

KEOTA GLASS

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Due to numerous requests for this article, which we are no longer able to fulfill, we are happy to reprint "Keota Glass" by Mary Musgrove which originally appeared in Volume 37, No. 7 of the Annals. However, not all photographs accompanying that article have been reprinted here.

Lafayette township in Keokuk county had a meagre population of 181 in 1856. It had been shunned by settlers because timber was scarce and because most of the land belonged to speculators at the time the township was organized. The *History of Keokuk County, Iowa*, published in 1880, states that "In order to remove this impediment and at the same time secure educational facilities, the few settlers began to levy enormous taxes for school purposes. This had the effect of bringing the speculators' land into market, and of erecting commodious school-houses on each four sections of land in the county. At the beginning of the late war [the Civil war] the township had a population of about 200. . . . The township now (1880) has a population of near 2,500, and so rapid have been the improvements during the last five years that nearly all the land is now under cultivation and it is now regarded as the garden of Keokuk County."

Such a booming growth of population and prosperity in this area could not have occurred without ready access to good transportation. In early 1872 a branch of the Chicago, Rock Island, and Pacific Railroad running between Washington, Iowa, and Sigourney was nearing completion. At that time, however, the people living in northeast Keokuk county and northwest Washington county still faced a transportation dilemma. There were no stations along the rail route between Washington and Sigourney. Stock and grain would have to be hauled all the way to one of these two towns, and passengers had to depend upon the stage at Talleyrand, a county town south of the railroad, to connect them with the distant train stops.

To meet the urgent need for convenient, accessible rail service, the town of Keota was laid out on the eastern border of Keokuk county (sec. 24 and 25, Lafayette township) in January, 1872. Among old-timers in Keota, the story is told that J. P. Yerger and C. H. Achard bought the land on the north side of the Rock Island tracks from William Smock, a farmer, and that when the town was built standing corn stalks had to be cut down.

The original plan of the town clearly shows its purpose. A side track north of the main railroad ran almost the full length of the town plat; tracks are still in this location. The main street, Broadway, parallels the railroad tracks a half block north. Although Keota now extends south of the railroad, the original town was north of the tracks with the business district on Broadway and on side streets running south to the tracks. By 1879 the county history could report with pride that shipping over the Rock Island from Keota amounted to 800 carloads a year. In October, 1879, shipments were: "Stock, twenty-six cars; grain, forty-two cars; emigrants' goods, two cars; merchandise, one car; potatoes, one car." This truly was a town created to take advantage of the transport facilities offered by the railroad.

Miss Kate Glover, who was born in Washington county in 1870 and came to Keota as a child in 1875 with her father, a blacksmith, tells an interesting story of how the town got its name. Since the original town was laid out exactly on the Keokuk county side of the county line (though it now spills over a bit into Washington county), it was called Keoton, a name derived from the names of the two counties. This proved harsh, unwieldy, and difficult to pronounce and spell, so it was shortened to Keota.

The first building in Keota was a drug store erected by J. S. Kulp in February, 1872; the post office was established in March of that year, with J. F. Wilson as postmaster. The school district was organized in August, 1873, and a school house was erected that fall. The town was incorporated in December, 1873, with J. S. Kulp as the first mayor. Once established, Keota grew quickly, becoming a lively town in search of new business.

More than one newspaper was established in Keota and published briefly, but the *History of Keokuk County, Iowa* gives much of the credit for Keota's rapid growth to G. L. Reed, editor of the *Eagle*, a weekly newspaper still being published. Checking early copies of the *Eagle* does seem to bear out the opinion that it was a progressive paper interested in building the town. The county history, as well as memories of many old-timers in Keota, give Reed credit for securing a glass works for Keota. The account in the history is as follows:

Mr. J. H. Leighton, then living in Wheeling, West Virginia, had been corresponding with parties in Oskaloosa, in this State, in reference to the erecton of works there, but not meeting with satisfactory encouragement he determined to look up a more desirable point. Seeing a copy of the Keota 'Eagle' in Wheeling, and being struck with the enterprise of the business men of this city, he determined to apply here and see what encouragement he would receive. Accordingly, Mr. L. corresponded with Reed, and through the courteous offer of Mr. Reed to lend him all the assistance in his power, he came on, and to-day, as a consequence, Keota, a comparatively new town in the wilds of Iowa, as the eastern capitalists would say, is blessed with glass works, in full blast, turning out as good work, and as much of it, as any factory of its size in the United States; in fact it is the only flint glass works this side of Cincinnati.

Miss Glover says that when Leighton's first query concerning establishment of a glass factory was received in Keota, the *Eagle* editor contacted everyone in the area who might have money to invest, securing their cooperation as prospective stockholders. A slightly different version is given by Mrs. Florence Herr of Keota. In seeking history of the glass factory, she learned that a man named John Bonshire had come to Keota in 1878 or 1879 and organized a stock company, and the editor of the *Eagle* used his paper to boost the enterprise. This is partly confirmed by Mrs. Margaret Collins of Charleroi, Pennsylvania, youngest daughter of John Bonshire: ". . . regarding my father, John Bonshire, and his brother William going to Keota, Iowa, I am not sure but I think my father and uncle wanted to guy the glass factory and were unable to get investors. . . ." Mrs. Verne Staley of

Pittsburg, daughter of William Bonshire, says: "My father, William Bonshire, is the other person who went with his brother John to Iowa to start a factory. . . ." This was, she says, fourteen years before she was born. Mrs. Collins was only a year old when the family moved to Keota, so she too has no personal memories of the glass factory; but it seems probably that the Bonshires also played a part in the financial history of the factory, with Reed and his *Eagle* providing major help at the local level.

Unfortunately the issues of the *Eagle* which would contain such articles, as well as news items concerning the glass factory, are no longer available. The extent of the paper's participation, and just what the editor had to say about the proposed glass works, cannot be learned first-hand. However, with ample local financing assured, Leighton came west to establish the factory and named it the "Eagle Glass Works" as a tribute to Reed's help in arranging for its establishment, though Reed himself held no stock in the company. (This is contrary to one report published in a newspaper during the 1950s, the error listing Reed as a stockholder apparently arising from misunderstanding on the part of the reporter. Other old-timers in Keota, though not old enough to remember the factory itself, say that Miss Glover's statement that Reed was not a stockholder agrees with accounts they heard as children.)

