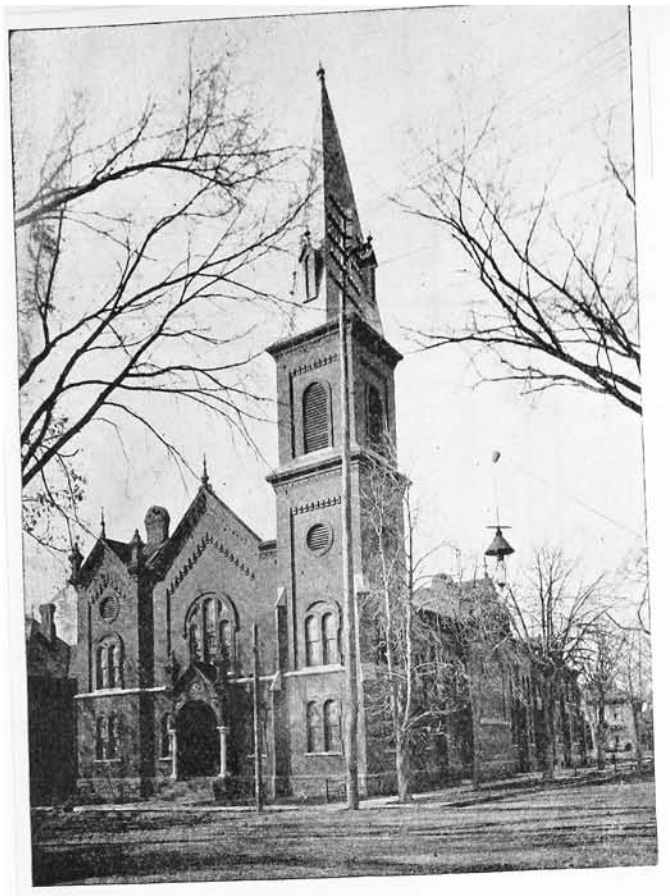


STATE STREET METHODIST EPISCOPAL CHURCH

State Street Church Started in '51

Methodism started in Ithaca in the year 1793 in the McDowall log cabin located where the Senior High School now stands. In 1820 the First Methodist Church was built and in it was installed the first church bell heard in Ithaca.

At a meeting in the First Methodist Church in 1851, the Seneca Street Methodist Church was organized with the following trustees: Henry H. More, Benjamin Tabor, Daniel Hugg, Charles Miles and Joseph Burritt. This church later become known as the State Street Methodist Church.

Most second churches of the same denominations in the same town owe their origin to "a church row," but not the State Street. The second Methodist Church in this city started in the days when Methodists at least believed in multiplying churches. Not only were the members of the First Methodist Church greatly in favor of this movement of placing another church in the western part of Ithaca, but the annual conference were delighted with the plan.

Conference Held Here

The conference was meeting in the city in 1851, so on a July day a large group of Methodist people gathered on the corner of Seneca and Plain Streets to witness the laying of the cornerstone of the new church by the presiding bishop, Edward Janes. At this same conference the Rev. Albert Graves was appointed pastor. The new society held its meetings in the town hall while their church was being erected and on Thanksgiving Day, 1851, the church was dedicated. At this same service three persons stepped forward professing "conversion to Christ. So the new church early become known as a church with an evangelistic spirit.

In 1877, during the pastorate of the Rev. Robert Hogaboom, it was decided to sell the Seneca Street property and move to the present site on the corner of State and Albany Streets. Here the present brick building was erected and dedicated in February, 1879, by Bishop Charles Fowler.

Church Redecorated

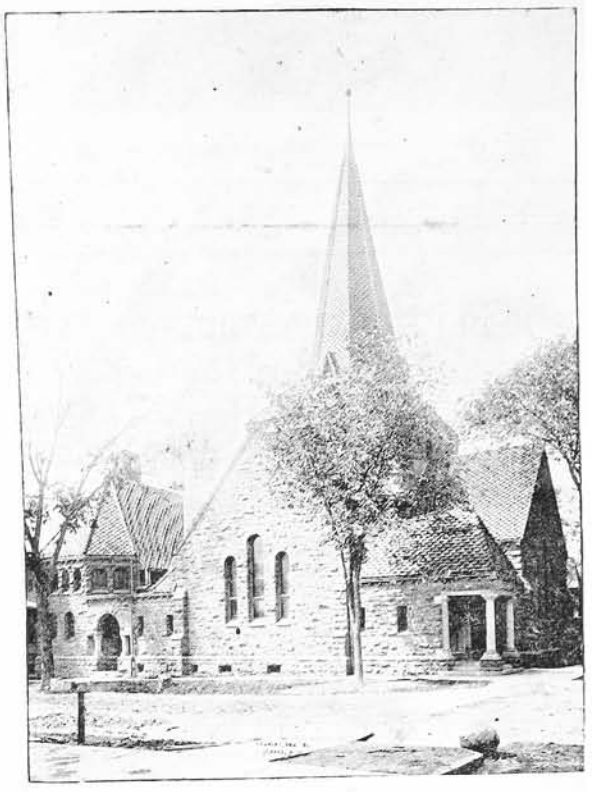
During the pastorate of Rev. J. C. B. Moyer the church was completely repaired and redecorated. A new pipe organ and new pews were installed. On Jan. 24, 1915, the church was reopened with Bishop William Burt preaching the sermon.

Last year the church was again redecorated throughout. On Palm Sunday it was reopened with an appropriate service dedicating at the same time the new Hymnals which had been installed in the pews, each one in honor of a friend of the State Street Church.

Thirty-three ministers have served this society as pastors:

Albert Graves, Ephrim Hoag, C. D. Burritt, S. G. Lathrop, Fitch Reed, W. N. Cobb, Hiram Gee, E. C. Curtiss, Thomas Harroun, Simon Gray, Benjamin Shove, John Crippen, D. D. Buck, Theron Cooper (two different pastorates), O. A. Houghton, R. Hogaboom, Milton Hamblin, R. D. Munger, T. F. Clarke, E. M Mills, W. H. Giles, C. L. Connell, S. F. Sanford, Ward Mosher, E. J. Roseengrant, J. C. Nichols, D. D. King, J. C. B. Moyer, A. E. Atwater, D. W. Baylis, Frederick Maunder, H. G. Burley, and Raymond H. Cox.

The old Seneca Street Church building which for many years had been used for a store was taken down last fall and the corner stone given to the State Street Church which will make it into a baptismal font.



UNITARIAN CHURCH

Unitarians In Ithaca Since 1865

This article is based largely on a statement prepared in 1924 by Mrs. John H. Barr

The First Unitarian Society of Ithaca had its beginnings in the period immediately following the Civil War. These were the days, too, when Ezra Cornell and Andrew D. White were organizing the educational enterprise that is now Cornell University. It was a time when many were breaking with old customs and turning new ground in education, in science, and in religion.

It was not strange then that when in 1865 a series of meetings was announced in the town hall, under the auspices of the American Unitarian Association, they attracted attention and were well attended. Among those who preached were some of the leading ministers of the Unitarian denomination, up to that time little known outside of New England, and especially identified with Boston. To Ithaca came Dr. Rufus Bellows of New York City, Edward Everett Hale and James Freeman Clarke from Boston, Samuel J. May from Syracuse, and G. Washington Hosmer from Buffalo.

The result was the formal organization of Oct. 15, 1865 of the First Unitarian Society, with the installation, just a year later, of the Rev. E. C. Guild as the first regular minister. A Harvard man and a graduate of Meadville, the Unitarian Theological School, Mr. Guild "got things started."

Among the active members of the early parish the names of these families are remembered: Wells, Walbridge, Donnelly, Delano, Perry, Morse, Edwards, Wyckoff. The late Edward Guild Wyckoff was named for the first minister. After two years the Rev. Mr. Guild moved to Baltimore.

Greek Second Pastor

He was followed by the Rev. John C. Zachos, a Greek, who had come to this country with Dr. Samuel Howe of Boston, the founder of the modern method of instructing the blind and the husband of Julia Ward Howe. During Mr. Zachos' pastorate the young people of the church were particularly active.

Then for a number of years the Rev. Rufus P. Stebbins was minister, until 1877. In these days the friendly and co-operative spirit that characterizes the Ithaca ministers today had not developed. On the contrary the then Presbyterian minister, an able and influential man, often preached against the Unitarians and also "that Godless institution on the hill." But once, when he was ill, Mr. Stebbins went to see him and was so sympathetic and helpful that the good doctor said when he left, "Well, you may not be a Christian, but you're the first minister in town to come and see me." After that, while they seldom agreed about anything, he and Mr. Stebbins were always friends.

It was during Mr. Stebbins' pastorate that the first church of the Unitarian Society was built, in 1873. It stood on East Buffalo Street, nearly opposite what is now the Unitarian parsonage. It cost $13,500 and was free from debt when Mr. Stebbins left Ithaca.

Then followed a series of ministers who are still remembered and beloved by the older members of the society: the Rev. Messrs. Henry C. Badger, Joseph Henry Allen, Alfred E. Goodnough, John W. Day, and John F. Dutton. This brings the story down to the early nineties.

Old Church Destroyed

During the time of the next minister, the Rev. John W. Scott, the old church on Buffalo Street was destroyed by fire. What seemed at first to be a catastrophe proved not to be altogether such, for it united the society in the desire to build a new and better church, and what was even more significant because it brought out expressions of sympathy and good will, including offers of material help, from many in no way connected with the society.

One story, and it is a true one, is that while the flames were still actively at work, one of the leading merchants of the town handed to the minister a check for a substantial sum, saying, with a smile, "For your building fund."

The lot at the corner of Buffalo and Aurora Streets was secured and the present church erected in 1893. William Miller, the architect, donated the plans and W. H. Perry superintended construction. Damaged by smoke from a fire in the basement in the autumn of 1935, the auditorium was completely redecorated and relighted during the summer of 1936 in a way which makes it more than ever a place of worship.

In 1898 the Rev. Ulysses G. B. Pierce came to Ithaca and for three years attracted large congregations by his brilliant sermons and pleasing personality. Since 1901 he has been minister of the Unitarian Church in Washington, D. C.

Long Pastorate Held

Perhaps no minister of the First Unitarian Society has made a deeper impression on the people of Ithaca within and without his parish than did the Rev. Cyrus W. Heizer. His pastorate lasted from 1901 till his death in October, 1914. During all this time he entered heart and soul into the life of the city and gave himself unsparingly to every need. It is remembered how on one Sunday when the Inlet was in flood and the lower levels of the town awash, he appeared in the pulpit in rubber boots, and dismissed the congregation after a brief but stirring appeal for volunteers. He was instrumental in the establishing of a separate court for juvenile offenders. He was believed by the entire community.

Mr. Heizer's successor was the Rev. Howard A. Pease, 1915-1917, who was followed by the Rev. J. A. C. Fagginer-Auer, 1917-1924, another brilliant preacher, who moved from Ithaca to a professorship at Tufts College and who is now professor of church history in the Harvard Divinity School.

During the past 12 years the First Unitarian Society has had four ministers, the Rev. John Lewis, from England, for a short pastorate in 1924-1925; the Rev. Frank S. Gredler, 1926-1931; the Rev. Leslie T. Pennington, 1932-1935, and then, after an interval when on many of the Sundays the services were conducted by various laymen in the society, mostly professors in Cornell University, the present minister, the Rev. Abbott Peterson Jr., who took up his duties here on Jan. 1, 1936.

While in the early days of the history of this church the word Unitarian was more than once conjured with in the pulpits of the city as being synonymous with heathen or atheist or non-Christian, much misunderstanding is now a thing of the past, and the place of this church in the great corporate body of Christianity is clearly recognized. "Imposing no doctrinal tests and requiring no acceptance of any written creed, this church cordially welcomes all who, in the love of the truth and in the spirit of Jesus Christ, desire to worship God and to serve their fellowmen."

Moral Society Bossed Ithaca In Early 19th Century

By B. M. CLAREY

Most folk don't know it but Ithaca—this seat of culture and education—was once a juvenile delinquent.

Even after Simeon De Witt, the surveyor, named Ithaca after a beautiful Grecian city, no one bothered to call Ithaca Ithaca. It was known as "Sodom," "The City" (in quite disparaging tones), or "The Pit." These references to our lovely little community would lead one to think it was a rip snortin', hell raisin' town in the early 1800s. It was.

Land promoters boosting the sale of swamp, swale, and cattail-covered soil referred to Ithaca as "The Chicago of the East." A hundred years later when Al Capone and Bugs Moran with their trigger happy companions were shooting up Chicago, someone (if he'd ever thought of it) could have called Chicago "the Ithaca of the Midwest."

Slumber Aften Disturbed

Homicide, however, was not the motive in Ithaca's shooting days. The boys would fire at will on occasion and disturb the slumbers of little children and old folks now and then. A loud bang and the peculiar whine of a closely passing pellet gave strangers an unfair impression of community spirit. Word got around the countryside about these happenings. Strangers, alighting from the stage at Grant's Coffee House, would dash right up to the desk and breathlessly ask: "Is it safe to remain here over night?"

A visitor's concern was twofold. He was worried about the boisterous boatmen and teamsters who had been attracted here by the War of 1812 blockade. Ithaca offered the gypsum and salt young America needed and it could be moved two ways—up Cayuga Lake and along the Erie Canal or toted over the hill to Owego 20 miles away. From Owego it moved down the navigable waterways to Baltimore and the Atlantic Coast.

