

A GEOGRAPHY OF BEER IN THE
UNITED STATES,
1933-1977

By

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CHAPTER I
HISTORY OF THE BREWING INDUSTRY
IN THE UNITED STATES

Introduction

The scope of this study will incorporate two areas of geography not usually dealt with simultaneously, economic and cultural. The quantity of beer produced and the location of its production are topics of an economic nature. Variance in the amount of consumption over time and space can be studied quantitatively. It is more difficult to ascertain the effect of many cultural groups within the nation on the amount of consumption.

Food and drink are one part of cultural heritage imprinted on America by generations of immigrants. The pattern created by the consumption of different food and drink has been of interest to market analysts for a long time. The study of these habits is also helping other disciplines discover the imprint of many ethnic groups on the American cultural landscape.

Colonial and Revolutionary War Years

During colonization of America a brew house was one

of the first structures to appear in a settlement, and sufficient beer for the voyage from the old country was the staple most requested from the company that supported the colony. "The Governor and Council of Virginia advertised in 1609 for two brewers to be sent to the Colony" (10, p. 4). The romantic and historical John Alden was not originally a member of the Plymouth Colony but a cooper "who had ostensibly been hired only to look after the hogshead of beer during the west bound voyage, [and] decided to stay in the New World" (10, p. 9).

Beer was difficult to ship, thus malt originally was imported from England. Soon barley was planted in large enough quantities to supply the locals for home and commercial brewers.

Tavern keepers purchased their beer from a "common brewer" (commercial) and a ceiling price per quart was imposed by the governor and company of the Massachusetts Bay Colony. The "common brewer" had to be licensed and the price also was fixed (10, p. 11). Stringent rules also regulated the quality of the beer.

Though the Dutch colonized later than the English, they were quicker to take advantage of the beer needs of their citizens and imposed licensing and tax regulations early. Beer was used as a trade item with the English colony of Virginia in the 1640s (10, p. 21). Many of the names still associated with the Dutch origins of New York and New Jersey such as Van Rensselaer, Van Cortlandt, Kip, Beekman, and

Rutgers, were owners or operators of commercial brewing concerns. Brewing was a viable industry and according to Baron (10, p. 23) there were at least ten commercial brewers in New Amsterdam when the British took over the colony in 1664.

In spite of the firm beginning in America, the brewing industry suffered setbacks. In the British colonies, rum imported from the West Indies became very popular. Rum's popularity resulted in less consumption of beer. In 1700 the New York Provincial Legislature passed: "an act for the Incouraging (sic) the Brewing of Beer and making Malt within this Province" (10, p. 47). Later in the eighteenth century, New York and Philadelphia regained importance as beer exporting centers. Georgia and Virginia imported most of their beer because the grains needed for brewing were not grown in sufficient quantity.

Reacting to British taxation measures such as the Revenue Act of 1764, and the Townshend Acts, many brewers supported boycotts and non-importation agreements. They also: "refused to supply English troops stationed in that colony with salt, vinegar and beer" (10, p. 91). Increase in the production of hops and barley, as with most other goods, was encouraged by non-importation agreements.

Many brewers continued to produce throughout the war years, although barley was scarce. Supplying troops with their promised daily ration of beer was always a major problem, and at times impossible.

Post Revolutionary War Industrial Development

The years following the Revolutionary War,

. . . village breweries continued in operation with equipment and a volume of business hardly exceeding those of a village baker. Until 1850, however, America manufactured more spirituous than fermented beverages, and it was not until ten years later that malt liquors gained the definite ascendancy they afterwards maintained (10, p. 113).

Hoping to discourage continued use of "ardent spirits" much encouragement was given to home brewing. Many articles were written for this purpose such as "Effects of Ardent Spirits upon the Human Body" in 1784, by Dr. Benjamin Rush, signer of the Declaration of Independence.

Massachusetts and New Hampshire both passed laws to encourage the growth of the beer industry. They also stipulated that any person erecting a building for the purpose of brewing in those states was to be "exempted from all taxes of every kind and nature that may be assessed under the authority of the State" (8, p. 41).

In 1810, then Secretary of the Treasury, Albert Gallatin, declared malt liquors as a firmly established industry. Some states were already emerging as large volume brewing states.

There were in all, 132 breweries, producing annually about 185,000 barrels (31-1/2 gals. each); of these, forty-eight were in Pennsylvania, forty-two in New York and thirteen in Ohio. The population at that time was just over seven million (10, p. 123).

In spite of the encouragement to beer producers, the industry did not grow until the middle of the nineteenth century. The most important growth factors include: "the introduction of German beer, and the widescale success of the steam engine and its consequent mechanization of industrial processes" (10, p. 124).

The early 1800s brought the rise of temperance movements in the United States. Associated with various religious groups, they originally were concerned only with limiting the use of strong liquors, but eventually they included wine and beer in their attacks. Many people joined this movement and though it was not politically aligned it did cause legislatures of several states in 1850-54 to pass Prohibition bills. Most were repealed after a few years.

Reasons for the decline in the Prohibition movement were: (1) more attention given to abolition during the era, and (2) unenforceable Prohibition laws (10, p. 198). Apparently the movement did not discourage brewers from opening new businesses. Many of those started during the period are still in existence today.

Milwaukee developed as a major "brewing city" with the establishment of Schlitz, Blatz and Millers during the 1840s and 1850s. A place of prominence in the industry was gained by Milwaukee shortly after most of Chicago's breweries were destroyed in the fire of 1871, and beer needs of the city were met by most of the Milwaukee firms.

The Civil War brought a new form of taxation, the

Internal Revenue Act of 1862. One dollar a barrel was collected in tax and each brewer also was required to pay a license fee. Grievances with certain provisions of the act (e.g. government intention to collect taxes on beer brewed before the act went into effect) prompted a meeting of brewers in 1862. The formation of the United States Brewers Association in 1864 was one outcome of the meeting. Strengthened by their unity, the association held its ground against renewed Prohibition movements for over 50 years. It also represented the industry before Congress and the Internal Revenue Office with forerunners of modern lobbyists.

Pre-Prohibition Years

Many inventions and innovations helped the brewing industry grow during the post-civil war years through the end of the 1800s. The extensive rail system that was developing encouraged the already major breweries to expand their consumer areas by shipping their products packed in ice. Branch offices and warehouses were established in major cities for the distribution of the products, and the companies changed from local to national breweries.

Techniques in brewing also were perfected during the 1800s. Brewing always had been a business with many risks involved. There were no guarantees over quality of barley, hops, water, as well as problems in handling and storage.

Louis Pasteur spent much of his time studying the properties of yeasts, fermentation, and bacteria because of his

fascination with micro-organisms, especially those that cause disease. Baron (10) noted Pasteur also

. . . wished to place the French brewing industry on a level with the German which had always been superior. Pasteur's main contribution was to prove that the so-called 'diseases' of fermentation were caused by bacteria, and that a yeast free of bacteria produced a fermentation free of disease. The practical results of his research into bacteria was the process which was at first called 'steaming' and then 'pasteurizing': that is, the heating of the finished product at temperatures high enough to kill all harmful micro-organisms or bacteria that might still exist in it (p. 238).

American brewers were slower than Europeans to adopt scientific developments, but brewers with a national market could not afford to lag behind. The Schlitz Company imported pure yeast from Copenhagen in 1883 and Pabst did the same in 1887 (10, p. 240). Pabst also hired a research chemist. Most other breweries rapidly adopted the new ideas when it was learned that the changes would ensure uniformity of their products.

Mechanization changed many aspects of brewing, the use of conveyor belts, bottle washing, sterilizing and bottle filling machines, took formerly heavy jobs and made them suitable for women. This pleased manufacturers because women could be paid less than men and they did clean, fast work. Horizontal growth (e.g. expansion directly related to the production such as: glass making, bottling) was also a logical step. Until the late 1800s, brewers by law could not bottle their product on the premises of the brewery. A bottling company had to be hired to handle the task. Soon

large breweries established separate buildings for bottling, and a few even made their own glass for the bottles.

As breweries were increasing their capacity and consumer areas, Prohibitionists once again were gaining followers and strength throughout the country. There were many different organizations with one common goal: Prohibition. The Anti-Saloon League was the most powerful of the organizations. Many persons in various elected offices, from the local to the national level, owed their jobs to Prohibition supporters. By 1913, 12 states had enacted Prohibition legislation.

The 1916 national election produced so many "dry" members of Congress that Prohibitionists were assured of introduction and passage of the "Prohibition Amendment." Involvement in the European war was foreseen at this same time. Several bills were introduced that would make the use of any food material for the manufacture of alcoholic beverage illegal. Anti-German feelings were manifested by boycotts of Beethoven, Brahms and beer (10, p. 306). By January 16, 1919, the required 36 states had ratified the Eighteenth Amendment which was to go into effect in one year. The National Prohibition Amendment had been launched under the stress of the war psychology and the stampede created by the Anti-Saloon League (8, p. 159).

Not being sure how long the new amendment would last, brewers had to find new products in order to stay in business. Many breweries continued to brew beer but then

de-alcoholized it, making "near-beer." Some companies turned to ice-cream, malted milk or malt syrup, chocolates, even spaghetti and macaroni products. Breweries that could not afford to diversify had to close and cease all operations.

The law proved to be very unpopular and quite unenforceable. The new Congress of 1933 found repeal a logical step for the jobs and the revenue it would produce. Beer became legally available again for public consumption on April 7, 1933. Breweries that had continued to produce beer-like products, of course, had an advantage over more diverse companies, "by June of 1933, some thirty-one brewers were back in operation" (10, p. 323).

Advancement in bottling and extensive use of delivery trucks had occurred during the interim. The changes were very prohibitive to the operations of small breweries. Even with the obstacles, there were 756 licensed brewers by June of 1934 (10, p. 323).

CHAPTER II

THE RESEARCH PROBLEM

Introduction

Production of beer is a major industry in the world, and the United States is the world's leading producer. Over 172 million barrels, of 31 gallons each, were produced in the United States in 1977 (15, p. 11). Beer production and consumption has increased steadily since the repeal of Prohibition, however, the number of breweries has steadily decreased from over 600 in 1935 to 93 in 1977.

Small family-owned breweries were once as much a part of American towns as the local bakery. Prior to the Eighteenth Amendment to the Constitution, which made beer illegal to produce, sell, etc., there were approximately 1,250 breweries. Prohibition forced many of these to close or to convert to another type of business (soft-drink, near-beer, warehousing, etc.). Similar to the disappearance of local bakeries, local breweries have almost disappeared from the cultural landscape of America.

Purpose

The purpose of this study is to identify and interpret

state to state variations in the production and consumption of beer since repeal. The change within the brewing industry and the resulting changes in the location, size, and concentration of breweries also will be studied.

Statement of the Problem

What is the state to state variation in the consumption of malt beverages? Why do these differences occur?

Why has the number of breweries dwindled while consumption and production have steadily increased? What factors have had the most affect on consumption and its relationship to production?

Basis for Study

In 1974, Wilbur Zelinsky (82) suggested studies be done dealing with a variety of consumer products:

Although the geographic analysis of patterns of consumption is one of the more scandalously neglected phases of economic geography for an obscure variety of historical and technical reasons (i.e. data) the potentialities would seem to be major (p. 147).

Data Study Area and Technique

Data from 1933 through 1977 used for the variables consumption and production of malt beverages on the state and national levels are from the United States Brewers Association publication Brewers Almanac. The annual volumes give the most precise information available for geographical analysis.

Disappearance of many breweries has made production figures on a state basis difficult to obtain. Disclosure of production figures for a state having only one or two breweries are not given to ensure confidentiality. The data, for several such states, has been grouped since the early 1960s.

Data for consumption and production are mapped on the state level for each ten year period from 1933 to 1977. Various data for 1975 and 1977 will be incorporated where available. The mapped patterns are then compared for variations that have occurred during the time period covered by the study.

The General Linear Model procedure, an option of the Statistical Analysis System are used to test for the relationship between beer consumption per capita and selected socio-economic independent variables. Scatter diagrams are produced using this procedure for the more important variables. All hypotheses were significant at the .01 level of measurement.

Definition of Terms

National brewery: Multi-location plants owned by one company such as Anheuser-Busch, Schlitz or Miller.

Regional brewery: A company with one or a few breweries and a limited distribution area such as Coors or Schafer.

Family brewery: A small company in both production

and distribution which is usually limited to one state or even a part of a state such as Hulls, or Haffenreffer.

Concentration: Majority of production of beer among a decreasing number of companies.

Taxpaid Withdrawals: Beer sales on a state level as determined by taxes paid.

Variables

The dependent variable, consumption, is measured by taxpaid withdrawals (in gallons) of malt beverages by state, divided by the population of the state that is over 21 years of age. This figure produces a measure in gallons per capita of the beer drinking population.

The 50 states of the United States are used as the units of study. The data were obtained for the years 1940, 1950, 1960, 1970 and 1975 from the United States Census Bureau. The number of breweries licensed to operate by state was taken from the Brewers Almanac. Information was not available for Alaska and Hawaii until they became states in 1960. Thus, they do not enter the analysis until that data.

Certain variables were chosen with the expectation that they would help explain the change in consumption over time as well as the variations from state to state. These variables are: (1) population over 21 years of age, (2) income per capita, (3) percentage of the civilian labor force employed in manufacturing, and (4) median age.

Population over 21 is used because in most states it is the legal age for purchase and consumption of alcoholic beverages. Although some states make a distinction according to alcoholic content by weight (3.2 as opposed to greater than 3.2), data do not allow for this differentiation. Other states have changed the legal age during the time period covered by the study. A slightly lower consumption rate per capita would be produced due to the larger population used as the divisor. Due to these disparities, only population over 21 are used to maintain uniformity of data through time for comparison purposes.

Income per capita has varied over time and from state to state. If the increase in expendable income and increases in consumption coincide by state, the former may help to explain the latter.

The variable "income per capita" gives an indication of the wealth of a population. The total population of the state is used for income while only the population over 21 is used for consumption. This gives a more accurate estimate because the portion of the population that purchases and consumes beer is the same as that which supports the remainder of the population (younger and older non-income earners).

Production of malt beverages by state (given in millions of barrels of 31 gallons each) was analyzed to determine any changes in the consumption patterns between 1940 and 1975. Total lack of production in many states in the 1975 data

made it necessary to use a dummy value of .001 in order to facilitate comparison. Some states have grouped production figures. The grouped figure was then divided proportionately dependent on the number of breweries (family, regional, national) and previously available figures for the states with missing data.

Beer and its consumption have had a masculine image for many years. Advertising, until recently has typified this image. The notion of great quantities of beer being consumed by blue collar workers stems from this same image. The variable percentage of civilian labor force employed in manufacturing is expected to test the validity of this concept.

Median age was used to determine if there is a relationship between agedness of a population and the amount of beer consumption of that population. Forty-one percent of beer in 1976 was consumed by persons between 21 and 34 years of age (15, p. 5), a change in median age may help to explain a change in consumption pattern.

Statement of Hypotheses

The following hypotheses were tested for strength and direction of relationship to consumption. It is expected that as per capita income increases so too will consumption of beer.

Jobs in the secondary sector (manufacturing) of the economy are usually associated with high salaries due to

strengthened labor unions and their demands. The percentage of the civilian labor force employed in manufacturing should produce a strong correlation when used as an independent variable with consumption.

The lower the median age, the greater the beer consumption.

The greater the population over 21 the greater the consumption per capita.