Concerning organization of the company, the county history also has the following:

Mr. Leighton came here comparatively unknown, although having the best of references from the attorney-general of the State of West Virginia and other prominent officials of the city of Wheeling; but even with these substantial tokens of his integrity and worth, it was only with the utmost endeavors and hard work that the large project was carried through.

These works are owned by a joint stock company, incorporated under the laws of the State, with the following officers:

President—J. C. Charlton.

Secretary—E. M. Ritchey.

Manager—J. H. Leighton.

Directors—H. Henkle, G. Gregory, J. W. Tallman,
R. S. Brice, J. C. Charlton.

Joseph Charlton, president of the glass factory, and E. M. Ritchey, secretary, are probably typical of the type of Keota community leaders who were associated with the venture. Charlton, born in Pennsylvania in 1818, first came to Iowa (Scott county) in 1853 and then to Keokuk county in 1855. He moved back to Pennsylvania shortly thereafter, returning again to Keokuk county in 1858. Having been a farmer until shortly after Keota was established, he opened a meat market under the name of Charlton & Son. He was mayor of Keota one term and "held various offices of trust." The county history says of him: "Mr. Charlton has been closely identified with the interests of Keota for the past six years, and was one of the foremost in the organization of the glass works, and deserves a great deal of credit for the substantial aid and encouragement of such an enterprise; although not the richest man in Keota, he has rendered more substantial aid in the advancement of the enterprise than any other citizen. . . ."

E. M. Ritchey was a younger man and a native of Iowa, born in Washington in 1847. His first business was in Iowa county at a place called Foote P. O., a mercantile business; he was also postmaster from 1869 to 1872. He moved to Keota in 1872 and continued in the merchandising business until about 1876 or 1877; at that time he opened a furniture store, Henkle & Ritchey, though at the same time he retained an interest in Littler, Ashby & Co., general merchandise. He was also a stockholder in the Bank of Keota. Concerning his relationship to the glass works, the county history says: "Mr. R. is also secretary of the Keota Glass Works, to which institution he has rendered substantial aid and encouragement . . . he is a man of more than ordinary ability, and by close attention to business has gained for himself an enviable reputation as a business man. . . ."

The company appeared, at first, to give considerable promise of success. In fact, according to the county history, after three months "the directors determined to double the stock, which was immediately taken, chiefly by the first stockholders." At the time the history was written, forty men were employed, but it was anticipated that the number would be increased considerably as the business grew; and the history also states that the factory had facilities for 80 workers.

Among the workers were a number of boys who were employed part-time. One of them was John Bonshire, Jr., who reportedly worked only a half day; he helped his father make fruit jar lids, his particular job being to carry the lids to the annealing oven. Before the days of strict child labor laws, other local boys probably found employment in similar jobs, helping out when and where they could.

The Keota glass works was almost undoubtedly the first in Iowa, probably the first to operate west of the Mississippi, and may well have been, as the county history claims, the first west of Cincinnati. This latter claim is also found in a World War II "Service Record Book of Men and Women of Keota, Iowa, and Community," sponsored by American Legion Post No. 424 and published during the late 1940s. While positive proof is lacking, it seems probable these beliefs are all correct.

Glassmaking in America had been confined largely to eastern areas where there were plentiful supplies of good glass sand and old, well-established centers of population. One concentration of factories lay in an area from Pittsburgh, Pennsylvania, to Wheeling, West Virginia, where a supply of good glass sand was available as well as ample deposits of coal for fuel. Among fanciers of early American glass this area is referred to as the "Middlewest," which it really was at the time the factories were established and before a surge of migrants settled the broad reaches of what is now called the middle west.

The name of Leighton is closely associated with this historic "Middlewest" of early glassmaking. William Leighton was the son of Thomas Leighton, one of the great early American glassmakers, who came from Scotland to work for the New England Glass Company. There were eleven children in Thomas Leighton's family, seven of them sons: James Hamilton, Thomas, William, John Hamilton, George Charles, Robert Eubank, and Peter Hill Leighton; also an adopted son, James Eagle Leighton. Of these sons, six are said to have followed their father in the glassmaking industry, William being probably the most illustrious. The elder Thomas Leighton died September 21, 1849.

William Leighton also worked for the New England Glass Company, retiring in 1858 because of poor health. In 1863, however, he moved to Wheeling, West Virginia, and became associated with Hobbs, Brockunier & Co., where he was responsible for many innovations and improvements in the process of glassmaking, chief among them being a soda-lime formula which produced glass suitable for tableware. William Leighton, Jr., working for the same company, designed and patented at least one popular pattern for pressed glass (Blackberry) and developed a process for production of Peach Blow glass.

The connection of J. H. Leighton, the Keota glassmaker, with this glassmaking family is partly established by his biography in *History of Keokuk County, Iowa*:

LEIGHTON, J. H., superintendent of the Keota Glass Works, Keota; born in Boston, Massachusetts, February 18, 1849; there he lived until about eight years of age [probably about 1857], when he, with his parents, moved to Wheeling, West Virginia; he is a practical glass blower, having been brought up in the business from childhood, the New England Glass Works having been under the control of the Leighton family for sixty-five years; in 1874 Mr. Leighton started and operated glass works in Wheeling, West Virginia, which concern he operated for about four months; meeting with misfortune he lost all he had; being a young man of good judgment, and not easily discouraged, he at once went to work for Hobbs, Brockinsener [sic] & Co., of Wheeling, where he continued for about one year, at the expiration of which time he went to Martin's Ferry, Ohio, remodeled and took charge of the old Excelsior Glass Works, now known as the Buckeye Glass Works, where he continued until 1878, when he came to Keota and built and started the Keota Glass Works; Mr. Leighton is a man of more than ordinary intelligence, good business qualifications, and deserves great credit and the help of the community for starting such an enterprise in Keota.

Unfortunately the name of J. H. Leighton's father is not given.

The biography of William Leighton in *The National Cyclopaedia of American Biography* says that he was the father of six children: Mary Ann, William, Stephen N., twins who died in infancy, Eliza, and George Leighton. Ignoring the apparent discrepancy in the number of children, it is apparent that J. H. Leighton was not the son of William Leighton, the best known of the Wheeling glassmakers, though he may have been a nephew.

