"In the Country" by Robert Todd – published in the *New Boston Bulletin* in 1998

In the COUNTRY with Robert Todd

Tree-mendous Trees

It was my deep emotional attraction to trees, forests, and woodland creatures that prompted a quick "yes" to the editor's request to write this column. So, despite my lack of journalistic experience, I have agreed to write regularly on general subjects relating to land and man's use of the resources on the land.

As the title indicates, I plan to feature large trees and their value in the first series of articles. Since early teen years my life has been influenced by fascination for nature. The forest was where I played as a child, then as a teenager I enjoyed doing forestry work on the family farm and in the Town Forest as part of the high school agricultural education program then offered in New Boston. This influence eventually led me to college and graduate training in forestry and resource management. Though my entire working life has centered around natural resources, I am still greatly inspired, awe struck, and at the same time satisfied by this association of stewardship.

Of particular interest to me, and to many others with similar interests, has been finding and gawking at big trees. Whenever travelling to distant parts of this country, I have always been drawn by seemingly magnetic forces to the biggest trees in the area. The giant sequoias on the slope of the Sierra Nevada, the massive redwood in the Muir Forest, and the Douglas fir spires reaching into the foggy sky of the Pacific Northwest have all been indelibly etched in my memory. The experience of standing under the vastly spreading crowns of live oak trees found in the deep south, some covering more than two acres, has been one of the most humbling of my life. The feeling induced by gazing on these wonders is, to me, beyond compare.

New Hampshire is not widely known for its "big trees," but I have seen trees here which are no less alluring and awe-inspiring than those described above. I have had the thrill of finding and measuring a state champion swamp white oak tree on the property of a client in Swanzey. The measurements required for the National Register of Big Trees, sponsored by the American Forests organization since 1940, were made and reported to the state sponsors of this nationwide program. The cumulative sum of three measurements—diameter, height, and crown spread—is the score given a particular tree. The oak in Swanzey scored higher than any other of the species previously reported in New Hampshire.

BRANDY MITROFF PHOTOS

Above: Robert Todd is dwarfted by New Boston's National Champion Black Birch.

Right: Todd (L) and landowner John Palmer with the stately old matriarch.

Similar statistics for all reported big trees in the state are maintained by the University of N.H. Cooperative Extension Service. Through efforts of volunteer community tree stewards, directed by the Extension Service, big trees are located and measured.

Two other organizations, the Dept. of Resources and Economic Development, Division of Forests and Lands, plus the Society For The Protection of New Hampshire Forests, cooperatively sponsor the state program and assist in recognizing the landowners with champion big trees by presenting them with plaques and certificates. The participating organizations also assist in monitoring the big trees. My client was as pleased as I with knowing that a tree on his property was a champion.

I have not been among the fortunate who have seen the black gum trees which have been the subject of considerable press and conversation among scientists and tree lovers, in general, during the past year. A small community of these trees was discovered in a swamp somewhere in Rockingham County. Scientists have learned that these trees are some of the oldest living hardwood trees in the world. Because they are over 400 years old, they would have been large trees when Columbus is said to have "discovered" America.

Notoriety for big trees is something not generally reflected on New Boston. I would bet that very few residents know, or would even believe, that there is a National Champion big tree in the forest on Hooper Hill. As the above pictures attest, a majestic black birch resides on land of proud owners, Heidi and John Palmer. On a recent sunny day the editor, John Palmer and I revisited the matriarch and spent time talking about her and to her in a comforting way. I have to believe that she enjoyed our touching, conversation, and overall examination of her being. Although in the winter of her life, she has managed to maintain dignity while enduring stress from time and the environment.

In many travels through New Boston forests, my emotions have been stirred by observation of notable trees, some of which I want to go back to and measure. Perhaps they will be champions, if not a national champion and if not a state champion, then at least a county champion. The program in New Hampshire registers big trees on a county basis. Any reader who has had similar encounters should be encouraged to make note of giants of the forest and in one's own back, or front yard. I would be pleased to assist with identifying, measuring and reporting big trees in New Boston.

The title for this column was borrowed from the name of a local version of the state sponsored Big Tree Program in the Chicago area. I read of the "Chicagoland's Treemendous Trees" project in an article appearing in my latest issue of the *Journal of Arboriculture*, published by the International Society of Arboriculture. The two objectives of that program were to inform people about the physical and biological values provided by trees, and to develop a catalogue of the locations of notable trees in the area. I believe that the primary benefit of these programs nationwide is the awareness they bring to the public of the broad range of values and meanings that big trees have for the people who notice and appreciate them.

The author, Robert Todd, is a registered land surveyor and forester.

The very first column is not available as a text document so we have scanned the January 1998 column only.

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The Value of Trees (publication date unknown)

As a preface to this essay I want to share an experience that flipped my emotions from being enraptured by the beauty of the landscape to being in deep empathy for the people who are affected by what I saw on the landscape. This occurred on Saturday, January 17, on my drive northerly on Route 89 to attend a forestry seminar. A brilliant sun, not seen for more than a week, pleasantly warmed me as it reflected from the surface of the new snow. Then, I entered the hilly portion of the drive through New London, Springfield, and Grantham and was struck by a great increase in the brilliance of this reflection. For a glorious moment I felt ecstasy! This moment of heightened emotion peaked and fell faster and stronger than an avalanche. I had immediately realized this was the result of the unusual ice storm that put so many people in discomfort during the past week throughout this section of the state.

I nearly lost control of my vehicle when the reality of what I was seeing took hold of my consciousness. Under the glistening crystals of thick ice firmly attached to the tree limbs was a scene I have never before witnessed. The most descriptive analogy I can think of is that some un-godly creature equipped with a huge mower swept over the trees tearing off most of the tree limbs in the forest canopy. Never has my consciousness gone from feeling a great naturalistic value to the realization of a great loss in utilitarian value of trees. Herein lies the theme of this column.

Naturalistic value emphasizes the many satisfactions people obtain from their direct experience with trees and the forest. This value reflects the pleasure we get from driving New Hampshire highways, hiking, camping, and nature observance in the broadest sense. In the narrowest perspective it is the mitigation of personal stress resulting from being in the presence of trees near residences and in urban parks.

The first issue of the Bulletin gives unsolicited testimony to the naturalistic value of trees and the forest. Marie MacDonald's article, Peaceful, Quiet and Just Plain Fun, includes excerpts from student writing assignments. I think it is prophetic that 6 of the 20 students referenced trees and nature as the source of our unique high quality of life in New Boston. These students are obviously aware of the value of trees and the forest. I'll bet they will become sensible land stewards of the future. I feel good about this.

How is this naturalistic value measured? It seems that such intrinsic characteristics are priceless, however people spend a large percentage of their discretionary income on placing themselves in contact with trees and the forest. In large proportion the state's number one industry, tourism, is comprised of this sort of spending. Gas spent on trips to view the foliage, money spent on meals along the way, and finally the expense of overnight accommodations, in summation, measure the value of the forests. This shows that, on a landscape level, there is a way to directly measure the value of the forest that is adequate for making land use policy decisions.