Society Organized

These noisy, tobacco chewing, hard drinking, gouging fighters were enough to keep the prudent away. Yet they were less feared than the other element, an element mobilized to establish law and order where none existed. It was the Moral Society.

The Moral Society took upon itself the task of making this thriving inland port a more peaceful place in which to live.

Composed of 40 business and professional men, all from the upper social level, the Society ran the town. Its members became drunk with power and the raw liquor distilled along Cascadilla Creek. They imposed their will on everyone. And a few, it is suspected, used their standing as society members in dealing with their clients.

The society had a great local spirit. It picked only on "strangers" and local characters who had no important sponsor. Tribute was accepted from those who could pay because that was good business and anyone who wasn't interested in amassing a fortune as quickly as possible wasn't worth the salt the Indians were hiding down the lake.

Ruler Established

Americana offers no more despotic group than the Moral Society. Greater crimes, perhaps, may be attributed to gangster forces and the Ku Klux Klan, but the Moralists in their day not only policed the community but established the rules of conduct. Heaven help the violator. For two decades their iron hand crushed the drunkards, the loafers, exhibitionists and those with bad manners. The society was organized in 1806 and lasted until 1837 or later, but in its dying days the punch was gone. Everyone referred to the group as the "chaotic society" and mounting ridicule of less important persons ended what was once tolerated because of the social prestige of their predecessors. Then too, in the early 1800s, peace loving Ithacans believed the Moralists were combatting more evil forces.

That page in Ithaca's history is a black one. Likewise its a blank one. In the Old Court House, the De Witt Historical Society has voluminus records. There any one can find out much of what happened around here since the time General Sullivan, acting on orders from George Washington, booted the Indians off Cayuga Lake. But when you start digging for facts on community affairs from 1816 to 1830, all you get is a lot of biographical dope on a railroad or steamboat promoter, who, if not a member of the Moral Society, was a likely candidate for the same—or for its punishments.

Three Were Influential

During this historical blackout three characters were influential in community life. They were overlooked in the historical concentration on others who amassed fortunes by thrift and shrewdness. A few of the wealthy turned philanthropist before dropping into the grave and if they happened to be a member of the Moral Society chances are their largesse could be traced to remorse.

Of this trio Tecumseh was outstanding. By day he was Ben Drake, an affable merchant whose standing in the community was indicated by the fact every one called him "Uncle Ben." At night he assumed the role of Tecumseh, sovereign leader of the Moralists. He issued the most frightening proclamations. It left the politicians particularly and the public generally in a dither.

Another was Dr. William Wisner, a martyr to Presbyterianism and temperance. The good doctor who was all but crucified in the wild and woolly Ithaca of the times is believed to have put the "chaotic" stamp on the Moralists he despised with the same fervor he felt toward all "Sabbath Breakers."

'The Castigator' Published

The third and lesser character was a practical printer, James M. Miller, who came back east after a spell at Fort Detroit. He called himself "Captain Caleb Cudgel" and published "The Castigator," an irregular sheet that collapsed in 1823 after 13 issues. Captain Cudgel pledged himself to "shoot at folly, expose hypocrisy and lash the rascals naked through the world."

With Caleb and his quill working overtime the Moralists bore down on all who offended their sensitive tastes. Of course a great deal of sin could be overlooked upon the deposit of a fee. But an out-of-towner came here with two strikes against him. The Moral Society, acting as umpire, generally fanned him and the poor guy was struck out both literally and figuratively.

Gay games were played with its victims. Running the gauntlet was one punishment. The offender against society was forced to dash through a double line of hardy men who took turns punching him with their fists as he tried to reach the other end before being clipped with a knockout punch under the ear. Actually this was worse than running the gauntlet when firearms were employed to impress a wrongdoer. The latter, knowing he was up against expert marksmen, just ran, confident that all these tormentors would do was shoot his hat off along with the heels of his boots.

So far as is known the Moralists never shot or hanged anyone but once they nearly drowned a drunk. Insobriety in anyone among these hard-drinking, religious men was not to be tolerated. They grabbed intoxicated non-Ithacans whenever possible and dragged them to the nearest creek where they were given the dunking treatment that English jurists used to order for the common scold. One night a group of Moralists tossed a drunk bodily into swollen Six Mile Creek. When it became obvious he was going to drown in water rather than liquor, the leader of the band dived in and rescued him a quarter mile away from the launching.

At times the Moralists would strip a drunk after dousing him and expose him in the streets, thereby conforming to Captain Cudgel's admonition to lash the rascals naked through the world. The Moralists invented the cute game of "Snitchr Puckr."

This was a greeting to strangers. A member would tap an unknown visitor at some inn on the back and when the person turned he would grab the brim of his hat with thumb and forefinger and place the little finger of his hand under the victim's nose. With a snappy clutch he would bring the nose and hat together while yelling "Snitchr Puckr." It was always good for a laugh—and usually a fight. The stranger never won.

Even more fun was derived from getting two drunks to sit on the floor with the feet braced heel to toe and hands clasping a stick. The game was to see which could pull the other to his feet. But the Moralists never could wait to determine who won because in their excitement over the contest they wouldn't refrain from dropping a few bucketsful of water on the contestants. The climax came when the pair was roped and hauled to the nearest convenient stream for a ducking.

Needless to say, Dr. Wisner did not like these goings on. He succeeded in 1816 a Dr. G. Mandeville who gave up the fight for decency in Ithaca. Wisner made it known from the start he was here to fight "intemperance, licentiousness and concommittant vices marking the track of Sabbath desecration." What annoyed him most in his work was the horse racing past the church on Sunday mornings when he read the gospel. It was not only wicked but distracting, he said.

The good doctor inherited a congregation of 31. He promptly excommunicated six, four men and two women. Starting from there he created a going organization that he addressed in 1866 on the occasion of his 50th anniversary sermon. Meantime he was treated cruelly by the unruly.

His first temperance sermons were delivered in the village's original schoolhouse. Ignoring warnings to desist, he continued until some group tore the building down. The mane and tail of his horse were shaved. Then someone whitewashed the horse before stealing the wheels from his carriage and hiding them in the woods. Later an attempt was made to cut the horse's throat but historical records do not reveal how this was circumvented.

Crowning Insult

The crowning insult to Dr. Wisner, whose white framed house stood on the site of the present Cornell Infirmary, was the work of unknown elements who boarded up his home. The vandals would swipe a sign from an inn advertising liquors and nail it across the door. All other passages from the house, even the windows, would be nailed tight. Dr. Wisner, on more than one morning, sawed or pounded his way to freedom.

Despite all this abuse and persecution suffered from those whose ideas of life differed from his own, the minister hung on in his fight to make the "Lord's Day" something more than "a day of idleness and dissipation."

Hypocrisy Not Exposed

So far as can be determined Captain Caleb Cudgel never exposed any hypocrisy. He had all the material necessary right in his lap with the Moralists. But the publisher of "The Castigator" obviously was in cahoots with Uncle Ben, the nocturnal Tecumseh. It is difficult, however, to tell from reading the old "Castigator" publications when Caleb was serious or facetious. Suffice it to say he was always interesting and mighty mad at those who sponsored antimasonry. Caleb Cudgel would not tolerate such thinking.

Whether the Moral Society died with "Uncle Ben" on Feb. 4, 1835 or earlier is hard to tell. He was the motivating force and so long as he was actively engaged in portraying Tecumseh, his edicts were generally well adhered to. There was a second Tecumseh operating in 1837 who removed a ban on the "limping beef and pork inspector" who had been placed "beyond the protection of this Moral Society's Laws."

Outcast Paid Off

The disconsolate inspector who had been denied "shelter, communication, cohabitation, employment or trade with any of his fellow citizens," the outcast apparently paid off to win a reprieve. Anyway the proclamation by the second Tecumseh, Uncle Ben's successor, pointed out the victim was most disconsolate and had seen the error of his ways. The ban was being lifted according to the pronouncement and the public might again speak to the limping inspector who "could be traded with and employed in his official and natural capacity of inspecting beef and pork — and no further."

Ben Drake was a masculinely handsome man. He was impeccably dressed in the fashion of the day with the upturned roll-away collar and long dark coat, tight fitting pants and boots. His Tecumseh outfit could have been Daniel Boone in the flesh had it not been for the hat. The latter was wide brimmed and low crowned like the comic strip gangsters in the Li'l Abner series. A fringed buckskin coat, leggings and moccasins made up the ensemble. Whether Drake wore this outfit as Tecumseh or as head of the wolf and deer hunting society he also commanded isn't known. It doesn't make any difference, regardless of what he wore he outdictated Adolph Hitler and Joe Stalin in their better days.

Ithaca had bounced its population up to 5,000 in 1830 and had a railroad connection with Owego from where its gypsum and salt could be transported by water to the Atlantic Coast. That put the teamsters out of business but the boatmen were still going strong and so was the Moral Society.

Tecumseh declared the currency of a Pennsylvania licensed bank invalid and threatened anyone possessing or passing its paper with dire punishment. "We do, of our sovereign authority," he proclaimed, "declare the money of the Silver Lake Bank no good . . ."

Here's an example of what he proclaimed:

"Members of the Ithaca Moral Society at your posts.

"Whereas it has come to my knowledge that certain of our ancient enemies, known and denominated as equestrians, circus riders, mountebanks, jugglers etc.; have the audacity and temerity to avow, manifest and make known their audacity and temerity to avow, manifest and make known their determination to enter within the bounds of this ancient and honorable society, willfully, maliciously and wickedly for the purpose of exhibiting, performing, acting and practicing certain feats, tricks, sleight of hand and other juggling, thereby filching from the worthy citizens of our ancient village the last remaining small change left them in the days of pressure and scarcity, corrupting their morals, vitiating their tastes and picking their pockets and whereas these same mountebanks. . . ."

Warned to Be on Alert

There was a great deal more redundancy in the proclamation which wound up with an order to "my liege subjects in their various departments, Engine, Hook and Ladder, Rope and Bucket Companies, Sappers, Miners and Perfumes with their various equipments . . . to be on the alert . . . hereof fail not." It should be noted that Uncle Ben was captain of Hook and Ladder Company 3.

Tecumseh's orders were specific insofar as sheriffs, bailiffs, constables, judges and justices of the peace were concerned. They were not asked but ordered to halt any performance the society disapproved. Once a traveling showman disputed the society's authority and staged a show in the Hotel Ithaca. He had a collection of wax figures and a monkey for entertainment. A good crowd had gathered when the Moralists burst in. They started a fight.

During the melee the exhibitor was roughly handled and tossed into the street. The crowd dispersed after the wax figures were s m a s h e d. The monkey, scared to death, hopped through an open window with Uncle Ben Tecumseh in pursuit. The monkey ran up a tree from which it glared at Tecumseh. The latter yanked out his horse pistol and shot the little fellow. "A wild and dangerous animal," he explained to the onlookers.

Saturday night was "Harvest Evening" to the Moralists. On this weekly occasion they rounded up all the drunks and tossed them into the Hog Pound, a wallow 30x40 feet with upended planks creating an 18-foot barrier. For a drunk it was as tough to escape from as a modern prison and few sober men could have gained freedom from incarceration in its slimy depths. It stood where the old Crescent Theater, now an Ithaca College gymnasium, is located.

Many of those engaged in dispensing the liquor that befuddled its drinkers were Moralists after hours and helped to confine such characters as Jaconiah, Old Galote, Barney Spry, Corporal Barber and others.

Ithaca Journal Jan. 1951

One Saturday night in 1813, a group of Moralists were drinking in the Gere Hotel, puzzling over the fact the town was so quiet. They wondered where Jaconiah, Old Galote, Barney Spry and Corporal Barber could be. After all it was their night for incarceration. They had let the society down. While this unusual occasion was being deliberated over rounds of drinks, an urchin called "Red Top," came in and asked for Mr. Grant of Coffee House fame. No one had seen him, the urchin reported, since he had gone out at 10 p.m. on an errand.

The Moralists weren't too concerned about Grant for his business demanded he be roaming about on a Saturday night. They continued drinking. Sometime later a "slip shod mained" (that's an old historian's opinion) burst in on the group. She was crying and wringing her hands. "Has anyone seen Squire Benjamin?" she pleaded. No one had. The squire's absence from the bout wasn't particularly unusual, the fellow might be engaged otherwise.

Others Missing

At midnight when the Moralists drained the last dregs from their cups, someone mentioned the fact that not only Joe Benjamin and Jesse Grant were missing but that Peleg Cheesbrough and Zacariah Hogan hadn't put in an appearance. Most unusual, they thought.

They hadn't been home, it was learned. Then the Moralists did get excited. Village bells were rung and torches lighted. Ithaca's greatest man hunt was under way. The search spread throughout the village and into every alleyway. It continued for hours before the society boys, somewhat woozy and very tired, decided to resume their quest on Sunday. They believed this to be a worthwhile effort that couldn't by any stretch of the imagination be regarded as Sabbath breaking.

