CHAPTER IX

GEOGRAPHY OF THE ITHACA-CORNELL REGION

AMONG the undergraduates, at least, there will probably be a good many readers of these pages of the opinion that only the predilection of the author warrants the appearance of this chapter in the volume. Accordingly, it may be well to disclose to such critics, at the outset, the surprising fact that a number of individuals have asked that a discussion of this kind be included in the book. If that is not enough justification for the insertion of some modern, every-day geography in a college book, then the following items from the experiences of the two founders of Cornell University will, perhaps, serve to convince continuing objectors that, even if a bit unpalatable, a little geographic reading, especially on the subject of the environment of their alma mater, will do them no harm.

Ezra Cornell had very little formal schooling. Later in life he acquired by his own undirected reading and observation a vast store of useful knowledge. He earned his fortune by promoting, constructing and operating telegraph lines in western states, and finally made it secure by consolidating these lines into a *Western* Union Telegraph Company. Again, he was able to increase enormously the value of the university's endowment by investing the funds in western timber lands. In both instances success depended upon, then, primarily, an intimate knowledge of the

geography of those areas. And yet, as he himself said, the only lesson in geography he ever had was in giving the boundaries of the state of New York, which was said to be limited on the west by the "unknown regions."

Under the circumstances it would not, of course, be surprising if Ezra Cornell had suggested that a mite more emphasis and accuracy be put into geographic training than was afforded him. If his case, however, be thought exceptional, the testimony of Andrew D. White may be more to the point in regard to the basic value of geographic knowledge. Quoting from his "Autobiography": "On arriving at the University of Michigan in October, 1857, I took especial charge of the sophomore class. Among my duties was their examination in modern geography as a preliminary to their admission to my course in history, and I soon discovered a serious weakness in the public-school system. In her preparatory schools the state of Michigan took especial pride, but certainly at that time they were far below their reputation. If any subject was supposed to be thoroughly taught in them it was geography, but I soon found that in the great majority of my students there was not a trace of real knowledge of physical geography and very little of political. With this state of things I at once grappled, and immediately "conditioned" in these studies about nine-tenths of the entering class. At first there were many protests; but I said to my ingenuous youths that no pedantic study was needed, that all I required was a prepa-

ration such as would enable any one of them to read intelligently his morning newspaper, and to this end I advised each one of them to accept his conditions, to abjure all learning by rote from text-books, to take up simply any convenient altas which came to hand, studying first the map of our own country, with its main divisions, physical and political, its water communications, trend of coasts, spurring of mountains, position of leading cities, etc., and then to do the same thing with each of the leading countries of Europe, and finally with the other main divisions of the world. To stimulate their interest and show them what was meant, I gave a short course of lectures on physical geography, showing some of its more striking effects on history; then another course on political geography, with a similar purpose; and finally notified my young men that they were admitted to my classes in history only under condition that, six weeks later, they should pass an examination in geography, full, satisfactory, and final. The young fellows now took their conditions very kindly, for they clearly saw the justice of them. One young man said to me: 'Professor, you are entirely right in conditioning me, but I was never so surprised in my life; if there was anything that I supposed I knew well it was geography; why, I have taught it, and very successfully, in a large public school.' On my asking him how he taught a subject in which he was so deficient, he answered that he had taught his pupils to 'sing' it. I replied that if he would sing the answers to my questions, I would admit

him at once; but this he declined, saying that he much preferred to accept the conditions. In about six weeks I held the final examinations, and their success amazed us all. Not a man failed, and some really distinguished themselves. They had all gone to work cordially and heartily, arranging themselves in squads and clubs for mutual study and examination on each physical and political map; and it is certain that by this simple, common-sense method they learned more in six weeks than they had previously learned in years of plodding along by rote, day after day, through text-books."

Hence, undergraduate readers, do not murmur because some statement of the geography of your new environment is thrust upon you, herewith; for of a certainty you have good warrant that it may be conned to advantage. The Ithaca-Cornell region is one of great geographic interest, and if, in your rides and rambles to its points of scenic attraction, you can see with the mind as well as with the eye, you will find your pleasure doubled. As for Ithaca itself, remember it was the home of Ezra Cornell, and that, in addition to his love for the university, the Founder also had great pride in his town, and that, despite his early deficiency in such training, no one better than he understood the town's geographic advantages and handicaps. For the sake of conciseness the paragraphs that follow are made quite formal. If some of the matter appears quite obvious to one on the ground, scarcely worth setting forth in print, consider how necessary to a clear understanding it will be to those, perhaps

the members of your own family or some subfreshman, who may read these pages at a distant place.