Beer has always been considered to be a market oriented product, produced near its consuming market. It is expected then that the greater the consumption by state, the greater the number of breweries. Associated with this would be the logical assumption that the greater the number of breweries the higher the number of barrels of beer produced in that state, and the higher the consumption would be.

States with high per capita consumption would be expected to be the greater producers of the product.

Review of the Literature

Most research concerning breweries and beer consumption has been done by historians, economists, and business administrators. In geography, the only studies have been of a historical or cultural nature, with the economic aspects largely ignored.

Stanley Baron (10) traced the history of brewing from colonial days through battles with temperance societies, establishment of "regionals," to the period following repeal

and early moves made by "national" concerns. It is an excellent work that has proved valuable as a foundation for most beer studies.

The rise of one important United States brewer, Pabst, is recorded by Cochran (23). The location, Milwaukee, is shown to have been of primary importance with its large German population, and proximity to the grain shipping centers. Topics of special note include the importance of advertising, mergers, and "winning a national market."

Economic studies of beer and breweries include those by Keane (45), Fisher (30), and Hatten (35). Keane shows the affect of the change in packaging of beer from kegs, used primarily for tavern consumption, to cans (1937) for "off-premise" consumption. Income is pointed out as a factor in the varying location of consumption, with more affluent drinkers preferring "off-premise" consumption to tavern consumption. Relations between labor, government, consumers and breweries are investigated by Fisher as contributing factors toward concentration within the industry. The brewing industry from 1952-1971 was the study area and time period used by Hatten (35) in his 1974 research. It was noted that many of the larger firms (i.e. Anheuser-Busch, Schlitz) traded profit for growth (expansion) during this era.

Hatten's work focused on strategic decisions, especially those that produced "competitive advantage" within the industry. Most important factors were found to be advertising,

promotional expenditures and aggressive plant expansion. The latter was accomplished by: (1) increasing the capacity of existing facilities, (2) acquisition or merger, or (3) construction of a new large capacity brewery in an area not already served by existing facilities. The last form is known as the "multiple plant strategy" and is shown in this study to have been the most advantageous choice made by what are presently the five most influential American brewing concerns.

In their 1974 study, Rooney and Butt (68) equate beer consumption patterns with ethnic backgrounds and religion to explain variations in extremes in the United States. The change in packaging and the decline of the tavern also are discussed.

Baldwin's (9) work is the most thorough study on beer by a geographer to date. The study area of Wisconsin was quite unique in that the state contains all three types of brewing concerns, family, regional and national. Changes in consumption within the state that may have had an affect on the brewing industry were not covered in the study, however, topics such as economic and locational factors were only briefly covered or only as pertaining to the historical growth of the industry.

CHAPTER III

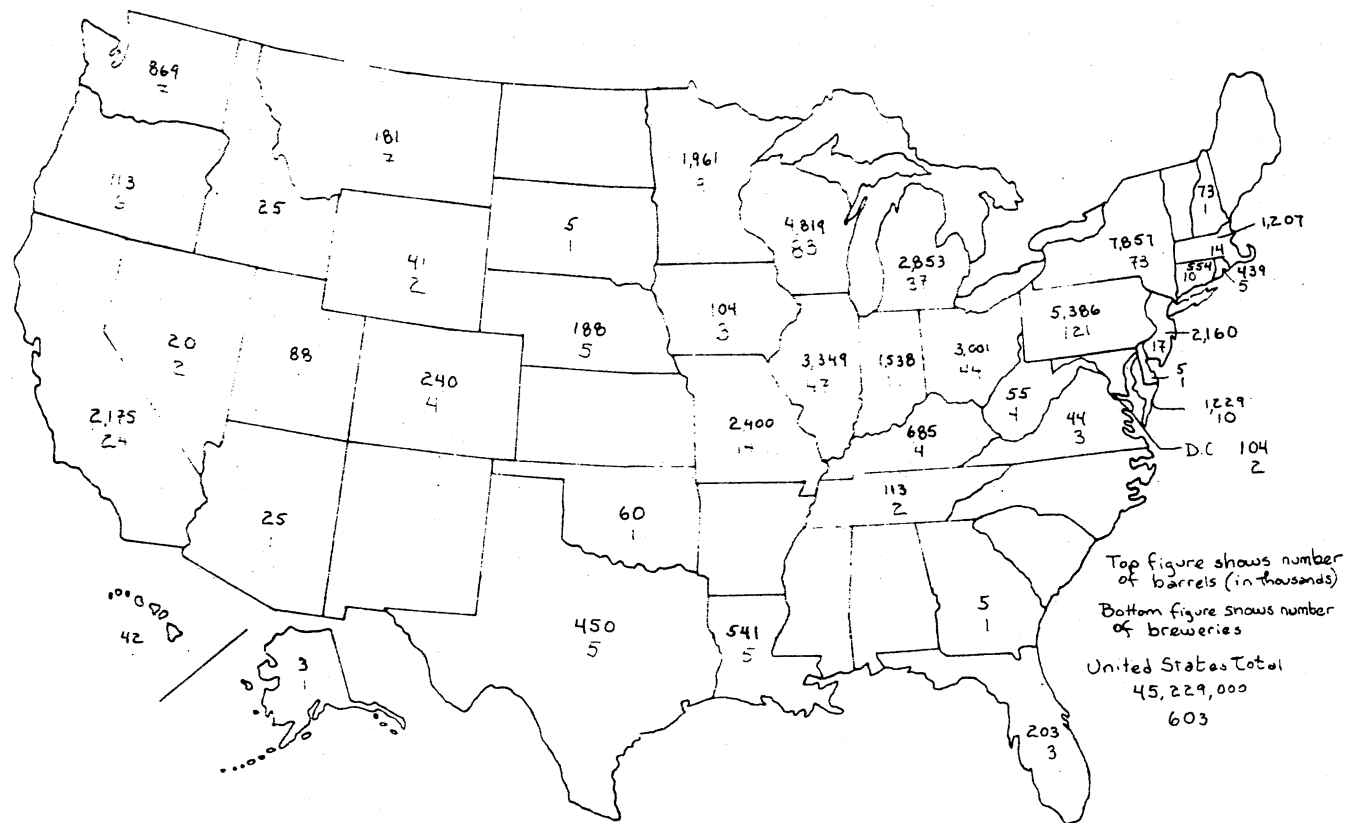
PATTERNS OF PRODUCTION AND CONSUMPTION OF MALT BEVERAGES 1933-1977

Production of Malt Beverages; Repeal - 1949

The mapped pattern for 1935, the second full year of production following Prohibition, shows New York as the greatest beer producing state (Figure 1). New York produced over 17 percent of the 45,228,605 barrels in 1935. When the New York total is added to the next three top producers, Pennsylvania (12%), Wisconsin (10%), and Ohio (6.6%), over 50 percent of the total is accounted for.

Almost every state had at least one brewery in 1935. Some of these were small family concerns with a very limited capacity such as those found in South Dakota, Georgia and Delaware where each produced just over 5,000 barrels annually.

The number of breweries is difficult to pinpoint, as many opened and closed faster than the government could record. An approximate number for 1933-1939 would be 600-620 in operation annually. By 1940 the number of breweries



Source: The Brewing Industry in the United States, Brewers Almanac (15, p. 31).

Figure 1. Production of Malt Beverages by State and Number of Breweries, 1935

in operation was 595. Many of the smaller concerns found new bottling and canning apparatus too expensive and profits not as great as anticipated.

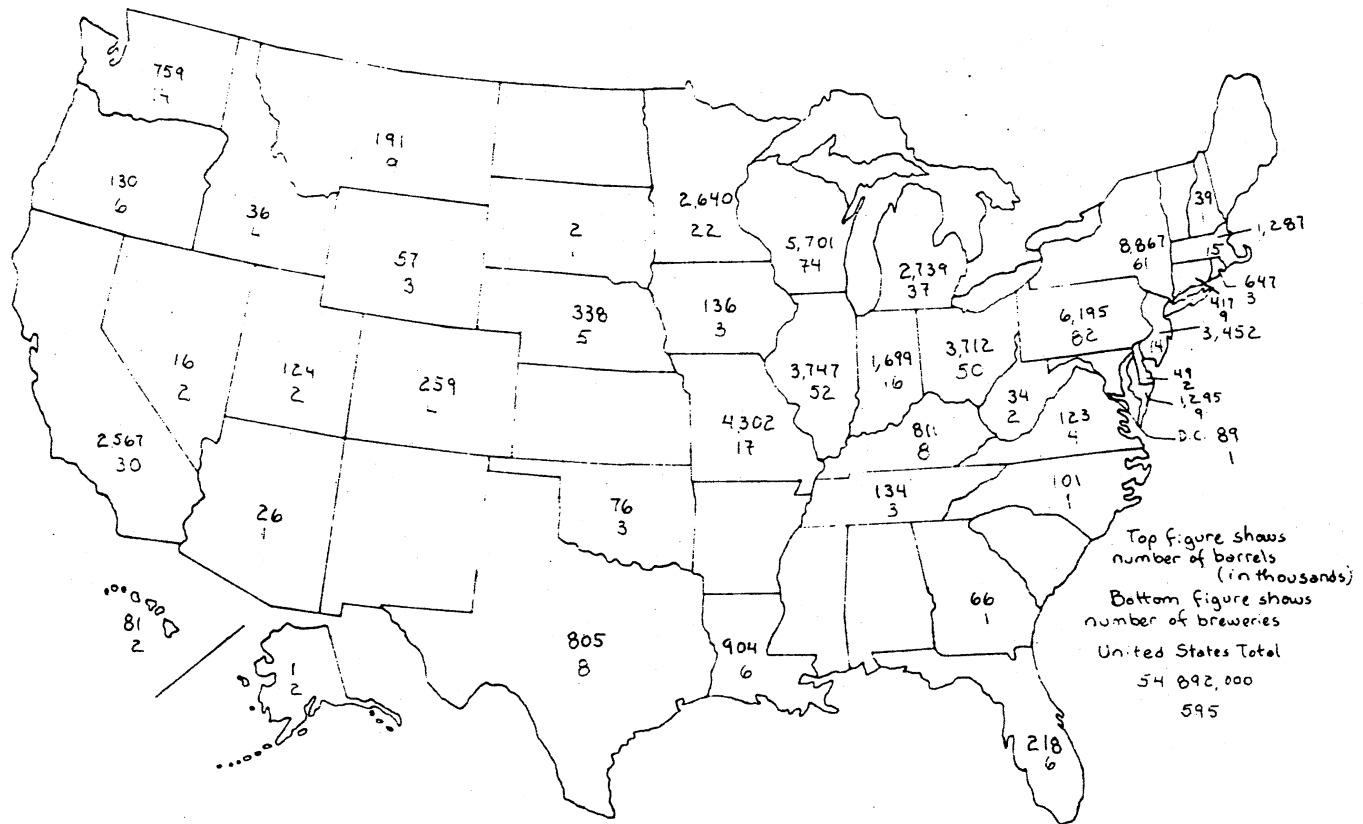
Production by 1940 (Figure 2) increased to nearly 55 million barrels with New York still the state producing the greatest portion (16%) of this total. Pennsylvania (11%), Wisconsin (10%), Illinois (6.8%), and Ohio (6.7%), along with New York still produced half the national total.

Missouri nearly doubled its production during the five year period from 1935-1940, gaining fourth position in United States production with 7.8 percent of the total. Other large increases were in Georgia which went from 6,000 barrels in 1935 to 66.5 thousand barrels in 1940, and Texas which also doubled its production.

Impending involvement in the European war caused panic among brewers during the 1940s. This time, however, brewers were united and maintained a strong lobby in Congress. Army reports were unveiled that proved beer consumption had a positive effect on morale and discipline. Production increased and was deemed "an essential industry" by the War Labor Board in 1945 (10, pp. 333, 334).

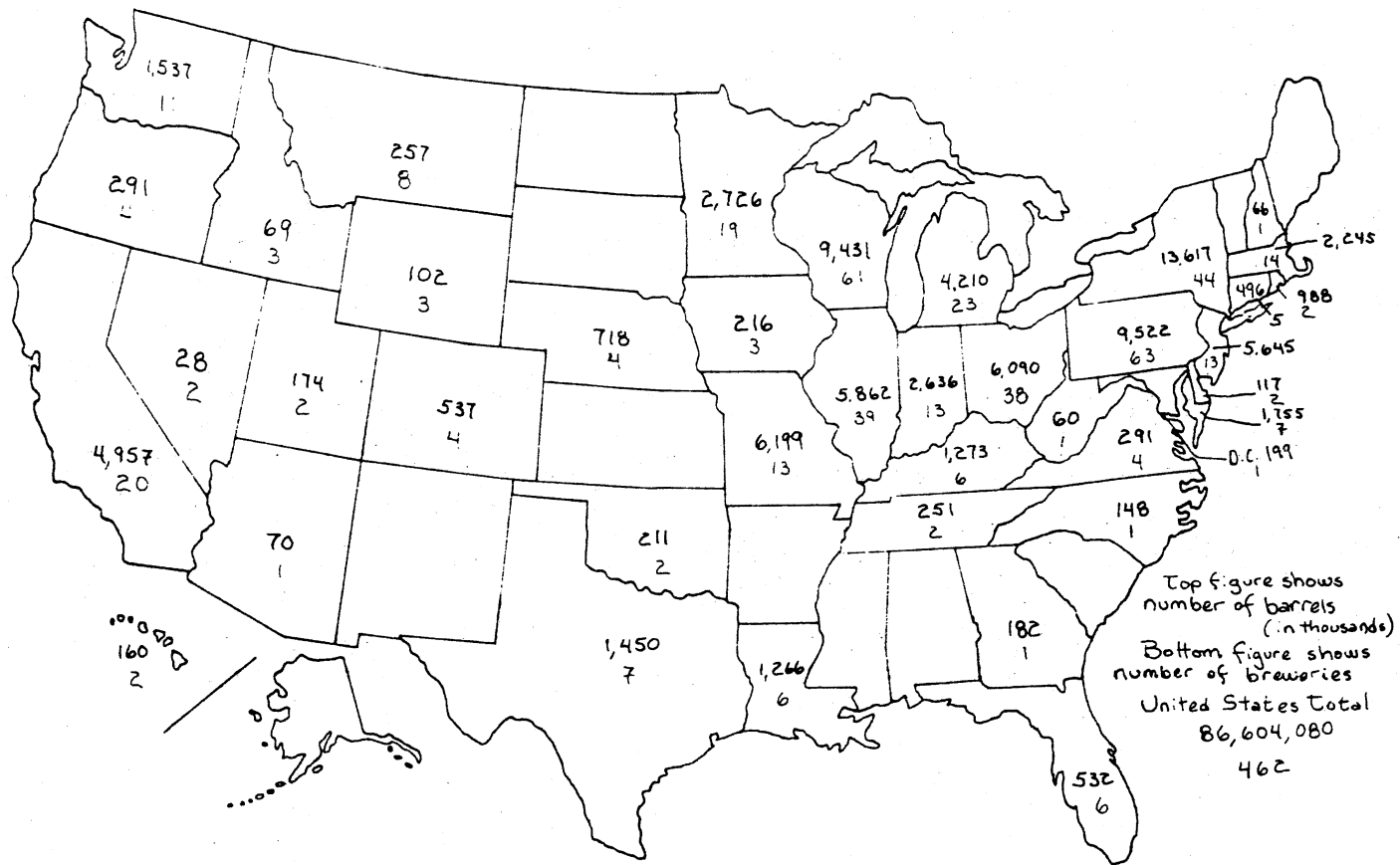
By the same year New York had increased its already high production by five million barrels and produced 16 percent of the 86 million total barrels (Figure 3). Pennsylvania was second with 9.5 million followed by Wisconsin (9.4), Missouri (6.2), and Ohio (6.1).