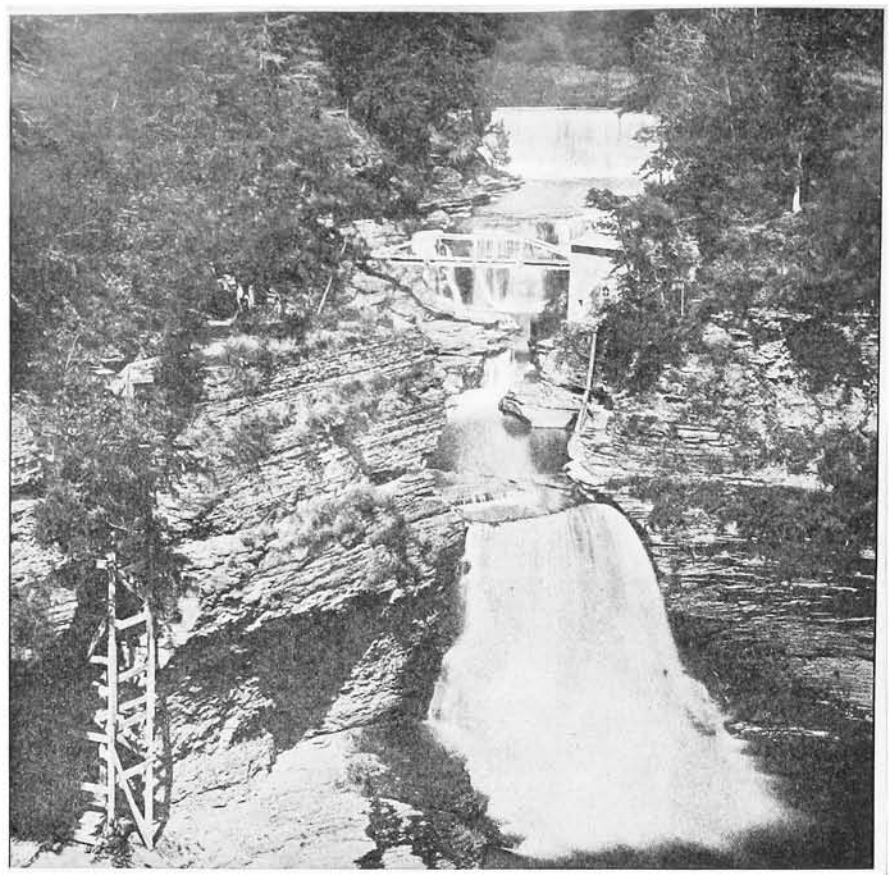
But the town's leading lights were discovered long before the last Moralist's snore. It was the custom in those days for all youngsters to dash out at the crack of dawn on Sunday and peer into the Hog Pound. Then they would race back home with information about the "Harvest Evening" haul. Imagine the moppet's surprise at peering through the knotholes and observing—bound and gagged and utterly filthy—four of Ithaca's most prominent citizens.

The Moralists and no one else ever thought to look in the Hog Pound for, after all, that was reserved for the not so nice people. Who perpetrated this crowning offense against the society was never determined. And where Uncle Ben and his horse pistol were on this night is a mystery.

There is no further reference in the DeWitt Historical Society's records to Jaconiah, Barney Spry, Corporal Barber or Old Galote nor is there any evidence they were members of a rowdy gang that treated their betters with such disrespect. As was mentioned earlier, the historians didn't have much to say about this era.

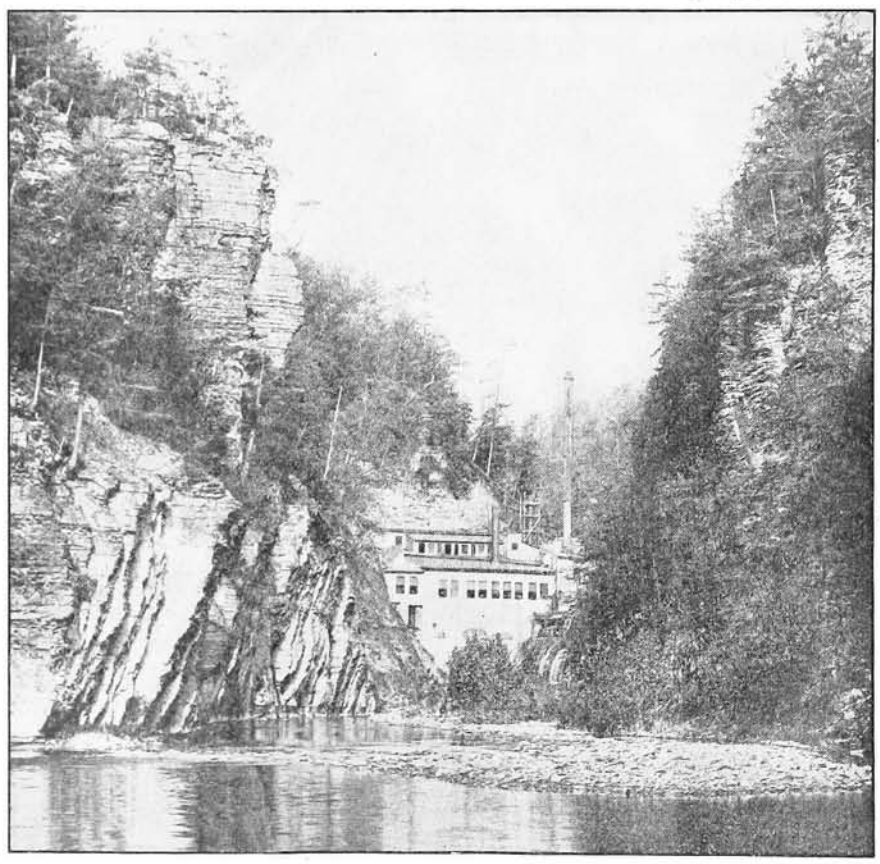
But after the Hog Pound episode, Ithaca never again took the Moralists so seriously as they did themselves.

THE END



THE FAMOUS TRIPHAMMER FALLS

The photograph from which this illustration was made was taken about 1872, before dynamite and the hand of man tore to pieces the original charm of Triphammer Falls to make way for the hydraulic plant that now furnishes Cornell University with its tremendous water power and Campus water supply from Fall Creek. On the left is shown the old winding stairs at a time when Triphammer Falls was one of the most enchanting views of scenic Ithaca.



OLD HYDRAULIC POWER PLANT IN FALL CREEK GORGE

The power house was built in 1892-93 at a cost of approximately $100,000. The turbines developed 800 horsepower at full head, which was used to generate electricity for lighting and power purposes, the water being carried to the turbines in a six foot iron pipe with a fall of 70 feet. The plant was a dual one, having two steam boilers installed for use at seasons of the year when water power was not available. The plant was destroyed by fire in 1905 and never rebuilt.

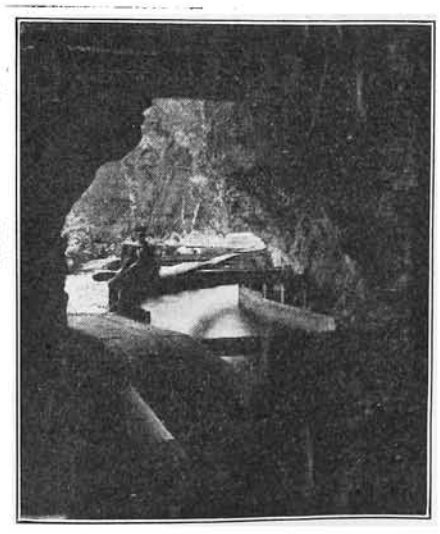
MEETING OF EXCISE BOARD

From The Journal, April 9, 1874.

The Board of Excise of the Village of Ithaca held their first meeting in the Trustees' room, this morning, at 9 o'clock, for the purpose of taking into consideration the matter of granting license. They were called upon by a large delegation from the Woman's Temperance Band, and delegations from the various temperance organizations, who presented petitions appealing to them to not grant license. The room was crowded almost to suffocation, and in the middle, inside a small semi-circle, formed by the desks of the trustees, sat the three Commissioners—President A. S. Cowdry, Mr. Amos Smith and Mr. L. Maurice.

Professor Russell stepped forward and presented a petition signed by 22 members of the faculty, and in behalf of the signers he proceeded to lay before the Board their views in a most able and touching address. The faculty had under their charge he said, five hundred young men and women, to whom they stood partially in the relation of parents. He said "We beseech you to look upon these young people as though they were your children. Guard them as in your power lies, by not granting license to any one."

At the session of the board this afternoon the following applications for license were presented: Samuel A. Holmes, hotel; Carl Schallowitz, saloon; Edwin Simpson, saloon; William H. Clark, saloon; Moses VanDroof, saloon; George W. Schuyler, druggist; White and Burdick, druggist. The board adjourned at 4 o'clock without having taken action.



THE POWER TUNNEL

This tunnel was put through in 1830 by Ezra Cornell, who appears in the picture. The tunnel was for years one of the attractions of Ithaca. It is still in use.

THE GEOGRAPHY OF THE ITHACA REGION

By O. D. von Engeln
Professor of Physical Geography, Cornell University

PART I—INTRODUCTORY

THE geographic description of a region from the modern point of view of the science involves something more than the mere enumeration and presentation of the natural features of the country and its inhabitants. Both the country and the way the people in it live must be interpreted.

The region must be explained. When this has been done the intelligent reader should have a clear understanding of the natural processes by which the landscape has been given its present aspect and how the inhabitants of the region have adapted themselves to their surroundings; historically, in the present and how the environment will affect their future.

It is not always possible to make such a geographic description complete. Some of the facts may be missing, others not understood, still others misinterpreted. From these sources come defects and for such as appear in this article the writer at the outset asks indulgence especially because in the discussion of a limited region much detail is included and on certain topics certain readers will be much more fully informed than the author who attempts to treat the whole subject.

It is certainly worth while for any community, that is the inhabitants of a given region, to see themselves geographically. Their neighbors near and far will also be glad of a chance to get acquainted. If this paper gives such opportunities its purpose has been accomplished. Perhaps a less formal manner of presentation would have been more in keeping with its local publication. But if it is remembered that there will probably be a number of readers wholly unacquainted with Ithaca scenes it will be appreciated that the formal method has its advantages. Moreover the formal discussion will help the local reader to imagine himself a stranger and as such to consider himself and his surroundings in an impartial and disinterested way.

PART II—THE ITHACA REGION

Location of the Region

The region to be described is located in western, central New York at the southern end of Cayuga Lake (the second largest of the Finger Lakes that characterize the general district) and centering about the city of Ithaca, which has a population of 16,092 people (unofficial, 1915 state census) and is the site of Cornell University. The discussion will be confined to the geographic conditions and geographic influences operative in the city itself or in its immediately tributary territory.

Ancient Geography of the Region

During much of the most ancient geologic time the Ithaca Region was the bottom of a shallow interior sea. This sea varied in dimensions during the different subdivisions of these early geologic ages, was at times widely connected with the open ocean, at others had only a constricted outlet and seems to have at least once been converted into a saline, desert basin when salts leached from surrounding formations were precipitated in thick, horizontal layers over its bottom. These layers of sodium chloride are the basis of the present-day salt industry of the region and from the days of early settlement furnished, by the medium of salt springs, the local supplies of this commodity.

It is evident, however, that the sea bottom must on the whole have been progressively sinking while clay, sand, salt and lime layers were being laid down, for while these have shallow water characteristics throughout their vertical sections, they nevertheless aggregate thousands of feet in thickness, as now existing, and that despite the fact that much of their original upper mass has been removed by erosional processes. These clay and sand layers were eventually converted into shales and sandstones by the pressure of later deposited material of the same kind and by processes of cementation.

Appalachian Revolution

In the closing epochs of the ancient geologic periods, during the extensive earth movements that have been termed the Appalachian Revolution, and in which the Appalachin mountains were first uplifted, this region in common with wide adjacent areas to the east and west was raised high above sea level. The uplift in this particular locality seems to have been essentially uniform, slow, and nearly vertical in direction, as the layered sediments were neither much fractured or disturbed. A (comparatively) slight compressive force was, however, exerted for the rocks were folded into a series of east-west striking undulations forming low arches and troughs in the rocks. The original slant to the south and west of the sediments deposited on the floor of the interior sea was increased by the uplift, as this was greater in amount to the east and north, but the total departure from the horizontal is only a few degrees.

Cretaceous Peneplanation and Tertiary Uplift

Following the uplift came a long period of denudation at the end of which, in Cretaceous (more recent) geological time, the region in common with much of the rest of the continent had been worn down by rain and rivers to a nearly featureless plain. Another uplift followed, like the first practically without compression.