The Ithaca-Cornell Region 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 centers about the city of Ithaca, which has a population of sixteen thousand and ninety-two people (unofficial, 1915 state census) and is the site of Cornell University.

During much of the most ancient geologic time the region was the bottom of a shallow interior sea. This sea varied in dimensions during the different subdivisions of those 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 material (deposited later) of the same kind and by processes of cementation.

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 Appalachian 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.

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.

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 Appalachian Plateau. This small region, hence lies on the 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 in so far as it is apparent in the present day topography, is indicated in the block diagram which will serve to make clear the important relations.

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, made by the north-flowing streams, however, afforded low altitude channels by which the ice could project lobes, in advance of the main front, for considerable distances into the highland area. These north-south valleys were, accordingly, 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, of which Cayuga Lake is one, with bottoms in some instances below sea-level, were developed. 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. 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.

BLOCK DIAGRAM OF THE ITHACA-CORNELL REGION

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 bed-rock; 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. (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.) 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, elsewhere 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.

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 over the moraine barrier. In the Cayuga Inlet valley this was at about one thousand forty feet above the sea; in the Six Mile Creek valley at nine hundred and eighty feet above sea-level. A farther 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. As the ice melted back farther 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 ma-

terial 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 bed-rock 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 deltafilling later floodplain 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 reëstablished 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. [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.]

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 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 subartic 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 ["Ithaca As It Was," H. C. Goodwin, Ithaca, N. Y., 1853, p. 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 cleared. Much of this timber was undoubtedly converted into lumber. In 1832 the export of lumber from the county ["Facts Relative to the Trade, etc., of the County of Tompkins," Ithaca, N. Y., 1832, p. 7.] had an annual value of four hundred thousand dollars, but in the same year ashes brought twenty-seven thousand dollars, indicating that much timber (estimated at sixty per cent) was burnt in clearing land for agriculture. The ashes were used to make potash, an industry that began as early as 1804. ["Early History of Ithaca." H. King, Ithaca, N. Y., 1847, p. 13.] 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 fifteen dollars per acre as farm land produced nearly five dollars per acre, annually, in natural regrowth of timber without care, for the twenty-two years required to produce the forest. [An Agricultural Survey of (part) Tompkins Co., N. Y. Warren, G. F. and Livermore, K. C., et al. Bull. 295 Cornell Univ. Exp't Station, Ithaca, N. Y., 1911, p. 471.]

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 eight hundred men, during two December days, closed in on a section of country about nineteen miles in circumference located some ten 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.

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 one hundred 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 eighteen

hours following midnight January 30, 1915. [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.] 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. [Climate and Civilization, Huntingdon, E., Harpers Monthly, Vol. CXXX, Feb., 1915, p. 367.] 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 4th, and the first one in fall October 10th, giving a season of one hundred and fifty-nine days. In the upland valley station, previously referred to, the corresponding dates are May 18th and September 27th, hence a growing season of only one hundred and thirty-two 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 two hundred days, at

Buffalo, N. Y., one hundred and seventy-four days, at Columbus, Ohio, one hundred and eighty-three 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 eight per cent 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 twelve per cent 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, [Compiled at the suggestion of the writer by Mr. L. A. Hausman, instructor in Meteorology, Cornell University.] that during the five years, 1909-13, from four to ten 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 that 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 thirty-four inches, at the upland valley station nearby it is thirty-eight inches; New York City has forty-five inches. While New York City has a greater rainfall, it is not so uniformly distributed as the Ithaca precipitation, Ithaca having one hundred and fifty-five days on the average annually with a precipitation of one-hundredth inch or more, while New York City has only one hundred and twenty-eight. However, New York City gets twenty-six inches during its growing season while Ithaca receives only seventeen. 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 twenty-two inches at Ithaca as compared to twenty-six inches at New York. As the soils of the Ithaca region have poor drainage conditions; are apt to be too wet in spring and too dry 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 fifty-six inches as compared to thirty-five inches at New York and forty-seven 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, thirty per cent of the time, followed by winds from the southeast for twenty-three per cent 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.