Simultaneously the number of breweries diminished by



Source: The Brewing Industry in the United States, Brewers Almanac (15, p. 31).

Figure 2. Production of Malt Beverages by State and Number of Breweries, 1940



Source: The Brewing Industry in the United States, Brewers Almanac (15, p. 31).

Figure 3. Production of Malt Beverages by State and Number of Breweries, 1945

more than 20 percent (Figure 4). In 1940 there were 595 and by 1942 only 462. Losses were greatest in states that had the most breweries, with New York and Pennsylvania losing 17 and 19 respectively. Though every one increased production, none increased its number of breweries.

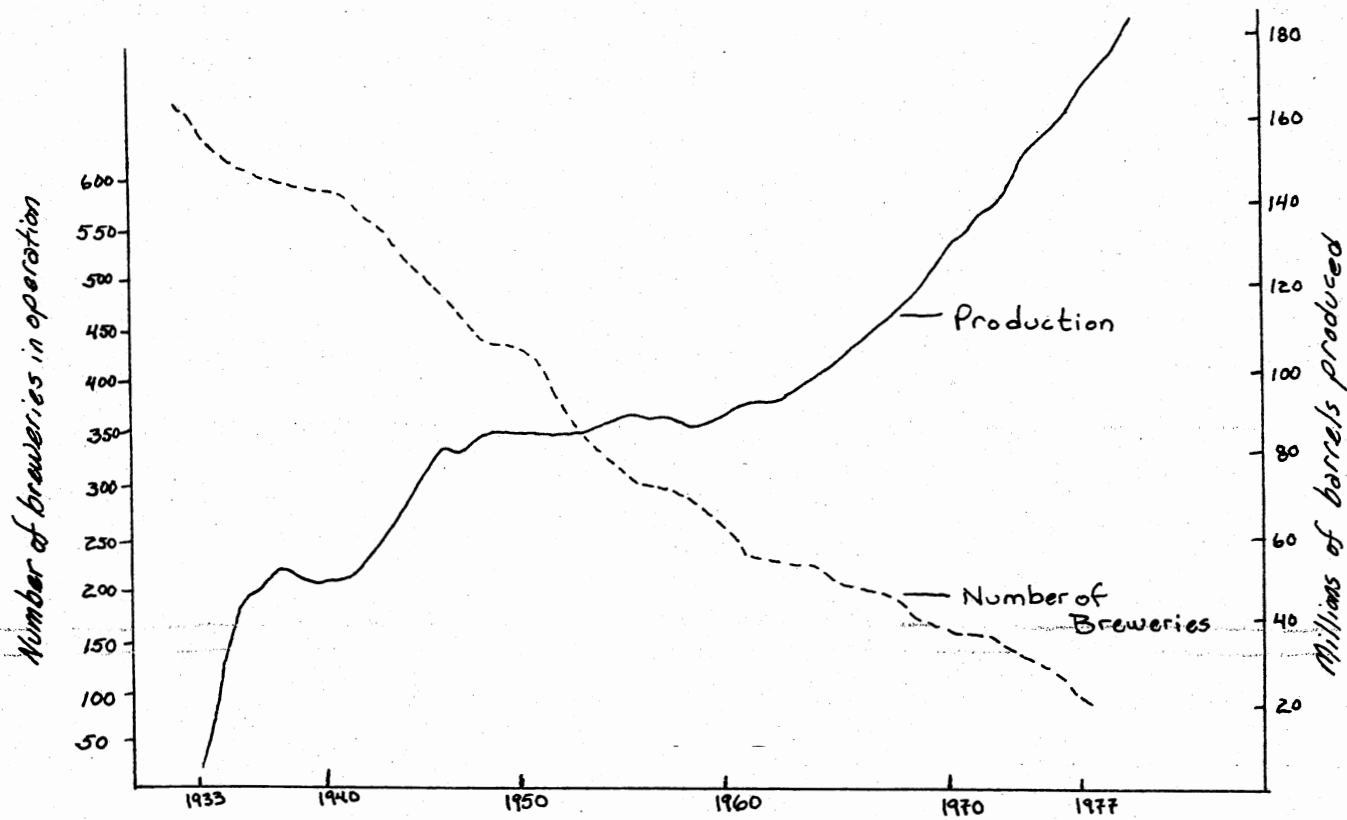
The major reason for these losses were increased costs for operation and expansion of brewery capacity enabling market expansion.

According to official statistics for the year 1939, the amount of money spent by breweries on plant and equipment was roughly \$20,000,000. This is to be compared with the same category of expenditure in 1947, when the total had risen about five-fold to approximately \$110,000,000 (10, p. 339).

Production of Malt Beverages

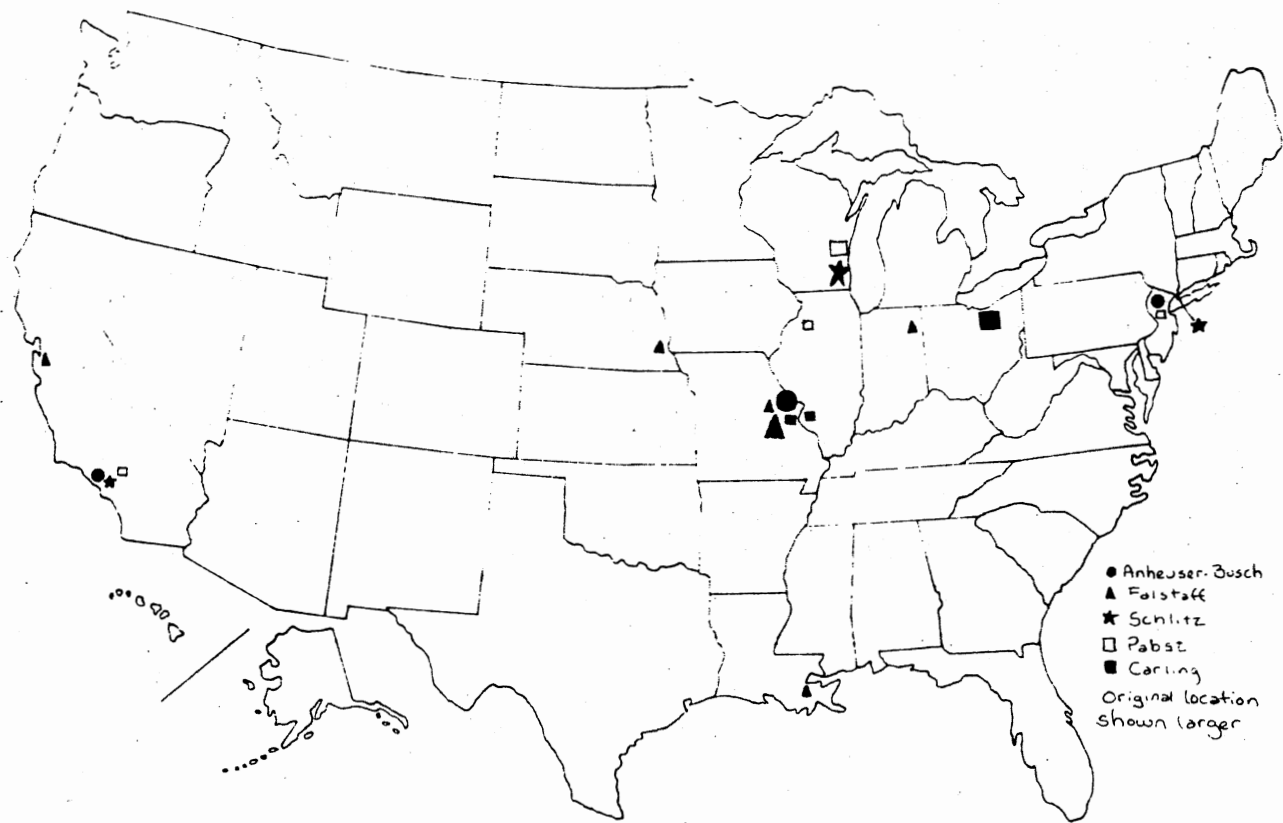
1950-1960

The first interstate expansion of a brewery concern wishing to increase its market potential appears in the data for 1950 as listed by the Alcohol Tax Unit of the United States Treasury Department. Only Falstaff Brewing Corporation had interstate branches during the 1940s with two locations in St. Louis and one each in New Orleans and Omaha. By 1950 three other breweries expanded outside their original region either by building a new plant or by the purchase of an existing brewery (Figure 5). Jacob Ruppert Company, a New York brewery opened another plant in Norfolk, Virginia. Schlitz and Pabst Brewing Companies, both Milwaukee concerns, expanded in a similar direction: Schlitz



Source: The Brewing Industry in the United States, Brewers Almanac (15, p. 31).

Figure 4. Millions of Barrels Produced and Number of Breweries, 1933-1977



Source: The Brewing Industry in the United States, Brewers Almanac
(15, p. 31).

Figure 5. National Breweries, 1955

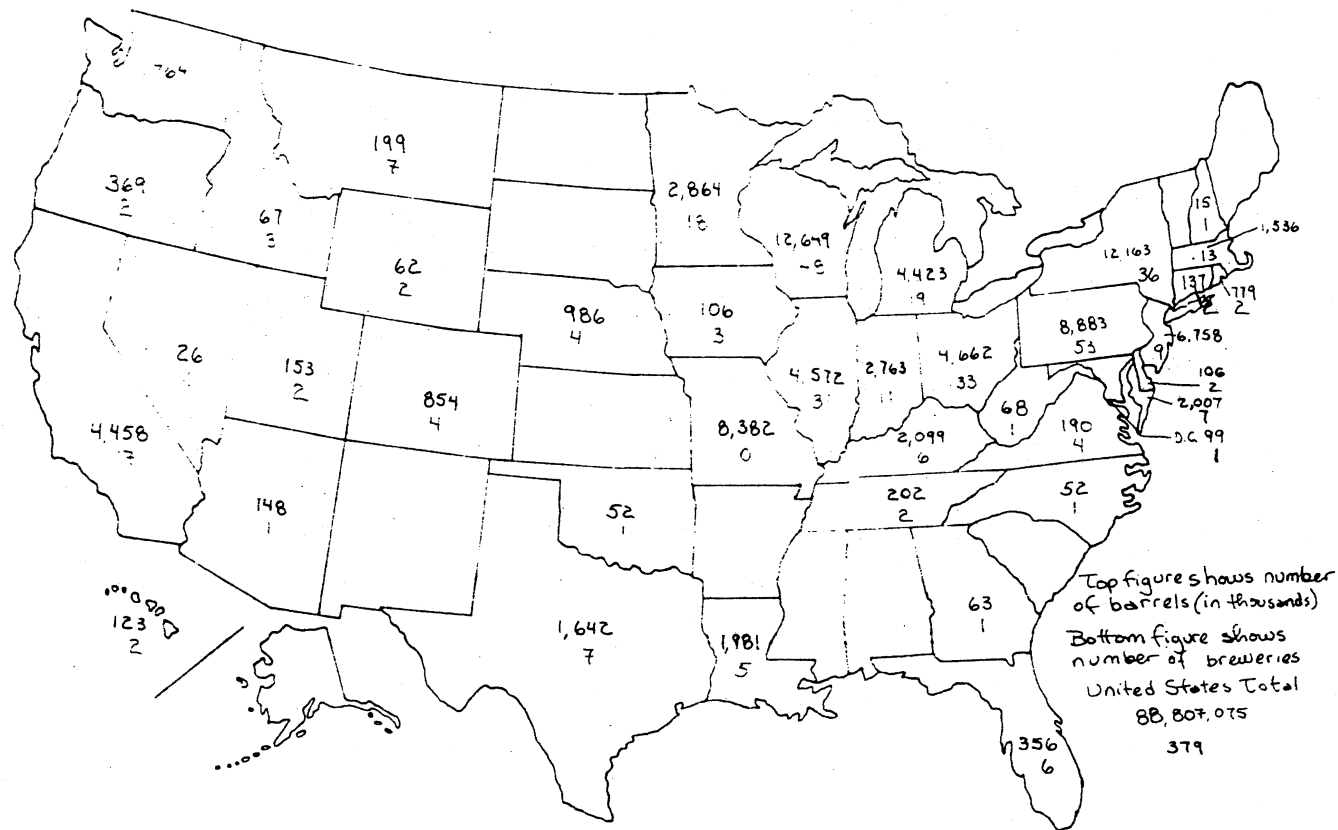
to New York City and Pabst to New Jersey. The decision seems to have been a good one for the latter two but the Ruppert concern in Virginia was sold within five years and Ruppert continued with its single location plant.

The increase in production over that of 1945 was only 2.2 million barrels for 1950 (Figure 6). But during the same five year period 83 breweries discontinued operations. Possibly this decrease was due to a post-war economic recession.

A decline in production is noted in the mapped data: Northeast, New York, Pennsylvania, Mountain States and California all produced lower quantities than during the war. Growth continued in the Central and Southwest. For the first time Wisconsin led the nation in production and number two; New York was a half million barrels less than Wisconsin. Missouri, Kentucky, Louisiana, Colorado and Arizona also show significant increases over the all time high production during the war.

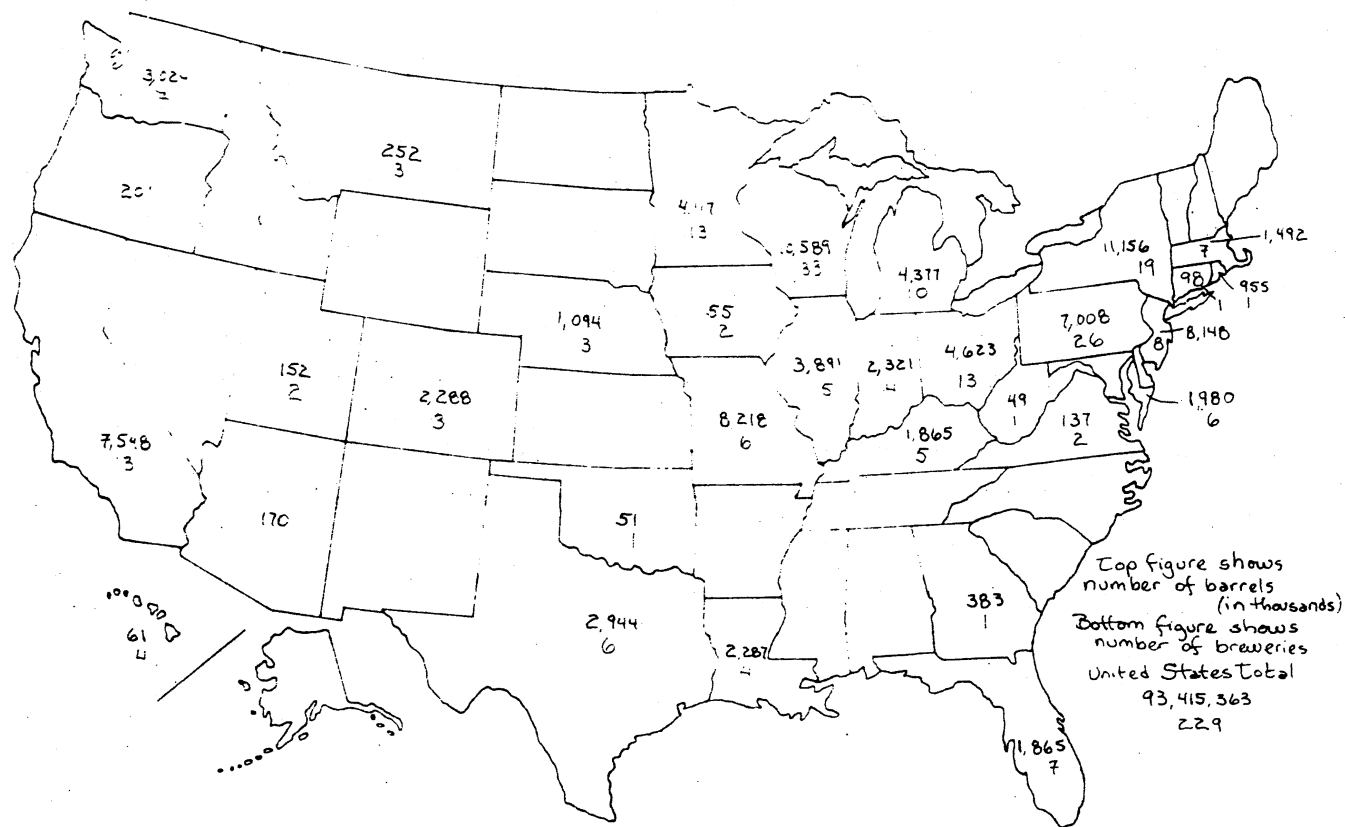
The smallest increase in production occurred between 1950 and 1960. The total production figure for 1960 (Figure 7) was 93.4 million barrels, only 4.6 million barrels over 1950. New York was once again the leading state of production, 600,000 barrels greater than Wisconsin. States following in order of production were Missouri, New Jersey, California and Pennsylvania.

