5738	5780	5823	5865	5908	50
6	4690	4725	4760	4795	4830	4865	60
7	4087	4118	4148	4179	4209	4240	70
8	3551	3578	3604	3631	3657	3684	80
9	3149	3173	3196	3220	3243	3267	90
10	2948	2970	2992	3014	3036	3058	100
11	2680	2700	2720	2740	2760	2780	110
12	2345	2363	2380	2398	2415	2433	120
13	2010	2025	2040	2055	2070	2085	130
14	1675	1688	1700	1713	1725	1738	140
15	1340	1350	1360	1370	1380	1390	150
16	1206	1215	1224	1233	1242	1251	160
17	1072	1080	1088	1096	1104	1112	170
18	938	945	952	959	966	973	180
19	804	810	816	822	828	834	190
20	670	675	680	685	690	695	200
21	637	641	646	651	656	660	210
22	570	574	578	582	587	591	220
23	536	540	544	548	552	556	230
24	503	506	510	514	518	521	240
25	469	473	476	480	483	487	250
26	469	473	476	480	483	487	260
27	436	439	442	445	449	453	270
28	436	439	442	445	449	453	280
29	402	405	408	411	414	417	290
30	402	405	408	411	414	417	300
31	369	371	374	377	380	382	310
32	369	371	374	377	380	382	320
33	369	371	374	377	380	382	330
34	335	338	340	343	345	348	340
35	335	338	340	343	345	348	350
36	335	338	340	343	345	348	360
37	302	304	306	308	311	313	370
38	302	304	306	308	311	313	380
39	302	304	306	308	311	313	390
40	302	304	306	308	311	313	400

SOMERS ZONE AND OVERLAP TABLES

Zones	UNIT VALUES							Feet in Depth
	70,000	70,500	71,000	71,500	72,000	72,500	73,000	
1	17500	17625	17750	17875	18000	18125	18250	10
2	11200	11280	11360	11440	11520	11600	11680	20
3	9100	9165	9230	9295	9360	9425	9490	30
4	7000	7050	7100	7150	7200	7250	7300	40
5	5950	5993	6035	6078	6120	6163	6205	50
6	4900	4935	4970	5005	5040	5075	5110	60
7	4270	4301	4331	4362	4392	4423	4453	70
8	3710	3737	3763	3790	3816	3843	3869	80
9	3290	3314	3337	3361	3384	3408	3431	90
10	3080	3102	3124	3156	3168	3190	3212	100
11	2800	2820	2840	2860	2880	2900	2920	110
12	2450	2468	2485	2503	2520	2538	2555	120
13	2100	2115	2130	2145	2160	2175	2190	130
14	1750	1768	1775	1788	1800	1813	1825	140
15	1400	1410	1420	1430	1440	1450	1460	150
16	1260	1269	1278	1287	1296	1305	1314	160
17	1120	1128	1136	1144	1152	1160	1168	170
18	980	987	994	1001	1008	1015	1022	180
19	840	846	852	858	864	870	876	190
20	700	705	710	715	720	725	730	200
21	665	670	675	679	684	689	694	210
22	595	599	604	608	612	616	621	220
23	560	564	568	572	576	580	584	230
24	525	529	533	536	540	544	548	240
25	490	494	497	501	504	508	511	250
26	490	494	497	501	504	508	511	260
27	455	458	462	465	468	471	475	270
28	455	458	462	465	468	471	475	280
29	420	423	426	429	432	435	438	290
30	420	423	426	429	432	435	438	300
31	385	388	391	393	396	399	402	310
32	385	388	391	393	396	399	402	320
33	385	388	391	393	396	399	402	330
34	350	353	355	358	360	363	365	340
35	350	353	355	358	360	363	365	350
36	350	353	355	358	360	363	365	360
37	315	317	320	322	324	326	329	370
38	315	317	320	322	324	326	329	380
39	315	317	320	322	324	326	329	390
40	315	317	320	322	324	326	329	400

