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TRANSACTIONS.

SHAKESPEARIAN CRITICISM.

By Irving Browne.

[Read before the Albany Institute, Nov. 23, 1880.]

I have not invited you hither this evening to listen to a learned philological or critical discourse. I have no pretensions for such an office. In asking your attention to the subject of Shakespearian criticism, my purpose is rather to recreate and amuse you for a few moments with some of the humors and absurdities of criticism on Shakespeare and his plays. While we owe much to judicious criticism for the correction of misprints, the emendation of obscure and incorrect passages, and the unfolding of hidden beauties in these immortal works, it must be confessed that the poet's critics have in many instances done their best to make him and themselves ridiculous, and not only have disguised his works but have striven to unseat the man himself. In short, criticism on Shakespeare has run mad and beaten its own brains out. From this sweeping assertion I must except the celebrated English editor, Mr. Knight, and our own American scholars, Messrs. Verplanck, White, Hudson and Furness. The variorum edition, which the latter is now publishing, illustrates both sides of my subject, and should be at the hand of every man who loves and would know Shakespeare.

But let us first inquire whether there *was* any Shakespeare, because if there was not it is of no use to spend our time on him.

The most audacious of many modern attempts at historical iconoclasm is that which seeks to prove that the plays attributed to Shakespeare were not written by him, but probably by Lord Bacon. This conjecture would dash down from his throne the acknowledged sover-

eign of literature, and establish in his place the man who of all would have been the most incapable of writing these dramas. The theory, I believe, was originated by a lady of the name of Delia Bacon, but whether she conjectured herself to be descended from the rival whom she sets up against Shakespeare, I have no information. The craze of this most mad lady was adopted and advocated in a book of some six hundred infidel pages, by Mr. Nathaniel Holmes, of Missouri, who is said, I blush to relate, to be a lawyer and a judge, although it is evident he is no judge of Shakespeare. The whole contention rests on the assumption that it is impossible that a man of such slender attainments, as Shakespeare is known to have been, could have written these wise, profound, brilliant, and altogether unparalleled dramas. But just as it requires more credulity to disbelieve than to believe Christianity, so it is much more difficult to disbelieve than to believe Shakespeare's authorship. No theory resting in mere skepticism and denial can win its way or carry conviction. It is possible that the assignment of the plays to Bacon is intended as a posthumous compensation for the detriment which his moral character has suffered. But it will not atone for his moral delinquencies, and his intellectual reputation needs no enhancement.

As to the evidence, the arguments adduced to support the theory are of the flimsiest, most baseless, far-fetched and laughably puerile description — such as a sensible man might use in his dreams, but only such stuff as dreams are made of. To these credulous persons trifles light as air prove confirmation strong as holy writ. For example, Shakespeare's manuscript contains few alterations or erasures; consequently he must have copied from Bacon's! So some poet, in returning something lent him by Bacon, accompanied it by some composition of his own, and remarked that while he did not give as good as Bacon sent, yet he sent him "measure for measure;" consequently, Bacon wrote "Measure for Measure"! This would seem better evidence that the borrower himself wrote it. These are fair examples of the arguments. On the other hand Bacon never claimed the plays in his life, nor by any of his remains; no contemporary can be shown ever to have suspected him as the author; all contemporaries who speak assign them to Shakespeare; and Bacon is the last man to whom they can be attributed, because they are entirely foreign to his style, as well in their glaring faults as in their magnificent beauties, and because to assign them to him in addition to his acknowledged works, would argue him a more superhuman genius than Shakespeare and vastly greater than any who has ever lived. If Bacon had written plays, would he have borrowed his plots, plagiarized some of his best lines

and ideas, and committed gross anachronisms? Bacon left his reputation to the vindication of posterity. Does any sane man suppose he would uot have left behind him a declaration of his authorship of these immortal works, if it had been his? Granting that he may have been deterred from owning the plays in his life-time on account of the disrepute of the occupation of a play-wright, this reason could not have weighed after his death. Moreover, the ambitious courtier would have been glad to read his plays to Elizabeth as Shakespeare did, despite the unpopularity of the vocation. The humorist of the New York *Times* says : " It is as easy to show the falsity of the delusion as to the existence of the Chinese language as it was to demonstrate the mythical character of the legends upon which the Christian religion was founded." Upon reasoning similar to that on which Archbishop Whately based his demonstration of the non-existence of Napoleon, James Freeman Clarke has jestingly proved that Shakespeare not only never wrote, but never lived. He says: "How can Shakespeare have been a real person when his very name is spelled in at least two different ways in manuscripts professing to be his own autograph? And when it is found in the manuscripts of the period spelled in every form and with every combination of letters which express its sound or the semblance thereof? One writer of his time calls him Shakescene, showing plainly the mythical character of the name. His wife's name has also a mythical character, and is probably derived from his song commencing, 'Anne hath a way.' Again, if he were a real person living at London in the midst of writers, poets, actors and other eminent men, is it credible that no allusion should have been made to him by most of them? He was contemporary with Raleigh, Spenser, Bacon, Coke, Burleigh, Hooker, Henry IV of France, Montaigne, Tasso, Cervantes, Gallileo, Grotius; and not one of them, although so many of them were voluminous writers, refers to any such person, and no allusion to any of them appears in any of his plays. He is referred to, to be sure, with excessive admiration by the group of play-writers among whom he is supposed to have moved; but as there is not in all his works the least allusion in return to any of them, we may presume that Shakespeare was a sort of *nom de plume* to which all anonymous plays were referred — a sort of dramatic John Doe. If such a man existed why did not others, out of this circle, say something about his life and circumstances? Milton was eight years old when Shakespeare died, and might have seen him, as he took pains to go and see Gallileo, who was born in the same year with Shakespeare. Oliver Cromwell was seventeen years old when Shakespeare died; Descartes twenty years old; Rubens, the painter, thirty-