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 twenty-five "elegantly built houses" was situated on the morainic hillocks that terminate the delta-floodplain 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. [See Handbook of American Indians, Bulletin 30. Parts I and II, Bureau of American Ethnology, Smithsonian Institution 1907, 1910, for references to literature.] 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, 1788-90. 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. This is the area that has recently been made a city park by Ithaca. It is well adapted to such use because of its romantic scenery and the association of the place with the earliest aboriginal occupation of the region adds much to the interest of the park as a recreation center. 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 nineteen 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

AN OLD STONE HOUSE

followed by the Ulster & 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 & Northern railway and the New York, Ontario & 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 farther 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.

Nineteen days more were needed to complete the last stage of the journey, the part from Owego to Ithaca, a distance of only twenty-nine 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, conse-

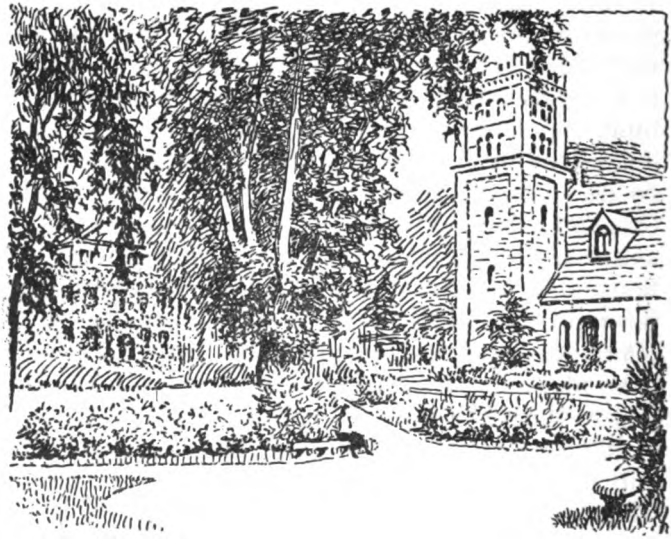
quently it was necessary for them to clear off the forest in advance of their march, hence the long time it took to cover the short distance. The highway they opened in this manner followed one of the lowlying gaps, across the upland country, due to glaciation, the through valley of Six Mile Creek, which 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 twenty-nine miles from Owego so arduously without good reason. While in the through valley of Six Mile Creek there has been developed an ample acreage of cultivable 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 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 Cascadilla 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 up-stream. The immediate utility of such water-powers 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 twenty-five bushels of grain per day was erected at the mouth of the Cascadilla gorge. In Six Mile the water-powers were farther up-stream, 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 farther 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 be-



IN DE WITT PARK

stowed 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 euphonious appellation, 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 found-

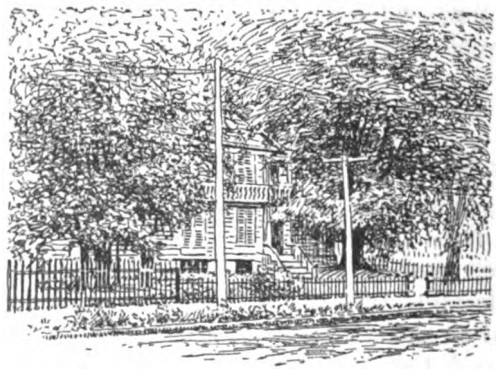
ing of the university, a degree of appropriateness he could not have foreseen. While DeWitt himself may not have been responsible for the many other classical place names found in this part of the state, it appears that this example of his served as a precedent.

The Jesuit missionaries, who were probably the first white men in the region, undoubtedly came by way of the St. Lawrence and Great 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, dry goods, 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. [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.]

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 farther 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 HOUSE OF MYSTERY

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, "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 one hundred and twenty miles to the descending waters to the Mississippi, must render it a place of great importance." [Life and Writings of DeWitt Clinton, (The), W. W. Campbell, N. Y., 1849.]