The elder Thomas Leighton died in 1849, a few months after the birth of J. H. Leighton. In the biography of the latter, reference to moving to Wheeling "with his parents" about 1857 suggests that they were both alive at that time. These two facts would seem to eliminate the possibility that J. H. Leighton was one of the sons of the elder Thomas Leighton. A point of confusion, however, is the fact that one of the sons of Thomas Leighton was named James Hamilton Leighton; from his place at the head of the list of the children of Thomas Leighton, he was probably the oldest son, too old to be the Keota glassmaker.

It would be helpful, in attempting to place J. H. Leighton, the young glassmaker of Keota and Iowa City, if his middle name were known. The closest guess is that it may have been Harvey, since one Keota source refers to him only as "Harvey Leighton." At any rate, on the basis of available evidence it seems almost certain that he was not the son of Thomas Leighton, but was probably a grandson; and that his father was one of the brothers of William Leighton, but which brother is not known. Attempts to check the genealogy further have so far been unsuccessful.

The county history also says, concerning J. H. Leighton: "Mr. Leighton, the manager, comes of a family of glass manufacturers, and possesses secrets relating to the manufacture of glass which have never been suffered to get out of the family, and as a consequence of this the glass which is being made under his direction is of a very superior quality. The goods turned out by this establishment are of a finer quality and can be subjected to more severe tests than any other made in the United States, and so generally has this fact come to be recognized that without any particular effort to introduce the goods, the demand far exceeds the supply."

In any case, J. H. Leighton's possession of a "secret" formula for soda-lime glass hardly seems surprising since he was apparently related in some manner to the man who developed the formula. His career as a glassmaker, however, was certainly less glorious than that of some other members of the family.

The county history gives the following formula for glass made at Keota:

Sand, pounds	1,400
Carbonate of soda, pounds	600
Lime, pounds	200
Nitrate of soda, pounds	200
Arsenic, pounds	10
Manganese, pounds	5

Kate Glover remembers with relish that when the mix for glass was ready to begin "cooking," the man in charge, presumably Leighton, would take from his shirt pocket an envelope containing a mysterious "secret ingredient" and ceremoniously add it to the mix. The formula above does not, of course, include this "secret ingredient," whatever it may have been. One comment has been made concerning the formula, however, and that is that it contained a great deal of arsenic, used when organic impurities were a problem, and of manganese (glassmakers' "soap"), used to clear the glass of tint. The formula is a silent reminder of the trouble Leighton had in making good glass, both at Keota and later at Iowa City when he operated a factory there.

Soda-lime formulas had been in use for making bottles and the like; but this was tinted, not clear glass. The clear soda-lime glass developed by William Leighton, a formula similar to the Keota formula and possibly identical, not only relieved the need for lead, which had become scarce due to demands of the Civil War, but also made possible production of a cheaper grade of clear glass for tableware; cheaper because of its ingredients and cheaper because it was ready to work at lower temperatures than lead glass, a saving in time and fuel. Such was the glass made at Keota, a cheap soda-lime glass.

The question of the formula used for making glass at Keota was more important than would appear at first glance. It was necessary to adjust the formula carefully to give the maximum clarity and brilliance in the glass, depending on the materials used and local conditions in producing glass. Availability of suitable ingredients at reasonable cost could be —

and at Keota and Iowa City undoubtedly was — a major factor in success or failure of the enterprise. But, given a satisfactory formula and good ingredients, care in measuring and mixing the ingredients was still necessary; it could mean the difference between a good batch of glass “metal” or an inferior one.

The late Frank Glover of Keota, brother of Kate Glover, who was born in Washington county in 1875 and died in 1955, was one of the workers in the factory. The Washington (Iowa) *Evening Journal*, October 19, 1953, has an interview with the Glovers concerning the Keota glass factory in which the following paragraph concerns the mixing department:

Mr. Glover indicated that probably the main reason the glass factory in Keota went broke was due to poor family relations. Three brothers and a brother-in-law operated the factory. The brother-in-law did all mixing . . . They fussed and quarreled continually, culminating in the resignation of the brother-in-law. Another brother tried to carry on the mixing of the glass but couldn't produce one piece of clear glass!

Exactly who these people were, Kate Glover is not sure, but she does remember that Frank would come home and talk about the workers Leighton had brought from the east and their quarreling among themselves. Since Frank worked in the glass factory steadily, he undoubtedly knew about any friction among the workers.

His first job was to hold the molds while the glass was put in them. He was then promoted to the mixing department. The vats in which the mixing was done were twelve to fourteen feet long, about half as wide, and almost as tall as a tall man. The vat was divided, and as Keota people remember Frank's account of the mixing, he stood on the top, at the division, sifting the mixture from one section to the other and back until it was well mixed and smooth, a dusty operation.

In this job he developed a “lung poisoning” from exposure to chemicals during the mixing and sieving, and was then made night watchman, a job he held until the factory closed. In this last position he watched the thermometers on the glass pots as the glass mix cooked. When the temperature approached the point at which the glass was ready to work, he would go to the homes of the workmen, regardless of the

hour, and summon them to work. If the streets were passable, he rode a bicycle; if not, he walked. This was true at any time, any day of the week — when the glass was ready, the men worked.

In Keota, apparently, the “fussing” among the glass workers was pretty well limited to working hours. Miss Glover stated emphatically that Mr. Leighton was not a drinker, that he was well-liked around town, and that there was no trouble with the men. Mrs. Miriam Richter, in doing research for her book *Iowa City Glass*, found evidence that in Iowa City the glass workers from the east were considered a quarrelsome lot, given to drinking and brawling. Keota people, however, seem to have no such memories. Perhaps this is partly because the Keota factory actually operated only a few months while the Iowa City factory operated three or four times as long; also the Iowa City factory was nearly twice as large as the Keota factory.

Perhaps when Leighton moved his operation to Iowa City, taking most or all of the eastern glass workers with him, he also imported additional workers. Their incentive to come west might have been the loss of their jobs in the east; at about the time the Keota and Iowa City factories operated, many of the eastern plants were apparently experiencing financial difficulties and were cutting back, combining, and in some cases closing. By 1890 the process had gone so far that some of the most famous and once most prosperous eastern companies had either closed or had been absorbed in mergers. With shrinking opportunities at home, the west must have looked inviting to glass workers, as it did to many other migrants.