nine years old; none of these have heard of him, although Rubens resided in England and painted numerous portraits there. Again, many important events occurred in his supposed life-time, to none of which he has alluded — as the battle of Lepanto, the St. Bartholomew massacre, the defeat of the Spanish Armada, the first circumnavigation of the globe, the gunpowder plot, the deliverance of Holland from Spain, the invention of the telescope and the discovery thereby of Jupiter's satellites. In an era of strenuous controversy between the Protestant and Roman religions, no one can tell from his works whether he was Catholic or Protestant. Unlike Dante, Milton, Goethe, he left no trace on the political or even social life of his time." His works display such an unprecedented universality of knowledge in one man, that he has been conjectured to be pretty much every thing — lawyer, physician, soldier, courtier, tailor. "In a time when others collected and published their works, no collected edition of his appeared until long after his death. Nothing that can be pronounced an authentic portrait of him has come down to us, and the effigies which we have are clearly of a formal and traditional type, with their preposterous expanse of forehead."

This is very fine reasoning, but by the same line of reasoning, if we admit that Shakespeare lived, we might prove that Raleigh, Spenser, Bacon, Coke, Burleigh, Hooker, Henry IV, Montaigne, Tasso, Cervantes, Gallileo, Grotius, Milton, Cromwell, Descartes and Rubens never lived, because Shakespeare says nothing of them. After all, such omissions are no more singular than that Thucydides has nothing to say of Socrates, his great contemporary, nor than that Plutarch, though the contemporary in his youth or in his old age of Persius, Juvenal, Lucan and Seneca, of Quintillian, Martial, Tacitus, Suetonius, Pliny the Elder and the Younger, does not cite them, and in return his name is never mentioned by any Roman writer.

The text of Shakespeare's plays has given rise to some very remarkable conjectural criticism. The variorum edition is almost as good a jest book as Joe Miller's. We might well exclaim, in the words of Madame Roland, slightly altered, "Oh, criticism, how many follies are uttered in thy name!" Once in a great while an important and sensible emendation is effected. Thus, in the description of Falstaff's death, the words "table of Greenfields" long stood as the *pons asinorum* of the commentators. The scholar who suggested "'a babbled o' green fields," instead, conferred a boon on mankind. But what a narrow escape from a leap out of the pan into the fire! Mr. Collier's folio would read, "on a table of green frieze," the passage then standing, "his nose was as sharp as a pen on a table of

green frieze," which is quite a figure of upholstery. (Here let us observe that the conclusive argument in favor of the received emendation seems to have escaped the attention of all the commentators until White. A mere reading of the passage suggests it: "for after I saw him fumble with the sheets *and play with flowers*, and smile upon his fingers' ends, I knew there was but one way: for his nose was as sharp as a pen, and *'a babbled of green fields.*" What more natural than to talk of green fields after playing with flowers?) It is hard to believe that Pope was serious when he conjectured that the words were a stage direction for a "supe," by the name of Greenfields, to bring in a table.

Perhaps the most disputed passage in Shakespeare is "that runaways' eyes may wink," in Juliet's soliloquy, where she is longing for the approach of night and her husband, that "Romeo may leap to these arms untalked of and unseen." Who or what is "runaway?" Those commentators who preserve the word have different explanations, some supposing it to mean Cupid, a runaway from Venus, while others suppose it to mean the sun, Phaeton, the night, watchmen, or Juliet herself. Others think it means vagabonds or tramps. Others would read "enemies," "runagates," "unawares," "renomy's," "rumor's," "rumorers'," "roamers'," "roving," "runabouts'," "Luna's," "yonder," "runaway spies," "soon day's," "curious," "envious," "ribald," "Uranus'," "no man's," "Cynthia's," "sunny day's," "sun awake's," "sun away," "sun aweary," "rude day's," while one imaginative person, having the legend of Godiva in mind, would read, "no man's eyes may peep;" and the climax is capped by one, who reading "runaways'," explains it by referring to boys who at night tie a cat or a dog to a door-knocker, and then run away. Here are thirty-three different explanations, and the conjectures cover twenty-eight large pages in fine type in Mr. Furness' new edition. A number of these conjectures may be easily set aside. The most ingenious one, Cupid, is disposed of by the reflection that he is usually represented blind, and therefore his eyes would always wink. In this very context Shakespeare speaks of "blind love;" in Cymbeline he speaks of the images of two "winking Cupids;" and he makes Mercutio speak of "Venus' purblind son and heir," and the "blind bow boy." If Cupid could see, then, as Mr. White observes, the marriage night would be the very occasion when he would be and would be desired to be wide-awake. No inanimate object will answer, because Romeo's coming was thus to be "untalked of" as well as "unseen." "Enemies' eyes" will not serve, because friends' eyes would be just as objectionable. Juliet would certainly not have wished her own eyes to wink on this occasion. There is some plausibility in calling watch-

men "runaways," judging from the standard of the modern police. "Unawares" would answer, but is inferior in beauty to "rumor's eyes," especially when it is remembered that Virgil depicts Rumor with as many eyes and tongues as feathers.

Or take the passage in "Cymbeline," where Imogen is excusing her husband's injustice to her, and says, "some jay of Italy, whose mother was her painting, hath betrayed him." We have had, instead of this, "who smothers her with painting;" "whose feather was her painting;" and "whose muffler was her painting." All agree that by "jay" is intended a courtesan, and it seems to me that the poet simply meant to say "whose mother was just like her."