Expansion by brewing concerns was most active during this period (Figure 8). Falstaff more than doubled its



Source: The Brewing Industry in the United States, Brewers Almanac (15, p. 31).

Figure 6. Production of Malt Beverages by State and Number of Breweries, 1950



Source: The Brewing Industry in the United States, Brewers Almanac (15, p. 31).

Figure 7. Production of Malt Beverages by State and Number of Breweries, 1960



Source: The Brewing Industry in the United States, Brewers Almanac
(15, p. 31).

Figure 8. National Breweries, 1960

number of plants through the addition of one in San Jose, California, one in Ft. Wayne, Indiana, and two in Texas (Galveston and El Paso). Anheuser-Busch added four plants to its single, St. Louis operation. These in Los Angeles; Newark, New Jersey; and Tampa and Miami, Florida. Carling Brewing Company operated plants in six states, Schlitz in five states and Pabst in four different states. All of these moves were made by firmly established breweries, all originally centered in the Milwaukee, Wisconsin, or St. Louis, Missouri, area, except for the Carling Brewing Company. Carling originated under Canadian ownership and began operation in Cleveland in 1933. Without the family origin (such as that of Anheuser-Busch or Schlitz) and tradition associated with most major brewing concerns, Carling's owners accepted the chain-brewery concept as early as 1954. An article in Fortune in 1959 quoted a company official as saying that the "200 or so firms now operating [in the United States] will be winnowed down to ten or twelve, with Carling's of course, as top dog" (52, p. 168).

Expansion occurred from its historic center in Wisconsin outward toward areas of greatest population, where east and west coast operations were started by what are now the industry's leaders (i.e. Schlitz, A. B. Carling). Also, new areas were penetrated where population and, therefore, consumption could be expected to increase such as Texas and Florida.

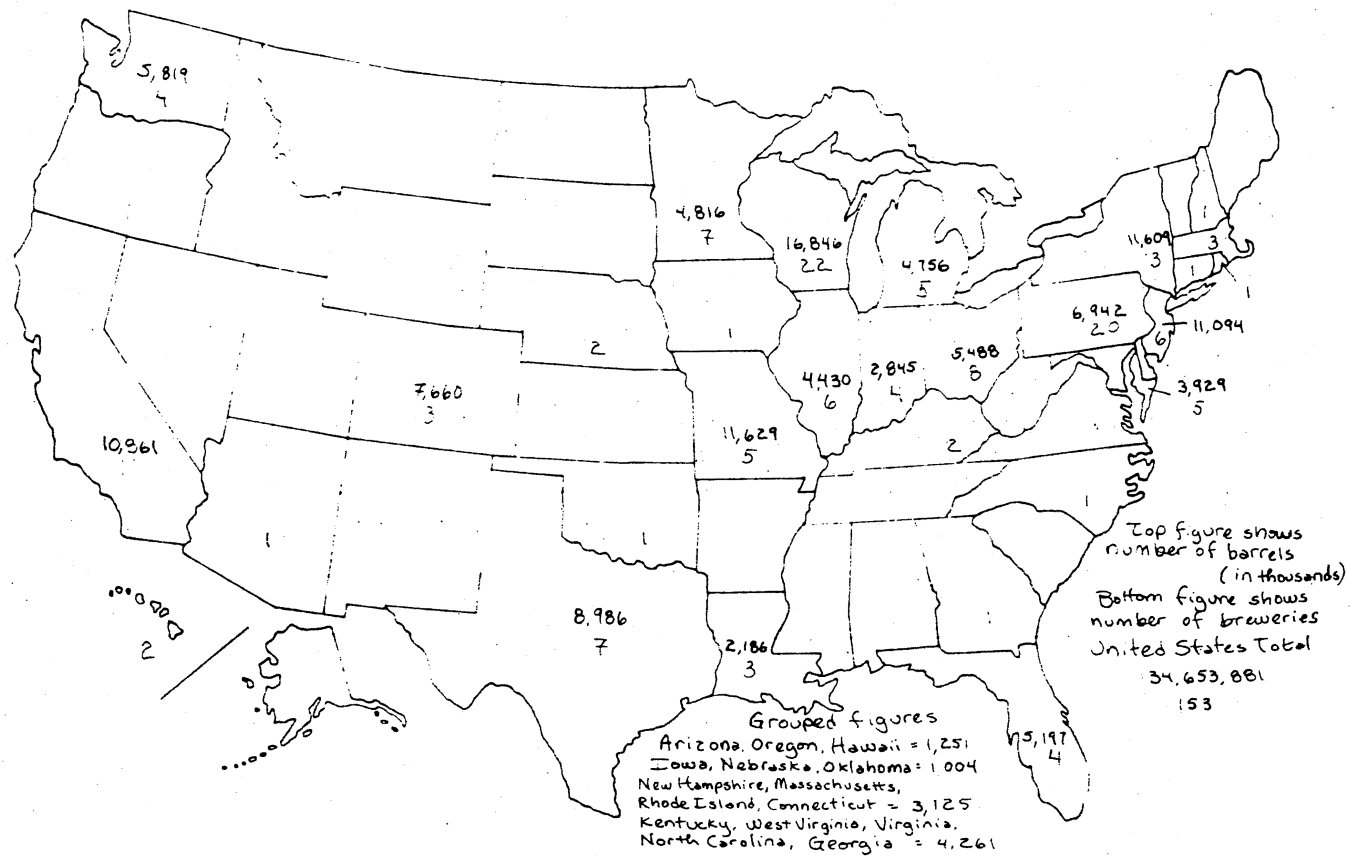
Production of Malt Beverages

1970

Production increased by 41 million barrels between 1960 and 1970 bringing total production to 134.650,000 barrels (Figure 9). Production and sale of malt beverages had by this time, "exceeded the previous year and established a new all-time high for twelve years" (15, p. 1).

Areas of largest increase are different than the historic "beer belt" previously noted. Wisconsin, New York and New Jersey were still the leading states of production but new areas rapidly were becoming prominent. Texas had the greatest production increase, tripling its output during the ten year period. This is a reflection of the new breweries installed (or old ones bought) by major brewing concerns that moved into the state during the early 1960s. Firms in Colorado increased their production by 5.5 million barrels and those in California by 3.4 million barrels.

Brewing companies also took steps towards expansion during the late 1960s, which resulted in further concentration of the industry. In the publication "Breweries Authorized to Operate" for July 1970 (20), there was a total of 153 breweries indicating a loss of 76 since 1960. Twenty percent of the operating breweries were owned by four companies: Anheuser-Busch (8), Schlitz (8), Falstaff (7) and Carling (7). Anheuser-Busch added four new plants in: Houston, Texas; Columbus, Ohio; Jacksonville, Florida (after



Source: The Brewing Industry in the United States, Brewers Almanac (15, p. 31).

Figure 9. Production of Malt Beverages by State and Number of Breweries, 1970

discontinuing operation in Miami); and Merrimack, New Hampshire. Schlitz added three new breweries during this period at Winston-Salem, North Carolina; Longview, Texas; and Oahu, Hawaii.

Miller Brewing Company had been a single location operation (Milwaukee) until shortly after being purchased by Philip-Morris Incorporated in 1969. New leadership and financial backing encouraged Miller to expand. It added a two million barrel capacity brewery in Azusa, California, and another in Ft. Worth, Texas (18).

Production of Malt Beverages

1977

By 1977 the expansion trend had leveled off with only a few companies building new breweries and closing some of their antiquated plants (Figures 10 and 11). More emphasis was devoted to vertical integration with many firms establishing or expanding aluminum can facilities., hop and rice cultivation, by-products such as cattle feed and even recreation facilities such as Busch Gardens.

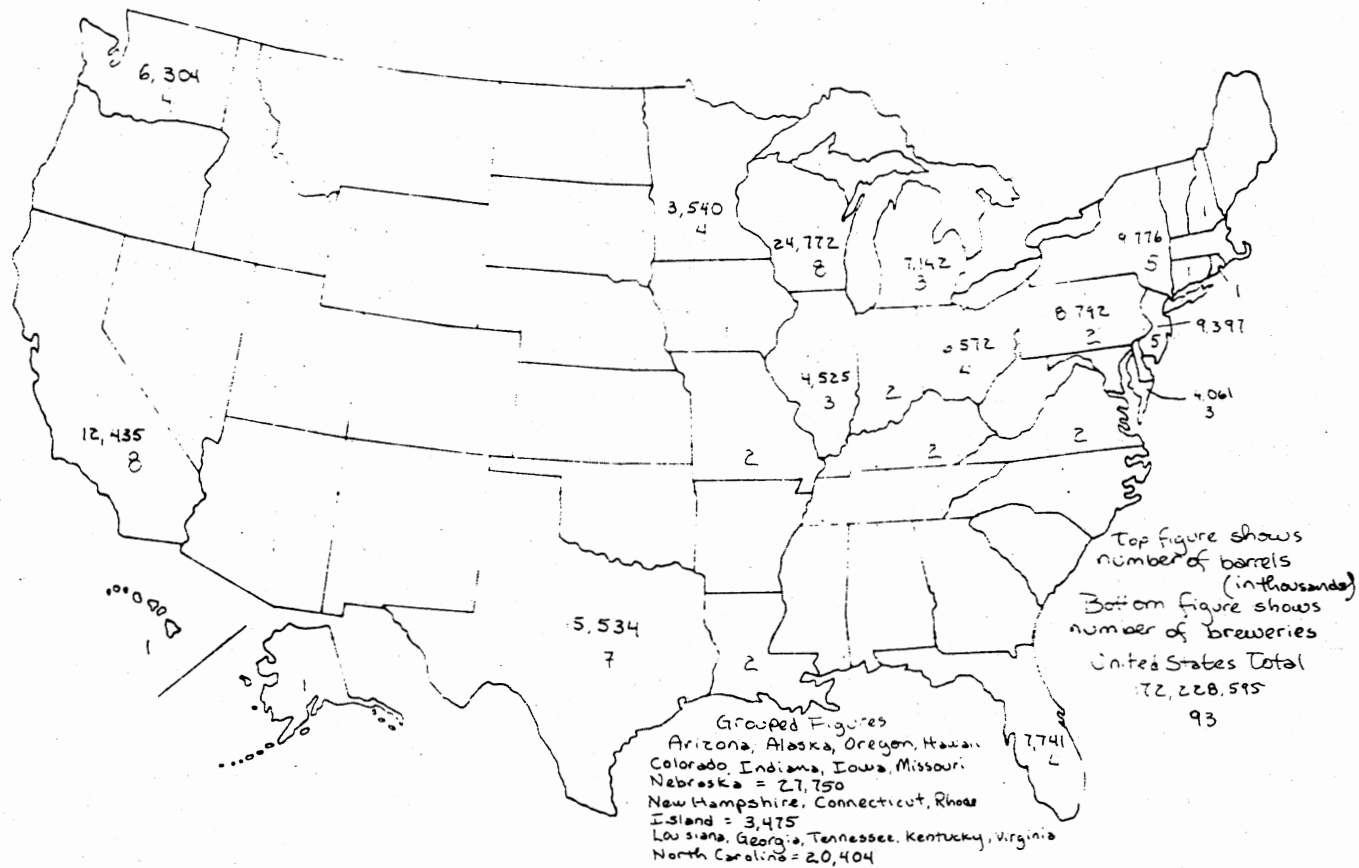
Carling had a total of six breweries after closing those in Atlanta, Georgia; Cleveland, Ohio (their original); and Natick, Massachusetts. Another plant was added in Baltimore and one in Phoenix, Arizona. The latter was their only operation in the southwest which was an area of growing consumption.

Miller opened its Fulton, New York, plant in 1976 with



Source: The Brewing Industry in the United States, Brewers Almanac (15, p. 31).

Figure 10. National Breweries, 1977



Source: The Brewing Industry in the United States, Brewers Almanac (15, p. 31).

Figure 11. Production of Malt Beverages by State and Number of Breweries, 1977

an annual capacity of eight million barrels. Another brewery is expected to open soon in Eden, North Carolina. It was expanded while under construction and has an expected capacity of 8.8 million barrels. Aluminum can plants are located near each brewery which "results in substantial cost savings for Miller" (63, p. 22).

In November, 1977 Miller began construction on a new five million barrel plant in Irwindale, California, which will replace the smaller old brewery in Azusa, California, when completed in 1980. Annual capacity in the existing Ft. Worth, Texas, brewery was increased to seven million barrels by 1979 (63, p. 6).

Anheuser-Busch consisted of ten breweries in 1977 with annual capacity of 42 million barrels. Newest additions are Williamsburg, Virginia, opened in 1972 along with the third Busch Gardens. The most recent brewery is located 40 miles northeast of San Francisco in Fairfield, California, and has an annual capacity of 3.2 million barrels. Busch also has

. . . nine company owned 'beer branches' which provide an income-producing segment of the distribution system. These 'beer branches' compliment the individual wholesalers and perform sales, merchandising and delivery services in their respective areas (3, p. 7).