SOMERS ZONE AND OVERLAP TABLES

Zones	UNIT VALUES							Feet in Depth
	73,500	74,000	74,500	75,000	75,500	76,000	76,500	
1	18375	18500	18625	18750	18875	19000	19125	10
2	11760	11840	11920	12000	12080	12160	12240	20
3	9550	9620	9685	9750	9815	9880	9945	30
4	7350	7400	7450	7500	7550	7600	7650	40
5	6248	6290	6333	6375	6418	6460	6503	50
6	5145	5180	5215	5250	5285	5320	5355	60
7	4484	4514	4545	4575	4606	4636	4667	70
8	3896	3921	3948	3974	4001	4027	4055	80
9	3455	3478	3502	3525	3549	3572	3596	90
10	3234	3256	3278	3300	3322	3344	3366	100
11	2940	2960	1980	3000	3020	3040	3060	110
12	2573	2590	2608	2625	2643	2660	2678	120
13	2205	2220	2235	2250	2265	2280	2295	130
14	1837	1850	1863	1875	1888	1900	1913	140
15	1470	1480	1490	1500	1510	1520	1530	150
16	1323	1332	1341	1350	1359	1368	1377	160
17	1176	1184	1192	1200	1208	1216	1224	170
18	1029	1036	1043	1050	1057	1064	1071	180
19	882	888	894	900	906	912	918	190
20	735	740	745	750	755	760	765	200
21	698	703	708	713	717	722	727	210
22	625	629	633	638	642	646	650	220
23	588	592	596	600	604	608	612	230
24	551	555	559	563	566	570	574	240
25	515	518	522	525	529	532	536	250
26	515	518	522	525	529	532	536	260
27	478	481	485	488	491	494	497	270
28	478	481	485	488	491	494	497	280
29	441	444	447	450	453	456	459	290
30	441	444	447	450	453	456	459	300
31	404	407	410	413	415	418	421	310
32	404	407	410	413	415	418	421	320
33	404	407	410	413	415	418	421	330
34	368	370	373	375	378	380	382	340
35	368	370	373	375	378	380	382	350
36	368	370	373	375	378	380	382	360
37	331	333	335	338	340	342	344	370
38	331	333	335	338	340	342	344	380
39	331	333	335	338	340	342	344	390
40	331	333	335	338	340	342	344	400

SOMERS ZONE AND OVERLAP TABLES

	UNIT VALUES						
Zones	77,000	77,500	78,000	78,500	79,000	79,500	Feet in Depth
1	19250	19375	19500	19625	19750	19875	10
2	12320	12400	12480	12560	12640	12720	20
3	10010	10075	10140	10205	10270	10335	30
4	7700	7750	7800	7850	7900	7950	40
5	6545	6588	6630	6673	6715	6758	50
6	5390	5425	5460	6495	5530	5565	60
7	4697	4728	4758	4789	4819	4850	70
8	4081	4108	4134	4161	4187	4214	80
9	3619	3642	3666	3690	3713	3737	90
10	3388	3410	3432	3454	3476	3498	100
11	3080	3100	3120	3140	3160	3180	110
12	2695	2713	2730	2748	2765	2783	120
13	2310	2325	2340	2355	2370	2385	130
14	1925	1938	1950	1968	1975	1988	140
15	1540	1550	1560	1570	1580	1590	150
16	1386	1395	1404	1413	1422	1431	160
17	1232	1240	1248	1256	1264	1272	170
18	1078	1085	1092	1099	1106	1113	180
19	924	930	936	942	948	954	190
20	770	775	780	785	790	795	200
21	732	736	741	746	751	755	210
22	655	659	663	667	672	676	220
23	616	620	624	628	632	636	230
24	578	581	585	589	593	597	240
25	539	543	546	550	553	557	250
26	539	543	546	550	553	557	260
27	501	504	507	510	514	517	270
28	501	504	507	510	514	517	280
29	462	465	468	471	474	477	290
30	462	465	468	471	474	477	300
31	424	426	429	432	435	437	310
32	424	426	429	432	435	437	320
33	424	426	429	432	435	437	330
34	385	388	390	393	395	398	340
35	385	388	390	393	395	398	350
36	385	388	390	393	395	398	360
37	347	349	351	353	356	358	370
38	347	349	351	353	356	358	380
39	347	349	351	353	356	358	390
40	347	349	351	353	356	358	400