Tertiary Physiography

Thus once again made a highland, the region also again became the scene of active stream cutting which continued until ridges between streams were rounded and valleys were worn and weathered broadly open. The slight slope of the strata to the south sufficed to make north-facing cliffs by weathering action, the most conspicuous of which, south of the Niagara cliff, was that due to the resistant top layers of sandstone in the Portage formation. To the east of Cayuga Lake this Portage escarpment or cliff is well developed in the Ithaca region along the north front of Turkey Hill and quite distinctly bisects the region into north and south halves. The part lying to the north belongs in general to the central lowland of North America, that to the south is part of the Applachian Plateau. Hence, this small region lies on the boundary zone between two important physiographic provinces. To the west of Cayuga Lake the Portage escarpment fades out as a distinct topographic feature and the merging of the plain and plateau upland is inconspicuous. Apparently the main drainage of the region at this time was by a stream to the north along the line of the Cayuga Lake trough. At Ithaca a number of streams flowing in broad, open valleys were confluent both from the east and south and these seem to have afforded most of the volume for the north-flowing Cayuga stream. Coming from the east was the Fall Creek following the base of the north-facing Portage escarpment. The valley next south of the divide formed by the Portage escarpment was developed by Cascadilla Creek also flowing from the east and in its lower course parallel to Fall Creek. Two other streams, Six Mile Creek from the south and the Cayuga Inlet from the southwest, occupied similar mature valleys. The closely spaced points of junction of these streams resulted in the development of an extensive interstream plain by the lateral wearing and weathering away of the spur ends of the divides separating their valleys. A remnant of this plain is now occupied by the campus of Cornell University and the East Hill section of Ithaca with farm lands in the rear. The end of the Portage Escarpment is known as Turkey Hill, its continuation eastward as Mount Pleasant, the divide between Cascadilla Creek and Six Mile Creek is Bald or Eagle Hill, that between Six Mile Creek and the Cayuga Inlet constitutes South Hill. The summits of these divides as they extend southward are slightly rolling (in a broad sense, level-topped) uplands and on their wider expanses probably present with but little change the topography of the Cretaceous wearing down to a plain. To the south, possibly some fifteen or sixteen miles from the present head of Cayuga Lake, an east-

west divide separated the drainage described from streams flowing into the Susquehanna. The physiographic development described, in so far as it is apparent in the present day topography, is indicated in the block diagram Fig. 3, which will serve to make clear the important relations.

Glacial Invasion

There is some evidence of another uplift following the development so far described but if this took place its rejuvenating effect has been much obscured by shortly subsequent invasion of the region by glacial ice in very recent geological time. The advance of the ice was almost directly from the north in the Ithaca region so that it thrust its front squarely against the rising slopes and escarpments of the Appalachian Plateau border. The breaches in the plateau front however made by the north-flowing streams afforded low altitude channels by which the ice could project lobes in advance of the main front for considerable distances into the highland area. Hence, these north-south valleys were first occupied by the glacier and as the ice thickened they became also the main channels of ice movement southward; were, in other words, the routes of the thickest, most powerful and most rapidly moving ice currents. The erosive effect of the ice was thereby concentrated in the north-south valleys and these valleys were much overdeepened by ice erosion and thus the basins of the Finger Lakes, with bottoms in some instances below sea level, were developed, of which Cayuga Lake is one. At the heads of the north-south valleys the east-west Susquehanna divide was shortly overtopped and the ice passing over proceeded to cut this comparatively narrow barrier completely away. Thus *through valleys* joining the northern drainage to the southern drainage by very low gaps were developed of which the Cayuga Inlet and Six Mile Creek valleys in the Ithaca region are notable examples.

The lower end of the Cayuga Inlet valley, in part possibly because it was originally larger, in part also because it was more directly in line with the ice movement was eroded more deeply by the ice than the Six Mile Creek valley when the ice current coming in through the Cayuga valley was divided by the nose of South Hill. Hence while the Cayuga Inlet valley now enters the main Cayuga valley accordant with the present grade, the Six Mile Creek valley that was less effectively ice-eroded has been left in a *hanging* condition. (See Fig. 4, p. 19.) The same relations are much more conspicuously apparent in the case of the east-west valleys, those of Cascadilla and Fall Creek. These troughs were nearly at right angles to the line of ice movement, hence were occupied only by diverted and relatively feeble glacial currents. Consequently as streams once more flowed in these east-west valleys they plunged at their lower ends in a series of cascades to the levels of the much more overdeepened north-south Cayuga Valley. As time went on the difference in resistance of the layers of the horizontal bedrock structure became effective in developing step falls and as these progressively wore back upstream the gorges were cut that now mark the north and south boundaries of the Cornell University campus which occupies the western border of the portion of the earlier interstream plain that the ice erosion failed to cut away. Nearby are many other east-west streams that show the same hanging condition with reference to the north-south Cayuga valley and a similar later development of gorges and falls.

A further complication in the development of the valleys must be considered. There were probably two if not more ice invasions of the region. After the withdrawal of the first ice, glacial debris, moraine, deposited in the valley bottoms commonly diverted the streams from the axes of the troughs to one side or the other of the valleys. After cutting through the thinner veneer of morainic stuff at such points the streams were let down on bedrock; into which they proceeded to cut side gorges. During the interval between glaciations these gorges developed to a much larger size than has been possible in post-glacial time.[1] A second ice advance resulted in further morainic deposits not disposed as the first had been. Consequently the previously developed gorges were in part filled up and the streams once more started along new channels over the valley bottoms. In places they found the earlier gorges and rapidly scooped out the unconsolidated glacial material, elsewheres they entered on gorge cutting anew. Thus the middle and lower sections especially of the east-west streams are at present marked by amphitheatre hollows where the stream is flowing along the line of an interglacial (?) wide gorge and these are connected by short sections of young, post-glacial gorges cut into the bed rock of the valley side. A cross-section diagram Fig. 5 will serve to make these relations more clear.

Though much lowered the east-west divides between the Susquehanna and the north-flowing drainage were not wholly swept away in the formation of the through valleys. Furthermore a somewhat prolonged halt in the withdrawal of the ice resulted in the development of a pronounced moraine-loop barrier across these valleys in the former divide region. Thus morainic ridges, plus so much of the original rock divide as remains below them, formed water-partings of considerable elevation during the later retreat of the ice and have continued so since. In the period immediately following the building of the moraines, north-flowing water from these divides was ponded back by the ice that still occupied the lower ends of the valleys and in this fashion a number of proglacial lakes were created. At first both the Cayuga Inlet and the Six Mile Valley had its separate lake (as well as some of the other valleys) standing at different levels according to the height of the divide at the south head over the moraine barrier. In the Cayuga Inlet Valley this was at about 1040 feet above the sea, in the Six Mile Creek valley at 980 feet above sea level. A further retreat of the ice resulted in the junction of the two lakes, the waters of the one in the Cayuga Inlet Valley flowing around the nose of South Hill in falling to the lower level of the lake in the Six Mile Creek Valley. These relations are illustrated in the photographs of relief models, Fig.'s 6, p. 19. As the ice melted back further to the north, successively lower channels of escape for the water were bared and the lakes in accordance fell to lower and lower levels.

During the existence of the high level lakes a large amount of freshly deposited morainic material was peculiarly available for stream transportation and this plus that brought by streams out-flowing from under or in the ice furnished a great quantity of sediment for deposit on the lake bottom. At the stream mouths huge deltas of gravel and sand were formed at each successive level of the lakes. These deltas are now conspicuous topographic landmarks as they project in well developed steep-front and flat-topped terraces on the valley sides. After any one of the lowerings of the lake the stream would cut through the delta just formed and use this material in part to build the new, lower mass. Thus all the deltas are bisected by the later channel of the stream that built them. When the bottom of any one delta was reached the stream found itself superimposed on the bedrock and started the erosion of a rock gorge. Enough time has elapsed since the complete disappearance of the ice barrier and the establishment of the present drainage levels for the extension of the delta building, at the mouths of the various streams confluent at the head of Cayuga Lake, to join and completely fill in the end of the basin. Over this delta filling later flood-plain and alluvial deposits have been spread and by this combination of processes the mile and a half long, level-topped Inlet Plain has been formed. On this plain the main part of the City of Ithaca has been built.

As early as 1656 white men, two Jesuit Fathers, entered the Ithaca region and dwelt among the Indians for some nine months. They departed because of anticipated difficulties with the natives and it was not until 1668 that the mission was re-established and continued until 1684 at Cayuga, N. Y., on Lake Cayuga. In 1671-72 Father Raffeix was temporarily stationed there and wrote an account of the natural aspect of his "canton." From this it appears that while most of the country was forested the Indians had made considerable clearings, the larger ones being "oak openings" which were burnt over annually for hunting purposes, while smaller tracts near the villages were planted to corn. Apparently these rather extensive cleared areas were located almost entirely to the north of the line of the Portage escarpment. Over the dissected plateau area from Ithaca south to the Susquehanna the forest was practically unbroken, dense, and tangled, the "dark forest," according to the testimony of this and other early observers.[2] On the rolling, upland summits white pine predominated. In the valley bottoms at Ithaca, particularly near the head of the delta-floodplain the white pine merged into oak, elm and maple woods, though there were also extensive cleared fields cultivated by the Indians on this ground, together with apple orchards, this fruit apparently having been introduced by the Jesuits. The same type of

[1] It is possible that these larger gorges were developed during a preglacial uplift of the region and were obscured by the ice invasion and its results.

[2] These accounts and other information in regard to the primitive flora of the region are summarized in "The Cayuga Flora," by W. R. Dudley, Bulletin of the Cornell University (Science), Vol. II, 1886.

forest continued northward along the shores of the lake and on the lower lands to the east of its shore. The front of the delta was marsh land, Lake Cayuga was called "Tiohero" or the "lake of flags and rushes" by the Indians because of such growth at both its northern and southern ends. Extensive swamps were also present at all the water partings. In these divide swamps the tamarack, black spruce and balsam fir were native and still occur, as well as the hemlock; though the last is much more abundant in the region and has its especial habitat on the sides of the post-glacial gorges. The tamarack, spruce and balsam fir, as well as the wild primrose (Primula Mistassinica) which is found on the cold, wet, south walls of the gorges are to be regarded as subarctic species which migrated from the north before the continental glacier and were left behind in such isolated but congenial habitats on the retreat of the ice. Primula Mistassinica for example, now has its natural habitat about the shores of a lake of the same name on the Labrador peninsula. On the dry and sandy knolls of the dissected, high-level deltas other exceptional forms occur, as for instance, the pitch pine and the red or Norway pine. In these special instances the native flora shows interesting adaptations to its geographic environment.

Thus practically all the region (for the Indian clearings were largely to the north) had originally a dense forest cover. Of this comparatively little remains. Clumps of trees, farm woodlots, still dot the lower slopes and valley bottoms, and a ribbon of forest marks the course of each of the gorges. Larger tracts of woodland occupy the higher parts of the uplands and the glacially over-steepened slopes of the through valleys to the south; and are also found on the swampy divide areas and over rough and stony morainic ground. Practically all of this is, however, second growth timber. As early as 1853 it was noted in a local pamphlet[3] that three fourths of the county (Tompkins) was improved land. In 1886 the only virgin tract of white pine consisted of an area about forty acres in extent that occupied the hillocky moraine at the head of the Inlet Creek, and this has since been completely cleared. Much of this timber was undoubtedly converted into lumber, in 1832[4] the export of lumber from the county had an annual value of $400,000, but in the same year ashes brought $27,000, indicating that much timber (estimated at 60%) was burnt in clearing land for agriculture. The ashes were used to make potash, an industry that began as early as 1804.[5] Latterly even the small timber on the steepened slopes and uplands is being cut and the land allowed to stand idle or used for pasture. Formerly the thick woods on the uplands held back the melting of the winter snows, now the water goes off very rapidly after spring first sets in. Much of the land now cleared ought to be replanted to forest. Neither the early or later clearing had much reference to geographic conditions. Woodlots still occupy rich lowlands; barren hillsides too steep even for good pastures were cleared. About thirty years are required to regrow merchantable timber on land that has been cleared and as this is a long time investment it would be well to exempt such lands from taxation until the forest is cut. Land that would not sell for over $15.00 per acre as farm land produced nearly $5.00 per acre, annually, in natural regrowth of timber without care, for the 22 years required to produce the forest.[6]

The primitive forest abounded in game. Deer were very plentiful, as were also bear; these animals supplied the early settlers with most of their meat. In 1789 the first trading was done by the Ithaca community and consisted of the exchange of maple sugar and marten, otter, beaver, fox, bear, and deer skins, for tea, coffee, crockery, hardware, lead, gunpowder, and liquor. In 1823 it was still thought worth while to organize a "Grand Deer and Wolf Drive" because in the southern part of the county the "repose of the settler is disturbed by the midnight howl of the Wolf and yell of the Panther." On this occasion some 800 men during two December days closed in on a section of country about 19 miles in circumference located some 10 miles to the southwest of Ithaca around Newfield. No record seems to be available as to the results of this hunt. By 1853 three fourths of the area of the county was reported as improved land but in 1832 deer skins were still an article of considerable importance in the list of exports.

Climate

The average and extremes of temperature in the Ithaca region vary several degrees according to the exact locality, the chief factors of this difference being relative elevation and distance from Cayuga Lake. The average annual temperature at Ithaca (campus of the University) is 47° F., that for the six summer months being a trifle below 60° F. and for the winter months 33° F. In the upland-valleys to the south and west the annual average temperature is 2° F. lower than at Ithaca. though the difference in altitude between the observing stations is only a little over 100 feet. This relation holds essentially for all the months of the year, as it does also for the average difference in temperature between the two stations on the hottest days for a number of years. But the upland valley station record shows an average of 6° F. greater cold for the coldest days in a number of years. From this it would appear that the effect on average temperatures of greater elevation and remoteness from the lake is a slight annual lowering of the temperature accentuated in winter extremes. The highest summer temperature officially recorded at Ithaca is 102° F., the lowest—20° F. This shows the climate to be one of great extremes in annual temperature and the range from day to day is also great; thus it extended over 30° F. in the 18 hours following midnight January 30, 1915.[7] The average temperature for the months when the university is in session, October to May inclusive, is only slightly below 40° F. the optimum average temperature for mental activity as defined by Huntingdon.[8] Perhaps the students and faculty have not appreciated this favoring geographic influence but no doubt it has been exerting its due effect.