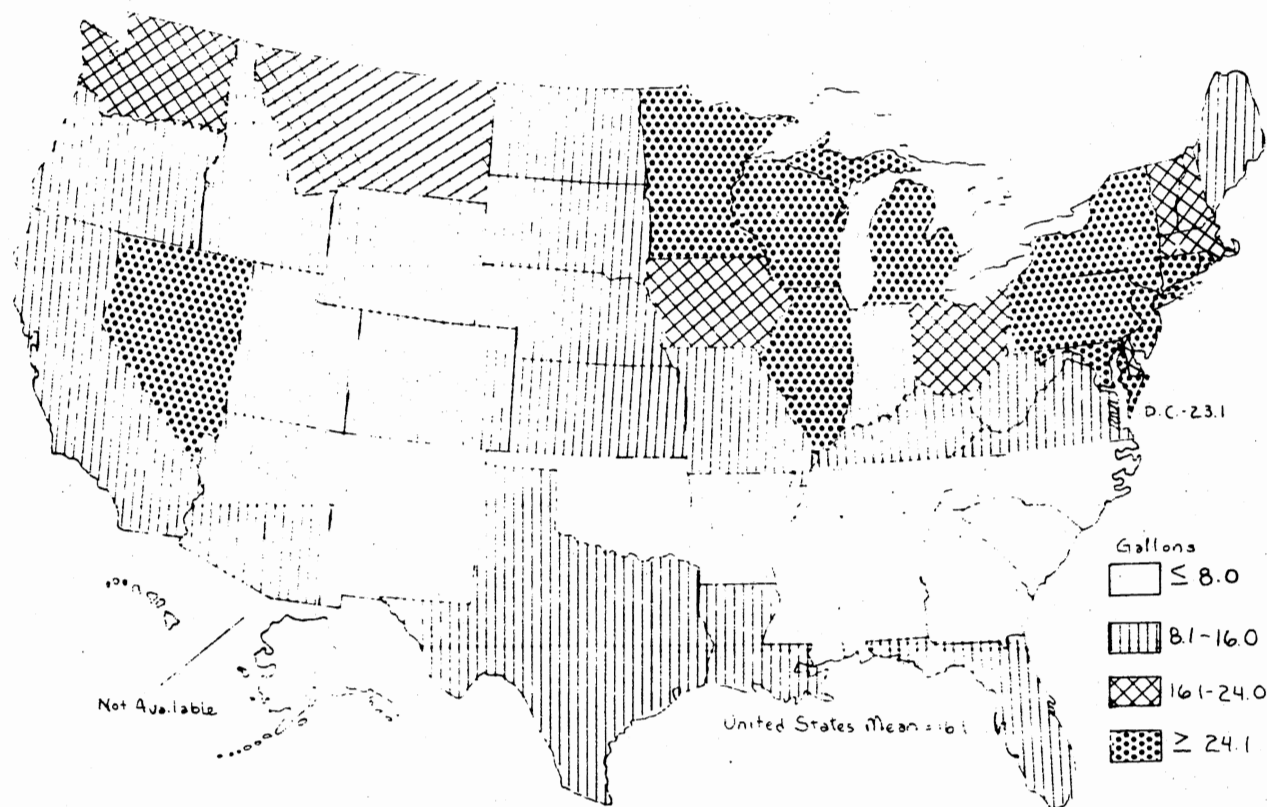
These are located in or near heavily populated areas including: Sylmar and Riverside, California; Denver, Colorado; Kansas City, Missouri; Chicago, Illinois; New Orleans, Louisiana; Washington, D.C.; Newark, New Jersey; and Cambridge, Massachusetts.

Consumption Per Capita Over 21

Examination of the 1940 per capita consumption map (Figure 12) shows Wisconsin to be the state with the highest consumption rate, over twice the national yearly average of 16.1 gallons per person. Michigan, Maryland and New Jersey all with consumption rates of approximately 29 gallons per person also stand out as high consumption states. The above average consumption tendency continued throughout the northeastern part of the United States, and through the "Manufacturing Belt," with the exception of Indiana (15.5), Ohio (22.4) and Iowa (16.3). Only three other states had higher than average consumption in 1940; Montana, Washington and Nevada. All other West Coast and Mountain states range from 15.7 gallons (Nebraska) to 11.5 gallons (Utah).

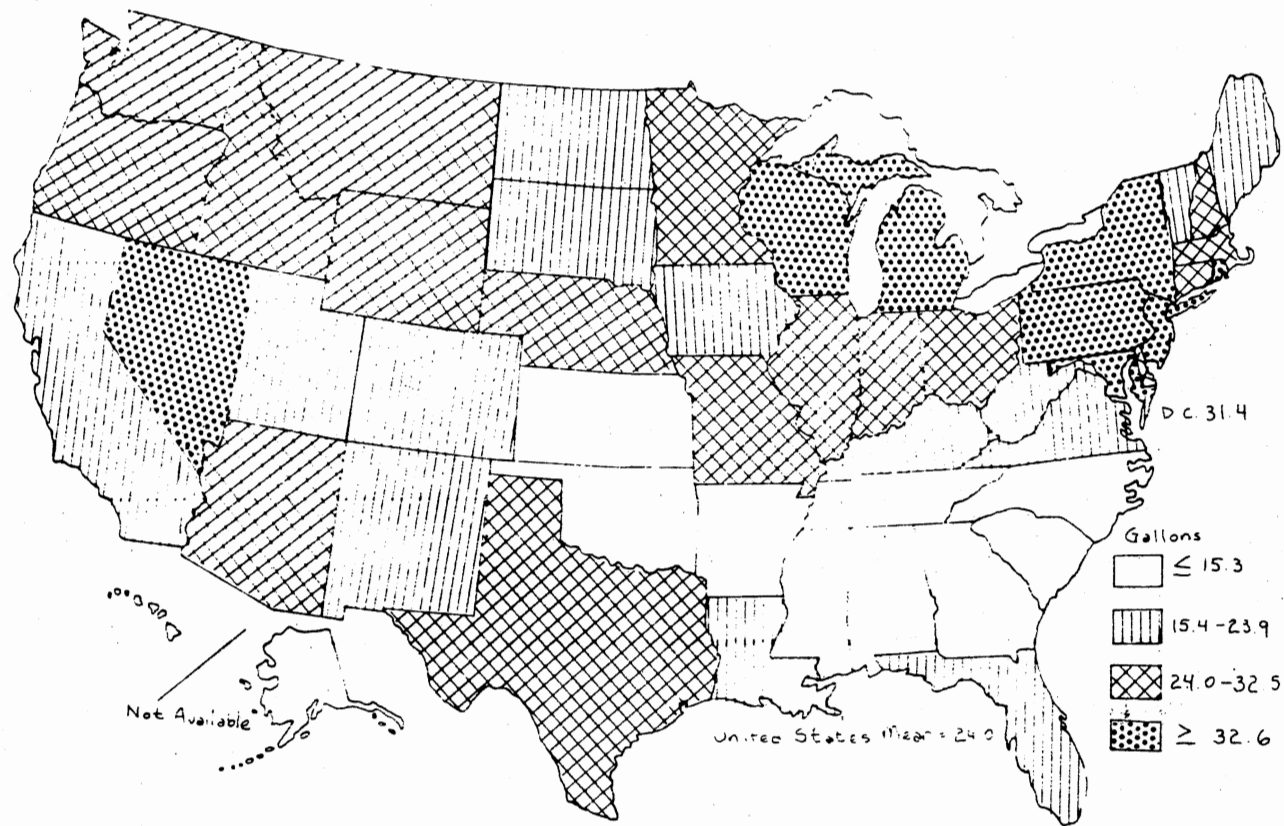
The entire southern part of the United States is well below the national mean and contains all low consumption states. Highest among these was West Virginia with 16.0 gallons consumed per person. The West Virginia average is only slightly below the national mean. Physically surrounded by high consumption states (such as Ohio, Pennsylvania and Maryland), Florida, Texas, Kentucky, Louisiana and Virginia are within one standard deviation below the mean. Lowest consumption levels are found in the traditional "deep south," especially Mississippi (2.9 gallons) and Georgia (3.0 gallons).

In 1950 (Figure 13) the mean consumption per capita of those people over 21 years of age for the United States was



Source: The Brewing Industry in the United States, Brewers Almanac (15, p. 31).

Figure 12. Consumption Per Capita Over 21,
1940



Source: The Brewing Industry in the United States, Brewers Almanac (15, p. 31).

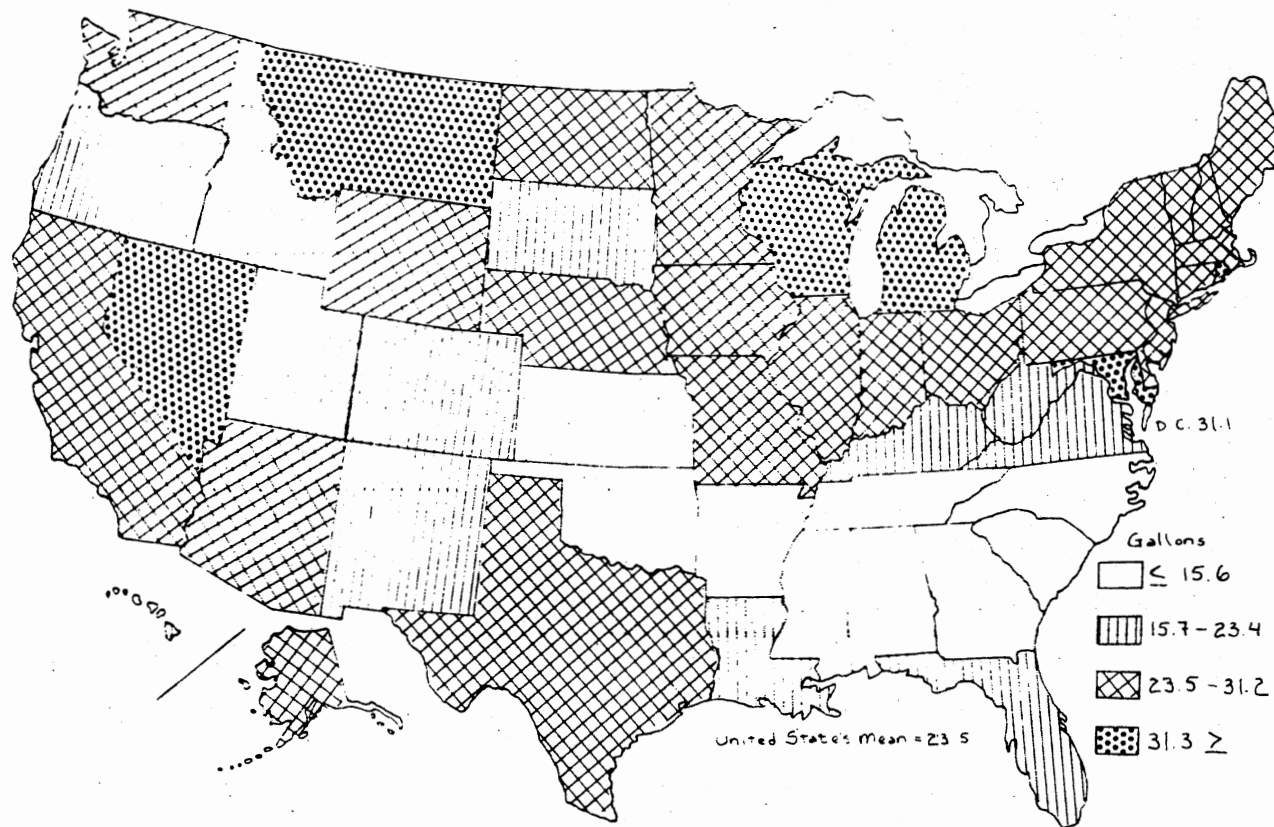
Figure 13. Consumption Per Capita Over 21, 1950

24.0 gallons. Wisconsin and Michigan are number one and two where 41.9 and 38.4 gallons per person respectively were consumed. The increase in consumption of eight gallons per person from 1940 to 1950 may be attributed to World War II. Many changes in American life style occurred because of the war, and beer consumption may have been one of them.

The northeast and north central states again appear as higher consumption areas than the remainder of the United States. Vermont and Iowa did not have as much growth as the region as a whole. They are just below the national mean with 23.7 gallons and 23.0 gallons respectively. Maine, though the lowest in this region, increased by 9.3 gallons per person over 21. Indiana joined the higher than mean group with 25.5 gallons per person over 21 consumed.

Areas of most dramatic growth appear in the plains and mountain states. Missouri more than tripled its consumption from 8.7 gallons per capita in 1940 to 26.7 gallons per capita in 1950. New Mexico more than doubled from 7.5 to 19.9 gallons per capita in 1950, although it remained below the United States mean. Consumption in Arizona and Texas almost doubled during the ten year period.

The 1960 (Figure 14) indicates a slight decline in per capita beer consumption from 1950. This decline originally occurred between 1948 and 1949 when withdrawals decreased by 11 million barrels. The decline continued for about two years and then leveled out during the 1950s. Consumption did not show any significant increases until 1960 when 1947



Source: The Brewing Industry in the United States, Brewers Almanac (15, p. 31).

Figure 14. Consumption Per Capita Over 21,
1960

withdrawals (95 million barrels: See Figure 4) were once again reached. The decline was not visible in the 1950 map because withdrawals increased by 30 million barrels from the 1940 data. Before the decline, withdrawals had almost doubled from just over 53 million barrels in 1940 to almost 97 million barrels in 1948.

Wisconsin still led the United States in consumption in 1960 with 43 gallons per person over 21. This is almost 20 gallons above the United States mean of 23.5. Nevada became second with 39.6 gallons per person, and Michigan dropped to third with just over 35 gallons. Michigan's consumption is actually three gallons less than the 1950 figure. All states in the "beer belt" remained higher than average though consumption decreased by about four gallons per person. Vermont and Maine, however, each increased by two gallons per person.

In the Great Plains, slight increases also are apparent. California, for the first time was above the United States mean, and significant increases are found in Montana, Arizona and New Mexico.

Surprisingly the deep south states had a growth in consumption of about 1.5 gallons per person. States on the border of the manufacturing belt border (Kentucky, West Virginia, Tennessee) seem to have followed the trend of their northern neighbors with slight decreases in consumption.

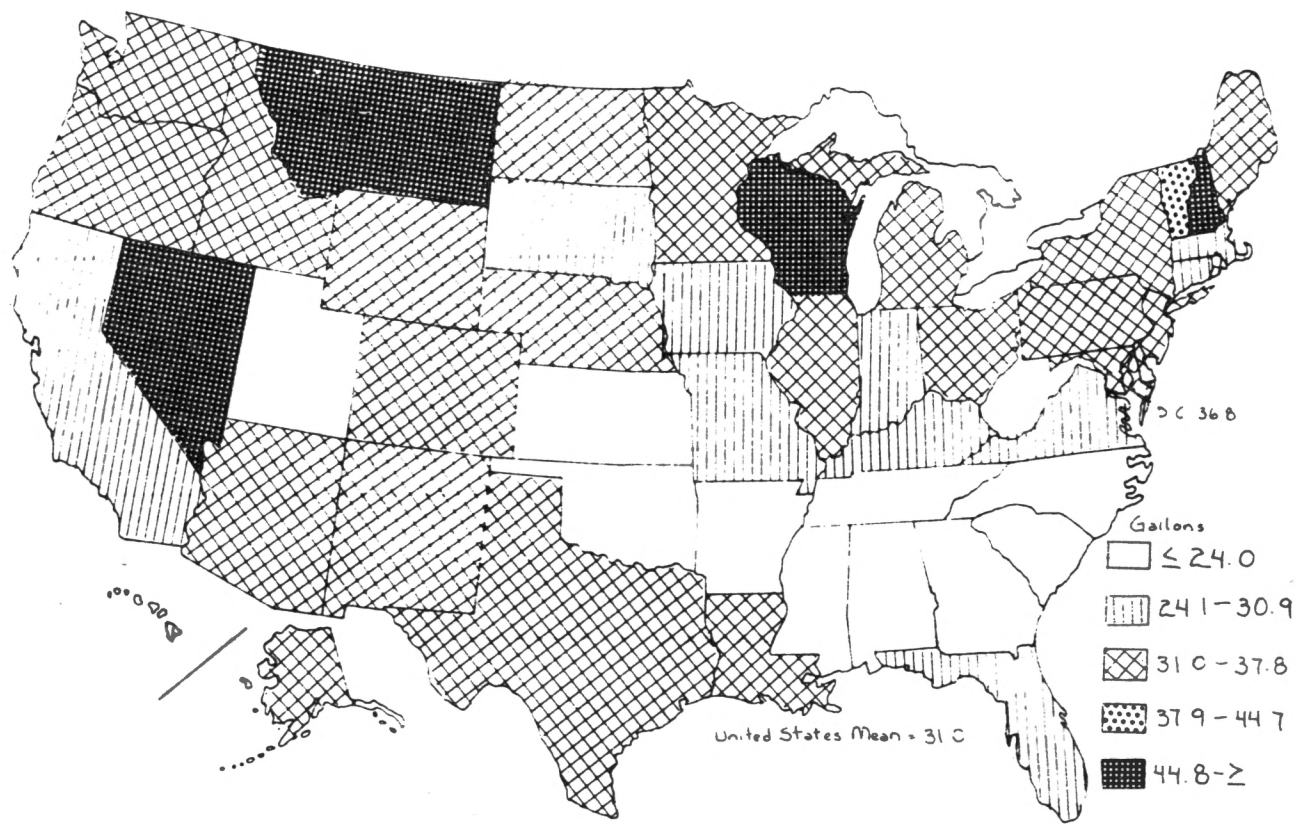
Information for Alaska and Hawaii first became available in 1960. The data indicates that Alaska was just above the United States mean and Hawaii was substantially below it.