Another interesting element is that the Iowa City people who invested in the glass factory there were, in some cases, so bitter after its failure that they told their children little or nothing about it, making it more difficult to obtain accurate information from old-timers. In Keota, however, a lot of people have heard about the factory; Kate Glover was very specific in saying that Keota people, while disappointed in the factory's closing, were not particularly bitter at either Leighton or the glass workers.

According to the county history, ground for the building of the Keota glass works was broken in May of 1879, and by September the plant was in operation. Exactly how long it operated is difficult to determine, but it closed early in 1880. Since the Iowa City glass factory, also under Leighton's management, was incorporated April 30, 1880, Kate Glover's memory that the plant at Keota closed in January or February of 1880 is undoubtedly accurate. Despite its auspicious start, the Keota company actually lasted less than a year and glass was manufactured probably only five or six months. Also, according to Miss Glover's memories, at the time the decision was made to close the factory, the material on hand was used up. (This is in contrast to the Iowa City factory, where a pile of white glass sand was left standing beside the building.) As much glass as possible was disposed of; Leighton purchased the machinery, including the molds (all of which had originally come from the east); and finally, the money remaining after settlement of debts and the leftover glass were divided among the stockholders.

The glass factory was located just north of the railroad tracks near the western point where the side track joins the main track. This is roughly a block west of the business district, a site which was probably economical to acquire and convenient from the standpoint of shipping;¹ for the glass factory also took advantage of Keota's rail facilities, bringing in coal and later sand, and shipping its finished products by rail.

As for the building itself, it was 50 x 104 feet, shaped "like a barn," one story high, and had a seven-pot furnace at the east end. It was frame, with vertical pine boards as siding. It probably had a chimney much like the one built at Iowa City. Along the south side of the building was what Miss Glover called a "lay," probably the local equivalent of "lehr"

¹The glass factory was south of Broadway, west of Davis street, and directly east of Carpenter street, in block 19. This block is only one lot deep; the factory occupied the back part of lots 3, 4, and 5. There are now houses at the front of these lots; and where the glass factory stood are yards, garages, gardens, and good-sized trees. According to residents, sherds of glass are seldom found in the gardens.

or "lehr" for annealing glass. This was a shed-like covered runway which ran along the south wall from the furnace room on the east end of the building to the storage and packing room on the west. Inside was a continuous "caterpillar-like" track or belt on which pieces of glass were placed as they were taken hot from the molds. At the east end, Miss Glover said, was the open door, and near this location there would be a fire under the lehr so that the pieces were kept warm and could cool slowly as they moved along the belt or track toward the west end — the annealing process. In the west room of the building were shelves and facilities for packing. Here the pieces would be lifted off the belt, stored, and packed for shipping. This equipment, she says, was among the things Leighton purchased from the Keota company and took with him to Iowa City.

Leighton apparently had trouble with the annealing process at both factories. Iowa City glass was sometimes so poorly annealed that it exploded, and many specimens known to have come from that factory have small cracks from faulty annealing. Pieces of glass believed to have come from the Keota factory also have these little annealing fractures occasionally, though there were no reports that the glass exploded or broke spontaneously.

After the glass factory closed, the building was remodeled with an opera house in the east half. A dance hall, also used for banquets, agricultural shows and the like, occupied the west half. While not too many Keota old-timers are exact about where the glass factory was located, many of them remember high school plays, graduation exercises, and entertainments in the opera house building. After several poor seasons, the building was torn down in about 1906, "a year or two" before the high school was built in 1908.

The process of making glass in Keota was apparently much like that used elsewhere at the time. As Kate Glover describes it, the molds were "hollow with something like cement outside," and with a "lid" to go down onto the mold, and a plunger. This machinery was mounted on a table which was wheeled up close to the opening of the furnace. After the mold had been filled, she remembers watching the plunger go down into the mold and then, when the glass had cooled

a little, the table would be wheeled to the door of the "lay" (lehr) shed and the piece of glass taken from the mold and placed in the lehr to anneal. Meantime, another table with a mold would be wheeled up to the door of the furnace — a continuous process.

In spite of the most optimistic hopes of the plant's backers, the glass produced was inferior in quality. It was, in fact, so highly tinted that the company's salesmen (probably two), who traveled even as far as Nebraska, found it impossible to sell. It was grayish, yellowish, or greenish; and some pieces even when new were slightly lavender. Bubbles and annealing fractures were not uncommon.

A piece believed to be Keota glass, in the writer's collection, is distinctly lavender-gray in color and is full of bubbles, some of them fairly large, elongated by action of the plunger. The top edge is rough but not broken; it was obviously this way originally, possibly from underfilling of the mold. There are dark specks in the glass, possibly impurities. The mold in which this cream pitcher was made seems to have been quite new and in good condition, for the fine details are sharp and clear. But the glass of which the pitcher was made is quite another matter. In fact, when it was first purchased and scrubbed before taking its place on the shelf, it seemed to have sugar on the bottom. But the "sugar" could not be scrubbed away even with a stiff brush, and examination showed that the roughness was caused by incompletely melted sand. It seems likely that this particular batch of glass had not been heated long enough to melt the sand entirely, much less cook out impurities and gas bubbles.

According to the county history, "Sand of a superior quality is procured within a few miles of the factory. . . ." Old-timers in Keota are in agreement that this sand came from the Skunk River somewhere near the town of Grace Hill in Washington county. Kate Glover refers to sand being "washed up" into a "big pile" down there, and she is quite sure it was river sand, not sand from a quarry. It was hauled to the factory in horse-drawn wagons, a distance of some ten or twelve miles. Clem Carter of Keota remembers factory worker Amos Schreckengast talking about the trouble the factory had with

this sand and attempts to wash the impurities out of it; no matter how thoroughly they washed, there were still too many impurities, and glass made from this sand was difficult to sell. This is curious corroboration of the belief in Iowa City that the factory there used sand from the same source as present-day building sand, which would be Iowa River sand. And once again, the sand proved inferior for glass-making despite its backers' enthusiasm.