SOMERS ZONE AND OVERLAP TABLES

	UNIT VALUES							Feet in Depth
Zones	80,000	80,500	81,000	81,500	82,000	82,500	83,000	
1	20000	20125	20250	20375	20500	20625	20750	10
2	12800	12880	12960	13040	13120	13200	13280	20
3	10400	10465	10530	10595	10660	10725	10790	30
4	8000	8050	8100	8150	8200	8250	8300	40
5	6800	6843	6885	6928	6970	7013	7055	50
6	5600	5635	5670	5705	5740	5775	5810	60
7	4880	4911	4941	4972	5002	5033	5063	70
8	4240	4267	4293	4320	4346	4373	4399	80
9	3760	3784	3807	3831	3854	3878	3901	90
10	3520	3542	3564	3586	3608	3630	3652	100
11	3200	3220	3240	3260	3280	3300	3320	110
12	2800	2818	1835	2853	2870	2888	2905	120
13	2400	2415	2430	2445	2460	2475	2490	130
14	2000	2013	2025	2038	2050	2063	2075	140
15	1600	1610	1620	1630	1640	1650	1660	150
16	1440	1449	1458	1467	1476	1485	1494	160
17	1280	1288	1296	1304	1312	1320	1328	170
18	1120	1127	1134	1141	1148	1155	1162	180
19	960	966	972	978	984	990	996	190
20	800	805	810	815	820	825	830	200
21	760	765	770	774	779	784	789	210
22	680	684	689	693	697	701	706	220
23	640	644	648	652	656	660	664	230
24	600	604	608	611	615	619	623	240
25	560	564	567	571	574	578	581	250
26	560	564	567	571	574	578	581	250
27	520	523	527	530	533	536	540	270
28	520	523	527	530	533	536	540	280
29	480	483	486	489	492	495	498	290
30	480	483	486	489	492	495	498	300
31	440	443	446	448	451	454	457	310
32	440	443	446	448	451	454	457	320
33	440	443	446	448	451	454	457	330
34	400	403	405	408	410	413	415	340
35	400	403	405	408	410	413	415	350
36	400	403	405	408	410	413	415	360
37	360	362	365	367	369	371	374	370
38	360	362	365	367	369	371	374	380
39	360	362	365	367	369	371	374	390
40	360	362	365	367	369	371	374	400

SOMERS ZONE AND OVERLAP TABLES

	UNIT VALUES							
Zones	83,500	84,000	84,500	85,000	85,500	86,000	86,500	Feet in Depth
1	20875	21000	21125	21250	21375	21500	21625	10
2	13360	13440	13520	13600	13680	13760	13840	20
3	10855	10920	10984	11050	11115	11180	11245	30
4	8350	8400	8450	8500	8550	8600	8650	40
5	7098	7140	7183	7225	7268	7310	7353	50
6	5845	5880	5915	5950	5985	6020	6055	60
7	5094	5124	5155	5185	5216	5246	5277	70
8	4426	4452	4479	4505	4532	4558	4585	80
9	3925	3948	3972	3995	4019	4042	4066	90
10	3674	3696	3718	3740	3762	3784	3806	100
11	3340	3360	3380	3400	3420	3440	3460	110
12	2923	2940	2958	2975	2993	3010	3028	120
13	2505	2520	2532	2550	2565	2580	2595	130
14	2088	2100	2113	2125	2138	2150	2163	140
15	1670	1680	1690	1700	1710	1720	1730	150
16	1503	1512	1521	1530	1539	1548	1557	160
17	1336	1344	1352	1360	1368	1376	1384	170
18	1169	1176	1183	1190	1197	1204	1211	180
19	1002	1008	1014	1020	1026	1032	1038	190
20	835	840	845	850	855	860	865	200
21	793	798	803	808	812	817	822	210
22	710	714	718	723	726	731	735	220
23	668	672	676	680	684	688	692	230
24	626	630	634	638	641	645	649	240
25	585	588	592	595	599	602	606	250
26	585	588	592	595	599	602	606	260
27	543	546	549	553	556	559	562	270
28	543	546	549	553	556	559	562	280
29	501	504	507	510	513	516	519	290
30	501	504	507	510	513	516	519	300
31	459	462	465	468	470	473	476	310
32	459	462	465	468	470	473	476	320
33	459	462	465	468	470	473	476	330
34	418	420	423	425	428	430	433	340
35	418	420	423	425	428	430	433	350
36	418	420	423	425	428	430	433	360
37	376	378	380	383	385	387	389	370
38	376	378	380	383	385	387	389	380
39	376	378	380	383	385	387	389	390
40	376	378	380	383	385	387	389	400