The scholar who shall suggest a better reading for either of these passages will earn the solid gratitude of all students of literature.

Another passage upon which a great deal of gratuitous stupidity has been bestowed is the famous passage in *Macbeth*, "withered murder

* * with his stealthy pace, with Tarquin's ravishing strides, moves like a ghost." Nothing can be more felicitous than this description of the long, eager, stealthy steps with which the murderer or ravisher steals upon his victim. The word "strides" originally stood "sides," and the emendation is Pope's. Rowe, Malone and Knight however preserve "sides." Knight says it is a verb meaning to match, to balance; that "ravishing" is a noun; and that the meaning is, murder, with his stealthy pace, matches Tarquin's ravishing. Dr. Johnson says a ravishing stride is an action of violence, incompatible with a stealthy pace, and he would read, "with Tarquin ravishing, slides," etc. A writer in the *Gentleman's Magazine* says of this: "Macbeth was treading on a boarded floor, up one pair of stairs, probably in a passage or lobby, which made a cracking noise, which obliged him, in his alarm, to take long and cautious steps. This granted, we may pretty safely adopt the word *slides*." Of course it immediately occurs to the reader that the castle probably had a stone floor, and a few lines further on Macbeth cautions the earth not to hear his steps, "for fear the very stones prate of my whereabouts." White says, "Pope's emendation will seem happy to every cautious person who has stepped through a sick chamber, or any apartment in which there were sleepers whom he did not wish to wake, and who remembers how he did it."

Again, where Macbeth says the blood on his hand would "the multitudinous seas incarnadine, making the green one red," some have related "one" to "green," and made the passage stand, "making the green-one red." It is to be remarked that the poet has just spoken of "seas" in the plural, and of course he would not speak of them in the

next line in the singular. The idea is plain — making the multitudinous green seas *one* red. Staunton finds it necessary to read, "making the green *zone* red."

So where Macbeth defies Banquo's ghost, he says, "if trembling I *inhabit* then, protest me the baby of a girl." "Inhabit" has disturbed the commentators. Most of those who accept it, read it in the sense of "stay within doors." Others suggest "inhibit," "inherit," "exhibit," "evitate," "evade it," "flinch at it," "I inhabit then," "I unknight me then." But Mr. White has hit the true sense of the word when he cites "oh Thou who inhabitest the praises of Israel."

Indeed, the amount of stupid and unnecessary criticism that is inflicted on our great poet is almost beyond belief. For instance, in respect to the passage in *Romeo and Juliet* where *Nurse*, calling for *Juliet*, says, "What lamb! what lady-bird! God forbid! Where's this girl?" so sensible an editor as Staunton remarks on the words "lady-bird," that they were a term applied to women of light and indelicate behavior, and that Nurse remembering this, suddenly checks herself, and exclaims, "God forbid" — that I should apply such a name to my charge! Hereupon, Mr. Dyce deems it necessary to remark, "Staunton is certainly wrong," and to explain that the meaning is, "God forbid" that any thing should have happened to *Juliet*. One hardly knows which the more to admire, the folly of Staunton or the simplicity of Dyce. If we could be permitted a suggestion, we would say that the reference was unquestionably to the popular Mother Goose melody :

"Lady-bird, lady-bird, fly away home,
Thy house is on fire, thy children will burn."

Nurse meant "God forbid" that any such bad fortune should come, on *Juliet* as the incremation of her palace and the contingent young Capulets with which it might be stocked. This now, is something like.

Or take Lord Campbell in his conjectural pamphlet on the question whether Shakespeare was a lawyer, in which he comes to the conclusion that there is a good deal to be said on both sides, and very little certain on either. Among the arguments in favor of the affirmative, his lordship adduces the lines :

"But my kisses bring again
Seals of love, but *sealed* in vain."

If this sort of seals were now in vogue among the legal profession, a seal would probably be deemed necessary for every conceivable legal document, and consequently, there would be even more lip-service among lawyers than at present.

Among the conjectures concerning the occupation of Shakespeare before he became a player, none is more entertaining than that of Steevens, founded on the passage:

> "There's a divinity that shapes our ends,
> Rough-hew them how we will."

The commentator is alluding to the trade of Shakespeare's father as a wool dealer or butcher, and conjectures that the poet followed the same business before he came up to London. He first gives the passage in support of this theory, and then proceeds: "Dr. Farmer informs me that these words are merely technical. A woolman, butcher and dealer in *skewers*" — and he emphasizes the point by the aid of italics — "lately observed to him that his nephew, an idle lad, could only assist in making them — 'he could rough-hew them, but I was obliged to *shape their ends.*' Whoever recollects the profession of Shakespeare's father, will admit that his son might be no stranger to such a term. I have seen packages of wool pinned up with *skewers.*" It has always seemed to us a mystery how Shakespeare's spirit could wait for Steevens to die a natural death after writing that. Perhaps the poet thought that it was one of the decrees of Providence that poets are always to be misunderstood, and that the passage in question might fitly be read thus:

> "There's a divinity that shapes our ends
> Rough, hew them how we will."

These specimens encourage us to look a little further into the misarrying labors of Shakespeare's editors and commentators. One of the choicest of these gentlemen is Becket, who might have been served as Henry treated his great namesake, without any necessity for repentance. A few samples will suffice. "'*Hamlet.* Govern these ventages with your fingers and thumb, give it breath with your mouth, and it will discourse most excellent music.' 'Ventages with your fingers and thumb,' I would read thus: 'Govern these ventages and the *umbo* with your fingers,' etc. *Umbo* (Lat.) a *knob*, a *button.* The piece of brass at the end of a flute might very well be called a *button.*" Oh, if one could stop such *ventages* as this with fingers and thumbs, what a dispensation it would be! But again: *Hamlet* in the grave with *Laertes* says:

> "Woo't weep? woo't fight? woo't fast? woo't tear thyself?
> Woo't drink up Esil? eat a crocodile?"