The influence of Lake Cayuga is particularly marked in connection with the length of the growing season as delimited by the last and first killing frosts. At Ithaca the average date of the last killing frost in spring is May 4, and the first one in fall October 10, giving a season of 159 days. In the upland valley station, previously referred to, the corresponding dates are May 18 and September 27, hence a growing season of only 132 days. This is almost a month's difference and there is reason to believe that in locations otherwise favorable and nearer to the lake than the Weather Bureau station at Ithaca the season may be even longer. It may be noted, in comparison, that the growing season around New York City is 200 days, at Buffalo, N. Y., 174 days, at Columbus, Ohio, 183 days. In central New York state latitudes hillsides with southern exposure are warmest, next come those facing east, then west, and last those looking to the north. From this it would appear that as Cayuga Lake extends north and south, a slope sheltered from the prevailing wind on the west side of the lake has a distinct advantage of location with regard to the duration of the growing season. This may be of more than usual importance in the Ithaca region because the locality lies within the belt of the average track of most of the cyclonic storms that pass over the northeastern United States. The resulting cloudiness reduces the amount of sunshine received at Ithaca to 8% less annually than that received at New York City (expressed in terms of the percentage of that possible in each place) and in April to 12% less. Accordingly hours of sunshine count for more in Ithaca than in New York City, especially during the month of April at the beginning of the growing season. It further appears on examination of the local weather station records[9] that for the past 5 years, 1909-13, from 4 to 10 hours more of early morning sunshine, than of late afternoon sunshine were received during each April. In May the reverse is the case. But as April is the critical month when the soil is being warmed up and growth started it would seem that the slopes which face the morning sun have the advantage in this also.

The reference to its position with regard to the average track of cyclonic storms will suggest that the Ithaca region is not deficient in rainfall. At Ithaca itself the average annual precipitation is 34 inches, at the upland valley station nearby it is 38 inches; New York City has 45 inches. While New York City has a greater rainfall, it is not so uniformly distributed as the Ithaca precipitation, Ithaca having 155 days on the average annually with a precipitation of .01 inch or more while New York City has only 128. However, New York City gets 26

[3] "Ithaca As It Was," H. C. Goodwin, Ithaca, N. Y., 1853, p. 3.

[4] "Facts Relative to the Trade, etc., of the County of Tompkins," Ithaca, N. Y., 1832, p. 7.

[5] "Early History of Ithaca." H. King, Ithaca, N. Y., 1847, p. 13.

[6] An Agricultural Survey of (part) Tompkins No., N. Y. Warren, G. F. and Livermore, K. C., et al. Bull. 295 Cornell Univ. Exp't. Station, Ithaca, N. Y., 1911, p. 471.

[7] These and other climatic data that follow are for the most part from: Climatic Summary for Ithaca, N. Y. Published Sept. 1914, Local Office U. S. Weather Bureau, Ithaca, N. Y. and: Frosts in New York, W. M. Wilson, Bulletin 316, Cornell University Agr. Exp't Station, Ithaca, N. Y. 1912.

[8] Climate and Civilization, Huntingdon, E., Harpers Monthly, Vol. CXXX, Feb. 1915, p. 367.

[9] Compiled at the suggestion of the writer by Mr. L. A. Hausman, instructor in Meteorology, Cornell University.

inches during its growing season while Ithaca receives only 17. Even if the amount of precipitation received at Ithaca during the two months of New York's longer growing season are added, the total falls below New York City's; only 22 inches at Ithaca as compared to 26 inches at New York. As the soils of the Ithaca region have poor drainage conditions; are apt to be too wet in spring and to dry out in summer it would appear that a higher summer rainfall would be of material benefit to the agriculture of the area. The annual snowfall averages 56 inches as compared to 35 inches at New York and 47 inches at Binghamton. This snowfall generally persists for considerable periods and affords good sledding, thus materially facilitates country hauling in winter. The prevailing wind direction is from the northwest, 30% of the time, followed by winds from the southeast for 23% of the time.

Several minor climatic influences may be noted here. Though possessed of romantic scenery, a lake, gorges, waterfalls, and hills, and though readily accessible from several large centers of population the region has never had as great a vogue as a summer resort as might be expected, the primary reason being the cloudiness and coolness of the early summer months. This has made lakeside hotel ventures in general unprofitable as such enterprises go. Then, too, bathing is not good, partly because of the general absence of good beaches and the abrupt deepening of the water offshore, also because when a warm south wind blows the warm surface waters are drifted to the north end of the lake and the water is cold; while on days when the waters are warm, a north wind usually makes the air too cool for comfort. While the open reaches of the lake are admirable for sailing, sudden squalls are common because of air drainage coming down the hanging valleys and first striking the lake surface at a distance from the shore. Because of this phenomenon and because of all year-round low temperature of the deeper waters of the lake, a number of drownings from upset sailboats and an even greater number from overturned canoes have occurred, and this record also adversely affects the popularity of the lakeside as a summer resort.

Early Settlement of the Region

In September, 1779, detachments from General Sullivan's army sent out by Washington to "Chastise and humble the Six Nations" utterly destroyed the Indian villages along Cayuga Lake and wasted the native plantations and orchards. One of these villages, Coreorgonel, consisting of 25 "elegantly built houses" was situated on the morainic hillocks that terminate the delta-flood plain area on the west side of the Inlet Creek. The Indians who occupied it were not of Iroquois stock, but Tutelos, originally inhabitants of the piedmont country of Virginia and the Carolinas. This is of interest in connection with the place names of the region for the Tutelos removed to this point in 1753 (after concluding a peace with the Iroquois who had long harried them) in company with an allied tribe, the Saponis, who had suffered like tribulations. The Saponis settled in one of the through valleys on the upland to the southwest of Ithaca and this today is called "Pony Hollow" a corruption of the original Saponi Hollow.[10] Although their settlements were destroyed and the Indians themselves driven toward Niagara in 1779, and although they had formally ceded their lands to the state in 1789, it seems that a considerable number of the natives remained in the Cayuga Country for some years later, as they are mentioned in the accounts of the first white settlement of the region, 1788-1790. Thus it is related that in winter the natives pitched their wigwams on the level lands within the mouth of the interglacial Six Mile Creek gorge near State Street, securing rather complete protection from cold northwest storms under the steep and high rock walls. With the advent of spring the Indians moved to higher ground particularly to the site of the earlier town of Coreorgonel where there were native orchards. Thus it appears that geographic conditions exerted some influence on the habits of the Indian residents of the region.

In September, 1789, three white families, comprising 19 individuals, removed from Kingston, N. Y. to the present site of Ithaca, bringing with them some household chattels. A month was consumed by this party in their journey from Kingston to Owego. Their route in the main followed geographic lines and is now paralleled for the most part by railways. From Kingston they went northwestward along a route that is now followed by the Ulster and Delaware railway. Crossing the divide of the Catskills they arrived at the headquarters of the East Branch of the Delaware river, probably near the present village of Arkville. Here canoes were fashioned in which they floated down the Delaware River to a point a little below the junction of the East and West Branches of that stream. This portion of the route is now followed by the Delaware and Northern railway and the New York, Ontario and Western road. From the Delaware they portaged across the divide between that stream and the Susquehanna at what was called its Great Bend near Lanesboro, Pa. No railroad crosses this divide just at this point but the Erie railroad makes the climb from the Delaware to the Susquehanna valley just a few miles further north and continues westward in the valley of the Susquehanna river to Owego and beyond. At the Susquehanna the settlers once more constructed canoes and floated down stream to Owego. While modern traffic between the east and the west has abandoned the settlers' route in large part, it is nevertheless of geographic interest to note its directness and the extent to which the stream courses were utilized in making the trip. (See Fig. 1.)

Nineteen days more were needed to complete the last stage of the journey, the part from Owego to Ithaca, a distance of only 29 miles. While an Indian trail, succinctly described as a well beaten path, marked the way between these points, it seems that the settlers secured horses and stock at Owego, presumably wagons also, consequently it was necessary for them to clear off the forest in advance of their march, hence the long time it took to cover the short distance. The highway they opened in this manner followed one of the lowlying gaps across the upland country due to glaciation, the through valley of Six Mile Creek, which was later destined to become an important factor in the development of the region.

Economic motives, a desire to improve their fortunes, led the settlers to emigrate. Purely geographic considerations, however, must have determined their choice of a new home. This is a nice distinction but one that may very fitly be made. It is also safe to assert that they would not have pushed on for 29 miles from Owego so arduously without good reason. While the through valley of Six Mile Creek has since developed an ample acreage of cultivatable lands, it must be remembered that primitively this section was densely forested while to the north the Indians had cleared large areas. But it was probably the wide expanse of almost perfectly level land on the delta-floodplain at the head of Cayuga Lake with its area of fertile, deep, and well drained soil on its eastern side, in view of the rich and immediate agricultural returns these acres promised, that exercised the controlling influence in the choice of a site for settlement. Visions of a future populous town because of the location at the head of the lake and the abundant water powers adjacent may also have had a bearing on the decision.

The immediate location of the first dwelling places was guided by geographic conditions. Three large streams, Fall Creek, Cascadilla and Six Mile Creeks emerge from the steep rock gorges that terminate their hanging upper valleys onto the lake-head plain on its east side, no stream of any size on the west side. Because of the abrupt change of grade at the ends of their gorges these three streams have built coalescing alluvial fans on the surface of the delta-floodplain, making the land higher and dryer on its eastern side and pushing the Inlet stream over to the base of the western bluff. Accordingly, as an early writer remarks, the exact location of the first cabin was determined "by the transporting power of Cacsadilla Creek." At this point an Indian clearing existed and here, too, the first crops were planted. This first dwelling, moreover, was just to the north of the mouth of the gorge of Cascadilla in which there were considerable waterfalls only a short distance upstream. The immediate utility of such waterpowers to the settlers is suggested by the fact that as early as the second year a flour mill, crude to be sure, but capable of grinding 25 bushels of grain per day was erected at the mouth of the Cascadilla gorge. In Six Mile the waterpowers were further upstream, less accessible; the immediate mouth of Fall Creek seems to have been very swampy, but these streams, too, were put to work at an early date. It is interesting to note further that the business center of Ithaca has grown up on the tract of land between the Six Mile and Cascadilla Creek gorge mouths that was first settled.

The young settlement early acquired the name of "Maricles Flats" or "The Flats" because of its environment. Its present name Ithaca was bestowed on it in about 1808 by Simeon DeWitt who in 1780 was appointed chief Geographer of the Army of the Revolution and in 1784. Surveyor General of New York State While "The Flats" was not a very eu-

[10] See Handbook of American Indians, Bulletin 30. Parts I and II, Bureau of American Ethnology, Smithsonian Institution 1907, 1910, for references to literature.

phonious appelation, it did express a geographic relation, hence it seems unfortunate that this geographer, at least by one-time title, who later resided in the settlement, should not have chosen a pleasing geographic name rather than Ithaca. This name has, however, since the founding of the university, a degree of appropriateness he could not have foreseen. While DeWitt himself may not have been responsible for the many other classical place names found in this part of the state, it appears that this example of his served as a precedent.

Transportation Routes[11]

The Jesuit missionaries who were probably the first white men in the region undoubtedly came by way of the St. Lawrence and Gt. Lakes route from the east, entered the northern end of Lake Cayuga and followed its extension southward in their explorations. The first merchant of the region, an itinerant trader, brought a small boat load of goods (tea, coffee, earthenware, drygoods, hardware, gunpowder, lead and liquor) up Cayuga Lake and exchanged these articles at Ithaca for fur and maple sugar. The very first settlers came by way of the north and south through-valley of Six Mile Creek from Owego on the Susquehanna River to the site of Ithaca at the head of Cayuga Lake. These facts suggest the early importance of the north-south lines of travel and communication in the region. It should be mentioned, however, that a considerable number of the early pioneers who settled at Ithaca came from the east along the course of Fall Creek and that it was along this route that the first road through the forest was cut, completed in 1795, connecting Oxford on the Chenango River with Ithaca.

In the first third of the nineteenth century water routes were considered all important. At an early date nearly every stream was utilized as a highway and with the opening of the Erie Canal in 1825 a further impetus was given to water transportation. Railroads were then considered useful primarily as a means to effect portage between water routes. From central New York the Susquehanna River was the great highway to the east until after the opening of the Erie Canal. When the Erie Canal was completed and opened the way to the west, it was felt that a north-south route connecting the canal highway to the west with the Susquehanna River route to the east would be of great importance. Ithaca, because of its geographic position at the lake-head terminal of western navigation, on the shortest overland route to the Susquehanna, seemed destined to become a great commercial center. As early as 1810 Governor Clinton wrote,[12] "The situation of this place (Ithaca) at the head of Cayuga Lake, and a short distance from the descending waters to the Atlantic, and about 120 miles to the descending waters to the Mississippi, must render it a place of great importance."