SOMERS ZONE AND OVERLAP TABLES

	UNIT VALUES						
Zones	**$7,000**	**$7,500**	**$8,000**	**$8,500**	**$9,000**	**$9,500**	**Feet in Depth**
1	21750	21875	22000	22125	22250	22375	10
2	13920	14000	14080	14160	14240	14320	20
3	11310	11375	11440	11505	11570	11635	30
4	8700	8750	8800	8850	8900	8950	40
5	7395	7438	7480	7523	7565	7608	50
6	6090	6125	6160	6195	6230	6265	60
7	5307	5338	5368	5399	5429	5460	70
8	4611	4638	4664	4691	4717	4744	80
9	4089	4113	4136	4160	4183	4207	90
10	3828	3850	3872	3894	3916	3938	100
11	3480	3500	3520	3540	3560	3580	110
12	3045	3063	3080	3098	3115	3133	120
13	2610	2625	2640	2655	2670	2685	130
14	2175	2188	2200	2213	2225	2238	140
15	1740	1750	1760	1770	1780	1790	150
16	1566	1575	1584	1593	1602	1611	160
17	1392	1400	1408	1416	1424	1432	170
18	1218	1225	1232	1239	1246	1253	180
19	1044	1050	1056	1062	1068	1074	190
20	870	875	880	885	890	895	200
21	827	831	836	841	846	850	210
22	740	744	748	752	757	761	220
23	696	700	704	708	712	716	230
24	653	656	660	664	668	671	240
25	609	613	616	620	623	627	250
26	609	613	616	620	623	627	260
27	566	569	572	575	579	582	270
28	566	569	572	575	579	582	280
29	522	525	528	531	534	537	290
30	522	525	528	531	534	537	300
31	479	481	484	487	490	492	310
32	479	481	484	487	490	492	320
33	479	481	484	487	490	492	330
34	435	438	440	443	445	448	340
35	435	438	440	443	445	448	350
36	435	438	440	443	445	448	360
37	392	394	396	398	401	403	370
38	392	394	396	398	401	403	380
39	392	394	396	398	401	403	390
40	392	394	396	398	401	403	400

SOMERS ZONE AND OVERLAP TABLES

	UNIT VALUES							
Zones	90,000	90,500	91,000	91,500	92,000	92,500	93,000	Feet in Depth
1	22500	22625	22750	22875	23000	23125	23250	10
2	14000	14480	14560	14640	14720	14800	14880	20
3	11700	11765	11830	11895	11960	12025	12090	30
4	9000	9050	9100	9150	9200	9250	9300	40
5	7650	7693	7735	7778	7820	7863	7905	50
6	6300	6335	6370	6405	6440	6475	6510	60
7	5490	5521	5551	5582	5615	5643	5673	70
8	4770	4797	4823	4850	4876	4903	4929	80
9	4230	4254	4277	4301	4324	4348	4371	90
10	3960	3982	4004	4026	4048	4070	4092	100
11	3600	3620	3640	3660	3680	3700	3720	110
12	3150	3168	3185	3203	3220	3238	3255	120
13	2700	2715	2730	2745	2760	2775	2790	130
14	2250	2263	2275	2288	2300	2313	2325	140
15	1800	1810	1820	1830	1840	1850	1860	150
16	1620	1629	1638	1647	1656	1665	1674	160
17	1440	1448	1456	1464	1472	1480	1488	170
18	1260	1267	1274	1281	1288	1295	1302	180
19	1080	1086	1092	1098	1104	1110	1116	190
20	900	905	910	915	920	925	930	200
21	855	860	865	869	874	879	884	210
22	765	769	774	778	782	786	791	220
23	720	724	728	732	736	740	744	230
24	675	679	683	686	690	694	698	240
25	630	634	637	641	644	648	651	250
26	630	634	637	641	644	648	651	260
27	585	588	592	595	598	601	605	270
28	585	588	592	595	598	601	605	280
29	540	543	546	549	552	555	558	290
30	540	543	546	549	552	555	558	300
31	495	498	501	503	506	509	512	310
32	495	498	501	503	506	509	512	320
33	495	498	501	503	506	509	512	330
34	450	453	455	458	460	463	465	340
35	450	453	455	458	460	463	465	350
36	450	453	455	458	460	463	465	360
37	405	407	410	412	414	416	419	370
38	405	407	410	412	414	416	419	380
39	405	407	410	412	414	416	419	390
40	405	407	410	412	414	416	419	400