On this Becket is thus delivered: "This proposition of Hamlet is too extravagant, too ridiculous to remain in the text. By such a reading the Danish prince appears to be a very Dragon of Wantley for voraciousness. I regulate the passage thus:

> **'Woo't weep? woo't drink? woo't eat? woo't fast? woo't fight?**
> **Woo't tear thyself? —Ape, Esil, Crocodile?'**

'Up' is misprinted for 'Ape,' 'Esel' in old language is 'Ass.'"

It may be well to command our faces long enough to remember that Esil was a common term for vinegar, and also might have been a corruption of Issel, one of the affluents of the Rhine. So much for Becket — "off with his head."

We next call up Mr. Jackson — and there is no mistake about the latter syllable of his name, however much the reader may be inclined to doubt it after hearing some examples of his powers. Take the speech of the *Clown* in *All's Well that Ends Well. Clown* has been singing an old ballad about the scarcity of good women, and then observes: "An we might have a good woman born but every blazing star, or at an earthquake, 'twould mend the lottery well; a man may pluck his heart out ere he pluck one." Mr. Jackson says: "How can a *woman* be born? A female, when introduced into life, is *an infant;* — the reading is highly injudicious, and the correction seems to have been made without reflecting on the incongruity which it produced. The old copy read: '*but o'er* every blazing star.' In my opinion, from the word *on* being badly formed, the compositor mistook it for *ore.* I read 'an we might have a good woman, but on every blazing star or at an earthquake, etc.'" We may dismiss Mr. Jackson, with the injunction to study St. John's Gospel, chapter sixteenth, verse twenty-one: "but as soon as she is delivered of the child, she remembereth no more the anguish for joy that a man is born into the world."

But this same passage nearly proved too much even for Malone, who says: "'*Twould* mend the *lottery* well.' This is surely a strange kind of phraseology. I have never met with any example of it in any of the contemporary writers; and if there were any proof that in the lotteries of Queen Elizabeth's time *wheels* were employed, I should be inclined to read — lottery *wheel.*" If you are going to read *wheel,* why not go the whole figure, and read *pottery wheel?* This would make still greater nonsense, if possible. Again, look at this passage in Hamlet:

> "*Marcellus.* My good lord,—
> *Hamlet.* I am very glad to see you; good even, sir."

The acute Jackson reads:

> "I am very glad to see *you* good; even, sir."

That is, as Marcellus has just called him "good," he gets "even" with him by calling *him* "good." This is an odd way of getting even.

Bishop Warburton may next amuse or enrage us. The bishop evinced the great variety of his knowledge in his commentary on this passage in *King John:*

> "O Lewis, stand fast! the devil tempts thee here,
> In likeness of a new untrimmed bride."

"Untrimmed," he says, "signifies *unsteady*. The term is taken from navigation." Perhaps the bishop found support for his notion that a bride was a ship, in Antonio's speech to Bassanio, where he laments the loss of his ships, and says, "My ships have all miscarried." But again:

> "One inch of delay is a South Sea of discovery.

This is stark nonsense! We must read *off* discovery." Dr. Johnson made this all right, however: "This sentence is rightly noted by the commentator as nonsense, but not so happily restored to sense. I read thus: 'One inch of delay is a South Sea. Discover, I prithee, tell me, etc.'" After this, who shall say that two heads are better than one? This will do for Warburton — and for Johnson.

One example will answer for the corrector of Mr. Collier's folio. *Imogen* says:

> "I have heard of riding wagers,
> Where horses have been nimbler than the sands
> That run i' the clock's behalf."

The corrector would read:

> "Nimbler than the sands
> That run i' the clocks, *by half!*"

Of Mr. Monck Mason we get a taste in his commentary on the following passage in *Anthony and Cleopatra:*

> "Her gentlewomen, like the Nereides,
> So many mermaids, tended her i' the eyes,
> And made their bends adornings; at the helm
> A seeming mermaid steers; the silken tackle
> Swells with the touches of those flower-soft hands
> That yarely frame their office."

Mr. Mason would read "tended her i' the guise," and construe "their bends" to mean the graceful curves of their tails! For this reading the letter *b* would seem superfluous—"their ends" would answer every purpose. Mr. Collier's folio corrector has his say on this passage. He reads, "*Smell* with the touches of those flower-soft hands." Even Mr. White seems a little astray here, for he says: "If Mr. Collier must be literal, does he not know that cordage will swell with handling?" Now to relapse for a moment into soberness, is not this the

meaning? — the "tackle" or cordage, loosened by the flower-soft hands, swelled with the swelling of the sails which the "tackle" confined and regulated? Mr. White, with a proper sense of the absurdity of "smell," remarks: "Though it may be a very pretty compliment to suppose that the tackle would '*smell*' (sweetly, of course,) with the touches of the hands of *Cleopatra's* ladies, the world will thrust upon me the profoundly true observation, *mulier recte olet ubi nihil olet.*"

Another passage over which has arisen a perfect blaze of idiocy is this from *Timon of Athens*, in which *Flavius* is lamenting his master's prodigality:

> "When our vaults have wept
> With drunken *spilth of wine*; when every room
> Hath blazed with lights, and bray'd with minstrelsy;
> I have retired me to a *wasteful cock*,
> And set mine eyes at flow."