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 1812-15) it is recorded that as many as eight hundred 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, eight thousand barrels in 1825 and two thousand two hundred and fifty tons in 1832. ["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.] In the latter year nearly two thousand tons of lumber and eight thousand seven hundred 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 one hundred and fifty thousand dollars 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 seventy-five dollars. On these the flour was floated down the Susquehanna river, arriving at its destination in from eight to twelve 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 the 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 one hundred to one hundred and fifty 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 the lake traffic and seemed to emphasize farther 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 five 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 steamer) 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 three days, one day less than by way of Albany. By 1837 there were three steamboats and from seventy to one hundred 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 de-

posits (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 farther 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. ["Considerations of the Claims of the Southern Tier of Counties." "Addressed to the Representatives of an Intelligent Public." Pamphlet, Albany, N. Y., 1825.] 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 horse-power railroad through the Six Mile valley. While the Six Mile valley route is at least ten 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 horse-power and later by a stationary steam engine, through a vertical distance of four hundred and five feet within a horizontal distance of only one thousand seven hundred and thirty-three 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. 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.

The glacial through-valley south of Seneca Lake is not hanging, furthermore, its bottom is aggrad-

ed 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 nine hundred feet high and the level of Seneca Lake four hundred and forty-four feet, while the divide in the Six Mile valley has an altitude of nine hundred and eighty feet and the Cayuga Lake level is three hundred and eighty-four 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 horse-power 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 one thousand and forty feet, the distance from Ithaca to the Susquehanna at Athens greater than from Watkins to Elmira by

thirteen 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 four hundred and fifty feet or more, while between similar points on the Seneca Valley route the grades are only a little over one hundred 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 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 1829-35 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 horse-power Six Mile valley railroad. In 1862 the project was revived with the idea that the water-powers 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 farther 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."

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 bed-rock is mostly shale and sandstone, the former predominating, the till material con-

sists 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, the worn-out condition of which 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 [An Agricultural Survey of (part of) Tompkins County, New York. Warren, G. F. and Livermore, K. C. Cornell University Agricultural Experiment Station, Bulletin 295, March, 1911.] 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 five per cent 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 fifty-six per cent of the acreage, buckwheat eight per cent and potatoes three per cent. 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 the levels of which are from five hundred to one thousand five hundred feet below the hill farms. The glacial over-deepening of the 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 four hundred to eight hundred feet just beyond the railroad. Because of such grades, bulk crops, potatoes for example, 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 season and the coolness of summer, which makes the growing of corn for grain uncertain. The normal climatic sequence for the region, 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 three miles from the valley station. How important a factor distance is may be appreciated when it is stated that a farmer within three miles of a market can make a labor income four times as large as that of the farmer seven miles or more away. Despite these difficulties, a large proportion of the farm incomes are derived from cattle production; forty per cent of the total farm receipts, of which thirty-three per

cent is from milk and butter and seven per cent 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

CITY HALL, ITHACA

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 often 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.

The early industries of the region were nearly all founded on the water-powers 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 four hundred 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 two hundred and twenty thousand dollars 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.

AN HISTORIC HOUSE, ITHACA

The dependence of the early mills and factories on the water-powers 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 ill-starred 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 pa-

pers, an advertising sign plant and an aeroplane company are now the important industries of the place. The last mentioned concern was attracted to Ithaca, 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 to bring 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 one thousand eight hundred feet or more to the salt beds themselves which are three hundred 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 storehouse at lake level, whence it is readily shipped either by water or on the railway that parallels the shore line. At the present time (1917) a mine shaft is being sunk to the salt beds and in the near future coarse rock salt will also be produced at a point a few miles down the lake from Ithaca. This will provide a further large quantity of bulk material for shipment by water over the lake and barge canal to centers of population east and west.