SOMERS ZONE AND OVERLAP TABLES

	UNIT VALUES							
Zones	93,500	94,000	94,500	95,000	95,500	96,000	96,500	Feet in Depth
1	23375	23500	23625	23750	23875	24000	24125	10
2	14960	15040	15120	15200	15280	15360	15440	20
3	12155	12220	12285	12350	12415	12480	12545	30
4	9350	9400	9450	9500	9550	9600	9650	40
5	7948	7990	8033	8075	8118	8160	8203	50
6	6545	6580	6615	6650	6685	6720	6755	60
7	5704	5734	5765	5795	5826	5856	5887	70
8	4956	4982	5009	5035	5062	5088	5115	80
9	4395	4418	4442	4465	4489	4512	4536	90
10	4114	4136	4158	4180	4202	4224	4246	100
11	3740	3760	3780	3800	3820	3840	3860	110
12	3273	3290	3308	3325	3343	3360	3378	120
13	2805	2820	2835	2850	2865	2880	2895	130
14	2338	2350	2363	2375	2388	2400	2413	140
15	1870	1880	1890	1900	1910	1920	1930	150
16	1683	1692	1701	1710	1719	1728	1737	160
17	1496	1504	1512	1520	1528	1536	1544	170
18	1309	1316	1323	1330	1337	1344	1351	180
19	1122	1128	1134	1140	1146	1152	1158	190
20	935	940	945	950	955	960	965	200
21	888	893	898	903	907	912	917	210
22	975	799	803	808	812	816	820	220
23	748	752	756	760	764	768	772	230
24	701	705	709	713	716	720	724	240
25	655	658	662	665	669	672	676	250
26	655	658	662	665	669	672	676	260
27	608	611	614	618	621	624	627	270
28	608	611	614	618	621	624	627	280
29	561	564	567	570	573	576	579	290
30	561	564	567	570	573	576	579	300
31	514	517	520	523	525	528	531	310
32	514	517	520	523	525	528	531	320
33	514	517	520	523	525	528	531	330
34	468	470	473	475	478	480	483	340
35	468	470	473	475	478	480	483	350
36	468	470	473	475	478	480	483	360
37	421	423	425	428	430	432	434	370
38	421	423	425	428	430	432	434	380
39	421	423	425	428	430	432	434	390
40	421	423	425	428	430	432	434	400

SOMERS ZONE AND OVERLAP TABLES

Zones	UNIT VALUES						Feet in Depth
	97,000	97,500	98,000	98,500	99,000	99,500	
1	24250	24375	24500	24625	24750	24875	10
2	15520	15600	15680	15760	15840	15920	20
3	12610	12675	12740	12805	12870	12935	30
4	9700	9750	9800	9850	9900	9950	40
5	8245	8288	8330	8373	8415	8458	50
6	6790	6825	6860	6895	6930	6965	60
7	5917	5948	5978	6009	6039	6070	70
8	5142	5168	5194	5221	5247	5274	80
9	4559	4583	4606	4630	4653	4677	90
10	4268	4290	4312	4334	4356	4378	100
11	3880	3900	3920	3940	3960	3980	110
12	3395	3413	3430	3448	3465	3483	120
13	2910	2925	2940	2955	2970	2985	130
14	2425	2438	2450	2463	2475	2488	140
15	1940	1950	1960	1970	1980	1990	150
16	1746	1755	1764	1773	1782	1791	160
17	1552	1560	1568	1576	1584	1592	170
18	1358	1365	1372	1379	1386	1393	180
19	1164	1170	1176	1182	1188	1194	190
20	970	975	980	985	990	995	200
21	922	926	931	936	941	945	210
22	825	829	833	837	842	846	220
23	776	780	784	788	792	796	230
24	728	731	735	739	743	746	240
25	679	683	686	670	693	697	250
26	679	683	686	670	693	697	260
27	631	634	637	640	644	647	270
28	631	634	637	640	644	647	280
29	582	585	588	591	594	597	290
30	582	585	588	591	594	597	300
31	534	536	539	542	545	547	310
32	534	536	539	542	545	547	320
33	534	536	539	542	545	547	330
34	485	488	490	493	495	498	340
35	485	488	490	493	495	498	350
36	485	488	490	493	495	498	360
37	437	439	441	443	446	448	370
38	437	439	441	443	446	448	380
39	437	439	441	443	446	448	390
40	437	439	441	443	446	448	400

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