For this prediction and similar fond anticipations later there was in those times ample justification, chiefly because the Ithaca region was then the originating point of a considerable bulk of export traffic that utilized the routes in question. Between 1808 and 1811 a turnpike or toll road was built over the Six Mile Valley route. During the war of 1812 the supply of gypsum from Nova Scotia was cut off from the States and this fertilizer material was secured in large quantities along the east shore of Cayuga Lake to the north of Ithaca. On a single day (between 1812-1815) it is recorded that as many as 800 teams passed over the Ithaca and Owego turnpike engaged in hauling the "plaister" (land plaster) to the Susquehanna River on which it was floated to the south and east. This commodity continued to be of importance in 1825 and the traffic in it is urged in 1862 as a reason for building a ship canal from the foot of Lake Cayuga to Lake Ontario. Salt was another mineral product shipped in quantity from Ithaca at an early date, 8,000 barrels in 1825 and 2,250 tons in 1832.[13] In the latter year nearly 2,000 tons of lumber and 8,700 tons of wheat and flour were sent out of the region. At that time most of this merchandise was being sent north and east through Cayuga Lake and the Erie Canal and it was estimated that this freight paid canal tolls to the amount of $150,000.00 annually. At an earlier date (1810) Governor Clinton describes the shipment of flour from Ithaca to Baltimore, Montreal and New York. For Baltimore it was conveyed overland to Owego where "arks" (barges) could be had for $75.00. On these the flour was floated down the Susquehanna River, arriving at its destination in from 8 to 12 days. At Baltimore the arks were sold for half price as "the rapids of the Susquehanna are fatal to ascending navigation." To Montreal the route was over that lake and the St. Lawrence River to the Canadian port. Montreal was considered the more certain market, expense of transportation being about the same to either Baltimore or Montreal. Goods were also shipped to and from New York City by way of Cayuga Lake, Seneca and Oneida rivers, Oneida Lake and Wood Creek, by canal (completed 1797) across the divide between Wood Creek and the Mohawk River at Rome, down the Mohawk (canal around Little Falls completed 1794) to Schenectady and from thence overland to the Hudson at Albany. It required six weeks to make the round trip from Ithaca to Schenectady with a boat carrying from 100 to 150 barrels of flour. The boats used were small and were propelled for the greater part of the way by poles.

In view of the slowness of such transportation it is not surprising that the advent of the steamboat brought a decided stimulus to lake traffic and seemed to emphasize further the coming importance of Ithaca as a terminal point on the shortest route from the east to the west. Passenger business particularly was affected. Thus in THE ITHACA JOURNAL of June 7, 1820, it was stated that passengers from New York City for Buffalo could leave the former city at 5 P. M., go by boat to Newburgh, there take stage and arrive at Ithaca on the evening of the second day. Embarking on the "Enterprise" (the Cayuga streamer) that evening they would be landed at the foot of the lake next morning and resuming the stage arrive at Buffalo that night, making the whole journey in 3 days, one day less than by way of Albany. By 1837 there were three steamboats and from 70 to 100 canal boats in service on Cayuga Lake. The latter were in large part engaged in conveying coal from Ithaca to the Erie Canal and this coal traffic was a very important factor in the apparent destiny of Ithaca as a great commercial center.

In about 1825 the importance of the coal deposits, (principally anthracite) in the Pennsylvania district directly to the south of Ithaca began to be recognized. Iron ores also had been discovered and the huge traffic that promised to develop in these commodities gave a further incentive to the project of connecting the Erie Canal with the Susquehanna highway by some more adequate means of transportation than by wagon. It was proposed that the state should aid in the building of a canal over the divide between the lake head and river navigation and the Ithacans urged that this canal should follow one or the other of the two valleys leading south from their town as these were the shorter routes.[14] There were, however, rival claimants for the route from the head of Seneca Lake and it was in this valley that the north-south canal was dug, the Chemung Canal, connecting the head of Seneca Lake with the Chemung River at Elmira, completed 1833.

There were good geographic reasons for selecting the Seneca-Chemung route as will appear later. Meanwhile the Ithacans and Owegans, undeterred by their failure to secure the canal and retaining faith in the geographic advantage of their shorter route, organized a company and with private capital built a horsepower railroad through the Six Mile Valley. While the Six Mile Valley route is at least 10 miles shorter than the Seneca-Chemung route to the Susquehanna, the geographic handicap of the Six Mile route that more than offset the advantage of less distance became plainly manifest when the railroad was built. As the mouth of the valley is hanging above the Ithaca level (due to differential glacial erosion as detailed in an earlier paragraph) it was necessary to convey the cars down the steep slope from the hanging valley lip on an incline. The trains were hoisted and lowered by a system of pulleys and ropes, operated at first by horsepower and later by a stationary steam engine, through a vertical distance of 405 feet within a horizontal distance of only 1733 feet. The grade of this incline can still be seen on the nose of South Hill. It is interesting to note that the same cumbersome device was also employed on the Mohawk and Hudson Railroad, the earliest portion (1831) of the present New York Central System, to raise trains from Albany into the Mohawk Valley. But while the grade at Albany was readily overcome later, the modern railroad line (Owego Branch D. L. & W. R. R.) that has succeeded the original Six Mile Valley enterprise is at present able to descend to the Ithaca level only by a series of switchback spurs. (See Fig. 3.) Another road, (E. C. & N. R. R.) built later in the same valley does not even attempt to make the descent but discharges Ithaca freight and passengers at East Ithaca a station on the level of the hanging valley lip.

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[11] Location of Towns and Cities of Central New York. Tarr, R. S. Bull. Amer. Geog. Soc. Vol. XLII, 1910, pp. 738-764.

Contains an admirable survey of this topic as affecting the broader area in which the Ithaca Region is situated.

[12] Life and Writings of DeWitt Clinton (The), W. W. Campbell, N. Y., 1849.

[13] "Facts Relative to the Trade (etc.), of the County of Tompkins," N. Y. Pamphlet printed in 1832 by Mack and Andrus, Ithaca, N. Y., p. 7,

[14] "Considerations of the Claims of the Southern Tier of Counties." "Addressed to the Representatives of an Intelligent Public." Pamphlet. Albany, N. Y., 1825.

The glacial through-valley south of Seneca Lake is not hanging, furthermore, its bottom is aggraded with morainic and out-wash material throughout its length. Hence the cutting of the Chemung Canal through it was a comparatively easy task. The Chemung canal had, too, the advantage of an adequate feeder in the Chemung River whose flow was in part diverted for the lockage down to the level of Seneca Lake. Then the divide at Horseheads is only 900 feet high and the level of Seneca Lake 444 feet, while the divide in the Six Mile Valley has an altitude of 980 feet and the Cayuga Lake level is 384 feet. The Seneca-Chemung route has, therefore, a lower divide and the rise from the lake level is much less. A canal in the Six Mile Valley would have been a practical if not a physical impossibility. The horsepower railroad with the system of inclined planes was not an absolute failure but it was not a real success and within a few years the company went into bankruptcy.

When the citizens of Ithaca, Owego, and Athens in 1825 petitioned the legislatures of New York and Pennsylvania for state support for a canal to connect Ithaca with the Susquehanna they proposed either the Six Mile route or a route through the Cayuga Inlet Valley as preferable to the Seneca route. The Cayuga Inlet Valley like the valley south of Seneca Lake is not hanging and its bottom is also aggraded throughout with glacial deposits. But the divide is at 1040 feet, the distance from Ithaca to the Susquehanna at Athens greater than from Watkins to Elmira by 13 miles, and there is no large feeder available at the high level. Hence the Seneca-Chemung route was chosen for the canal but the Cayuga Inlet Valley was made later the route of the Lehigh Railroad, the only through line entering Ithaca. The passenger business of this road between New York City and Buffalo is now sent through Ithaca but the freight business is largely routed over the other loop of the road that parallels Seneca Lake. The reason for this discrimination is that leaving Ithaca in either direction involves a climb of 450 feet or more, while between similar points on the Seneca Valley route the grades are only a little over 100 feet. The railroad does not, however, descend to the level of Seneca Lake at its head, but like the E. C. & N. Railroad in the Six Mile Valley discharges freight and passengers for Watkins on a hillside station above the Seneca lake-head town. The climb out of Ithaca to the north might have been almost entirely eliminated by following along the west shore of Cayuga Lake. But the road across the interlake country had been built before its incorporation into the Lehigh system, it already served a fertile farming country, it connected the towns built at the heads of the gorges[15] and the advantages of the level route would have been more or less offset by the necessity of winding around the minor indentations of the shore. The branch Lehigh road built along the east shore of the lake suffers from the latter defect.

Another transportation project by which the Ithacans hoped to make their city a terminal point was a direct ship canal to Lake Ontario, in order to get in touch with the western commerce and the Montreal market. Here they came into rivalry with the Oswegans whose route was shorter and better supplied with water. The Ithaca project, however, seemed likely of realization in 1829-1835 and led to a fever of real estate speculation in the community which abruptly collapsed in the national panic of 1837. When first agitated this canal was to be used in conjunction with the horsepower Six Mile Valley railroad. In 1862 the project was revived with the idea that the waterpowers from the hanging valleys could be used to grind western wheat and that Lake Superior copper ores could be smelted at Ithaca with anthracite coal brought over the Six Mile Valley railroad from the Pennsylvania fields to the south. But coke from bituminous coal shortly supplanted the use of the costly anthracite for smelting and the wheat country moved still further westward.

The Inlet harbor of Ithaca has been improved and made one of the southern terminals of the new Erie Barge Canal. It may be that this will give some impetus to water commerce on Cayuga Lake centering at Ithaca but it can not well do much. In the early days when the Ithacans first anticipated great growth their expectations were built primarily on the basis of the export tonnage of lumber, plaster, flour, wheat and salt originating in the territory. They also hoped to become the outlet for the Susquehanna country. The lumber is gone, the plaster no longer in demand, as a great wheat raising section the region can not begin to compete successfully with the western lands and salt is about the only one of the early bulk products still produced in quantity. The railroads have absorbed the Pennsylvania coal traffic and carry it over other routes. The Hudson-Mohawk gateway enabled New York City to surpass Baltimore and Philadelphia as seaports, hence the difficult grades of the more direct cross-plateau routes make them of importance only in the coal carrying trade, and this does not affect Ithaca except in the matter of local consumption. If Ithaca ever becomes a commercial and shipping center of importance it must be on the basis of development of resources within the immediate region. As these seem totally inadequate to bring about such a result Ithaca can not hope to become, as it did once, "the great central city of New York State."

Agriculture

A number of geographic factors affect the agricultural conditions in the region, especially with reference to the kind of crops that have and can now be produced profitably. The origin of the soils, the topography of the region and its climate must all be taken into account.

The soils are for the most part of glacial origin, rock material fined by glacial grinding, but much of it has been reassorted and redeposited by water action. The uplands above the level of one thousand feet are quite uniformly covered with glacial till. As the bedrock is mostly shale and sandstone, the former predominating, the till material consists of commingled shale fragments of small size with clayey and sandy fine particles making up the bulk of the mass. The substratum is often very dense and hard, the soil itself is usually thin, deficient in lime content and poorly drained. The shallowness is due to the comparatively light load of material transported by the ice in the thinner masses that moved over the uplands and their rapid melting off, the low lime content to the shaly bedrock from which it was derived and the poor drainage to the compaction of the material by the weight of the ice and to the fact that its clayey nature lends itself to puddling. These soils are the famous Volusia series whose worn out condition has been held in part responsible for the decline of farming in central New York. The upland country to the south of Ithaca has in fact been described as an abandoned farm district.

The characterization as an abandoned farm district rests on the evidence of decrease in rural population and the number of unoccupied houses. For these facts the nature and condition of the soils are not wholly responsible. There are no abandoned farms in the sense of abandonment of title. The decrease in population and the resultant vacant houses are primarily the result of the introduction of machinery in farm operations, and it has been shown by a detailed survey[16] that the larger farms that have come from this change in methods are uniformly more profitable than small units. The region was settled in the days of the scythe and grain cradle. Hill slopes too steep for modern cultivation were then cleared and farmed. These now are waste land or used only for pasture. As noted in an earlier paragraph they should be returned to forest before the soil is all washed down.

In the days of early settlement, much of this land as well as that at lower levels was planted to wheat, as is evident from the export figures quoted. Now only 5% of the total acreage in the townships surveyed in detail is devoted to this crop. Probably the depletion of the organic matter originally present in the soil due to continuous cropping is in part responsible for the decrease. Another reason for the decline of the wheat crop was the appearance of insect enemies. But what wheat is now raised gives a better yield per acre than the average for the wheat-growing states of the west. Hay is, however, now the universal crop, covers 56% of the acreage, buckwheat 8% and potatoes 3%. Topography and climate conditions are also in part responsible for the decline in farming on the uplands. With the advent of railroads, shipping points were almost all concentrated in the north and south through-valleys whose levels are from 500 to 1,500 feet below the hill farms. The glacial overdeepening of these valley troughs made very steep slopes; hence all the descent is accomplished in a very short distance. Roads, moreover, were laid out at an early date without reference to the valley stations, therefore often lead straight up hill for from 400 to 800 feet just beyond the railroad. Because of such grades, bulk crops, potatoes for expamle, to which the soil is adapted, can not be very profitably produced. This topographic difficulty must also be contended with in hauling market milk. Climatic limitations are imposed by the shortness of the

[15] Location of Towns and Cities of Central New York. Tarr, R. S. Bull. Amer. Geog. Soc. Vol. XLII, 1910, pp. 756-758.