Of course this is very obscure. Hanmer interprets "wasteful cock" as a cockloft or garret! Warburton coincides. Pope changes it to "lonely room." Knight reads "*from* a wasteful cock." Chalmers thinks it means a cistern waste-pipe. Now, why not "improvident rooster?" and "retir'd" in the sense of "gone to bed?" meaning that having been up all night, he had not gone to bed until an unnecessarily vocal chanticleer was announcing the too-evident approach of day. There is nothing like a little common sense in interpreting such passages; and what *can* Mr. White be thinking of when he says that the words in question mean wine-cask cock, or faucet?

Mr. White takes Johnson severely to task for his interpretation of Lear's words, "Age is unnecessary;" and if Mr. White is right, it ought to be embraced in the present collection of the absurdities of Shakespearian criticism. Johnson thinks the words mean, "Age has few wants;" Mr. White thinks they were used ironically to mean, "Age is superfluous." With great deference, we submit that for once Johnson is right, and for once Mr. White is wrong. Let us look at the context. *Lear* has been complaining to *Regan* of the treatment which he has received at the hands of her sister, *Goneril*, who has dismissed some of his followers — "She hath abated me of half my train." Regan replies that he is old, and "should be ruled, and led by some discretion that discerns your state better than yourself;" and asks him to return to her sister, and say he has wronged her. Hereupon *Lear* flies into a passion, and kneeling down, rehearses the speech which he imagines himself to deliver to *Goneril*, asking *Regan* to "mark how it becomes the house:"

"Dear daughter, I confess that I am old,
Age is unnecessary; on my knees I beg
That you'll vouchsafe me raiment, bed and food."

The gist of the matter is his complaint at having his comforts and the number of his servants reduced; nothing about his being in the way; and so he asks *Regan* to note how unbecoming it would be in him, an unthroned king, to confess to his daughter that she was right in reducing his train, and to beg for the bare necessaries of life. It is worthy of note that Shakespeare has here enumerated the items which the law regards as "necessaries" — a fact which may well be cited to show that Shakespeare had received a legal education.

One of the best satires on Shakespearian criticism is John Poole's Travesty of Hamlet, with notes after the manner of Pope, Johnson, Warburton, etc., published in London in the early part of this century. As it is not a familiar book I will give an extract. First the text:

"*Ophelia.* I thank you — so 'tis best — you counsel right —
My coach — three thirty-five — good night, good night."

Then the commentary:

"*My coach — three thirty-five —*

"This is an exquisite touch of nature. Ophelia is now wavering between sense and insanity; she calls first for *one* coach, and then for *three hundred and thirty-five* coaches.— *Warburton.*"

"This I allow to be an exquisite touch of nature; but by the illustration which the Right Reverend has attempted, its force is obstructed, and its beauty obscured. *Three thirty-five* is evidently the *number* of the *hackney coach* which brought Ophelia to the palace. And here the poet has given an instance of his unbounded knowledge of human nature. In a short interval of lucidity Ophelia calls for her coach; and then, regardless of the presence of the 'Majesty of Denmark,' she calls for it by its number, 335. This is madness pathetic and interesting; had she, as Dr. Warburton erroneously supposes, called for *three hundred and thirty-five coaches*, it would have been a representation of madness too terrific for exhibition on the stage. Madness is agreeable only until it becomes outrageous.— *Johnson.*"

The reader of Dickens will remember in *Nicholas Nickleby* that *Nicholas*, while a member of Mr. *Crummles'* theatrical company, went with Miss *Snevillici*, the leading lady, to solicit the patronage of the leading townspeople for her "bespeak" or benefit. Among others, they called on Mr. *Curdle*. "As to Mr. Curdle," says the author, "he had written a pamphlet of sixty-four pages, post octavo, on the character of the *Nurse's* deceased husband in *Romeo and Juliet*, with

an inquiry whether he really had been a 'merry man' in his life-time, or whether it was merely his widow's affectionate partiality that induced her so to report him. He had likewise proved, that by altering the received mode of punctuation, any one of Shakespeare's plays could be made quite different, and the sense completely changed; it is needless to say, therefore, that he was a great critic, and a very profound and original thinker."

Having been long engrossed by a passion for the study of Shakespeare, I was of course aware of the existence of this tract. Many years' fruitless search for it had, however, long since left me in despair of ever finding a copy. The author, whose modesty was equal to his merit, had printed but few copies, and those only for private circulation. Consequently it never found its way into any of the great repositories of literature. Although Mr. Dickens refers to it, he does not say that he ever saw it. He may have derived his information respecting it from Mr. Crummles, or from same member of his theatrical company. I had made most thorough researches and inquiries among the descendants of the Crummles family, and among the descendants of nearly every prominent member of that company, but in vain. My nearest approach to success was when I was informed by a grandson of Mrs. Henrietta Petowker Lillivick, that he had heard his grandmother say that she had once possessed a copy, but not esteeming it of much value had given it my informant's father when an infant to play with. I abandoned the search some years ago, but recently stumbled on a perfect copy of this inestimable treasure by merest accident. In the year 1869, I discovered it in the cabinet of curiosities belonging to the late Mr. Nathaniel Hawthorne (formerly customs-officer at Salem, Massachusetts), an account of which may be found in that gentleman's sketch, entitled "A Virtuoso's Collection," and which, at the date of that sketch, was the property of the Wandering Jew, by which designation Mr. Hawthorne was understood to intend the author of "Lothair." By the courtesy of the family of Mr. H., I was permitted to inspect this singular collection at my leisure. This precious volume lay between Alexander's copy of the "Iliad," and "the Mormon Bible in Joe Smith's authentic autograph."

My delight at the discovery was greatly enhanced by observing that this copy (No. 6 of 25 copies taken off on large paper, none on small) seems to have been presented by the author to the great antiquary, and bears on its fly-leaf this inscription: "To Jona. Oldbuck, Esqr., from his obdt. servt. and co-labourer, Cream Curdle."