By 1970, average beer consumption in the United States had increased to 31.0 gallons per person over the age of 21 (Figure 15). Wisconsin still leads the country with 46.9 gallons per person, followed closely by Nevada, New Hampshire and Montana. New Hampshire showed the greatest per capita increase in the country, 14.9 gallons per person. Vermont and Maine exhibit similar growth to that for New Hampshire (12.3 and 8.7 gallons per person).

States that were just above the United States mean in 1960 (Indiana, Iowa and Missouri), had fallen one to two gallons below the United States mean by 1970. This in part is due to the population of the three states growing older due to out-migration of young people.

Areas of greatest increases between 1960 and 1970 are in the mountain states and the southeastern United States. Oregon, Idaho, Colorado and New Mexico just below the United States mean in 1960 were all well above it in 1970. Utah and California were the only states in the western area that remained the United States mean in 1970.

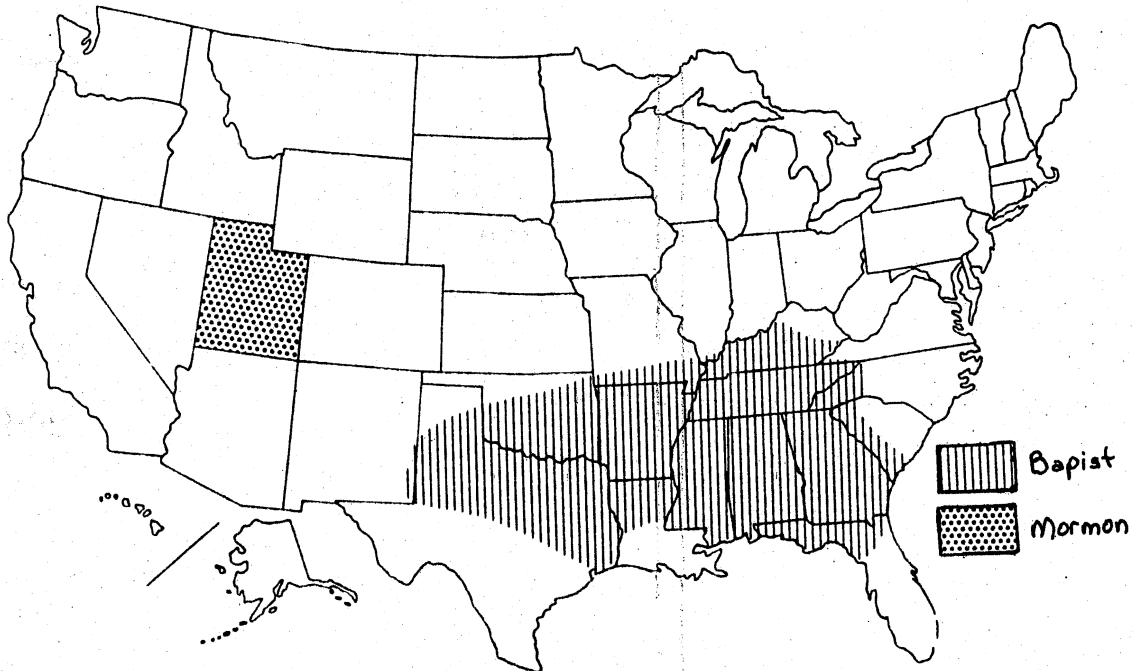
Religious restrictions and the effect of them on the amount of intake are difficult to measure. Differences attributable to religion in the two areas of the country are visible when the mapped pattern of leading Christian denominations in the United States by counties (Figure 16) is compared to the consumption per capita map (Figure 15). The southeastern United States with a population of at least 50 percent Baptist by county has been an area of historically



Source: The Brewing Industry in the United States, Brewers Almanac (15, p. 31).

Figure 15. Consumption Per Capita Over 21, 1970

low consumption. Predominantly Mormon Utah is a state where low consumption also can be attributed to adherence to religious restrictions toward alcoholic beverages.



Source: Jordan (41, p. 231).

Figure 16. The Baptist and Mormon Areas of the United States

The pattern in the south shows signs of change since 1960. Beer consumption in the southeastern states of Mississippi, Georgia, South Carolina and North Carolina doubled between 1960 and 1970. Significant increases also were experienced by all the states surrounding the heart of Dixie.

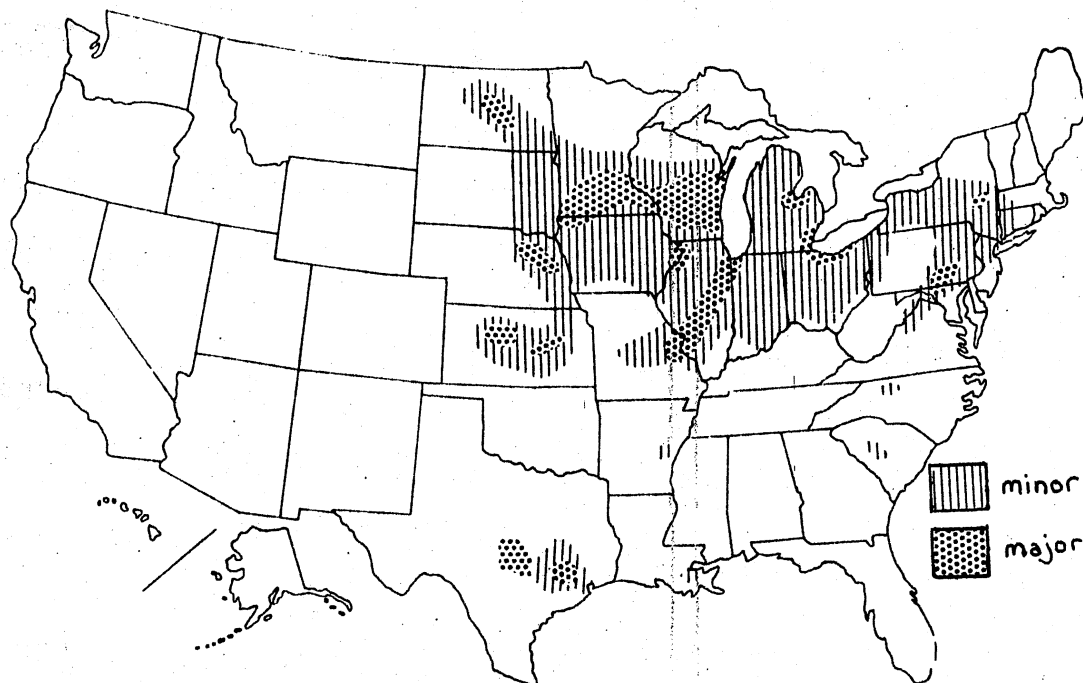
More draught beer also has been consumed in these states than previously. Between 1970 and 1977, all of these states experienced an increase in sales of draught beer when sales of draught beer have been declining in most of the United States. This may be an indication that younger members of the population are frequenting taverns more than their elders, who were denied this form of social life due to legal (Prohibition) or religious restrictions.

Louisiana has been an exception to the low consumption pattern of the South resembling Texas in its consumption trends. Much of this difference is due to the early French-Catholic settlements and influence still dominant in the southern one-third of the state.

Similar to the effect of religion on consumption patterns, the ethnic origin of settlers in portions of the country also have an effect on the amount of consumption. The large number of German immigrants in the mid-1800s introduced lager beer to the United States (see Chapter I). The introduction of this lighter beer attracted many new consumers and became the most popular type of beer in the United States by 1866 (10, p. 189).

The distribution of major and minor concentrations of German speaking people is shown in Figure 17. If this pattern is compared to the pattern produced for consumption per capita in 1970 (Figure 15) a strong association can be seen. The manufacturing belt and upper-midwest are shown as areas of German concentration and above average beer consumption.

The consumption of draught beer is also above average in Pennsylvania, Wisconsin, Iowa, South Dakota, Nebraska and Kansas.



Source: Jordan (41, p. 198).

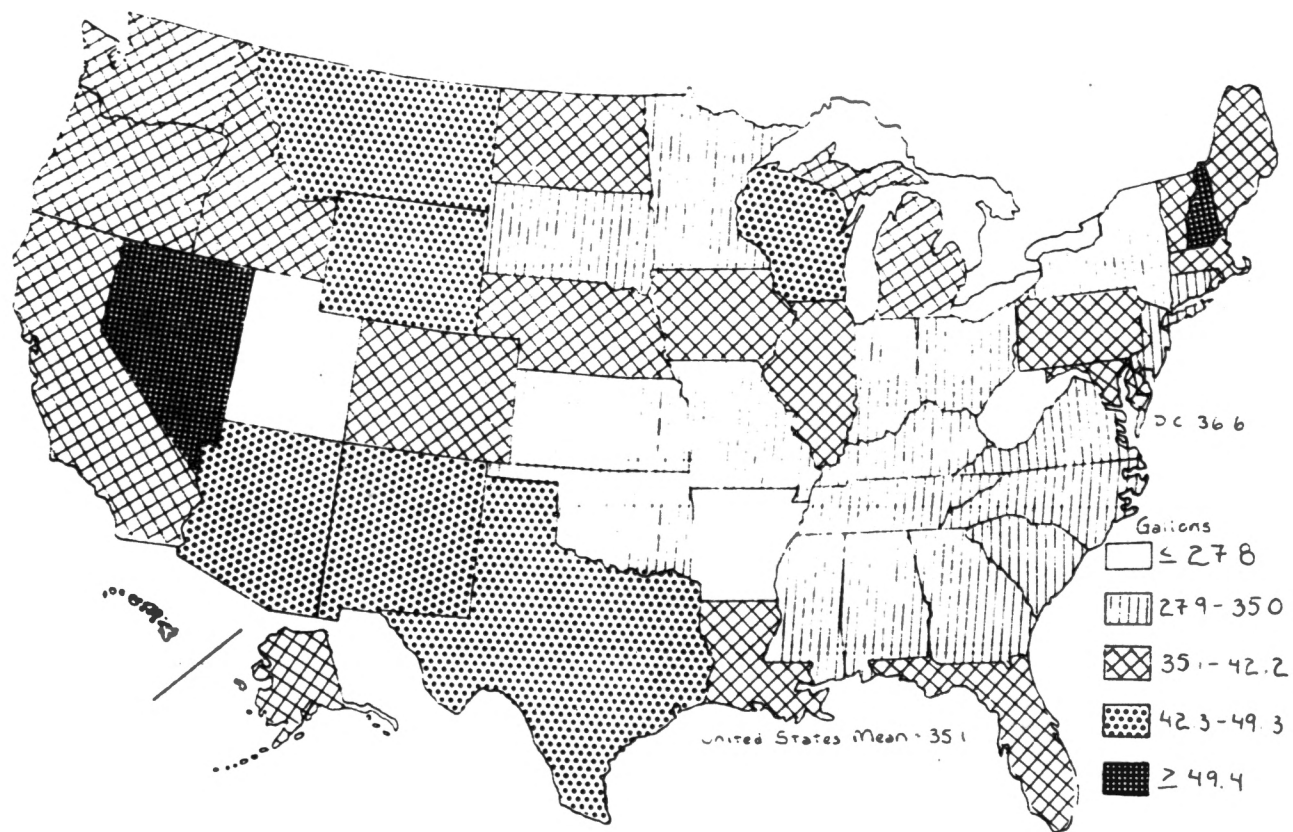
Figure 17. The Distribution of German Descendants in the United States

The influence on the brewing industry is still prominent in the 1970s. All of the present industry leaders (Anheuser-Busch, Miller, Schlitz, Coors) have German origins that stem from pre-Prohibition years.

Production of beer is also highest in Wisconsin, a result of historical inertia and German influence (5.3% of the population in 1970). Formerly high production states have not retained the position they once held. The yearly increase in production in Minnesota, Michigan, Illinois, Ohio and Pennsylvania is much less than that of California, Texas and Florida. New York and New Jersey once major production states with German populations comprising 2.8 and 3.1 percent respectively experienced decreases in production of over two million barrels between 1970 and 1977.

Consumption during 1977 reached record highs in most all states (Figure 18). Nevada had the highest adult rate with 56.7 gallons per capita consumed. This figure is 21.6 gallons per capita above the United States mean of 35.1 gallons. New Hampshire is second with 50.9 gallons per capita. It is also the only state in the northeast experiencing a level of consumption extremely greater than the national average. This may be attributed to lower prices due to state operated liquor stores and tourist trade (68, p. 837). Wyoming moved into third place followed by Wisconsin, which slipped from its former lead in consumption status.

Many states showed marked increases since 1970. Hawaiians increased their consumption by 14.1 gallons per person. In part this increase can be attributed to the increased tourist trade during the seven year period, but it is not possible to exclude the portion consumed by tourists from the total consumed by people of the state. This probably is true



Source: The Brewing Industry in the United States, Brewers Almanac (15, p. 31).

Figure 18. Consumption Per Capita Over 21,
1977

also in New Hampshire and Nevada which both increased more than most states during the same period. New Mexico jumped 12.6 gallons per capita, from one standard deviation above the national average to two standard deviations and the rank of sixth in the United States in consumption. Alaska showed an increase of 8.3 gallons per capita, a reflection of the change in age structure which may be due to the increase caused by pipeline workers and in-migrants during the intervening years. Both California and Florida joined those states with above average consumption of beer. California increased by 6.7 gallons per capita while Florida showed a gain of 7.8 gallons per capita.

The southeastern United States continued to be the lowest region of beer consumption. These states did show increases in per capita consumption in direct proportion to the increase seen nationally of about five gallons per capita during the seven year span.

In 1977 only three states were in the interval two standard deviations below the mean. West Virginia, Arkansas and Utah. West Virginia showed the smallest increase in consumption, only 2.3 gallons per capita. Kansas, Oklahoma, and the southeastern states of Tennessee, Mississippi, Alabama, Georgia, North Carolina and South Carolina, all increased from two standard deviations below the mean to one standard deviation below the mean. Increases were greater than the United States average increase of four gallons per capita, and Alabama increased by 12.2 gallons per capita.