The possibility that sandstone might have been the source of sand at Keota or Iowa City has been checked as carefully as possible. There is a small outcropping of Pennsylvanian age sandstone at the north edge of Iowa City on the east side of the river across from the present city park. This sandstone, buff in color, would appear to have too many impurities for satisfactory glass sand. Pennsylvanian age deposits of sandstone also occur in a number of spots near Keota, the only one which could be checked being a little east of Grace Hill. In an abandoned quarry there a thin layer of sandstone occurs, but this sandstone also seems to have too many impurities, being dark buff to almost reddish in color. Sandstone suitable for glass manufacture does occur in Clayton County, Iowa, but it is a different formation from the sandstone in Johnson, Washington, and Keokuk counties.

It may be that Leighton had learned to use river sand for glassmaking in the east, though this cannot be proven. Such sand would probably have come from erosion of fine sandstones which are themselves suitable as sources for glass sand. It would probably have been a relatively simple matter to wash out accumulated impurities from river sand from such sources. Skunk river and Iowa river sand, however, come from glacial deposits and contain many minerals in addition to the quartz or silica sand desired for glassmaking. Such minerals as hematite (an iron mineral), feldspar, hornblende, garnet, flakes of mica, etc., composed the rocks the glaciers ground up as they moved southward. These could hardly be washed out of sand and would remain as impurities hindering the glass-making process.

And so it happened that at Keota Leighton found it necessary to ship in sand. Kate Glover cannot remember with

certainly the color of the local sand used, nor of the sand which was later shipped in, but she is quite sure that the better quality glass sand arrived in railroad cars from the east. The Oskaloosa, Iowa *Daily Herald* of June 27, 1942, contains an interview with one of the Bonshires, who was visiting in Keota at that time. In it is reference to "the huge quantities of white sand," undoubtedly the better quality shipped-in sand. This newspaper interview gives the name as "D. W. Bonshire, Jr.," Mrs. Verne Staley of Pittsburgh, a daughter of William Bonshire, says, however, that the visitors in Keota were John Bonshire, Jr., his wife and his sister Mary. Neither she nor Mrs. Margaret Collins, sister of John Bonshire, Jr., could identify "D. W. Bonshire, Jr.," so the initials are probably an error in printing.

The possibility that the good sand used at Iowa City may have come from Clayton county has been discussed in an article in the Summer, 1964, issue of the *Annals of Iowa*. Kate Glover, unable to remember the exact source of the shipped-in sand used at Keota, thinks it may have come from the Great Lakes region; but when asked about the possibility that it came from Clayton county, she did not rule that out. Neither was John Bonshire, Jr., able to give the source of the good sand.

With better sand, Leighton was able to make better glass and apparently had a little better success in selling it. Some pieces which are almost undoubtedly products of the Keota factory are really quite good, though the tendency towards a slight tint continued. But the shipped-in sand proved to be too expensive, a factor in the company's financial difficulties.

It is almost ironic that after operating a factory in Keota for approximately six months, having trouble with local sand and then running into financial difficulties partly because of the cost of shipping in good sand, Leighton took molds, equipment, skilled glass workers, and his dream of an Iowa glass factory to Iowa City, attempting the whole thing all over on a larger scale, trying once again to use local sand, and once again having to ship in sand. The second time, however, it took a little longer for the bubble to burst.

Coal for use in manufacturing glass was brought by rail

from Oskaloosa, possibly another source of trouble for Leighton, who was accustomed to working with a higher grade of coal in the east. In fact, several Keota people have commented on the fact that in using Iowa coal, it was necessary to cook the glass longer than had been anticipated before it would reach proper temperatures, which of course increased fuel costs and, to some extent at least, labor costs.

In the case of coal, as in the case of sand, the enthusiastic local appraisal of Iowa raw materials was to prove wrong. The county history was published in 1880, probably about the time the glass factory closed, but was apparently written sometime late in 1879 before the plant's troubles became too great. The history says "coal peculiarly adapted to the melting process is procured at Oskaloosa, at a distance of thirty-five miles, from which circumstances this establishment has great advantage in freights over every other in the country." But apparently the freight advantage was not enough to offset other added expenses incurred because of use of Iowa coal.

With regard to coal, John Bonshire, Jr., was very specific. He considered the coal from Oskaloosa to be the greatest single difficulty experienced by the Keota plant. In using this coal, thirty-six to thirty-eight hours were required to melt the glass and achieve a proper working temperature, whereas in Pennsylvania only twenty-six to twenty-eight hours were required. He is quoted as believing that "this loss of time together with a not too popular choice of profitable lines to manufacture . . . are doubtless the reasons why the local project eventually failed."

Still another factor which may have entered into the early failure of the Keota factory was a problem involving molds, which was recounted by Frank Grover for the *Washington Evening Journal*, October 19, 1953. Among items manufactured were tea sets in a pattern locally known as "Daisy." The mold for the cream pitcher in this set was accidentally broken and was returned to the mold maker in Pittsburgh to be repaired or replaced. Meanwhile, the factory continued to make the other pieces of the tea set — the sugar, spooner, and covered butter dish. When the new mold came from Pittsburgh, it was not the Daisy pattern but some other

pattern, and meantime a lot of material had gone into sets which remained unfinished. As Kate Glover puts it, this caused quite a lot of "commotion around town," especially among the stockholders. Unfortunately she does not know what became of the incomplete Daisy pattern sets.

Altogether the venture of making glass in Keota proved to be not nearly as profitable as its backers had hoped. The financial difficulties probably cannot be traced to any one thing but rather to a combination of friction among the workers, possibly inexperienced help, difficulty with local sand and the expense of obtaining adequate sand, difficulty with Iowa coal and the attendant added costs, breakage of a mold and mismanagement in using material for Daisy pattern tea sets which later could not be completed, and the difficulties encountered by salesmen in selling an inconsistent and often inferior product.



Exhibit of Keota Glass

On the plus side is the fact that production seems to have been tailored to the needs and demands of the area. Not all glass produced went into pressed glass; Kate Glover remembers watching expert glassblowers at work, their chief product apparently being lamp chimneys. She still has a glass ball which one of these men blew. A photograph of Keota

glass accompanying a display in the Wilson Memorial Library in Keota shows a blown glass dipper and a glass hat. Also in the picture is a blown glass novelty that is puzzling since it has no apparent opening but encloses a small broken doll. This once belonged to Mrs. Bill Helsher, who has since given it to her brother. Another product of the imaginative glassblowers is the striped cane in the picture, which is on exhibit in the library.