In addition to the naturalistic value, I mentioned that there is a functional value of the forest. Most people realize that the trees in the forest can be harvested and converted to forest products. The value of the tree measured in board feet, cords, or tons provides income to land owners, tax revenue to the town, and a stream of revenues through value added processes right down to the ultimate consumer of the final product. The sum of these revenues is a measure of the value of the forest products industry, the fourth largest in this state. In 1996 New Boston received over $16,000 in tax revenue from the harvest of timber in town. This would indicate that landowners received a total income of about $200,000 from the sale of timber. An adequately stocked forest with white pine and red oak crop trees is capable of producing annual growth increments worth up to $35 per acre.

Trees in an urban or residential setting provide functional values beyond the inherent forest product value. The International Society of Arboriculture has published a manual for plant appraisers entitled, Guide for Plant Appraisal, which is now in its eighth edition. The method detailed in this manual identifies many of the functional values of trees; shade, noise control, erosion control, air conditioning, screening, natural beauty, and wildlife attraction, to name a few.

The use of the "Guide" in shade tree appraisal in this area of state could result in values of up to $36 per square inch of cross-sectional area of the trunk measured at 4.5 feet above the ground. That 12-inch diameter sugar maple tree in your front yard could be worth up to $4000 depending on its condition and location.

In my work appraising trees during the past twenty years, I never cease to be amazed at how much people think their trees are worth when they have been cut by their neighbor, run into by the delivery truck, or damaged from excessive trimming by utility companies. On the other hand those responsible for the action or damage have little regard for the value of the trees in question.

I guess it is my experience and training that causes me to be so sensitive to the naturalistic and functional values of trees and the forest. My heartfelt sympathy goes out to the folks who own trees damaged by the recent unprecedented ice storm in the central part of the state. I congratulate the teachers and parents who have nurtured student awareness of the value of trees and forests. Lastly, I hope that the next time you look at the trees in the yard and in the forest you will think about how much better off we all may be because the trees are there.

A Legacy of a New Boston Native (publication date unknown)

Last fall I was at Katie and Lou Kachavos's home and in the course of our visit Katie told me they were selling beams salvaged from the old barn on their property. The old barn had lost its struggle with gravity while trying to maintain its posture under a load of heavy snow a couple of years ago. We reminisced about the era of its existence from about 1780 until its recent demise. Seeing an opportunity to obtain material for wood carving projects, I tuned out the reminiscence and offered to purchase one of the old beams.

Katie and I went out to an orderly pile of about 25 beams and trusses all that remained of the ancient structure. While examining these hand hewn and mortised pieces, I noticed that some early settler had skillfully cut them "to the line" with his adze. Several species of trees from the old growth forest that covered New Boston at the time of settlement were represented in the pile. White pine, hemlock, white oak, red oak, and chestnut were all resting in the pile, perhaps in the same proportion as they stood in the forest.

The chestnut pieces particularly interested me, not so much for the suitability of the wood for carving, as for the sentiment I held in my heart for this species. I feel that our society suffered an unfortunate loss of the species as a result of the chestnut blight. This deadly fungus disease, like so many others that devastate our resources, was introduced from foreign countries. Chestnut blight fungus is a native of Asia and was probably

introduced on nursery stock. It was first noticed in the New York Zoological Park in 1904, then it spread so rapidly throughout the natural range of the chestnut that in a period of about 30 years the species was eliminated as a commercially valuable tree.

Settlers in New Boston and the southern New Hampshire region were dependent on the many gifts from the fast growing chestnut tree. At the time of New Boston's settlement, the period of 1735 to about 1780, chestnut held a position of dominance in most of the forest. To the settlers chestnut was one of the most favored woods for construction of homes and furnishings. Often the beams, shingles, siding, and inside paneling for a single house were all from this easily milled wood. Split rails and posts from the smaller chestnut trees lasted in the form of livestock fencing for over fifty years. The wood has chemical constituents that resist the break down of wood usually brought on by decay organisms living in the soil and on above ground wood structures. A necessary chemical used in processing heavy leathers was tannin extracted from bark of this tree.

As our country grew chestnut wood was put to its greatest use. Large proportions of railroad cross-ties, trestles, and the telegraph poles that ran alongside were all of chestnut. The Forest Service estimates that, at one time, the amount of chestnut timber harvested was double the amount of white pine and at least equal to all other hardwoods combined. What a tremendous resource this was!

My ancestors were nourished by the many bushels of sweet, wholesome nuts that a single chestnut dropped each fall. So plentiful was this resource that they were used as animal fodder, especially for pigs. Deer, turkey, ducks, geese, bear, and squirrels were fattened on consumption of chestnuts and they in turn supplemented the diet of families fortunate enough to have a hunter in the family.

With my jackknife I sliced across the end grain of the beams to renew a picture of the annual growth rings. The rings were close together and uniformly spaced across the exposed grain representing, perhaps fifty years. This is an observation typical of old growth. I was sure that my chosen beam was from a tree already a large member of the forest at the time my family settled in Nutfield, now Londonderry, in 1720. A quick subtraction from the present dated the beginning of life for this piece wood at about 1580. Katie has knowledge that the barn was built about 1780 and I believe the tree from which the beam was cut had to be about 200 years old. Wow! I was holding in my hand a 400 year old antique. Compelled by the idea of owning such a historic part of the former New Boston landscape, I paid Katie for the beam and with alacrity hoisted it into my truck. It now resides in my barn awaiting a new form at the choice of my carving tools. I hope that I can guide them to a fitting subject. Who knows, this wood may be transformed into an heirloom to be admired for a millenium.

Often, in my walks in the forest, I come upon persistent chestnut sprouts, or a chestnut log lying on the ground, nearly sound underneath a thin weathered cloak. That portion of town called Chestnut Hill is a site well suited to the growth of this species and there are remnants of the chestnut forest still visible to the keen eye. Although the equally persistent fungus disease has eliminated the "tree form" of the plant, it is amazing that the root systems are still vital and support a "shrub form" of growth. It is common to see sprouts that have reached a diameter of 5 to 6 inches before being infected by the fungus that destroys the cambium and eventually girdles the stems. On all such occasions I stop and pay reverent tribute to a species that contributed so much to the life of my ancestors.

I feel deep personal regret that I can not walk through a forest dominated by the once splendid American chestnut species. However, I remain positive about the prospect that the deadly fungus will mutate and become harmless. From the root systems will then sprout a renewed chestnut forest for future generations to enjoy.

PATTERNS ON THE LAND (4/98)

Nearly every day I walk across a tiled floor, most frequently in my own home. I appreciate these 9-inch squares that have been placed by an artful craftsperson to please our eye and to resist our scuffing heels. However, by a habit long established, my eyes focus away from the decorative figures and colors on the tile to the continuous line and grid pattern formed by the edges of the tiles as if they were property lines to be surveyed.

My imagination, excited by the grid pattern on the floor, brings instant recall of similar grid patterns I see from the window of an airplane in flights across the central plains of this country. The scales of these two images are vastly different, but from 30,000 feet the land "tiles" appear to be the same as those at my feet. The floor tiles are a mere 81 square inches in area, whereas the "tiles" on the ground are over 3,000,000 times larger, being 1320 feet square and 40 acres in size. The immensity of the grid pattern, the philosophy behind its origin and the awesome effort involved in establishing the "tiles" has always amazed me.