Change in How Beer is Consumed

The tavern has played an important role throughout the history of beer in the United States. Originally beer was made in taverns and purchased for consumption on the premises and for home consumption. Taverns and inns were associated with travelers in colonial times, but also served as meeting places for townspeople.

German immigrants in the 1800s brought with them the tradition of "Bier Gartens;" essentially social meeting places but a place where beer was consumed. Germans usually took the whole family out to beer gardens, especially on Sunday afternoons (10, p. 181). This idea became very popular in the United States centering around areas with high percentage of German population.

After Prohibition, people once again returned to taverns but not in numbers as strong as previously. Neighborhood bars then served as centers for local gossip, listening to sports events on the radio, and related social activities while beer was consumed.

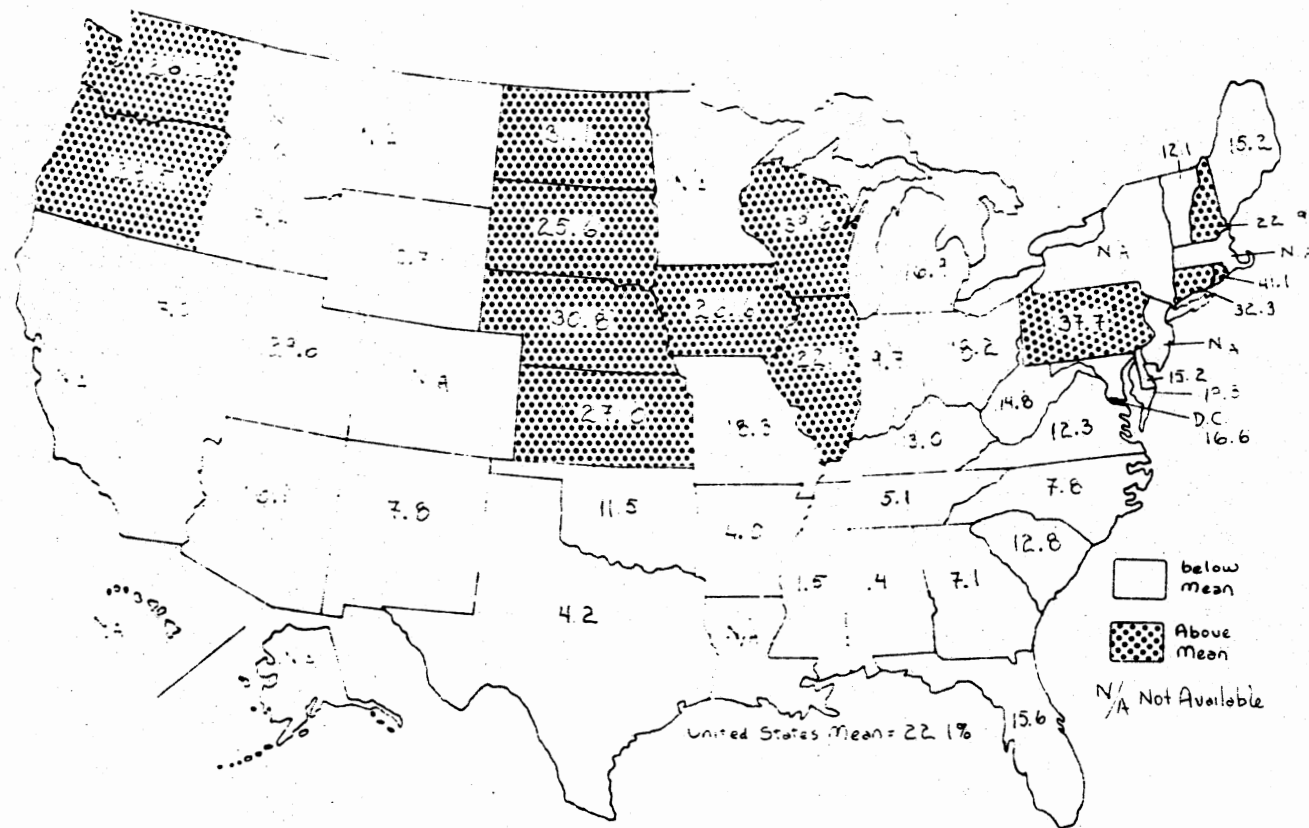
The post-Prohibition era in brewing brought many changes, most of these in the container used for packaging the product. Formerly draught beer was all that was sold in taverns and bottles were used for home consumption. Then "Tavern Keepers" also found it simpler to sell bottled beer. Draught beer, which is not pasteurized, requires special handling and has to be sold fast. The draught equipment has to be maintained; there is inevitable leakage and spoilage

and it is harder to keep a check on employees when only draught beer is sold (10, p. 327).

Technology changed the mode of beer consumption. The canning of beer began in 1935. Because cans were less fragile than bottles, transportation costs were lower for cans. Also, cans disposability made them preferable to bottles which had to be returned for deposit.

Since the introduction of canned beer, consumption of draught beer has decreased steadily. In 1934, the first full year of production following Prohibition, 75 percent of all beer consumed was draught. The beer can introduced in 1935 caused a five percent decrease in draught during the first year. By 1939 consumption was approximately equal between draught and package, in 1977 only 11 percent of all beer consumed was draught. This chapter shows the change in mode of consumption over time and areas that were most or least affected.

The map for 1955 (Figure 19) indicates that states where beer consumption has been shown to be highest (Wisconsin, Pennsylvania, New Hampshire, Connecticut and Rhode Island) are also the states where draught (tavern) consumption is above the national average. Areas of high draught consumption are not necessarily areas of high per capita consumption. Tavern consumption was still an important part of social life in North Dakota, South Dakota, Nebraska, Kansas, Iowa, Oregon and Washington. Surprisingly, due to religious restrictions of Mormons, in Utah almost 30 percent of the



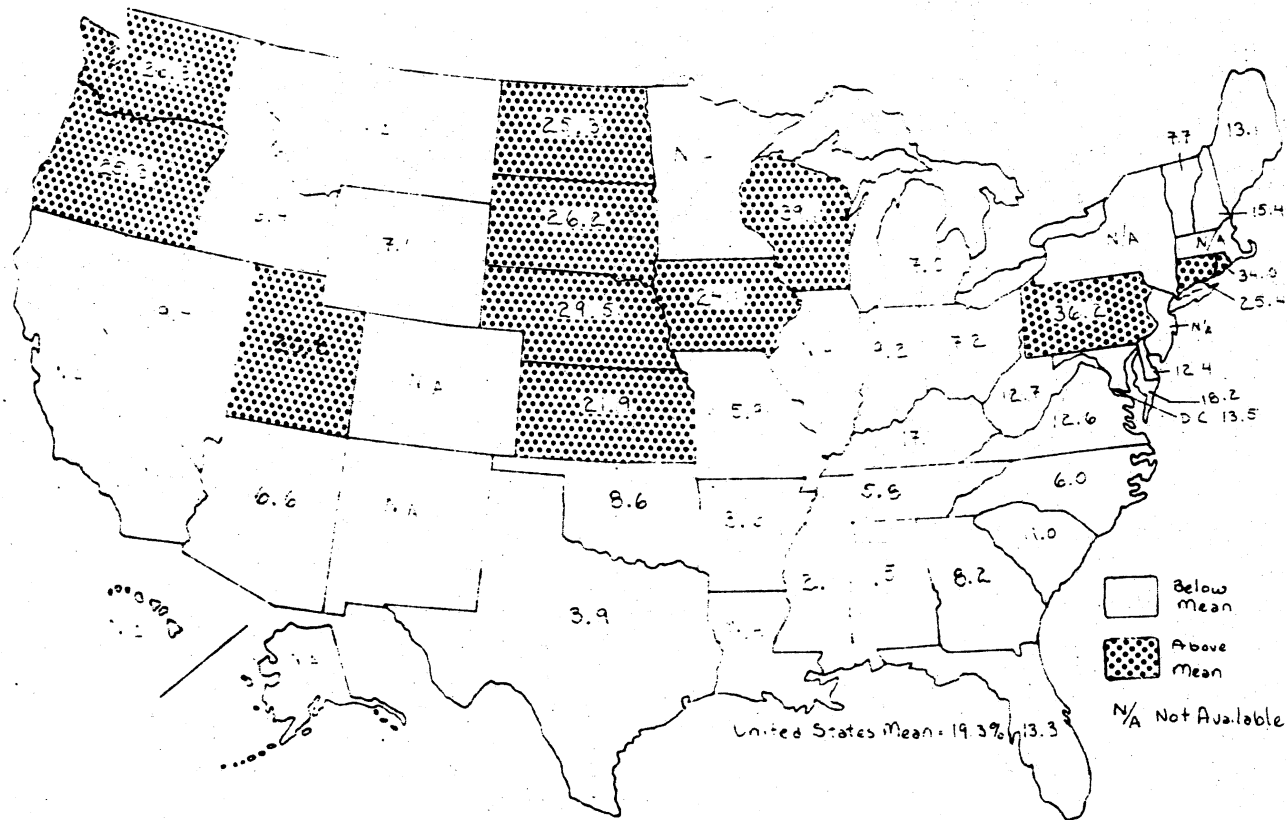
Source: The Brewing Industry in the United States, Brewers Almanac (15, p. 31).

Figure 19. Draught as Percent of Total Consumption, 1955

beer consumed was draught. In the southern states, as with consumption in general, draught beer is a very small percentage of the total consumption. Unfortunately, states that might be very interesting, such as California, Minnesota, New York, New Jersey and Massachusetts do not report figures for packaged and draught beer. They report only for total consumption.

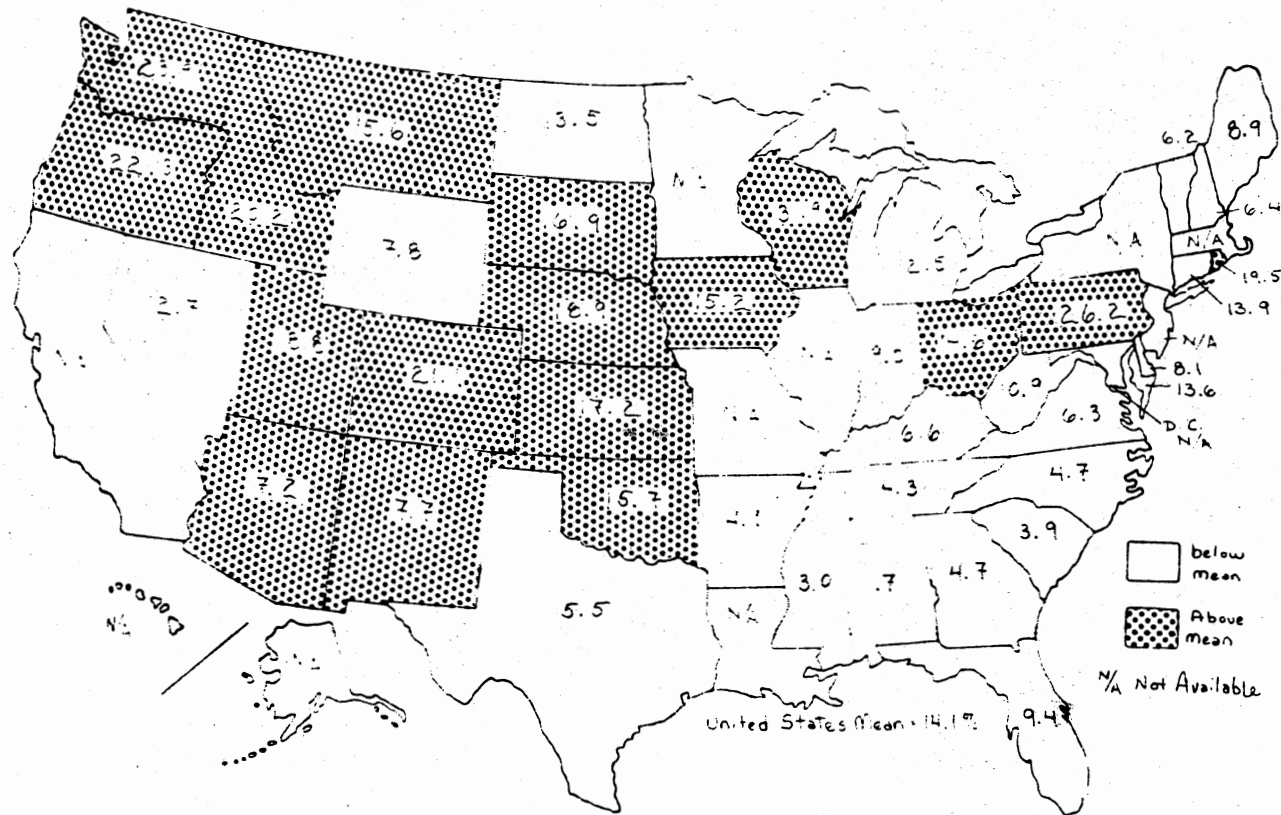
When compared to the 1955 map, the 1960 map (Figure 20) indicating draught beer as a percentage of total consumption shows the drop in percentage of draught beer consumed in the United States for the five year period. The mean for 1960 national consumption was 19.3 percent. States previously shown to be high draught consumption areas remain above the mean with the exception of New Hampshire, Michigan, South Dakota and Washington even showed a slight increase. A few states that remain below the United States mean also showed significant increases in draught consumption. Among these are Nevada, Arizona, Mississippi, Georgia and Kentucky.

By 1970 the United States draught beer average had fallen from 19.3 percent in 1960 to 14.1 percent (Figure 21). Wisconsin and Pennsylvania were again the highest though they both experienced decreases during the ten year period (7.2% for the former and 10% for the latter). The number of states greater than the mean increased (16 in 1970 as compared to 12 in 1960) because the percentage of draught consumption did not drop as drastically in these states as compared to the rest of the United States. Only two states, Arizona and



Source: The Brewing Industry in the United States, Brewers Almanac (15, p. 31).

Figure 20. Draught as Percent of Total Consumption, 1960



Source: The Brewing Industry in the United States, Brewers Almanac (15, p. 31).