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. [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.] 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 two hundred and fifty-nine feet above the lake level. Glacial erosion has removed practically all the weathered rock material, and the practically complete absence of residual clay, in 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 eighteen 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 tramway 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 accommodate 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 æsthetic 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, a very exceptionally rich and compact collecting ground for the botanist and zoölogist; 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

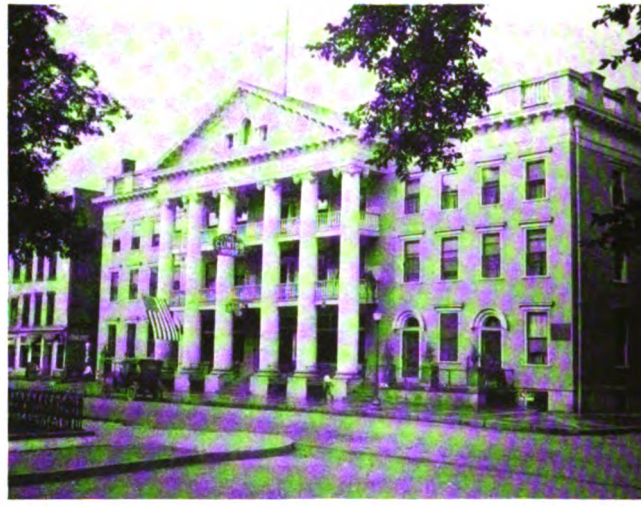
AN EARLY COLONIAL HOME, ITHACA

of the over-steepened slope, separated primarily by a difference in altitude of some four hundred 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.

With the increasing use of motor cars, and with the promised extension of the trolley lines an admirable solution of this difficulty has, however, been found, for that part of the community that has its chief interest or business in the university's activities, by the incorporation and development of

OLD COLONIAL HOMES IN ITHACA



THE CLINTON HOUSE

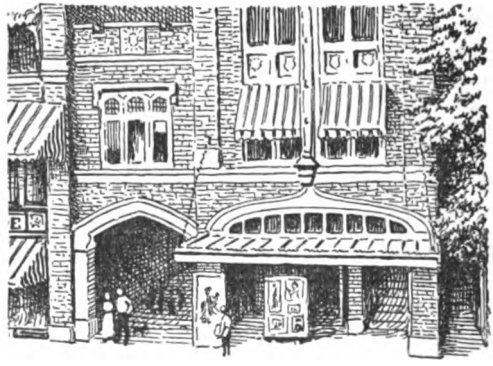
Exterior erected in the early days of Ithaca, then known as the finest hotel between New York and Buffalo

THE NEW ITHACA HIGH SCHOOL

the Village of Cayuga Heights. This thriving and most attractive suburb occupies a portion of the valley slope of Cayuga Lake about one-half mile to the north of the campus. Being outside the city it is immune from the very heavy tax rate levied on Ithaca property. This saving, and the exceedingly fine views of both the lake and valley that Cayuga Heights residents enjoy, probably more than compensate for this suburb's greater distance from the business center than that of the other residential districts. The village is, moreover, admirably laid out, and many fine sites are still available for future growth. The hillside site has 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. 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 guarded conveniently against contamination. At an earlier date much of the water supply was secured from artesian wells and such water is



A "MOVIE" THEATRE IN ITHACA

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.

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 unskillful.

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 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 water-powers of both Fall Creek and Cascadilla Creek by reservoirs and central converting plants would be of great industrial advantage. Any additional development of industrial or commercial activity will, of course, bring about growth in population. This is eminently desirable and will react favorably on the university's interests, for it is extremely unlikely that such growth will ever keep pace with the university's expansion and consequent dominance of the situation. In closing, therefore, it may not be amiss to recommend to such readers of these lines that may be in search

of a home site where the leisure of ample means may be made enjoyable by both physical and intellectual stimulus, that the Ithaca-Cornell region affords these with its beautiful scenery, really fine autumn climate, with access to innumerable concerts, plays and lectures of metropolitan standard, combined with the pleasure of living in a cultured community. For a family with children to educate the location is almost ideal, for the elementary and secondary schools of Ithaca are of exceptionally high grade, and, combined with the facilities for higher education provided by the university, meet all demands for the training of any generation in any field. And the advertising slogan of the community is "Ithaca Invites You."