[16] An Agricultural Survey of (part of) Tompkins County, New York. Warren, G. F. and Livermore, K. C. Cornell University Agricultural Exp't Station, Bull. 295, March, 1911.

season and the coolness of summer which makes the growing of corn for grain uncertain. The normal climatic sequence for the region of a wet spring followed by a dry summer is a particularly unhappy combination for the thin, clayey upland soils. They are boggy and cold in spring planting time, ploughing tends to puddle them and then in the summer droughts they dry out and bake, partly because they are thin and partly because the puddled condition prevents the vertical rise of water.

In addition to the handicap of the hills in hauling milk to market there is a further disadvantage in that the average farm is over 3 miles from the valley station. How important a factor distance is may be appreciated when it is stated that a farmer within 3 miles of a market can make a labor income four times as large as that of the farmer 7 miles or more away. Despite these difficulties a large proportion of the farm incomes are derived from cattle production; 40% of the total farm receipts, of which 33% is from milk and butter and 7% from stock sold. This is due to the fact that a combination of milk and crops for sale pays better than the exclusive production of either the one or other, because labor can be kept more continuously employed. From the geographer's point of view it would seem that sheep could be profitably produced on the steep slopes. But the land values are apparently too high for successful sheep raising.

In the valley bottoms and on the slopes of the north-south valleys below the thousand foot level as well as over the plain to the north of the Portage escarpment a wide diversity of soils exists. These have essentially the same bed rock origin as the upland soils but consist of mingled morainic accumulations, glacial outwash gravels and sands and clay and delta deposits of sand and gravel made on the bottoms of the proglacial lakes. In contrast with the hill soils these soils are usually deep for the wash of material from over and under the melting glacial front tended to concentrate the deposit of its morainic load around the margins of the projecting valley lobes. Because of this greater thickness the valley soils are free from the poor drainage conditions and drying out exhibited by the thin upland soils. The partial or complete water assortment of the material has resulted in better textural conditions and their diversity permits of a wider variety of crops. Thus apple orchards and vegetable gardens succeed on the well drained, lighter soils. On the whole, however, the crops are much the same as on the uplands but with better yields and greater profit to the farmer. Only one or two crops deserve special notice.

Grapes are produced to a limited extent on the east-facing slopes just above the level of Cayuga Lake. The soil conditions are essentially the same on the other side of the lake but there few or no vineyards are found. This seems to be a response to more genial climatic conditions on the west side, and is especially interesting in connection with the statistics of an excess of morning sun in April given in an earlier paragraph. The dry alluvial farms that were cultivated by the first settlers on "The Flats" and planted to corn and potatoes are now almost wholly occupied by the city of Ithaca. On the west side of the Inlet near the edge of the delta a part of the originally swampy land has been filled in with dredged material secured in enlarging the stream to barge canal depth and width. This filled land has been planted in large part to peach orchard. This is an interesting experiment as peaches usually fail in the region on account of frosts. In such close proximity to the lake the equalizing influence of the waters may be sufficient to make the crop reasonably certain.

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Industry

The early industries of the region were nearly all founded on the waterpowers furnished by Fall, Cascadilla, and Six Mile Creeks in plunging through the post-glacial gorges to the lake level from their hanging valley lips. In the aggregate the volume of these powers is considerable. Fall and Cascadilla Creeks descend some 400 feet within a distance of one half mile. Because of the early development of these powers and the parcelling out of the rights to numerous individuals it has, however, to date been impossible to utilize the full head provided by the abrupt descent of these streams. With a single hydro-electric power plant and distributing station located at the foot of the gorge of Fall Creek supplied by the full volume of the stream a much greater amount of power could be secured than is now or has been. The same thing can be said of Cascadilla. But even in this event at least two separate power plants would be required. In other words it is a geographic disadvantage that the drainage of the comparatively small area that centers at Ithaca should be divided among three streams. The disadvantage does not stop at the power plants. To utilize the fall effectively a large reservoir is needed in the upper valley of each stream, particularly now that the forest has been removed and their volume fluctuates from floods in spring and fall to mere threads of water in summer. The sites for such reservoirs are, however, available and steps are now being taken to develop the Fall Creek power in an adequate way.

Even with such development it is doubtful whether the available power from these streams would be sufficient to supply a considerable industrial center as was anticipated in 1835, when, during the period of speculation that preceded the contemplated construction of a ship canal from the foot of Cayuga Lake to Lake Ontario, the sum of $220,000.00 was paid for only a portion ("sundry water-powers") of the Fall Creek power rights. On the scale that manufacturing enterprises were then conducted this price might possibly have proved a profitable investment if raw materials for conversion into finished products had flowed into Ithaca from the outside as was anticipated.

The dependence of the early mills and factories on the waterpowers is indicated very clearly by the way they were all scattered along the stream courses. Their nature indicates that they were also dependent on local supplies of raw material to a very large extent. Grist mills came first, then plaster mills; chair, sash and door factories using the local lumber supply, also saw mills; boat yards, building canal boats; a distillery (local corn) tanneries, probably dependent at first on the nearby supply of hides but later utilizing only the regional resources of bark, oak and hemlock; oil mills (local flax seed?) and a paper-mill probably dependent on local supplies of rags. At early dates, however, there were numerous textile enterprises, woolen carding and fulling mills, cotton factories and silk mills which must have received their supplies of raw material from other regions and depended for success on the utilization of the local water powers or cheap labor. A foundry and furnace for iron smelting was established in 1822, by 1834 there were three such enterprises in Ithaca.

It is significant that but few of these industries have survived. Those which were justified geographically in that they were founded on the supply of local raw materials and local demand were eminently prosperous in their day. The others in almost every instance had illstarred and short careers.

The output of the local factories today consists of very specialized products of high value as compared to their bulk, are furthermore largely the creations of local inventive talent and mechanical skill. This is quite fitting in view of the modern topographic remoteness of Ithaca from centers of population, routes of commerce and supplies of bulk raw materials. A factory making a patented chain drive, a shot gun works, a calendar clock company, a paper mill specializing in waxed papers, an advertising sign plant and an aeroplane company are now the important industries of the place. The last mentioned concern was attracted to Ithcaa on their own statement by the geographic advantages of the site in that the level, unoccupied lands of the delta flat and the open expanse of the lake, gave opportunities for starting and alighting safely and in trying out hydroplanes. Very recently, too, a motion picture company has established its studios on the lake shore. This enterprise utilizes to the fullest possible extent the manifold scenic attractions of the Ithaca region and has probably done more than any other agency in bringing Ithacans to a realization of the natural beauty of their locality.

Two industries making bulk products still exist. These avail themselves of abundant supplies of local raw material, of the facilities for cheap water transportation (which will be much enhanced by the barge canal) and of the exceptionally favorable conditions of location for the manufacture of their respective materials that the region affords. They are the salt plants and the cement plant situated on the east side of the lake near Ithaca.

In earlier years salt was made in the region by evaporating the brine flowing from natural springs or from wells. Now double tube wells are sunk 1,800 feet or more to the salt beds themselves which are 300 or more feet thick. Water sent down one tube issues from the other as a saturated salt solution, and is conveyed to settling tanks on the steep hill-slope. After precipitation of gypsum and other impurities the concentrated brine is evaporated with artificial heat, the salt dried centrifugally and accumulated on the floor of a store house at lake level, whence it is readily shipped either by water or on the railway that parallels the shore line.

The cement plant is a conspicuous example of the positive influence of a combination of favoring geographic factors in conducing to the prosperity of a particular enterprise otherwise handicapped. The margin of profit in the cement industry is relatively small, the capitalization required per ton of actual product is

the same as that in the pig iron industry, but the finished iron product has a value from three to four times greater than that of the same amount of cement.[17] The tremendous modern use of cement has made possible large scale production in plants of maximum industrial efficiency. The Cayuga plant is comparatively distant from the large centers of consumption but has other advantages that outweigh this handicap.

Its supply of raw material is furnished by the Tully limestone and the Hamilton shale which underlies the limestone. At the exact site of the plant the rocks have been folded into a low arch which has resisted erosion because of the durable limestone formation that caps it. The glacial erosion of the north-south Cayuga Lake trough has created a steep slope from the lake shore to the crest of the arch which is just behind the mill at an altitude of 259 feet above the lake level. Glacial erosion has removed practically all the weathered rock material and the practically complete absence of residual clay in the joint and bedding planes renders unnecessary the washing operation to remove such substance that must be adopted in some cement quarries of the United States that are located outside the zone of notable glacial erosion. The limestone is 18 feet thick at the quarry, thus of ample bulk for large scale production. As much larger quantities of limestone are needed than of the Hamilton shale at its base (into which it passes abruptly) it is of considerable significance that the shale is below, for if it were above the cost of its removal or timbering would make the enterprise much less profitable. The steep slope and the amount of elevation above lake level make possible the use of an aerial trainway to carry the rock directly from the quarry face to the upper story of the mill for grinding without expenditure of power.

This series of geographic advantages have made possible the profitable operation of a small cement mill in competition with much larger plants less favorably situated, but possessing more up-to-date equipment. The geographic disadvantage of being comparatively remote from centers of consumption, Buffalo on the west and New York on the east is offset in large part by the availability of a water transportation route to those points. Without these geographic advantages the plant could not have survived, possessing them it has attracted the attention of a large corporation which proposes to develop it from a local enterprise to an industry of state wide importance.

The dominating factor in the development of modern Ithaca as a residential center has been the selection of the place as the site of Cornell University. The founder, Ezra Cornell, was indifferent to the honor of having his name attached to the institution but was insistent on the site at Ithaca in preference to Syracuse where it was urged that the university should be located. In this he was amply justified if beauty and natural interest of situation count for anything in the placing of an institution of learning.

The campus occupies the interstream plateau between Fall Creek and Cascadilla Creek. This is of ample dimensions to accomodate the university buildings and grounds and to provide also on the east the farm acreage necessary for the Agricultural College experimental plantings. It is a rather adventitious geographic advantage that this limited area of farm land should have very diversified soils, till, moraine, glacial lake sands, silt and clay and delta material, giving opportunity for tests under a variety of soil conditions. The flat tops of the delta terraces that flank each of the boundary creeks have also provided admirable sites for a number of the buildings.

The west edge of the quadrangle is just above the over-steepened slope of the glacially-eroded Cayuga Lake Valley, hence commands a view of the country for miles around. To the north one looks over a long expanse of lake; to the west down on the city in the valley below, and across it on a wide extent of field and woodland chequered hillside. On the southeast the prospect is even more distant and extends far into the bold and rugged topography of the uplands. It is commonly felt that no inconsiderable fraction of the institution's cultural and educational influence is owing to its aesthetic surroundings, and the site is considered by many to be the most attractive of all the seats of higher learning in America. To this scenic attractiveness must also be added the unique opportunities for natural history studies, including geography, that the complicated physiographic development of the region affords, and which entails the existence of extremely varied habitats for both flora and fauna, making it in consequence an exceptionally rich and compact collecting ground for the botanist and zoologist; as was early remarked by the celebrated naturalist, Louis Agassiz.

Itself admirably situated, the university, as stated before, is responsible also for the modern growth of Ithaca as a residential center. This dates from about the time when the city's dreams of future commercial greatness had been finally dissipated. Since then the interests of the population have been divided between the business district on the valley flat and the campus at the crest of the oversteepened slope, separated primarily by a difference in altitude of some 400 feet. The result has been the development of a hillside town in a place where there was ample room for residential growth on comparatively level lands to the south and west. Practically all the hillslope between Fall and Six Mile Creeks is covered with residences. The actual distance from the campus to the business center of the city is short, but the direct down hill streets are so steep as to be exceedingly tiresome to climb and dangerous to descend in winter when there is an ice and snow cover. This steepness has also made the transportation problem difficult. The grades are too heavy for trolley lines to negotiate directly. Hence circuitous routes are necessary, with diagonal ascents of the slopes. Even under those conditions the motors must be geared very low, high rates of speed are impossible. The combination of roundabout routes and low speeds make anything like rapid transit from the valley to the campus out of the question. Moreover, even with their long routes the trolleys do not serve a wide area. The upshot of this, in connection with the utilization of practically all the plateau area by the university, is that the extent of available residential tracts is quite limited. Conservation of time and energy necessitates living at some place convenient to both the town and the campus for a large part of the community. These circumstances conjointly have developed the condition of high prices for lands, and exceedingly high rents for apartments in what is in other respects a village residential center. The hillside site has also made the matter of fire protection a difficult problem which is further aggravated by the fact that most of the apparatus is housed in the valley because the university is exempt from taxation. Modern motor fire trucks have however done much to overcome this difficulty.

The water supply, too, was for a long time inadequate but by availing itself recently on a proper scale of the really excellent opportunity afforded by the geographic conditions for creating a sufficient reservoir the community has solved the water problem. It will be recalled that the characteristic features of the bottoms of the hanging valleys, just above their lips, are a succession of amphitheatres, and connecting rock gorges, developed as the streams flow in and out of their earlier interglacial courses. (See Fig. 5.) One of these gorges in Six Mile Creek has been closed by a high dam and the amphitheatre in the interglacial gorge above it flooded, providing an ample reservoir at low cost. Moreover, as the drainage area of the upper section of the creek is comparatively small, it can be conveniently guarded against contamination. At an earlier date much of the water supply was secured from artesian wells and such water is now used to some extent for making artificial ice. Owing to an unwillingness to recognize the local origin of these artesian waters they were overdeveloped in an attempt to supply the whole community with them.