A great deal of production seems to have gone into two kinds of strictly utilitarian glassware of the type later advertised by the Iowa City factory as "Bar Ware." These two kinds, on display in the Keota library, are panelled beer mugs with a distinctive six-sided handle, and heavy goblets or beer schooners with a somewhat bulbous stem.

Four of these goblets were given to the Historical Museum by Miss Genevieve Johnson of Des Moines. Her parents were married in Keota and obtained a set of goblets at the factory for household use. They are the shape called "hotel goblets," having what is now known as a "no-nick" edge, typical of much of the early glassware produced for use in hotels, restaurants, and bars. While the glass was still hot, the goblet was taken from the mold and the top edge rolled on a table, curving it inward. When stored, the top edges and bases of these goblets did not touch, so there was less danger that edges would be nicked. There is a close resemblance between these goblets from Keota and the largest size from Iowa City. Mrs. Alva Bohrofen of Keota has a number of authentic Keota goblets which bear a strong resemblance to the other two sizes of plain goblets manufactured at Iowa City. One of them has straight and slightly flaring sides, not rolled inward.

Although the Iowa City glass factory advertised bar ware among its products, beer mugs have not yet been authenticated as products of that factory. Several styles of beer mugs from the factory at Keota, however, are known. Most numerous are the panelled mugs with recessed bottoms, distinctive six-sided handles, and definite thumb rests. At the time the American Legion obtained its first clubrooms in Keota, shortly after World War I, Mrs. Henry Page (Mae

Tallman Page) gave the organization a dozen of these mugs from the Keota factory. She had obtained them from her father, Platt Tallman, one of the stockholders. Such mugs are now on exhibit in the library in Keota, and several are shown in the picture of a display of Keota glass. children in the family used for their milk. The mug was shown to Kate Glover and to a number of other old-timers in Keota, all of whom believed it had probably been made there.

The writer has also obtained two smaller mugs, probably ale mugs, similar to this one. Both are of glass which strongly resembles Keota glass, and one was purchased in Keota but without any authentication. It seems possible these were also products of the Keota factory, but no one is able to say with certainty whether such smaller mugs were actually made there.

A mug in the writer's collection was purchased from Mrs. C. E. McGowan of South English, Iowa, whose father purchased a store in South English in 1884, but had worked in the same store for several years before that. Mrs. McGowan knows only that the mug came from the store and that the store obtained such glassware by the barreland; she does not know its source. This particular mug was one of several the

Better authenticated is a plain slender mug purchased from Clem Carter; it was checked for him by Amos Schreckengast, who worked in the factory and who told him only six of these mugs were made. This mug is plain with straight sides, tall, slender, has a recessed bottom, three steps on the outside at the bottom edge, a rounded handle with a mold mark running up the outside and a ridge running up each side. Clem Carter also has a very large, heavy, panelled mug which is believed to be Keota glass.

An authentic Keota mug which belongs to Glen Richardson, whose family was associated with the *Eagle* for many years, also has plain straight sides and is somewhat taller and more slender than would be expected. It has a round handle with a mold mark on the outside and a thumb rest at the top. The bottom is only slightly recessed, and the bottom edge is beveled and grooved. There is a shallow band at the top on the outside. The most distinctive feature of this particular mug is that it is panelled on the inside, thirteen panels

having been cut in the plunger, with the odd-numbered panel matching the handle.

In all of this bar ware the writer has examined, the glass is somewhat inferior, seldom very bright, often gray, greenish, or yellowish, but particularly lavender with age.

In addition to lamp chimneys and bar ware, the Iowa City factory also advertised that it produced fruit jars, a utility item which would have been in considerable demand. When questioned about this, Kate Glover said that she believes the Keota factory made wide-mouthed jars of fairly clear glass. These jars had glass tops with a button in the middle. It was necessary to buy big jar rings in using them and to have clamps to hold the lids down. No jars have been located, either from Keota or Iowa City.

The best single source of information on tableware made in Keota is the picture already referred to. In the foreground are a number of plain sauce dishes, one of which is presently on exhibit in the library at Keota. It is small and heavy with rounded sides; the bottom is not footed but has a small ring. The sauce dishes known to have been made in Iowa City, by contrast, are thinner, have straight sides, and are footed.

In the center, on the second level of the picture, is a large compote in a swirl pattern, about which nothing further could be learned. Mrs. Bohrofen has a compote, also from the Keota factory, which has plain rounded sides and a high, plain-domed top. The stem is hollow, panelled, topped by a ring, and wider at the base; the foot is high and humped.

In the lower left portion of the photograph is a spooner (possibly a sugar without lid) which appears to have been made in a two-piece mold with a design of flowers and leaves running along the joint of the mold. It is quite indistinct in the picture; the pattern has not been identified, and nothing further is known concerning it.

At the lower right in the picture are three pieces of the Daisy pattern tea set, including the cream pitcher for which the mold was broken. This pitcher appears to have been made of better glass than the one in the writer's collection, and the workmanship is definitely better. The other two pieces in the picture are a sugar, without cover, and a butter

dish, also without cover; in the original complete set, both of these had lids.



Photo by James Strueber

Keota Glass Creamer, Daisy Pattern

Those familiar with Miriam Righter's book *Iowa City Glass* may recognize this pattern from one of Mrs. Righter's illustrations. The story, as Mrs. Righter tells it, is that Benjamin Hull, father of Robert W. Hull of Iowa City, was a worker in the Iowa City glass factory and had as a roomer one of the glass-blowers, whose name was Hahne. This roomer, supposedly noting his landlord's fondness for prairie chickens, promised to make him a piece of glass in this motif. The piece he brought home was a spooner with scalloped top; it had prairie chickens and deer heads on alternate panels, superimposed on a panelled pattern of daisies. Mrs. Righter was unable to learn whether the piece actually had been designed specially or whether it was one Hahne happened to have.

Kate Glover, however, recognized it as the spooner of the ill-fated Daisy tea set, but she was unable to remember deer or prairie chickens as part of the set. Since Leighton



Photo by James Strueber

Sheraton Pattern Sugar and Creamer; Probably Keota Glass

purchased all the Keota molds and took them with him to Iowa City, it seems a fair guess that Hahne knew of the existence of this orphan spooner mold, made the piece and added the prairie chickens and deer, either by recutting the mold or perhaps by casting them from other molds and adding them to the spooner while it was still hot.