CHAPTER X

OVER HILL AND INTO HOLLOW

THE great panorama of nature that is spread before the newcomer's eyes from the vantage point of the Cornell campus is only a formal and distant introduction to the scenic charm of the environment. The grandeur of the initial prospect, with its wide expanses of hillslope, its restful valley aspect and the blue lure of the lake waters, only suggests the infinite variety of scenic interest that remains concealed. To know these hidden things intimately calls for something of the ardor of the explorer. For such an enthusiast there are gorges and waterfalls almost without number to be sought out, rambles by purling brooks slipping from field into forest, and unexpected glimpses of shimmering lakes and peaceful country villages to be had from lonely hilltops. It is not a region of rugged and awe-inspiring mountain splendor but of the kind that pleases and soothes from the motor road, yet holds enough of the wilderness aspect in its remoter places to gratify the discovering instinct of the tramper.

It is not claimed that this scenic attractiveness is a resource peculiar to the immediate environment of the university. It is shared by all the Finger Lakes country of Central New York and the wonder is, that, altogether aside from the fact that Cornell is located in the area, the region is not more favorably known and more commonly visited

by the tourist public. It would be difficult to conceive a district holding in store more of quiet beauty and romantic wildness than this. In the past the relative inaccessibility by rail may have had something to do with its not becoming celebrated, but with the modern vogue for motor-touring, and the completion of excellent state roads, there can be little doubt but that the Finger Lake country will be more and more the resort of

those who plan their trips with discrimination. On the other hand, it is true that Ithaca and Cornell are central to some of the finest features of the general region, and on that account this chapter is inserted. These paragraphs and pictures may serve to acquaint some readers with the possibilities of the environment or perhaps to incite the incoming undergraduate with an immediate desire to seek out the places mentioned. In either event they will be of good purpose.

With past experience as guide, there is at once a great temptation to go far afield, to strike out, immediately, away from the beaten track. That would be a mistake for the newcomer at Ithaca and Cornell. The city itself has recently begun to recognize this fact, the concrete evidence being that a City Park has been made of the Six Mile Creek gorge for that part of its extent that parallels the main street of the town. Within a few blocks of the principal hotels one can descend into a rock-walled chasm, and, following along paths that lead through clumps of woodland, into open glades, to the foot of foaming falls, and along steep ledges, find enough of sylvan beauty to while away an afternoon most agreeably.

INSPIRATION POINT

If the hour is not too late, the trolley ride "around the loop," with perhaps a stop at "Inspiration Point" will afford

a delightful relaxation from the earlier walk and an added scenic gratification. Near the summit of its winding ascent, from the valley bottom to the campus plateau, the trolley route along a considerable distance affords the passenger an outlook directly down on the city and for miles up the lake. This makes an especially pleasing prospect, one of which even the old inhabitant does not tire; a ride around the loop is quite an institution among the good citizens of Ithaca.

Immediately adjacent to the campus, at its south entrance from College Avenue, there is a pretty path among the hemlocks bordering the upper length of Cascadilla Gorge. This was a favorite retreat of Goldwin Smith, during the two years that he spent at Cornell, hence is known as Goldwin Smith Walk. On the far side of the campus, along Beebe Lake and Fall Creek Gorge, is a similar path leading to Forest Home village. Both of these walks are of romantic aspect, the first affording intimate glimpses of rushing water in a narrow rock gorge; the latter opening out wider views over the placid waters of the little lake with its forest-covered slope opposite—especially beautiful in autumn.

From the upper bridge across Fall Creek, on the north side of the campus, one can look down into the tremendously deep lower gorge. Just at this point, so the story runs, as told by Griffis in his "Pathfinders of the Revolution," a white maiden, made captive by the Seneca Indians at the Cherry Valley massacre, was found and rescued by her

lover, a member of General Sullivan's expedition. It seems that the maiden had been able to send a letter back to her white friends by a negro captive whom the Indians regarded as a trusty. In this letter she described a hiding place that she had discovered, near a great waterfall, in a gorge at the south end of Cayuga Lake, a place to which she proposed to flee if ever a punitive expedition should be sent into the lake country. The exact locality she fixed as the point where a little primrose, not found elsewhere in the region, flourished on the

IN UPPER FALL CREEK GORGE

gorge walls, and of this flower she enclosed pressed specimens. Fortunately for the success of her plan the Indians departed several days before the white troops came into the Cayuga region, the maiden was able to elude them, and to attain her retreat;