Geographical Index of the Future

It is comparatively simple to recount and point out the geographic influences that have and are contemporaneously exerting an effect on the individual and collective fortunes of a community. To predict what conditions will be important in the future or to suggest better utilization of resources at hand is more difficult and open to criticism as opinions may differ. But such efforts constitute a phase of applied geography and one that has been much neglected, hence is deserving of some exposition in this connection even though unskilful.

The transportation prospect of the future for the region is the maximum utilization of the Ithaca terminal of the barge canal. It is extremely likely that the salt and cement companies will avail themselves of this to a very large extent in shipping goods both east and west. Water transportation is so much cheaper than railroad transportation that if the cargoes were available there could be no question of the barge canal being profitable. Bulk cargoes other than salt and cement would need to be furnished largely by agricultural and lumber products. It might be feasible also to maintain a passenger steamer plying the length of the lake if by arranging circular tours out of New York City by way of Ithaca, Cayuga Lake, Niagara Falls, Lake Ontario, the St. Lawrence, Lake Champlain, Lake

[17] Eckel, E. C., A Comparison of the Iron and Cement Industries, Cement Age, March, 1911, pp. 139-143; also The Cement and Iron Industries, a Comparative Study, Eng. Mag. March, 1911, pp. 854-867.

George, and the Hudson River, enough tourists could be attracted to visit the Finger Lake Country. Such a steamer would need to be fast and commodious to be successful.

The development of the agricultural bulk products would necessitate providing roads to the upland sections with low enough grades for the operation of tractors capable of hauling a string of wagons to the lake terminal. It would also need co-operation among the farmers to provide an adequate quantity of shippable products. But potatoes, apples (properly graded and packed) and beef cattle in view of rising meat prices could be shipped, and are all adapted to production in quantity in the region. With proper reforestation of the hillslopes and summits there would also be a constantly increasing supply of valuable pine lumber to send out. For return cargoes western corn for cattle fattening and perhaps bituminous coal and coke from Lake Erie ports could be secured.

Industrial expansion ought to be largely along the line of specialized manufactures, requiring intelligent labor, such as are now successfully established at Ithaca. The presence of the University would provide an incentive for the removal of skilled artisans to an inland center. Other salt and cement companies might find it profitable to establish plants. An increasing volume of high value small bulk products would compensate the railroads, at least in part, for any loss in traffic on account of barge canal shipments. The consolidation of the waterpowers of both Fall Creek and Cascadilla Creek by reservoirs and central converting plants would be of great industrial advantage.

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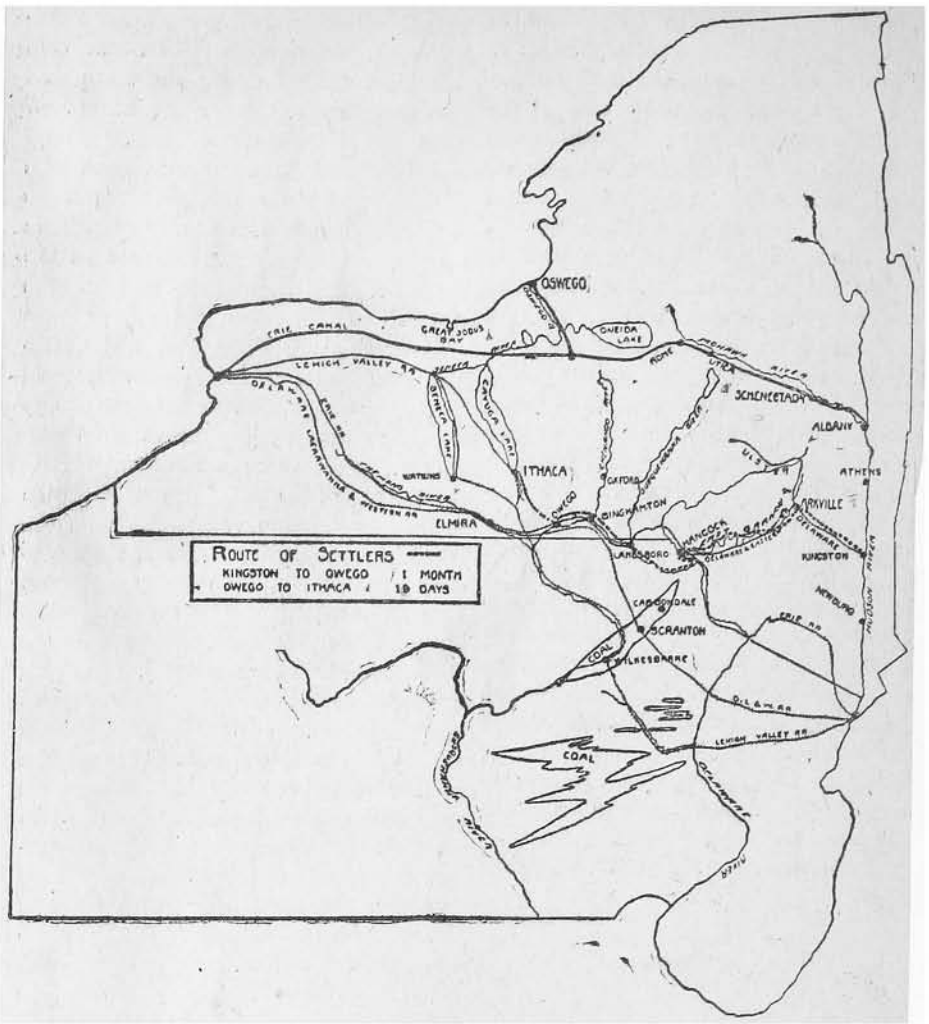

Fig. 1. THE GEOGRAPHY OF THE ITHACA REGION.
Map of New York State Showing Location of Region Described and Route Followed by First White Settlers

Fig. 2. THE GEOGRAPHY OF THE ITHACA REGION (See page 21)
Photograph of a model of North America illustrating an interpretation of the geography of the continent at the time when the salt layers were being laid down at Ithaca and elsewhere in the same basin.

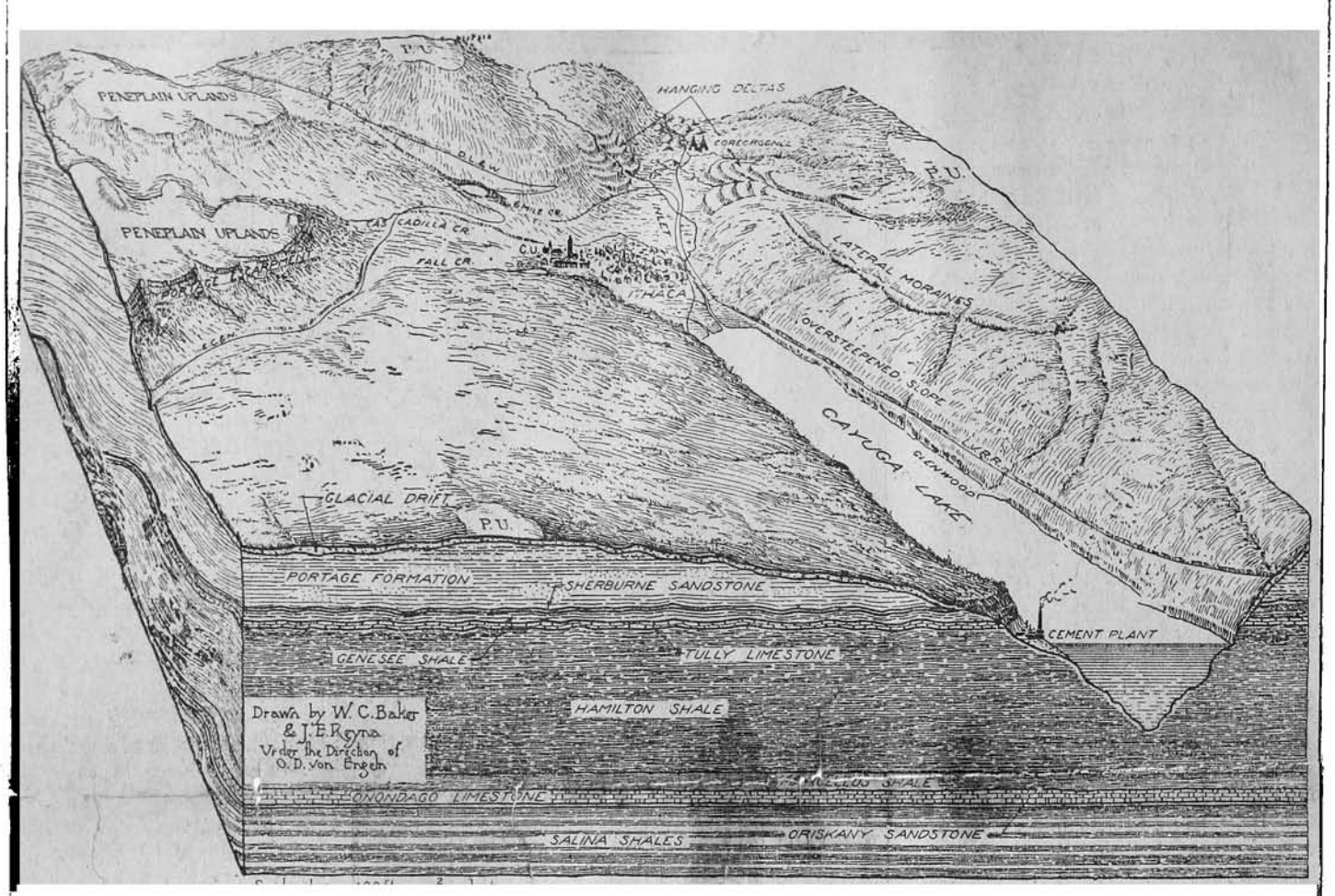

Fig. 3. THE GEOGRAPHY OF THE ITHACA REGION.

Block Diagram of the Ithaca Region Showing its Geological Structure and Physical Geography and Their Relation to the Human Occupation of the Area

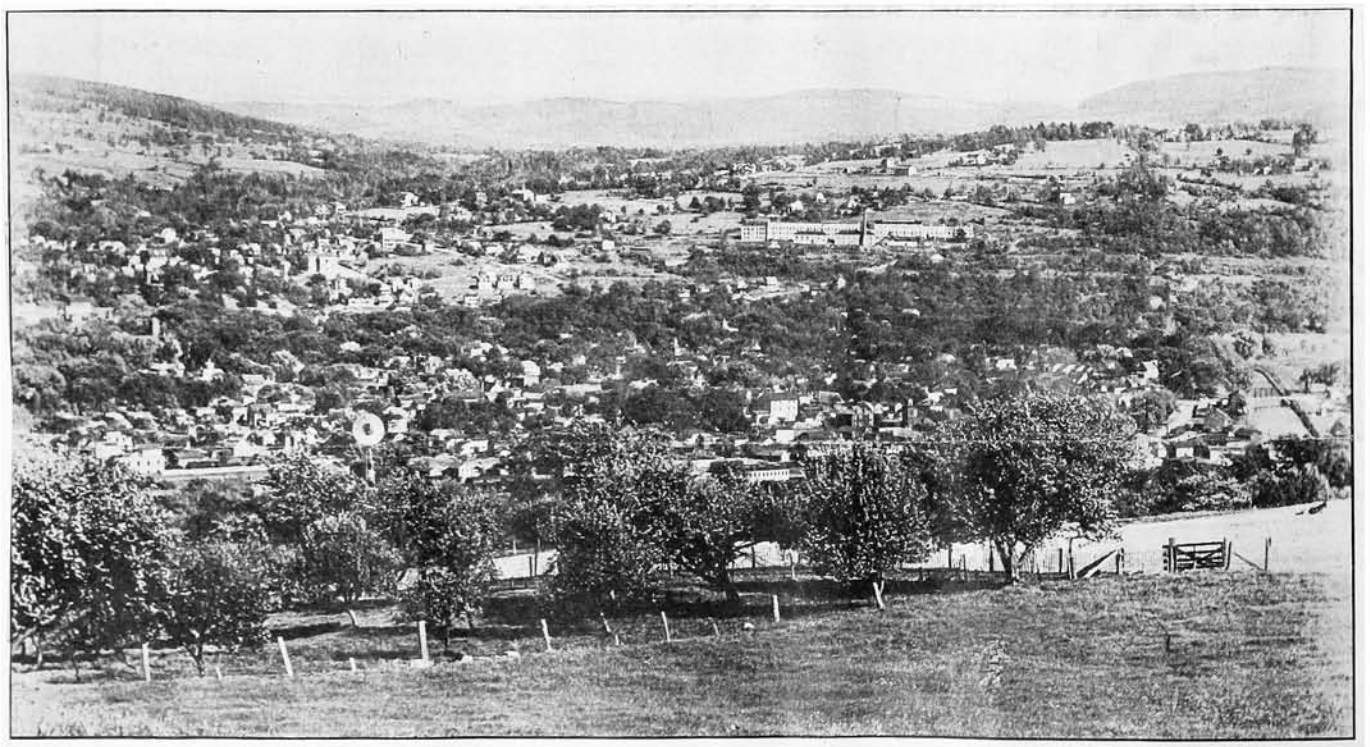

Fig. 4. THE GEOGRAPHY OF THE ITHACA REGION. (See page 21)

Hanging Valley of Six Mile Creek from west side of Cayuga Valley.