What I am thinking about is, of course, the Public Land Survey System established by our Federal Government in 1785 as a means to encourage the distribution and settlement of public lands- a way to implement "Manifest Destiny". From my perspective as a land surveyor, the most impressive aspect of this pattern is that it was set upon the land by thousands of surveyors in a relatively short time. It was virtually complete by 1805. This survey system defines land boundaries in all but the original thirteen colonial states and Texas; a system not equaled anywhere else in the world!

Could there be a similar underlying land pattern in New Boston that influenced settlement of the west? There is no such idea held by the surveying community or geography scholars. Boldly, I share with you a premise that the first successful settlement of New Boston was made possible by a survey system that may have been the precursor, by some 34 years, of the Public Land Survey System. Many surveying engagements in town during the past thirty years have led me to this very interesting comparison and discovery.

In the Public Land Survey System (PLSS), the township is the primary division, laid out in a square six miles on a side. New Boston was granted in 1751 with a description that is a square, six miles on each side. So far the comparison shows strict conformance. Secondary division in the PLSS created sections that are squares, one mile on a side. New Boston's development history has no such secondary division. Let's look into this a little deeper before scrapping my premise.

Usually, the public land settlement was on the third level of division, a square with sides measuring 2640 feet. These early quarter sections were called homesteads and contained 160 acres. Proponents of the PLSS reckoned that a 160-acre homestead was needed to support a family in that era of subsistence agriculture. For the most part, settlement in New Boston was upon a secondary division of square lots containing 150 acres, each with 2556 feet on a side. The "homestead" in New Boston is nearly the same size and shape as the homestead in the PLSS. Could it be that people prominent in designing the settlement of New Boston was also principles in designing the Public Land Survey System? This is a question I will leave unanswered for the present.

The pattern of development in New Boston can be traced to an original layout that is unique to our town. No other town in New Hampshire that I am aware of has this pattern so strikingly similar to that of the PLSS. The pattern on the New Boston landscape owes its integrity, to an astonishing degree, to the existence of miles and miles of stonewalls built upon the lot lines. The herculean feat of building these walls overshadows the task of surveying the lines. It is said that a crew of two men with a pair of oxen and a gallon of hard cider could build about one rod of wall per day. By calculation, 35,000 crew days were required to build the walls marking the original lot lines. In addition, 35,000 gallons of cider would have been consumed, enough to more than fill

one of the Fire Department's cisterns. Could our ancestors have left a better monument to their hardship and privation?

We all acknowledge that a great amount of land subdivision has occurred in town during the past thirty years, without doubt more than the sum of all subdivision during the previous 200 years. I was astonished to learn through my work that there is still one, and only one, original homestead lot left intact. Original Lot 53 has never been subdivided! It was reserved by the town and given as an incentive to bring the first minister, Rev. Solomon Moore, in 1768. To the best of my knowledge this lot was the home of no other than the Moore family. Today the lot is managed as woodland. There is no building on the property, only the stone foundation that once supported the home of the last resident, Ann Moore, whom sold to McCurdy in 1852.

Aside from what forestry and other natural attributes Lot 53 may have, It has also unequalled historical and cultural values relating to the lay out and settlement of our community. It is my sincere wish that this property will score highly in the Forest Land Evaluation and Site Assessment (FLESA) and that it will catch the focus of efforts to maintain its unique value.

You should applaud the Planning Board, Forestry Committee, and Selectmen for appointing a committee to initiate a FLESA. Out of this study will come an inventory of parcels that have outstanding forestry and wildlife attributes. The inventory will be incorporated in a report to the Town with recommendations for maintaining the special values on these lands. This is sorely needed now that we anticipate considerable fragmentation of forests for residential use. More to come on this.

Our Survival Depends on Trees (5/98)
Original title: LOOKING BEYOND THE TREES INTO THE FOREST

Single trees and small groups of trees in our yards add much to the value and enjoyment of our property. Most homeowners I know in New Boston acknowledge this fact. However, owners of older homes may benefit more than new residents living on properties recently extracted from the forest environment. The benefits from shade trees on old and new properties are out numbered by the many benefits derived from a forest of trees.

It is common and pleasing to see one hundred-year-old sugar maples that have grown magnificently on the grounds surrounding old homes. Some are said to have been planted to memorialize a birth, a marriage, or a death in the family. As such, these plants become spiritual symbols of human life and link one generation to another. My favorite lawn tree is a sedate eastern red cedar well over a hundred years old. Aside from its graceful habit and uncommon occurrence, I feel a kinship to the life it represents. This sentiment arises whenever I look at the early photographs found in my attic. Several show members of my ancestral family gathered near this tree, a particularly slow growing species. One of my favorite pictures shows my grandfather and great-grandfather with a team of horses, and the cedar tree clearly visible in the background. It is when I look at this still vigorous tree and think about my great-grandfather (he died in 1917 at the age of 94) standing in the same spot, that I feel human mortality is transcended to a small degree.

Not only do trees deeply impact our moods and emotions; those precious plants sharing our immediate living space also contribute much to our comfort and health. The shade provided by the sugar maple on the west side of my house cools the rooms, and I believe saves me the cost of running the air conditioner on those scorching July days. The Norway spruce and white pine trees I planted between the barn and the house have effectively blocked the north wind that once drifted snow in my driveway. I believe that these dense limbed evergreens reduce the cost of heating my house. With little care from me the trees near my house continue to hold down my overall oil and electric bills, year after year.

Although my "urban" trees are not part of the surrounding forest, they provide high-rise apartment dwellings for several bird species, the companionship of which my wife and I greatly enjoy. I am not sure that I can rank the natural beauty of my trees with the other benefits they provide, but the brilliance of fall colors captures full focus of our sensibility during the season.

Those who live in new houses must be patient with the trees in their yards. These trees have been subjected to numerous stress factors and years will pass before they adjust to the much different growth conditions in the lawn and backyard. In the forest, trees share root systems with surrounding trees. These trees no longer benefit from such underground support systems. In fact, they probably must overcome damage to their root systems from cutting and filling of earth, and general excavation necessary for construction of the new home. Because these trees grew from seedlings in a dense forest environment, the crowns are adapted for survival under those conditions. For the crowns to develop a structure typically expected of a shade tree will require much time and care.

From the forest, a community of trees and associated plants, come benefits that cannot be provided by the trees on our small backyards and lawns. You and I enjoy these economic and social benefits of the forest with relatively small investment. My column in the February issue of this paper covered the economic contribution of the forest to the economy of this State and of this community. You may recall that the forest products industry is the fourth largest in the State. Further, more than $200,000 worth of timber is harvested annually in New Boston. This annual harvest generates tax revenue for the town and supplements landowner incomes.

One of several inherent forest benefits is the reduction in air pollution directly attributable to trees. On a personal level, I appreciate the trees and shrubs along the gravel surface road near my house. In the summer, we like to open doors and windows, and this is when the road surface is the driest. Passing 10-wheeled trucks can raise thick choking clouds of dust. A large amount of this dust is filtered and gathered by leaf surfaces and is washed to the ground by summer showers.