By the permission of Mr. Hawthorne's family I am enabled to present to the literary world an outline of the argument of this masterly

treatise. It is a singular and significant coincidence, that this should occur contemporaneously with the publication by other literary seekers, of the lost books of Livy, which also formed a part of the Hawthorne collection. As the discovery of the long-missing portions of Livy may render it necessary to re-write Roman history, so it is possible that my discovery may establish new canons of Shakespearian criticism.

My only regret in connection with this subject is, that I am not able to furnish the public with any information as to the ingenious critic, beyond what is given in Mr. Dicken's historical essay on the boarding schools and theatres of England, known as "Nicholas Nickleby." His life seems wrapped in as much obscurity as that of the great author whom he has done so much to illustrate.

The introduction to the treatise is as follows :

"Human ingenuity seems to have exhausted itself in conjecture on the principal characters of Shakespeare's drama. As to the precise degree of duskiness that obscured Othello's skin ; as to Hamlet's age and figure; whether the third Richard really had a hump; and a thousand similar inquiries, there seems to be no room for discussion, although they are by no means settled points. But in the chase after the prominent and apparent, it has long appeared to me that many of the great dramatist's more recondite beauties have lain unadmired, and many of his more hidden difficulties unexplained. In the crowd of the great, the grotesque and the striking, the humble have mingled unnoticed. It has long been my favorite project to write a series of essays on these neglected passages and personages, and to do my modest endeavor toward presenting to the world all that can be ascertained or conjectured of their meaning and history. I am the more persuaded to this task, because I believe that every line and word of this prodigious genius is fraught with weighty significance, and that every character to which he makes even remote allusion is intended to convey a lesson.

"Then, again, I suspect that the popular judgment is erroneous in regard to many of the characters of the Shakespearian drama. For instance, I am by no means ready to admit that Sycorax, the dam of Caliban, was as black as the world generally supposes Shakespeare intended to paint her. True, he puts very harsh sentiments concerning her into the mouth of Prospero, but it must be remembered that the magician had driven her from her sovereignty, usurped her possessions and enslaved her son, and naturally would not entertain kindly feelings toward her. We hate none so deeply as those whom we have injured. A defense of this unpopular but deeply slandered lady, was to form the subject of one of my essays.

"Another essay I had projected on the geography of Shakespeare. I would show what great natural changes have been wrought since the times in which the scenes of his plays are laid. For example, Bohemia, now an inland country, must once have had a seaport, and Mantua, regarded in modern times as a rather unhealthful locality, was so salubrious in the days of Romeo and Juliet, that an apothecary had nearly starved to death there for want of custom.

"Another essay I had designed on the punctuation of Shakespeare, to show that by altering the received mode of punctuation, any of his plays could be made quite different, and the sense completely changed. For example, in *Romeo and Juliet*, the following passage has always seemed obscure to me: '*Servant.* Madam, the guests are come, you called, my young lady asked for, the nurse cursed in the pantry and every thing in extremity,' etc. Now what is the sense of 'the Nurse cursed in the pantry?' Who should curse her in the pantry, and why should she be cursed? Of course, the inference is, that she was cursed by the other servants; but why, pray? And why should one servant inform her mistress that these other servants were cursing the nurse? This is all wrong. Now we know that *Juliet* was of a hot and impetuous temper, and that the *Nurse* was her personal attendant. We may infer too, that Nurse, like other servants, was frequently out of the way when wanted. Let us then alter the punctuation, and a flood of light breaks on us from this passage, and renders it at once sensible and characteristic: 'Madam, the guests are come, you called, my young lady asked for the Nurse, cursed in the pantry, and every thing in extremity."

Then follows the passage from the play in relation to the Nurse's deceased husband, which is too broad, as well as too long, for quotation here. The reader will *not* find it in the judicious Mr. Bowdler's Family Shakespeare. The gist of it is that *Nurse* has been gabbling away about *Juliet* and her age, and tells how when she was an infant she fell down and bumped her forehead:

> "And then my husband — God be with his soul!
> 'A was a merry man — took up the child,"

with a rather indelicate jest, to which the precocious Juliet responded "Ay."

The commentary then proceeds:

"The first query that naturally arises in an examination of these passages is whether the Nurse's deceased husband really was a merry man in his life-time, or whether it was his widow's affectionate partiality that induced her so to report him. All will agree, that there

is nothing in his language as reported, that evinces any wit or a merry disposition. Consequently the widow must have referred to some general trait which really, or in her imagination, characterized him. I am not aware that the husbands of nurses, as a class, are more merry than other men. Nor am I aware that widowed nurses are more apt than other widows to attribute merriment to their deceased spouses. We must look then for idiosyncrasies really existing in the husband's character, or supplied by the wife's imagination. Now can any thing be found in the context to indicate that the deceased had any especial cause for merriment? I think so. The context shows that during his life his wife was engaged in the occupation of a nurse. It also depicts the husband as sitting and watching the infant Juliet in her gambols. I infer, for reasons hereafter adduced, that this married pair had no children at the time in question. These things being so, the husband was evidently not an active contributor to the support of himself and his wife, but the latter supported both. Surely this was a situation well calculated to afford merriment to the husband. It would certainly be so regarded by most of modern husbands, for although there is in the masculine mind a theoretical abhorrence of the wife's earning the family subsistence, yet it seldom assumes a practical form.

"Starting with this foundation, we next infer that the husband's merry disposition was actual rather than ideal, for the reason that wives who support their husbands are not apt to invest them with any merely imaginary virtues.