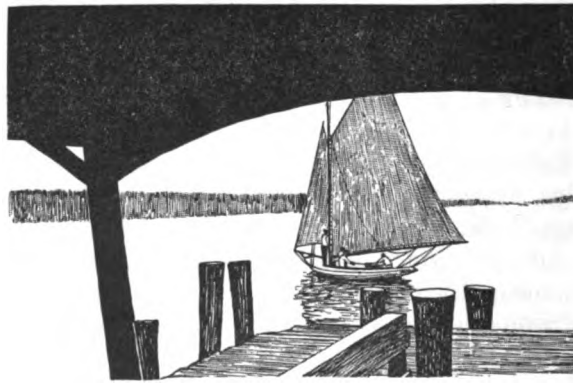
where, after an anxious search, her lover eventually discovered her; the little primrose playing its romantic part just as she had planned. The great waterfall of her letter, however, is now identified by the quite unromantic name of Triphammer Falls.

Just below the bridge, on the south side, is a path by which one may descend to the bottom of the gorge and, if the water is not too high, follow its course, dry shod, to another large falls just above the suspension bridge. Below this falls is a great pool that in recent years has been a favorite swimming place for the Summer Session students. This pool presents a quite animated appearance on a hot July afternoon, when a hundred or more bathers and divers may be disporting themselves at the same hour.

Farther down the gorge is the lower trolley bridge, from the side of which the brink of the Ithaca Falls is visible, as is also the entrance to the famous tunnel constructed by Ezra Cornell. The more adventurous may find the lower end of this tunnel and thus gain entrance for an exploration of its length. It will then be noted that the roof of the tunnel is formed by a durable stratum of sandstone, while the passage itself is cut through friable shales. It remained, however, for Ezra Cornell to see how feasible and economical this relation of the rock strata made such an engineering project, and also to carry out the plan.

From the brink of the rock wall, above the Ithaca Falls, Cayuga Lake is once more visible and invites a voyage on its waters. If one yields to its

lure, bear this warning in mind (the only lines in this volume printed in black face type): **Do not venture on Cayuga Lake in any craft that is liable to upset from its own crankiness, from waves or wind, unless you are willing to wear a life-preserver that will support your inert body indefinitely.** It will not avail that you are a strong swimmer, the open waters of Cayuga are almost icy cold the year round and soon numb the efforts of the most hardy. Hence almost every year is marred by one or more tragic drownings.



CAYUGA LAKE FROM RENWICK PIER

In summer, daily steamboat service is available to points on the western side of the lake near Ithaca, occasionally an excursion trip is made to its northern end. On a bright, warm day either the short trip or the long trip is extremely enjoyable, especially if a stop for dinner is made at Glenwood Point or at one of the other hotels along

the shore. From Glenwood one has a very impressive view of the university buildings crowning the heights above the town.

But the main objective of a trip down Cayuga is the Taughannock Gorge and Falls. If the steamer service is not available to its lower end, the gorge may also be reached by rail or road at its head. For those who love a scramble, however, the climb up the gorge from its lower end is much the better way to get a proper conception of its phenomena.

The beginning of the gorge, down stream, is marked by a very pretty, though low, waterfall over the Tully limestone. Just above this point the black cliffs of the Genesee shale begin to rise on each side and shortly attain really grand aspects. Canyons in the western plateau districts of the United States present sheer cliffs of much greater height, but the Taughannock development, occurring in what is, in general, a placid agricultural country, gains in impressiveness by this contrast with the normal scenic aspect of the region.

Although the gorge is of considerable width, the stream, flowing from side to side over its bottom, forces the path at times to slippery ledges, so that the climb up the mile or more of distance to the foot of the big falls is not without its minor thrills. For most of the way the gorge sides are forested but, at its head, the site of the falls is marked by a great open pit, where overhanging rock walls rise on either hand, bare and black, to

the plateau level some three hundred to four hundred feet above. Into this plateau level a smaller, upper gorge has been cut by the stream, and from the end of this upper gorge the waters plunge in a vertical fall of some two hundred and fifteen feet, or about forty-five feet "higher'n Niagara" in the local phrase. To get a vivid sensation of the actual scale of the place it is necessary to approach the foot of the fall quite closely and then look up. Thus the observer becomes aware of the insignificance of his own stature and the cliffs take on menacing proportions. But the falls themselves are lovely, and in a different way from that of other cascades in the region because of their straight descent. Seen from above, framed by the forest greenery, they make a notable picture.