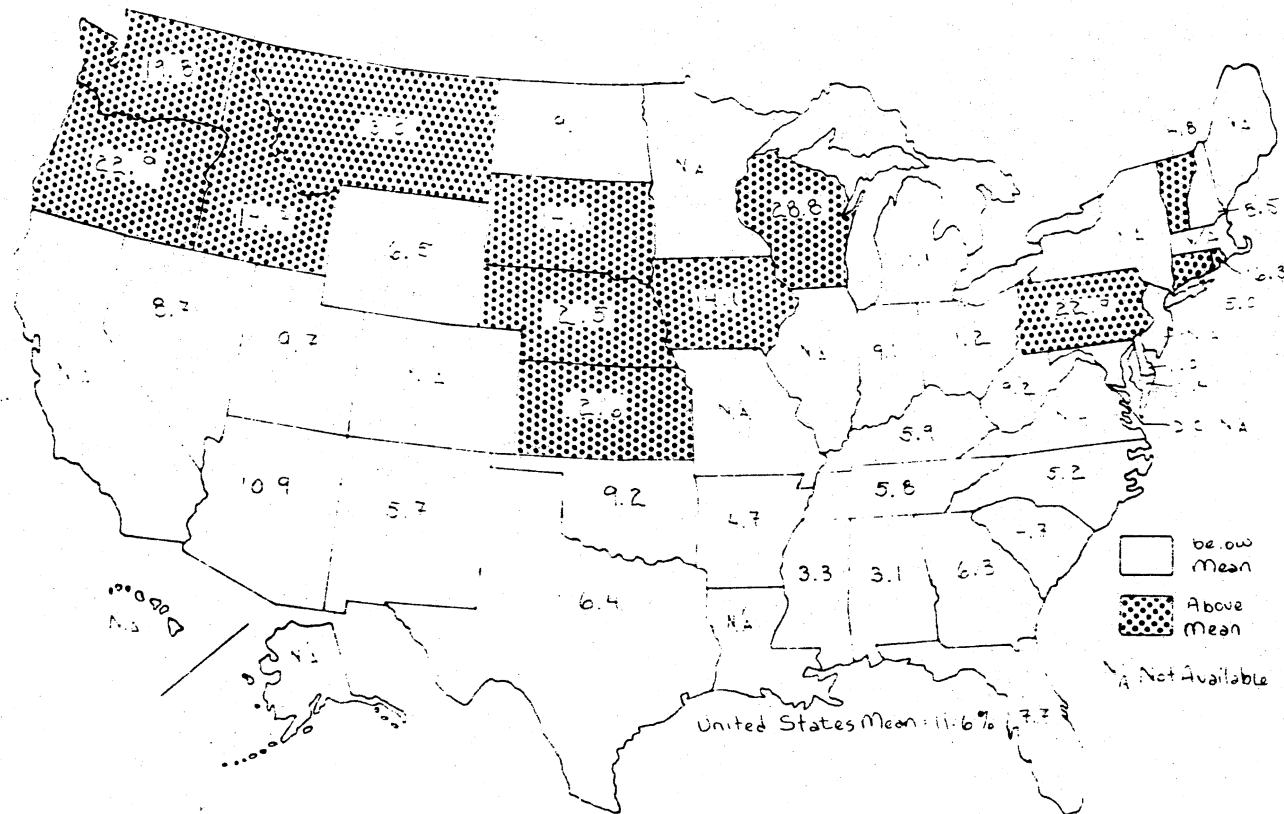
Figure 21. Draught as Percent of Total Consumption, 1970

Idaho, that were above the United States mean, showed net increases in draught consumption. States still below the United States mean -- those in which more draught was consumed than previously -- include Nevada, Wyoming, Texas, Arkansas and Mississippi. The most significant increase was in Oklahoma's consumption of draught beer. At a time when most of the United States was steadily decreasing Oklahoma increased by 7.1 percent in the ten year period.

A change in reporting, dividing sales by draught and package makes data available for Montana, Colorado and New Mexico. Montana appeared 1.5 percent above the United States mean while Colorado was seven percent higher, neighboring New Mexico was almost seven percent below average.

Most southern states showed large decreases. Kentucky fell from 17.1 percent in 1960 to 6.6 percent in 1970 while Virginia declined from 12.6 percent in 1960 to 6.3 percent in 1970. South Carolina, Georgia and Florida lost 7.1 percent, 3.5 percent and 3.9 percent respectively during the ten year span.

The mean for draught consumption by 1977 (Figure 22) was only 11.6 percent on the national level. The states with high consumption of draught are similar to those with overall high consumption with the exception of Nevada and New Hampshire. Total consumption in these two states is the highest in the country. Both have a large influx of tourists which partially accounts for high consumption. New Hampshire's lower tax (as mentioned previously) accounts for an



Source: The Brewing Industry in the United States, Brewers Almanac (15, p. 31).

Figure 22. Draught as Percent of Total Consumption, 1977

an inflated figure in that state. Draught consumption is much lower than would be expected which may represent a trend of bar owners toward increased use of bottles and cans. This has been found to more convenient, bottles and cans are easier to store, and less loss due to spoilage occurs when the tourist trade experiences slack periods.

States of high consumption, such as Wisconsin, Pennsylvania, Montana, Oregon and Washington, are also high in consumption of draught beer. The large percentage of German stock in Wisconsin (5.3, the highest in the United States) could explain some of this quantity (20, p. 132). Neighboring states of Iowa, South Dakota, Nebraska and Kansas with 3.6, 4.0, 4.2, and 1.9 percent of German stock respectively also have draught consumption higher than the United States mean. These states also have experienced a decrease in draught consumption of four to five percent since 1970. Other states exhibiting a rapid decline in draught include Arizona, Utah, Nevada and Oklahoma. Although Arizona does have a brewery the other states do not. Breweries in Colorado, California, Texas and Oregon probably do not find it profitable to use the space and special handling needed to ship kegs into these states, when cases of bottle or cans may replace kegs.

Areas of increase in draught consumption include Vermont, Connecticut and Delaware. In seven years 1970-1977 Vermont showed an 8.8 percent increase while other states declined. The increase in Connecticut and Delaware was not

as large but all are probably attributable to lowering the legal age for consumption of alcoholic beverages.

The southeastern United States is also an area of increased draught consumption but only at the rate of one or two percent over seven years. This could be attributed to less outmigration of persons between 18 and 35 than previously experienced in these states due to better job market (i.e. increased manufacturing) (20, p. 42).

CHAPTER IV

ANALYSIS

During the early years covered by this study (1930s, 1940s and 1950s) states with a strong manufacturing sector were the most economically stable. The residents of these states employed in manufacturing benefited financially and as their income increased, their habits as consumers changed.

In the 1940s Rhode Island and Connecticut were the states where the highest percent of the labor force was employed in manufacturing; 45.8 and 43.5 respectively. Connecticut was the third highest state in per capita income, following Washington, D.C. and Delaware. Consumption in all of these areas was also very high, well over two standard deviations above the mean of 16.1. New York, New Jersey, Maryland, Pennsylvania, Ohio, Indiana, Illinois, Michigan and Wisconsin all follow this same tendency.

Beginning in the early 1960s and continuing until now, tertiary activities have become an increasingly larger part of many states economic base. This change produces an increase in the high income brackets and an increase in all alcoholic beverages consumed, including beer. Since 1950, the variable income per capita has become increasingly less

important in explaining consumption patterns (Table I).

TABLE I
CONSUMPTION AS RELATED TO INCOME
PER CAPITA

r values	1940	.74
	1950	.82
	1960	.65
	1970	.37
	1975	.34

The research hypothesis was accepted though the strength of the relationship has decreased over time. The increase in income per capita has not produced a corresponding increase in consumption. This, however, may be due to the exclusion of inflation rates through time.

Manufacturing in many states increased during World War II. States with a large percentage of manufacturing grew and states not previously important became more industrialized. Income, however, did not follow the same pattern (Table II).

There is a slight negative correlation (-.29) between income per capita and percentage of labor force employed in manufacturing for 1975. This is quite opposite of previous years when there was always a positive relationship. This

is not to say that jobs in manufacturing do not pay as well as formerly but that a strong manufacturing base does not have as positive an effect on income per capita as in previous times.

TABLE II
INCOME PER CAPITA AS RELATED TO
PERCENTAGE OF LABOR FORCE
EMPLOYED IN MANUFACTURING

r values	1940	.43
	1950	.26
	1960	.14
	1970	.02
	1975	-.29

The same trend can be seen when consumption per capita is compared to percentage of labor force employed in manufacturing (Table III). The r value for 1940 was .38 and by 1950 had become even stronger .48, as did values between consumption and per capita income from .74 in 1940 to .82 in 1950. During the late 1950s and early 1960s an economic recession caused a slight drop in consumption, this same decrease can be seen in r-values between consumption and percentage of manufacturing.

TABLE III
 CONSUMPTION CORRELATED WITH PERCENTAGE
 OF CIVILIAN LABOR FORCE EMPLOYED
 IN MANUFACTURING

r values	1940	.38
	1950	.48
	1960	.13
	1970	-.22
	1975	-.45

The direction of the relationship has reversed completely since 1950 when the strongest positive r-value occurred. The state with the highest consumption per capita in 1975, Nevada typifies the negative relationship. The percentage of persons employed in manufacturing in Nevada was only 4.5 percent of the labor force in 1975. North Carolina, the state with the highest percentage of persons in manufacturing (36.9) has a consumption rate approximately ten gallons per capita lower than the mean for the United States. New Hampshire and Wisconsin are the only states that still reflect the trend of the 1950s, both have consumption rates just below that of Nevada, and approximately 30 percent of these forces are employed in manufacturing. The research hypothesis was correct for the early years of the study (1940s, 1950s) but must be rejected due to the negative correlation in the 1970 and 1975 data.

The relationship between the amount of consumption per

capita and the median age of the population of a state also has changed dramatically over time (Table IV). The strongest relationship was found in the data for 1950 when the United States median age was 30.2 years, by 1970 this figure was down to 28.1 years for the United States. While consumption during this same 20 year period has increased greatly, there is not relationship between the states with the highest consumption and the median age of the population in those states. The research hypothesis was rejected and the null accepted. The higher the median age the greater the consumption due to the strength of the relationship during the 1940s and 1950s, a time when median age was higher.

TABLE IV
CONSUMPTION CORRELATED WITH MEDIAN AGE

r values	1940	.67
	1950	.72
	1960	.48
	1970	-.10

Through the time period covered in this study there has been little or no relationship between per capita consumption and the greater than 21 population of a state (Table V).

TABLE V
 CONSUMPTION CORRELATED WITH
 POPULATION OVER 21

r values	1940	.27
	1950	.11
	1960	.18
	1970	-.24
	1975	-.16

The value for 1970 was nearly opposite the slight positive figure for 1940, but even this trend disappeared in the 1975 data. This variable may have been more significant if used as a percentage of total United States population on a state basis. The hypothesis was rejected due to the weak relationship between variables.

The linearity of the relationship of the variables consumption and number of breweries helps to re-enforce the idea that brewing is not as market oriented as it once was (Table VI). The pattern in r-values, during the study period between these two variables, is the same as was found between consumption and income though the values are not as strongly positive. The value for 1950 was stronger than that for 1940, then remained approximately the same (this while most small breweries were being incorporated by larger ones or discontinuing operations). By 1970 this relationship decreased drastically in strength. The research hypothesis was accepted.

TABLE VI
CONSUMPTION BY NUMBER OF BREWERIES

r values	1940	.58
	1950	.61
	1960	.62
	1970	.17
	1975	.19

When production was entered into the analysis the trend of decreasing strength of relationships between variables over time, continued. In 1940 there existed a moderate positive relationship (.54) between consumption per capita and production, meaning in many cases states with high per capita consumption were the same states which were producing large quantities of the product. Consolidation of breweries in the intervening years has produced a much weaker (.13) positive linear relationship. The hypothesis was accepted.

The relationship between the amount produced by a state and the number of breweries involved in this production has showed a great decrease in strength. The r-value for 1940 was .91, a very strong positive relationship. States with a high production level were the states with a large number of breweries. Brewery capacity has increased while number of breweries decreased during the study period resulting in a weaker relationship. At present fewer breweries produce a greater volume than at any previous time. The correlation

value for 1975 was .58. Therefore, hypothesis number six was accepted.

Results of production and population over 21 correlation exhibits the same pattern as the preceding pair. The relationship was very strong in 1940, $r = .87$ and decreased in strength, by 1975 the r -value was .55. It appears that soon after repeal breweries were more market oriented than in 1975. Many of the breweries that discontinued operations were located in heavily populated areas (e.g. Pennsylvania, Massachusetts, see Figures 1-3 and 6-7). The hypothesis was accepted.

New Trends in the Brewing Industry and Consumption Market

Americans have been weight-conscious for many decades. In 1967, Rheingold, a New York area concern, introduced Gablinger's, a low calorie low carbohydrate beer. Sales initially were very strong indicating a great market potential. Later sales were considerably lower, perhaps due to disappointment in the product. A few other breweries also made attempts along this line. For example, Meister Brau was acquired by Miller in 1972. After working for one year on improving the taste, Miller test marketed their new product and found it an overwhelming success. For a short time there was an inadequate supply to meet the demand. Other national companies scrambled to produce a similar product, enabling their customers to get their favorite tasting beer

with fewer calories.

Although the intense advertising campaign that went along with the introduction of this product was aimed at men, it also proved successful "among young people and women, who may be lured by the lights into drinking beer for the first time" (26, p. 5).

The Brewers Almanac (15) stated in 1956:

Other factors believed to have led to gains (in consumption) included increased social acceptance of beer and ale; a more important role played by women, who now are accounting for 22 percent of all malt beverage consumption (p. 3).

By 1976 women were reported to have consumed 36 percent of the beer in the United States (47, p. 184).

Miller also proved to be successful in reintroducing another idea that had been tried but never with significant popular results. This was the seven ounce bottle. "The smaller bottle was aimed at a segment of beer drinkers who do not like having their beer get warm while they leisurely drink it (65, p. 3)."

A new development, stemming from environmental awareness, in the form of various "bottle bills" and packaging restrictions may help to delay the demise of some regional breweries. Savings from use of less energy in glass making will help to cut some present expenses. At the same time, aluminum can manufacturers must develop an opening without the standard ring-pull tab, now illegal in a few states and soon to be in other states by the 1980s.

Summary

Per capita beer consumption of beer has increased during the study period. Per capita income also increased. These increases did not occur proportionately in each state, income per capita does not influence the amount of consumption, as it once did.

Beer consumption no longer has a positive correlation with employment in manufacturing but rather a negative one. States where employment in manufacturing is a high percentage of the labor force are no longer the states with greater per capita consumption.

The median age declined in the United States during the study period. The relationship between consumption and median age went from a strong positive correlation to no relationship. This may be the intermediate stage before a strong negative correlation in the future. A return to a strong positive correlation, however, is more likely if the group now consuming the largest quantity of beer (ages 18-35) maintains its present consumption level.

No relationship was found between consumption per capita and population over 21, by state. This variable may have proved more significant if used as a percentage by state of the United States total.

The correlation between consumption per capita and number of breweries by state while never a strong positive relationship has become even less significant. This due to optimum locations chosen by national brewing concerns. Rather

than locate in state with the high consumption, a location seems to be chosen that will serve an entire region. This also was seen in the relationship between consumption per capita and production by state.

States with the largest number of breweries are no longer the greatest producers of beer. National brewers have increased capacity greatly while regional brewers have increased only slightly. This means one or two national brewers in a single state can easily exceed the amount produced by eight to ten regionals.

The closing of regional breweries in many states with large populations over 21 combined with opening of new breweries in less populated areas has produced a weaker relationship between the amount of production and the population over 21.

Conclusions

Since the repeal of Prohibition, beer has gained in popularity and is no longer considered a less expensive way of getting drunk. Beer has been accepted among people of all income levels and by women in much larger numbers than ever before. This trend will probably become even stronger with the increase in sales related to lower calorie beers and smaller container sizes.

Sales of draught beer will continue to decrease and it will be produced only on a very limited basis. People have been convinced that canned and bottled beer is every bit as

good as draught. Since patrons do not mind the difference, neither do tavern owners, who along with producers, find there are fewer problems serving the packaged product and as much if not more profit.

Only the largest volume breweries will be able to continue operations through the 1980s. Increased costs of every aspect, raw materials, energy, labor and transportation will cause the demise of any remaining family brewing concerns and many regional. In the 1950s and 1960s only the "big five" will be able to incur these expenses by charging more for the product. Due to the greater volume in sales the increase will be more evenly distributed than a regional brewer would be capable of and still show a profit. The 1990s will find only a few companies responsible for all beer produced in the United States.

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