"It has been conjectured by some that Nurse intended by the words, ''A was a merry man,' to indicate his occupation, and to say that he was a professional buffoon or zany. This is a conjecture not to be despised. The profession of a merry-andrew was a common and popular one in the time of the drama, as well as in the dramatist's own day, and it is quite consistent that one whose wife was a professional nurse, should himself be a clown or pantaloon. This hypothesis is fortified by the fact that at Verona, where the scene is laid, are the celebrated remains of a Roman amphitheatre, and it is fair to presume that opportunity, as well as tradition, would inspire in the inhabitants a fondness for theatrical amusements, and that actors and pantomimists should be in demand there. The only thing that contravenes this idea is the fact, already made apparent, that Mr. Nurse was supported by his wife, and thus was in no need of making merry professionally. And yet the personage in question may have been a jester, attached to the family of Capulet, whose wealth and standing were such as to justify this inference.

"The conjecture that Nurse intended by the parenthetical remark in question, to announce her husband's family — 'a was a Merriman" — is not to be tolerated and is only cited here to show how much difficulty commentators have found in this passage.

"So, too, the conjectural reading 'a was an American,' is insupportable. This reading was devised by some of my countrymen, who, in venting their spite against our trans-atlantic cousins, would make Shakespeare guilty of a gross anachronism. That God's mercy should be invoked for one because he is an American is an exhibition of British spite with which I have no sympathy. But the short answer is that America had not been discovered at the time this scene is laid and but little was known of it even in the dramatist's day.

"The conjectural emendation, 'a was a married man,' has more extrinsic evidence to support it, but still I cannot give it my adhesion. It is claimed by those who suggest it, that Nurse made the observation as explanatory of the husband's conduct toward Juliet; that because he was a married man, he 'took up the child,' an action undoubtedly more natural to the married than to the single. Some satirist of the married state has suggested that with this reading Nurse's exclamation, 'God be with his soul!' is more pertinent. This is a sneer at marriage which Shakespeare was not apt to make and which I cannot approve.

"Another conjecture suggested to explain this obscure passage is that the phrase was 'mariner' or 'marryner,' as it would have been spelled in the dramatist's day. In this view, it is claimed, the prayer 'God be with his soul!' is explicable on the hypothesis that the husband had been lost at sea. Again, say the proponents of this theory, the 'jest' seems, in Nurse's estimation not to be in any thing uttered by the husband, but in Juliet's response 'Ay.'

'I cannot choose but laugh,
To think it should leave crying and say — Ay.'

"Now say they, 'Ay,' and 'ay, ay, sir,' is peculiarly a sea phrase, and when uttered by an unknowing child to a mariner, would, of course, have been laughable, but not so on any other hypothesis. This is not absurd, but it seems unnecessary, for as I have before indicated, the ordinary reading is defensible, and there is therefore no need of refining upon it.

"Assuming, then, that the Nurse's husband was really 'a merry man,' let us inquire as to some of his other characteristics. We infer that the organ of philoprogenitiveness was largely developed on his cranium. The act of rescuing the little child was a most kindly one. Who but Shakespeare could have drawn such a picture? I infer from

this and other passages, that our dramatist himself was fond of children. The play does not disclose whether the Nurse's husband was also a father at the time of the events dramatized. I suspect he was not. Although not conclusive, yet the fact that his wife was a nurse in the family of another, is presumptive evidence that they themselves had no family. It appears that they had lost a child, and I judge it to have been their only one. If they had had any children of their own at this time, the garrulous mother would have been pretty certain to refer to them, as well as to the lost one. This, I admit, is not conclusive, for women now-a-days are much more apt to talk of dress and other vanities than of their children, and speak as little of their dead children as of last year's fashions. But there is one thing that leads me to be almost certain that this gentleman then had no children. If he had then been a father, he would not have been so moved by Juliet's misfortune, and so swift to rescue her, because such accidents are common among children and their frequency hardens parents to their effects. They let their children pick themselves up, and then scold them for spoiling their clothes. But when the children and clothes belong to others, and thus the accident causes the custodians no expense or trouble, they give their sympathies play. If this had been his own child, with all his love of children, Mr. Nurse would not have been so merry. He would have regarded the stumble as a fault to be tolerated in other people's imperfect children, but not in his immaculate offspring."

But to relapse into sobriety in conclusion. Conjecture has been usefully employed in endeavoring to determine whether Hamlet's madness was real or feigned. Books have been written on this point, and some strong arguments may be adduced on either side. Indeed, a great Shakespearian actor believed that his madness was partly actual and parly pretended. My own impression is that he commenced with simulating and ended with reality. "Seneca, the rhetorician, tells us of one Gallus, a rhetorician, who imagined that the transports of madness, well represented in dialogue, would charm his audience, and took so much pains to play the madman in jest, that he became so in earnest." All are familiar with the internal evidences cited to prove the hypothesis of real madness, of which Hamlet's procrastination seems to us the most convincing. But the principal reason for my belief, and one that I have not seen adduced, is that on no other hypothesis can any adequate motive be assigned for the play. A pretended madness, assumed to gratify revenge, is a crude and commonplace idea on which to base the far-reaching consequences, and out of which to develop the sublime philosophy, which stamps this

the greatest of dramas. Such a plot would be exactly in the spirit of other dramatists — Webster, Marlowe, Massinger — but it is not Shakespearian. Besides, thus considered, the work would lose all traces of that exquisite discrimination for which Shakespeare is remarkable: Elsewhere he has treated of insanity of different degrees and nature, as in *Lear*, proceeding from filial ingratitude, in *Malvolio* from vanity, in *Othello* from jealousy. After these analyses, there would be nothing novel or forcible in the representation of mental disorder arising from grief at the death of a parent, and nothing elevated in the depicting of madness assumed as a cover for revenge. Then, again, in this very play we have the madness of *Ophelia* arising from disappointed love. There is no reason to suppose that the dramatist intended to contrast real with pretended madness, for he makes no sufficient discrimination between them, and it cannot be that he intended in the same play to give two examples of madness, springing from similar causes. Moreover we have had in Shakespeare an unquestioned instance of assumed madness in the character of *Edgar*, in *King Lear*. But if we regard Hamlet as one who, starting out to assume madness, gradually falls a victim to real melancholy, as one who, simulating a fever, may excite himself into an actual feverish condition, this drama takes on a new and startling significance. It then occupies a fresh field even among Shakespeare's manifold and wondrous creations, and furnishes us with an intellectual analysis of insanity, flowing from a spring hitherto unknown to literature.