Three other gorges, and their included waterfalls, deserve especial mention in this account: Buttermilk, Enfield and Watkins. The first two of these have been purchased and made accessible to the sightseer by a public-spirited citizen of Ithaca—Mr. R. H. Treman; the third is now a New York State park. All three are easily reached by motor, over fine state roads, at distances of approximately, three, seven and twenty-five miles, respectively. Buttermilk can be explored in the course of an afternoon's tramp from Ithaca, it is sylvan-dell like in its several reaches and contains many interesting pot-hole cauldrons. Enfield is the wildest of the gorges in the region, its pristine conditions are practically untouched, it, no doubt, will best please the romantic nature lover. The

exceedingly straight chutes, with sides determined by joints in the bed-rock, of the upper gorge, are a very unusual feature in gorge scenery; and the view from the great Lucifer Falls, a vantage point that can be attained with perfect safety by those who are not made dizzy by great heights, is of exceptionally impressive sweep. Watkins Glen, with its concrete walks and iron railings, gives opportunity to view typical gorge scenery of the Finger Lake country to those who from age or infirmity are not equal to the task of scrambling through the less improved occurrences. The peculiar feature of the Watkins Glen is that the water channel, in characteristic stretches, is confined to narrow, spiral grooves, and these in turn are quite uniquely fluted.

It will be noted that each of the gorges has features not duplicated in the others, and that is a hint of the further resources of this kind that the region holds in store for the enthusiastic tramper, who may wish to find places less generally known than those cited. Practically every stream of the region, in descending to any one of the lake levels, flows through one or more rock glens. Merely as a suggestion along this line Lick Brook, Coy Glen and the headwaters of Six Mile Creek may be named as worthy of the beginning efforts in a systematic searching out of such places. It may also be hinted that some of these streams yield fine catches of trout to the competent fisherman, to say more would be telling.

Only a few miles distant from the campus are

two quite prominent hill summits, Eagle or Bald Hill to the southeast, and Turkey Hill to the east. Both these afford magnificent views of the country to the north, including the university site and the lake basin. Farther afield, to the south, are other still greater heights that will afford recompense for more ambitious climbs in the wider prospects over hill and valley that are opened up from their summits. On such slopes, too, the arbutus blooms in early spring and, at the end of June, at particular spots, the laurel provides a very riot of beautiful blossoms.

For those who do not wish to indulge in the cross-country tramping that hilltop objectives entail, smooth going is available to a number of points of considerable interest that also have the merit of providing a pleasant outlook all along the way. Perhaps the finest is the walk across Cornell Heights suburb and the Cayuga Heights Village residence section to the state road that parallels the crest of the east valley slope of Cayuga. This gives many fine views up the valley, over the city, and down the lake; makes one envy those who have their abodes placed on the jutting points that command both these outlooks. It is a walk to take in late afternoon for then one is almost sure to surprise a fine sunset, for these come frequently and are famous for their display of color. Other easy walks are through Forest Home village and up the Fall Creek valley to Varna, the one south along the Six Mile valley on the road that continues the State Street highway, or to go out along the Tru-

TAUGHANNOCK FALLS

IN ENFIELD GLEN

mansburg road on the west side of the Cayuga Valley.

For the autoist the trip to the George Junior Republic, an institution of national fame, to Dryden, to Cortland and thence on to Homer is to be especially commended for its beauty and wide extent of view all along the route. Homer is the birthplace of Andrew D. White, is also the home of "David Harum," and has many fine bits of colonial architecture, particularly doorways. Other trips that find especial favor are those to Groton and Auburn by the side of Owasco Lake, to Brookton where there is an old mill and some picturesque houses under grand elms, to Slaterville Springs, once a famous resort on account of its mineralized waters that have the peculiar property of giving a metallic iridescence to glass articles immersed in them for a time; and the hackneyed, but always worth while ride to Watkins. In fact, a tour of the whole Finger Lakes district will be found interesting, and varyingly so, every mile of the route.