On a regional level, trees remove gaseous pollutants from the air by absorbing them through pores in leaf surfaces. Natural growth processes take up carbon dioxide, and as part of these same processes, trees release oxygen for us to breathe. The United States Forest Service has published documents claiming that, on a daily basis, one acre of forest can produce enough oxygen to sustain eighteen people. Human respiratory disorders are caused by the increasing emission of sulfur dioxide, hydrogen flouride, ozone, methane, nitrous oxides, and chlorofluorocarbons from urban land uses. The air purification benefit provided by a forest is perhaps the most effective defense we have in protecting human lungs from these dangerous gases.

We hear a lot about the greenhouse effect and that carbon dioxide contributes to about half of the phenomenon. Although all experts do not agree with Al Gore on the seriousness of the greenhouse effect, they do seem to agree that forests worldwide act as a carbon "sink" by removing carbon dioxide from the atmosphere and storing it as cellulose in the woody mass. The management of forests to regulate the climate may become necessary for survival on this planet.

The modification of local climate by the forest is a benefit we can experience personally. I enjoy stepping into the forest during the months of July and August and feeling an immediate 10-degree drop in temperature from that experienced outside the forest. This benefit becomes increasingly important as urban land uses continue to merge and become continuous from one node to another, such as in the Nashua to Manchester corridor. Hot summer days in this area must be quite uncomfortable for those who spend their time outside. As for me, I prefer the forests in New Boston.

The plant diversity found in a forest provides habitats for wildlife species that cannot survive in an urban environment. The pleasure of encountering wildlife in the forest is one that I cherish. Memories of coming

upon a fawn lying in a hemlock thicket, of watching a clutch of wood ducks emerging from a tree cavity to follow their mother on the water of a beaver flowage, among many other encounters, remain among those most vivid in my mind.

While studying at the University of Massachusetts in 1970-71, I learned a basic principle of ecology relating to urban development and environmental quality. Simply stated, the principle is, as more of the landscape is covered with pavement, roofs, and other impervious surfaces, the greater becomes the high flow in streams during storms and lesser become the low flows during drought. As a result, streambanks erode to gouge channels wide enough to accept the higher flows, an unsightly and unstable situation. Flows in the summer become so low as to render streams useless as fisheries and as recreational resources. The most recommended remedy is to establish strategic greenway borders along perimeters of all wetland resources. This demonstrates a great role that forests can play in diminishing the negative impact of urban run-off. In short, forests hold rainfall, like a sponge, to allow slow infiltration into the soil. Then, the water absorbed in the forest litter and percolating through the soil pore spaces is released into wetlands and streams, slowly and gradually.

The New Hampshire Department of Environmental Services has recently published a handbook for use in minimizing the degrading effects of urban run-off upon water quality. The handbook lists the concentrations of heavy metals, fertilizers, salt, petroleum products, pesticides, and harmful bacteria, that are all contained in urban run-off. A highly recommended measure to remove these harmful components is to detain the run-off in ponds and then release it as sheet flow through filter strips, land covered with trees and shrubs. The filter strip effectively and passively reduces the concentration of pollutants before run-off returns to natural wetlands and streams. The implication here is that forested buffers adjacent to and surrounding pockets of urban development may be the most effective means of reducing non-point source water pollution.

However, if the above forest benefits are to be sustained, then there has to be a change made in public policy at the local level. The policy that is decided for implementation should appear as a revision to the New Boston Master Plan. It is imperative that the new policy ensures a balance between, (1) the land required to meet the needs for housing and other urban land uses, and (2) the forestland needed to maintain the social, economic, and ecological benefits that we expect. Although such a balance may shift over time as technology and human values change, the challenge cannot be rationalized or avoided. Further, we should not be lulled into ambivalence by what seems to be an abundance of forest in 1998. Conversion from forests to urban land use is certain, quick, and predominantly irreversible. When will one more residential lot cleared from the forest result in a level of economic instability and environmental degradation unacceptable to our community?

THE FACE OF NEW BOSTON (6/98)

The landscape, politically bounded as the township of New Boston, has features that are as unique as the features on my face and yours. Just as the features on our faces are used to identify you and me, so do the features on the face of our town make it distinct from Goffstown, Bedford, Mont Vernon, Lyndeborough, Francestown, and Weare. Our distinct facial morphology is the result of evolution and genetics over more than four million years of human ancestry. Landscape morphology in New Boston is the result of forces that have been at work since the origin of the earth 4.5 billion years ago (for perspective consider that one billion seconds is equal to 32 years).

Although the faces of all human beings have the same features, eyes, ears, nose, lips, and cheeks, each face has them arranged and sized in a unique way. The landscape features common to the towns in this area include drumlins, kames, eskers, kettle holes, bedrock knobs, and outwash plains. These features were laid down on the earth's bedrock skeleton by periodic glacial activity ending about 10,000 years ago. Each town has its own diversity and abundance of these features creating a very distinctive "face". The character of these

features influenced man's use of the land. These land-use patterns are the "makeup" that accentuates the features of New Boston's face.

Drumlins are one of the most common landscape features in New Boston. The name of these features sounds like they are a Walt Disney creation, but actually, they are one of the oldest landscape features dating back more than 2 million years to the beginning of the ice age. The great glaciers bulldozed the drumlins reshaping and compacting the soil. On these low, hogback shaped hills, elongated in a northwest-southeast orientation, the early settlers cleared the forest and established their farms. Within my memory, there were many New Boston farms depending on the drumlin landform for an agricultural resource. One of the most visible drumlins in town is located near the intersection of Tucker Mill Road and Route 136. The Dodge Farm uses this as pasture and for crop production. It is particularly beautiful because it is open and readily observed by travelers on Route 136. Brown's Hill north of Beard Road was known as MaPaDot Orchards and had a long history of apple production.

The farm now occupied by George Daniels also has a very visible and pleasing drumlin situated between Bunker Hill Road and Colburn Road. Until recently, this drumlin was used as a pasture. The following can also be characterized as drumlins: South Hill, Hooper Hill, Wilson Hill, Clark Hill, Meetinghouse Hill, and Cochran Hill. Sited on all were many farms important in the history of our town.

Presently, the drumlin features contribute greatly to the rural character and identity of New Boston. I wonder if the most visible of these features will continue to provide this social value. Not only are these hills pleasing to look at and to look out from, they are also attractive as homesites.

Eskers are relatively new features on the landscape, having been laid down by streams running through cracks in melting glaciers. This landform is comprised of sand and gravel deposited in long serpentine ridges with a near knife edge crest and very steep sides. Walking along the top of an esker, as well as being physically challenged in climbing "on all fours" to its crest, always amazes me. New Boston has, or had, one of the longest esker trains I am aware of in this part of the state. With minor gaps, this esker train runs from the Lyndeborough line near the southwest corner of town, parallel with and adjacent to the Piscataquog River, to the intersection of Gregg Mill Road and Route 136 near the Byam farm.

Sand and gravel in the eskers is an important source of construction material which has contributed greatly, and until it is totally removed, will continue to be a positive factor in the local economy. Luckily, not all of this feature will be removed. Long segments of the esker lie on properties subject to conservation easements. These easements have clauses, enforceable by law, that prevent removal of the soil. Therefore, future generations are ensured to have the same thrilling experience of walking an esker.