The two remaining pieces in the Keota photograph, a goblet and a compote, are both recognized patterns. The goblet is panelled forget-me-not, which Ruth Webb Lee (in *Early American Pressed Glass*) says was made by Bryce Bros. of Pittsburgh, Pennsylvania, during the 1870's and was listed in their catalog as "Regal." It seems possible that Leighton, since he had grown up and worked in the Wheeling area and obtained molds from at least one of the firms doing such custom work in Pittsburgh, may have obtained used and worn molds of the panelled forget-me-not to bring to Keota.

The pattern of the compote is now commonly known as



Photo by James Strueber

**Sheraton Pattern Goblet and Spooner (Both Slightly Lopsided);
Probably Keota Glass**

Sheraton; according to the Kamm-Wood *Encyclopedia of Antique Pattern Glass*, v. II, it was made in the early eighties by Bryce, Higbee & Co. of Pittsburgh "in the standard range of items," and its original name was "Ida." The writer has a sugar, with cover, two creamers, and a spooner which originally came from Iowa homes within a fifty mile radius of Keota, and has seen other pieces for sale in the area. The color and quality of the glass strongly suggest that they may be of Keota origin; and as additional evidence, two pieces have annealing cracks. Another piece, a narrow hexagonal pickle or relish dish with enclosed handles, came originally from a farm in the Kalona, Iowa, area; in this case the dealer from whom it was purchased commented that Keota people claim the pattern and her label carried the notation "Keota?". This is somewhat better in quality but still grayish and not bright. The molds on all these pieces appear to have been worn.

A comparison of this pattern with the Alhambra pattern, made in Iowa City and probably nowhere else, reveals an apparent relationship between the two designs. The half

circles of the Sheraton become triangles in the Alhambra; the spokes of Sheraton are adjusted to this new shape and a little triangle is added at the top, with a Maltese cross between; Sheraton has bands of two raised lines with a row of little dewdrops between; in Alhambra, diamond shapes, more suitable to the design, replace the dewdrops. It is interesting to speculate whether the two were possibly products of the same designer.

So far as is known, neither panelled forget-me-not nor Sheraton was made in Iowa City, nor, for that matter, any of the other patterns of table ware previously produced at Keota (except for the plain goblets discussed as "bar ware," which were also apparently sold for household table use.) Possibly Leighton had experienced so little success in selling the Keota products in these patterns that he decided it wiser to put emphasis on other patterns.

Research done on possible sources of second-hand molds for use in the factories at Keota and Iowa City has turned up something interesting: Panelled forget-me-not, made at Keota, and Wheat and Barley, believed by some Iowa Citians to have been made there, were both originally products of Bryce Bros., and Sheraton was made by Bryce, Higbee & Co. These molds would have come from Pittsburgh. Among the products of the Iowa City factory, frosted stork motifs, oval beehive industry platters, and "Elaine" plates are credited by various authorities to the Crystal Glass Co. of Bridgeport, Ohio (one book, *Old Glass: European and American*, by N. Hudson Moore, gives a Pittsburgh address for this company.) In addition to original designs apparently obtained from custom mold makers in Pittsburgh, Leighton may have obtained used molds chiefly from two sources. It is possible that Leighton may have made some of these patterns in the factory he operated at Martin's Ferry, Ohio, and that the worn molds he brought with him to Iowa, and perhaps the machinery, came from this source. In Moore's *Old Glass: European and American* there is a list of American glass

factories in operation, mostly before 1850. In it are two notations:

EXCELSIOR Co.

MARTIN'S FERRY, VA.

MARTIN'S FERRY, VA. 1860?

EXCELSIOR Co. 1860.

This is probably the same company mentioned in Leighton's biography in the Keokuk county history: ". . . [about 1875 or 1876] he went to Martin's Ferry, Ohio, remodeled and took charge of the old Excelsior Glass Works, now known as the Buckeye Glass Works, where he continued until 1878, when he came to Keota . . ."

The Excelsior Flint Glass Company of Pittsburgh is listed in Tracy H. Marsh's *The American Story Recorded in Glass* as having had an award-winning display at the Philadelphia Centennial in 1876. Some glass companies did maintain business offices in one city and a factory in another, but there is no indication whether this company was the same as the one Leighton had taken over about that time; on the other hand, Leighton was said to have changed the name to "Buckeye Glass Works," which would rule out this Pittsburgh company. And if the work done at Keota and Iowa City was a sample of the glass Leighton turned out, the fact this company had an award-winning display would also suggest he was not the man in charge.

Available references make no mention of patterns of glass produced at Martin's Ferry, either before Leighton took over the plant or while he ran it — or later if indeed it continued in operation. This gives rise to the interesting possibility that some "Ohio" glass which resembles Iowa glass and which has been attributed to other factories on the basis of circumstantial, and sometimes rather flimsy, evidence, may actually have been produced by Leighton at his Martin's Ferry plant, the molds having then come west with him to reappear as worn and apparently second-hand ones when used at Keota or Iowa City. This would not, of course, apply to patterns which appear in catalogs of other companies; and lacking proof, it is only an interesting matter on which to speculate with reference to other patterns for which the commonly accepted attributions lack firm proof.

The writer has two dishes obtained in Keota which were almost undoubtedly made there, but which are not patterns shown in the picture of Keota glass. Both are oval, both of fairly good glass but with the characteristic yellow-gray color of so much Keota and Iowa City glass. The larger dish, which is supposed to stand on four short legs, really stands on only three; one is too short. It had been sold by Clem Carter to Mrs. Isaac Sprague of Keota; Mr. Carter received the piece from Edgar Banty, who had received it as a gift from one of the glass factory workers. The smaller dish was obtained from Clem Carter, who depended on Amos Schreckengast's authentication.

Another item, utilitarian and less interesting, is the plain tumbler with etched bands. It was obtained from Mrs. Joe Schlatter of Washington, Iowa, who gave as its original source, Mrs. Frank Pulver of Keota, whose family obtained this tumbler, and others, from the factory. Also from the same source is a heavy wine glass with three etched bands. In shape and style it closely resembles goblets believed to have been made at Iowa City but not yet authenticated. The quality of glass and workmanship suggest the possible kinship of these pieces with authentic Keota glass.