By far, the most prominent landform in Town is Joe English Hill. By reason of its visibility from most perspectives, I think of Joe English as the nose on our topographical face. My wife remarked that it even looks like my nose. I was not offended by her comparison because we are privileged to be in the presence of such a rare landform. Although bedrock knobs are abundant features, this highest hill in New Boston is a special form of bedrock knob. Geologists have given this type a special name, ***roche moutonnee*** (rosh moo-to-nay).

Moving over our special hill, ice sheets a mile thick scraped and pulled at the bedrock structure giving it a smooth rounded appearance on the northwest and a high cliff face on the southeast side. Granite blocks, some the size of houses, plucked by the glacier from the cliff face, are strewn for miles along its path to the southeast. The sculptured result is a magnificent resource.

Travelers approaching New Boston from the air, or along any road from the south, sense the beauty of Joe English. In the fall, trees on its slopes adorn colorful cloaks enjoyed from afar. Up close and personal, the crest of the hill reveals views that will render hikers more breathless then from the exertion of the climb. I

cherish the view to the ledge face from the fields of the Barss Farm on Joe English Road. It is fun to hear your own loud whistle or hoot come back in a few seconds as an echo. Often, the ledge face is scaled by rock climbers, a terrifying thought by one who favors *terra-firma* (the firmer, the less terror).

Crags in the cliff create a bird nesting habitat not found for many miles around. Species that would find this habitat attractive include: osprey, bald eagle, American kestrel, and the rare and endangered peregrine falcon. Although I have never seen any of the species in this list at the cliff, I have observed many swallows, probably barn swallows, surfing the wind currents in front of the cliff.

Personification aside, we should be aware of the contribution these physical features make to the quality of life we enjoy in New Boston. Until these features are re-shaped by the next ice age, let's use our land in a way that will sustain the inherent values of our "face" so that our descendants will also benefit.

TO CATCH A FROG (8/98)

"Dear Grampa,

I am trying to catch a frog. If I do you should come over and check it out. I am going to school and my mom is going to pick me up, then I will have lunch, then I am going to try to catch my frog. I hope it doesn't get killed. I am going to set up an aquarium and put it in the living room and I am going to feed him bugs and I am going to put water and grass in the aquarium and a rock for the frog to sit on. Good bye."

This message was recently delivered by "email". It was dictated by my special, almost 6-year-old, grandson and typed by my daughter. I was deeply touched by this message, as much by the content as by the greeting. This child is focused on the wonders of the natural environment. He is particularly enthralled by the creatures he finds in wetland habitats.

Last summer he shocked his parents by pursuing a northern water snake into a stone retaining wall on the lakeshore. This snake is perhaps the most aggressive native species and will strike anyone causing a threat. In this encounter, Tyler received a bloody wound as he reached into the void in the wall where the snake had slithered. The profuse bleeding and Tyler's shrieks frightened his parents even more than it spooked him. The amazing result is that he has no lingering fear of handling the amphibians that fascinate his imagination.

My observation of Tyler's intense attraction to frogs, salamanders, snakes, turtles, and other wetland creatures, causes recall of my own childhood. I was also attracted to the creatures and plants found in such rich abundance in wetland habitats. This early interest in plants and animals, that part of nature repulsive to most young people, led to a life-long interest and a career in natural resource management.

One rhetorical question came to my mind while pondering my grandson's message. How many Tylers will it take to raise the consciousness of our community to the level that all the functional values of wetland systems are recognized and protected? I am certain that the level of awareness attained to date and the measures currently used to manage wetland systems will not long preserve these values.

This prediction is not mine alone, for the "1997 Report of Ranked Environmental Risks in New Hampshire" states that of over fifty environmental risks analyzed, out of the top ten in the ranked list, five involved loss, or degradation of open space, forests, shorelines, and wetlands. This is not an alarming statement when we imagine the change in land use, during only the next twenty years that will be brought on by

population increase. The Office of State Planning predicts that our County will have 130,894 more people sprawled on the landscape by the year 2020, an increase of 38% over today's population density.

What are the practices in place to preserve our wetlands and how are they inadequate? To be blunt, our land use regulations act to preserve the space on which the wetlands are situated, but do not work to sustain the functions that wetlands provide. In effect, our community ordinances and state laws require landowners to draw a line around the wetland on their property, then the mandates restrict passing over these lines with proposed land uses. However well-intended our ordinances and laws may be, the qualities they are meant to protect will disappear soon after land development occurs up to the jurisdictional line around the wetland sites.

As an example, I offer a hypothetical situation that I have often witnessed. Lets assume the existence of a marsh adjacent to a pine and oak forest. A landowner obtains a permit to develop the site for a commercial establishment with a large parking lot. There is not a lot of room on the property, so the forest is completely removed and a paved parking lot is built up to the wetland line. Within a short time, the scenario is duplicated on the opposite side of the wetland. We recognize this picture as part of the normal process of urbanization in accordance with land use regulations.

Let us now examine the consequences in my example. Progressively, the wetland values, meant to be protected by our ordinance, will disappear just as effectively as if the stream had been sealed in a pipe and the wetland filled for use as parking. It is easy to understand several of the consequences. First, the removal of trees eliminated shade. Secondly, the parking lot increased the run off quantity and added polluting materials to the runoff. Third, use of the area by our native wildlife species that are dependent upon wetlands is greatly diminished. The travel corridor adjacent to the marsh once used by the larger creatures is gone.

The cumulative effect of the first three changes in my example bring on a fourth change--that being related to vegetation in the wetland. Where there was once a diverse mixture of native species of herbs, grasses, sedges, and shrubs, we see now a solid stand of Common Reed, Phragmites communis, sometimes growing to a height of fourteen feet in disturbed wetland areas. Or, another undesirable species called purple loosestrife, Lythrum salicaria, may colonize the wetland and completely dominate the site. This species, a native of Eurasia, has a profuse purple flower appearing in late summer (see the July issue of this column for more information about this habitat-altering invader).

The four changes in my example are some of the most obvious, but are not all of the changes that work in cumulative ways to destroy most of the wetland functional values. Not withstanding the well-meaning purpose statements in our ordinance, the mandates in the ordinance only work to prolong the painful death of our wetland systems. I do not have the space in this article to explain how this happens, but I know the result is certain.

This essay is not meant to be a criticism of the conservation effort by this community during the past twenty years, for we have done much. Reticence on my part, for not sooner advocating a change in the ordinances, casts guilt upon me as much as anyone in the community. We can rationalize by acknowledging that awareness of wetland values has only recently been elevated; further, the science of wetland management and preservation is very new. However, we must recognize that the rules and policies currently in effect will not be adequate during the next twenty years in this rapidly urbanizing community.

The Tylers of our community must lead the way in applying new science to management of our wetland ecosystems. A revision of our Master Plan and Land Use Ordinances may then truly effect the results given only "lip service" in the purpose statements appearing in these documents.

A Pharmacy in the Forest (9/98)

"Take a handful of ground willow bark in warm water and call me in the morning". This may have been regular advice given by early Native American medicine men. The same advice given in this age has become a cliché; "Take two aspirin and call me in the morning". There is probably no more common remedy than aspirin, but few know its origin to be the willow tree. Since the beginnings of civilization man has looked to trees and other plants for medicine to cure his ills. At present, some of our most important medicinal constituents are tree products. However, the pill formulations and fancy packaging obscure the origin of prescription and non-prescription remedies alike. The role of trees in our health is not common knowledge, even in the minds of plant people, myself among them.

When I head off into the forest in the morning, thoughts about the role of trees in the treatment of human ailments is way beyond my consciousness. I am focused on my goal for the day, it usually being to recover property corner evidence, or to examine a client's woodlot for harvesting potential. My thought process centers on how to get the job done efficiently and without being injured or exposed to plants that cause unpleasant, itchy skin irritation.

A jab in the eye from dead hemlock branches has, on several occasions, caused loss of work production while the sensitivity and soreness healed. Fortunately, no permanent damage resulted. Several times a year, it is necessary to fetch around in poison ivy for an iron pipe marking a property corner. It seems that the most likely place to find property corner markers is in the thickest growth of poison ivy. The skin blisters and accompanying itch from poison ivy exposure are minor symptoms compared with those from poison sumac exposure. It is less frequently that I encounter this wetland shrub that emits the most potent of skin irritants. The blisters raised on me are usually 2-3 inches long and an inch wide. These generally break in a day or two leaving a large sore. Scars from these are long lasting.

Woodland travel is imperiled by the presence of mountain laurel tangles and hobblebush thickets. I have taken many bone jarring, muscle pulling falls caused by these plants grabbing my feet and hanging on. Black locust and hawthorn trees have some of the longest and sharpest thorns of any plants in the country. These are capable of tearing clothing and digging deep into flesh of unwary persons. It is understandable then that I think more, on a daily basis, about averting dangerous plants, than on the value of plants to my overall health.

Some recent readings about the importance of plants to modern medicine have helped me set aside negative thoughts about the dangers of plant encounters. Sharing information on this subject with readers may be enlightening to all. This subject has not been part of my training, or experience. Therefore, I draw upon two texts that I recently acquired. The first, Know Your Woods: A Complete Guide To Trees, Woods, And Veneers, by Albert Constantine, Jr. has an entire chapter on drugs from trees.

Constantine surprises me with his statement that White Pine bark is used as an ingredient in cough syrups. Further, a derivative of the bark is used in the treatment of bronchial afflictions. I will certainly have more respect for the pungent and sticky pitch that covers my hands after clearing a survey line through a white pine thicket. This author also gives me reason to value even more highly the beautiful white oak trees that stand guard along the Piscataquog River along Route 13. According to Constantine the dried inner bark is used to formulate externally applied medicine known for its astringent properties. I had to look up the word, "astringent", and found that it means to "pucker up" tissue, probably the same way that a styptic pencil stops bleeding from razor nicks.

Constantine goes on to list the value of Sassafras extract as a diuretic. I did not know what this meant either, so on checking Websters I learned that a diuretic causes an increase in the flow of urine. Sassafras is a common tree in southern New Hampshire and has a distinctive leaf shaped like a mitten. Bark and leaves of young

growth have a strong, pleasant aroma when crushed. As a Boy Scout, I learned how to make tea from Sassafras root bark. Now I know why I had to jump out of my sleeping bag during the night and make a beeline run to the latrine. Somebody should revise the Boy Scout Manual to address the side affects of drinking Sassafras tea.

Another common species mentioned in Constantine's book was Black Cherry. Apparently, the bark yields hydrocyanic acid that is used in the treatment of bronchitis. However, I would be real cautious about this one. The letters c-y-a-n in hydrocyanic are real close to making the word "cyanide", a deadly poison. Furthermore, my grandfather always told me that livestock might die from consuming wilted cherry leaves.

Many more surprising facts about trees and medicine were revealed in Natures Services: Societal Dependence on Natural Ecosystems, edited by Gretchen C. Daily. Some of the most amazing I will quote. "One in four medicines and pharmaceuticals owes its origin to germplasm materials or other vital products of plant species"(263). "Plant derived cancer drugs now save around thirty thousand lives in the United States each year with annual economic benefits estimated to total $370 billion dollars"(264). This information may lead one to conclude that forests may be liquidated for the production of medicinal extracts. However, most plant origin drugs are readily duplicated in the laboratory.

The potential for the use of plants as medicine seems immense. There are hundreds of plant tissue extracts waiting for discovery. I think this is a great argument in support of forest management to maintain biodiversity (maximizing the number of species grown in a forest). One major consequence of losing plant species through extinction is that potential cures may be lost. Medicines to combat a disease currently unknown to man may come from one plant extract. If that species of plant becomes extinct, then it seems the disease may spread unchecked with unimaginable suffering and loss. AIDS is a disease that has become epidemic in some countries. "Three promising responses to AIDS are derived from plants"(Daily 263).

Learning more about man's dependence on plants for health has strengthened my connection to plants. The next time my body becomes torn, or bruised by trees in the forest, I will take solace in knowing that I can go home and use medicine that may have come from the same species of plant that caused my pain. I do not remember looking at the ingredients in Olbas, one of my favorite remedies. What I recently found on this label was a convincing testimonial for the plant kingdom. The main ingredients are: eucalyptus, wintergreen, clove, menthol and oil of turpentine (all are plant derivatives).

Umbrage For Tradition Broken And Praise for The Soil (10/98)

There was no harvest at Todd's Corner this summer! No luscious tomatoes, no tasty corn, and no juicy sweet cantaloupes were picked to thrill the taste buds residing in the neighborhood. No intensely colored and beautifully shaped flowers were cut from that garden to adorn our dining room table. This Fall, there are no pumpkins for the grandchildren to reincarnate as Jack-o-Lanterns for Halloween. I do not expect this lament to be as saddening to readers as it is to my neighbors, family, and especially, Laura and me. Though, I am quite surprised by the number of people that noticed the change in the landscape and made comments about their feelings. Some made sorrowful remarks and others were jubilant that I had relieved myself and my wife from the hard labor gardening represents.

I have to admit that the respite had its benefits. Without the garden, we had more time to enjoy family affairs and personal times in which we probably would not have indulged. However, my feelings about the garden are deeper than those related to taste, as in food, and aesthetics, as in the beauty of flowers. There is a burden of guilt that I have to bear for breaking a tradition that has great cultural significance (not as in tillage of the soil) to my family and friends. Four generations of my family have gardened continuously on that 50-foot wide by 150-foot long plot of land for at least one hundred and forty years. My heritage relates as much to that plot of ground as it does to the house in which I live.

The memories I have of my grandparents and even my father are associated with gardening. My earliest recollections are of helping my grandfather plant seeds, perhaps that experience planted the "seeds" of attitudes and perceptions I hold about land use and the environment. I even gave up bike riding and baseball for the opportunity to ride the huge brown horse, named Jerry, that my Dad hitched to the cultivator. He did not have a tractor until I was in my mid-teen years. During the ensuing few years when I was away from home, the garden did not grow as many memories for me until I worked in it alongside my Dad, in his "autumn" years, and with my own son and daughters, in their "spring" years. Three generations working in the garden at once created special memories. I believe that this broken tradition is a spiritual loss more difficult to bear than the physical loss from the interruption of harvest.