Mrs. Frank Kline of Keota formerly had a bread plate which is believed to be Keota glass. She describes it as oval, shaped much like Iowa City glass platters in Beehive or Frosted Stork patterns, but having a plain margin with no border. The rim of the plate bore the words "Give Us This Day Our Daily Bread." The center motif was a sheaf of wheat and a vine, and it may have been partly frosted. It was impossible to make comparisons, but this plate might resemble the Wheat and Barley pattern bread plate, a pattern which Leighton may have made at Iowa City and therefore may also have made at Keota, perhaps only in small quantities or occasional pieces.

Three other bread plates are on display in the Keota library, but there is a possibility these may not be Keota glass. One is the "101" pattern, a product of the Bellaire Goblet Company of Findlay, Ohio, and perhaps other makers (Ruth Webb Lee in *Early American Pressed Glass*). Another

is a Liberty Bell "Signers Platter," made in quantity by Gilinder & Sons, Philadelphia, at the time of the Centennial Exhibition in 1876 (Tracy H. Marsh, *The American Story Recorded in Glass*). The third, oval in shape, has a cross in the center and the motto around the edge. Some members of the family to which these three plates belong believe they may be Keota glass, but the belief is based chiefly on the fact that the grandmother from whom they were inherited had been "great on getting souvenirs for each of her three girls," and would have been "apt to want them (the girls) to have a piece of glass made in Keota." Since both the "101" platter and the Liberty Bell are well-known pieces produced in quantity elsewhere, and since the quality of glass of all three, especially of the "101" platter, seems a cut or so above the quality of most Keota glass, the authenticity of these pieces may remain in some doubt. On the other hand, Leighton's apparent practice of using old molds from other companies, and perhaps of indulging in the not-uncommon practice of copying, without permission, popular lines from other manufacturers, does leave open the possibility that the family is right and these three were also made at Keota.

In her first letter on the subject, Kate Glover says: "The factory made beer mugs, fruit dishes on stems and with lids, bread plates with words on them, sauce dishes, goblets, 'tea sets,' a sugar bowl, butter dish (both with lids), cream pitcher and spoon holder all with pretty designs in the glass, and other pieces." John Bonshire, Jr., says that the factory made "lamps and lamp chimneys, tableware such as butter dishes, cream pitchers, water and beer glasses, jelly glasses, and fruit jars. They also made novelties of many kinds such as canes and paper weights. . . ." An article in the *Keota Eagle* in 1955 gave the same information. It has been possible to identify specimens of most of the items mentioned, though photographs could not be obtained of all of them. Still unidentified are lamp chimneys and fruit jars, which may have looked about like all the other lamp chimneys and fruit jars produced at that time, without any special identifiable characteristics. The mention of paper weights is interesting. There was no evidence of their manufacture in Iowa City; but at

Iowa City the workers did make glass marbles of various sizes, while none are known to have been made at Keota.

After the factory at Keota closed in early 1880, what of the young glassmaker, J. H. Leighton? He took the equipment to Iowa City where a glass company was incorporated at the end of April that same year. By September, his new company was running an advertisement in the *University Reporter*, a monthly student publication. It read: "Iowa City Flint Glass Works, Manufacturers of Table Ware, Lamp Chimneys, Fruit Jars, and Bar Goods." Apparently the glass factory in Iowa City was in operation in early September, or was so nearly ready to begin operation that the cost of advertising was justified. Other Iowa City newspapers published during the years the factory operated have not been preserved, making this student publication the best evidence available of the factory's starting date. It operated until early summer of 1882, a total of 21 months or perhaps a little more, considerably longer than previous research on the factory indicated.

At the Iowa City plant, a 13-pot factory, the production was said to have been a carload of glass a day. On the same basis, production at Keota may have been as much as half a carload a day. Assuming that the Iowa City factory operated 21 months and the Keota factory six months, and that both factories worked at least five and probably six days a week, Leighton's production of what can best be called "Iowa glass" may have been more than 500 carloads.

The official state census for 1880 and 1885 adds a little more on the subject of Leighton's history. He is listed in the 1880 census for Johnson county, the 2nd ward of Iowa City: "J. H. Leighton, male, white; age, 30; glass manufacturer; born, West Virginia [an error]; a boarder." The landlady may have given the census taker this information and, knowing that Leighton came to Iowa from West Virginia, assumed he was born there. The 1885 census shows him still in Johnson county, and this time the age given for him would appear to be an error, but there is little doubt it is the same man: "James H. Leighton, age 37, white male, glassblower, born Massachusetts." At the same address in the 4th ward of Iowa

City were also the following: "Ada K. Leighton, 37, white female, born Johnson County; Frank Burr, 16, white male, born Johnson County; Richard H. Leighton, age 1, white male, born Ills. (Illinois?)." It appears that by 1885 Leighton had acquired a wife (possibly a widow), a son one year old, and possibly a stepson. He listed glassblower as his occupation, but for whom he worked and why he was still in Iowa City, three years after his factory there closed, are unanswered questions.

The only clue is from the *Iowa State Gazetteer and Business Directory for 1884-5*, in which we find a notation: "Iowa City Glass Works (capital, 40,000), Milton Remley pres, Daniel Boyle supt." It is possible that with a family to support, Leighton had taken on work there as a glassblower. By the time of the 1890 state census he had left Iowa City and it has proven impossible to trace him.

He left behind in Iowa a quantity of glassware, some quite bad and some quite good; an empty factory at Iowa City, later to become a glove factory; a factory at Keota converted to an opera house; and a group of people who had shared with him in the unfulfilled dream of a great glass-producing center in Iowa. Above all, Leighton left a colorful bit of history and glassware which excites the imagination.

Acknowledgements

The writer is deeply indebted to Miss Kate Glover* of Keota, whose store of vivid memories has been one of the chief sources of information. Miss Glover describes herself as having been a "nosy" youngster; there surely can be no question that her lively red-headed Irish curiosity, coupled with an excellent, accurate memory and vitality to live well into her 90's, have made it possible to record history which would otherwise have been partly lost.

The people of Keota, too, have been uniformly helpful. They have opened their doors and given their information freely, solely in the interest of helping preserve their town's history for all the people of Iowa to enjoy.

*Miss Glover has since passed away.

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