This Summer, while enjoying more backyard barbecues than usual, I thought about how hard my father, grandfather, and great-grandfather toiled in the garden to sustain themselves and their families. Then, my thoughts turned away from the people who tilled the soil to the soil itself. These thoughts became very profound as I imagined it possible some elements taken up by beets and carrots were converted to genetic material, upon consumption of the vegetables by my great-grandfather, and passed along in chromosomes through the genetic process to my body. I now realize that I have more than a spiritual link to soil, there is also be a physical bond, I feel it is part of me and I am part of it. For a life time, I too have consumed vegetables from this garden.

The "soil" thoughts continued all Summer, I guess this guilt thing can be pretty big. But, I am now able to rationalize the guilt and think more reverently and respectfully about soil. It is astonishing to behold the functions provided by the soil to mankind as a whole. In concert with the other natural resources the soil sustains life, a fact that is obscured by the general lack of connection between today's society and the land. The soil is a mantle over the earth about 18 inches in depth and is the habitat most taken for granted. With the hope that some awareness will be gained and that some praise will be shared, I shall list the major environmental functions provided by the soil.

The soil's ecosystem functions are interrelated and any attempt to list them separately may be an over simplification. In this column I do not pretend to be a pure scientist, so I think I can get away with some degree of simplification in the interest of understanding.

Modification of rainfall and runoff. A healthy soil layer with a high level of organic content soaks up rainfall, then meters its distribution to plant roots, ground water supply, and streamflow. Without soil, rainfall would run off the earth's surface in flash floods. Consequently, there would be no water to sustain plants, no water in wells to sustain our lives, and no water between rainfall events to flow in streams.

Platform to Hold Up Plants. Most terrestrial plants have their root systems anchored in the soil mantle to hold them in place against high winds and the force of gravity. The importance of this function becomes apparent when you think about the barren landscapes dominated by exposed ledge, or by highly eroded soils. I observe that plants that do become established in shallow soils soon blow over.

Source of Plant Nutrients. This function is chemically complex and relates to the smallest particles in the soil, humus and clay. These particles have an electric charge, usually negative, which attracts oppositely charged ions of potassium, phosphorous, nitrate, calcium, and magnesium (major plant food ions) that are suspended in the soil solution. In exchange for plant food, the soil particles trade off hydrogen and aluminum ions. This attraction between soil particles and plant food ions is the basis of soil fertility and plant growth. Without this function, plant food would leach beyond the reach of plant roots and growth would diminish.

Waste Disposal. All the homes in this community are connected to a subsurface waste disposal system. We all flush the toilet and forget about our waste until the system fails and needs to be repaired. The most common cause of failure is the homeowner's lack of responsibility to maintain the system. If the septic tank is not pumped regularly (every three years is recommended), it fills with organic matter that overflows from the tank to the leachfield. The excessive load of organic matter is more than the system can handle and the waste backs up into the house, or runs out on the surface posing a threat to human health and causing a big repair expense to the homeowner.

Cycling of Major Elements. Carbon, nitrogen, and sulfur are major elements that cycle through plants, animals, water, and the atmosphere. Soil stores much greater amounts of these elements than do the other natural resources. The soil's ability to participate in normal cycles depends on the health of the subterranean habitat. Maximum organic matter content and high populations of soil flora and fauna are critical to this ability. An unhealthy soil environment upsets the cycling of the major elements and can result in surface and groundwater pollution, and on a large scale, an increase in greenhouse gases.

Will Laura and I "pull the plow" next season? I do not know at this time. However, that small plot of land will, forever, trigger deep feelings about my heritage and strengthen my reverence for the soil and our natural resources. I hope that sharing my thoughts and feelings will bring every reader a little closer to the earth, and at a minimum, cause everyone to quit calling soil "dirt".

Pathways to Our Past (11/98)

I walked softly along the ancient highway so as not to disturb its sleeping features. My eyes strained to detect obscure evidence of structures placed by our earliest land developers. My research indicated that New Boston's proprietors most likely built this road during the years prior to the township incorporation in 1763 for the purpose of connecting the village to Amherst, the seat of County government at the time. So that they could sell land and make a profit, the proprietors invested heavily in surveying the original lots and in the construction of roads and bridges. The first settlers needed a road system to "go to market, to meeting, and to worship".

There! I see stones laid upon stones framing a dark opening, from the droppings at the opening I gather that the stone structure serves more as a porcupine den, than as a culvert, its original use. Drainage ditches, dug by hand, are still visible leading to and away from the culvert on opposite sides of the old traveled way. Most of the way, the roadway artifacts are contained within stonewalls, carefully laid up three rods apart, commemorating some early settlers aching back.

On the crest of a small hill I stop to rest and notice that I am standing in a shallow "cut" removed by use of pick and shovel to ease the grade for oxen, horses, and generations of folks travelling afoot. Proceeding to the base of the hill, I notice a "fill" section of the road. It is here that the roadway is most distinct.

My eyes, driven more by imagination than conscious perception, see faintly defined wagon tracks. Can I still make out footprints? Perhaps that slight small depression in the road surface is print of a heel. Could it be a footprint made by one of the New Boston volunteers, Benjamin Wilson, Lewis Towns, or Abner Lull as they trudged southerly along this road, where I now stand, to fight and die in the Revolution? Such imprints were never erased by more modern activity. Indeed, the records revealed that the Town discontinued this old highway in 1850, finding that its function was supplanted by a less hilly and more direct route laid out and constructed to the west, a road now known as Route 13. No motorized vehicles, except those employed in logging activities on the land, have ever passed on this ancient highway.

Recovering from this imaginative inspiration, I went along my way to note observations serving the more practical side of my reconnaissance. Later, I found myself continuing to ponder the significance of the

ancient highway. Where else in this town could I find such ancient artifacts? No other physical feature, built by the hand of man, with such an early origin, has been recalled. The possible exception may be several old mill foundations I have seen, but it would seem that roads were established, by necessity, before mills.

I am relieved to learn that recent events have turned away the need for this ancient highway to be put to modern use. It appears likely that other people will have opportunities to experience the mystery inspired by walking along this old highway.

The subject of my recent study brought on thoughts about the arcane presence of other ancient highways. I concluded that there are only a few in New Boston, which may have such cultural significance. Understandably, I may be one of only a few residents that has occasion to be "touched" by an old highway experience. To see how the town expressed interest in old highways, I reviewed the "Master Plan For the Town of New Boston". This left me with a feeling of grave concern. The chapter entitled "Historic Preservation" does not identify ancient highways as a historic resource. Although these ancient artifacts would, I believe, meet all the evaluation criteria for being historically significant, it appears that we have overlooked these treasures in our land use planning.

My belief in the importance of old highways was recently reinforced while watching television. An ABC News feature by Peter Jennings, on April 4, 1998, with a Jerusalem time line, stated that archeologists had unearthed a section of old road remains about 100 yards long. The road was paved with stones still in place after a span of 2000 years. Archeologists speculate that, since records show the road ran from the Dung Gate at the old city entrance up to the temple, Jesus may have traveled upon the road. The significance of this old road is obvious. New Boston's old highways do not, of course, transcend the importance of that road in Jerusalem. I would say though, that our old highways reflect equal heritage and certainly express the character of New Boston as well as other features identified in the Master Plan.

Standing as a great symbol of an event in American history is the Oregon Trail. This old highway runs from Independence, Missouri to Portland, Oregon. The height of its use was during 1852 when an estimated 50,000 men, women, and children deepened the wagon ruts over Mitchell Pass on Scott's Bluff, Nebraska, on their way to the gold fields. I am fortunate to have stood in Mitchell pass to observe the old road. The feeling that came over me was similar to the feeling I had on the old highway in New Boston. Our old highways are also symbols of American history, but on a local scale. Fortunately, the Oregon Trail lies predominantly on public lands which assures its integrity for future generations. New Boston's old highways, on the other hand, can be physically erased forever by one pass of a bulldozer.

I strongly believe that the old highways in New Boston should be inventoried, researched, and by some means protected as a significant historic resource. Perhaps a preservation effort could be planned and implemented to serve a recreation benefit as well. A hiking trail with historic interest points becomes potentially more of an attractive experience.

Too soon my column-inch allotment has been taken up by these comments on pathways to our past. Therefore, I must continue my discourse on roads in the next issue. You may enjoy reading my next column about a unique road in New Boston that was the subject of litigation decided in the New Hampshire Supreme Court.

Crooked Highways and a Straight Turnpike (12/98)

Most of the highways that comprise our present transportation system, a cobweb network with eight radial threads running outward from the town center, were established during the first one hundred years of settlement. Unlike the roads I described in my last column, our present roads were favorably sited and continue

to serve our society. Over time this network has not been altered much in its appearance on a map. Sure, there have been sections of these original roads that have been straightened, widened and discontinued where modern uses demanded higher standards. There have been several relocations of original roads away from dwellings. The homeowners found that the once convenient close proximity of roads traveled by horse and buggy became an annoyance when traveled by modern vehicles.

Aside from the obvious difference in mode of transportation, the management of our highway network has manifested great change. Originally, the road system was divided into many maintenance districts. Each district had a "highway surveyor" who was responsible for construction, repair, and maintenance of roads in his district. James P. Todd, my great grandfather, was a highway surveyor in the vicinity of Todd's Corner and some of his record books are still in my attic. Judging from the amount of time recorded in the journals for labor, material, and use of ox teams, I would say that road maintenance was once a large part of the local economy.

I do not know when the maintenance responsibility became centralized as it is today, but, I have seen indications that it occurred during the latter part of the nineteenth century. The maintenance of some of our early roads was incorporated into the state highway system and is now maintained by the NHDOT. This change probably followed closely behind the common use of the automobile.

During most of this century, the major road actions taken by Town Meeting related to discontinuance of public highways that were no longer necessarily convenient, such as short streets between two "radial" highways. No significant number of new streets was developed in this town until the onset of our dramatic growth, beginning in the 1970's. All of the highways we now travel were developed by local authority to meet the needs of our citizens, except for one- a road now called the Second New Hampshire Turnpike.

Look over a map of New Boston and note the existence of the Turnpike in the southwest corner of town. The Pike runs northwesterly from the Mont Vernon line straight to the Lyndeborough line. Its siting is not now, nor ever has it been, a route convenient, or necessary for providing New Boston residents access "to market, to meeting, and to mill". Still, it carried regional commerce and was instrumental in the development of those towns through which the Pike passed over in a central transect. Francestown is a good example of a town so fortunately touched by the Pike's location; New Boston is not. Consequently, the Pike was scorned and vilified by New Boston residents and Selectmen alike.

The American Revolution left our Government with diminished financial resources. Faced with the need for economic recovery, the Legislature felt it necessary to facilitate commerce among the regions of New Hampshire. Accordingly, the Legislature empowered private enterprise to build highways, a power previously reserved as a governmental function. The empowerment was through passage of an act on December 26, 1799 that established a corporation entitled, "Proprietors of the Second Turnpike Road in New Hampshire.

The Act authorized the Proprietors to survey, lay out, make and keep in repair, a turnpike road four rods wide running as straight as possible from the Courthouse in Amherst (now the Amherst town office) to the Lottery Bridge in Claremont. The Proprietors were authorized to charge tolls, in amounts set by the act, to all passing on the Pike, except the mail coach and those on way to worship, to mill, or to conduct family business.

The incentives in the Act seemed strong and apparently attracted many entrepreneurs because there were thirty-two similar turnpikes established throughout New Hampshire following the American Revolution. The biggest incentive was the promise of buy-out by the State at any time after 40 years from passage of the Act (the earliest buy-out for the Pike would have been December 26, 1839). In the Act the State agreed to repay the Proprietors all money expended by them, plus 12%, minus the actual tolls received. What ultimately happened may be one reason that our State Government reflects antipathy today, in the eyes of some. On June 4, 1837,

the Legislature audaciously repealed the Act, only two years before the Proprietors could cash in on their investment. I wonder how many investments became worthless by the State's broken promise?

Anyone should guess the next turn of events in the life of the Pike. The Proprietors closed up shop and abandoned the business! In effect, there was a road in appearance, but it had no status upon the instant the Turnpike Act was repealed. Therefore, there was no maintenance applied, and although still traveled, it soon became nearly impassable. Each year following the abandonment, the Town Meeting considered warrant articles "to see what the Town will do about the Turnpike Road". Each article was passed over by an unsympathetic body of taxpayers and nothing was done.

Soon, several people in town, inconvenienced by the impassable condition of the former Pike, petitioned the Court of Common Pleas to force the Town to maintain the road consistent with that on other Town roads. The Court of Common Pleas found the Town was not liable for maintenance, but the petitioners persisted in an appeal to the State Supreme Court where it was heard in the December term of 1840. I read the surprising decision and was amazed to see the amount of English case law used to support the arguments. I suppose that our country was so young that American jurisprudence in this area of law may have been totally lacking. My short take on the decision is that the Court found the road had no public servitude after the repeal of the Act, therefore New Boston had no obligation to repair it. Supporting the decision were the major facts that it was not laid out by any highway authority, no public dedication was made, the road was not used for a period of twenty years, and the Town or State had not "inherited" the abandoned right of way.

My imagination was filled with curiosity about the life of the Pike following the Court's decision. This compelled me to search the Town Meeting records subsequent to 1840 for warrant articles relating to the Pike. I did find one lay out record of a one half mile long segment beginning near the toll house and running in an arc westerly from the original location to avoid a steep grade. Although I have not exhausted the sources, no other record of lay out over the old Pike has yet been found. I wonder if the Town eventually assumed maintenance. Thence, over a period of twenty years use, it attained legal status as a "prescriptive highway" which has continued to the present. If this is so, then the width is no more than that necessary to accommodate the highway improvements, shoulder to shoulder. This would be a demeaning state compared with the glorious 4-rod (66 feet) width it once enjoyed.

I find it incredible that I have lived in New Boston my entire life, have been involved in Town activities, and have done considerable property research during my career as a land surveyor, all of which have never before revealed this clip from our history. I also find it incredible how short sighted the Legislature was regarding the disposition of the Pike after repealing the Act.