Let me say, in conclusion, that there are few old writers who have so small need of critical and conjectural help as Shakespeare. He has a vocabulary peculiarly his own, but his unskilled reader gets the meaning of most of his recondite words from the context and his own instinct. We are all learners at his feet. He is his own best commentator.

NOTE.— An eminent Shakespearian commentator and editor writes to me: "We sadly need insight into the domestic and public virtues of Sycorax (as suggested in the present ingenious essay), and also into the life and character of James Gurney, in *King John*, Ullorxa, in *Timon*, and many others."

A southern judge writes me: "Do turn your attention to an essay on Falstaff. Was he a coward *per se*, or only 'upon instinct?' With me Jack shall ever have the benefit of the doubt. And does not he himself assert — and who dares question his veracity — 'I have led my ragamuffins where they are *peppered?*'"

Since writing the foregoing, I have been informed of an essay written by Morgann, about one hundred years ago, proving in brilliant style that Falstaff was one of the bravest of mortals.

A Boston Shakespearian scholar, in writing of the foregoing essay, says: "Yet the critic himself falls into the error of finding too much in a little. His interpretation of the Nurse's 'What, lady bird! God forbid!' which renders it necessary to suppose Juliet a mother in order to drag in a reference to a familiar rhyme, is scarcely an improvement on the reading which would make the Nurse call her darling an opprobrious epithet." When I pointed out to him that I was jesting, he answered: "I can only plead a recent course of English humorists as an excuse for my denseness of intellect."

I. B.

LIFE IN THE ARCTIC.

By Mr. Harry Macdona.

[Read before the Albany Institute February 28, 1882.]

Ladies and Gentlemen — To-night I am to go with you into the Arctic regions — that mysterious realm of perpetual ice and snow, which even two centuries of undaunted human daring and noble endurance has failed thoroughly to explore. It is the home of the hardy Vikings, the scene of thrilling sagas, the only spot of all earth from which inquisitive man has not yet driven wonder and mystery. When it is known that the polar regions include about 11,600,000 square miles, or about one-seventeenth of the whole globe surface (a territory sixty times greater than the area of France), wonder ceases to inquire for the cause of the restless activity that has for two hundred years worn itself out battling to wrest the frost-bound secret. Of what use will be the secret when it is known ? I am frequently asked. That will remain for time to tell.

I am not here to discuss the *uses* of Arctic exploration, although a great number occur to me at this moment, but to endeavor to entertain you for a little while, and to say that the discovery of the pole is the one problem that now enlists the disinterested enthusiasm of the race, the one thing on which dollars and cents are not contingent, and that men are better and bigger for the effort. It is chivalry's last stronghold.

Now, to touch more than briefly on the salient features of the long history of poleward discovery, or to give you more than a very sketchy idea of the vast territory over which it extends, is of course impossible in the confines of a lecture. The subject has a literature of its own full of stories more thrilling than the wildest romances.

At the outset one is puzzled where to begin the story, it has so many phases of interest. I infer, however, that the latest phase, linked as it is with the sympathies of the American people, will most entertain you, and so I shall undertake, in a general way, briefly to outline the history of the search for the pole, which finds its last melancholy episode in the loss of the "Jeannette." The first expeditions poleward, you know, were made in obedience to the commercial idea,

and almost a century before the Columbian era the Zeni Brothers, Venetians, attempted to reach India by the north-west passage. Early in the sixteenth century England, jealous of the growing dominion of Spain, began to search for a shorter passage to India than the tedious route around the Cape of Good Hope. Sebastian Cabot, with letters-patent from Henry VIII, attempted the north-west passage with instructions to "discover and conquer unknown lands." Then Sir Hugh Willoughby attempted the north-east passage and met with a fate in many respects similar to that of De Long. He reached Novaya Zemlya, and was forced back by the ice to the coast of Lapland. His party was disposed in three boats, and he was found dead with his men on the Tundra coast. Richard Chancellor, in charge of one of the boats, was cast away on the coast of Russia, and made his way to the presence of the Czar, who granted him the magnificent privileges on which the Muscovy Company was afterward founded.

The fate of Sir Hugh Willoughby was seized upon by the geographical theorists of England, who had pinned their faith on the north-west way, as a conclusive argument against the practicability of the north-east route, and Frobisher, the foremost among the advocates of the way to the north-west, after many years of disappointing endeavor to interest "the mercenary men of trade" in his scheme, finally appealed to the court and the ministers of Elizabeth. In 1576 he made a voyage, and, while he failed to find the north-west passage, he thought he had discovered what was of greater value. On the shores of Frobisher Inlet he discovered a sort of black ore, and thinking it contained gold he returned to England and announced his discovery. A number of metallurgists in London were either deceived by these samples or were parties to a gross fraud, for they declared the ore to be rich in gold, and the wealth of the frozen north became a great court sensation, as we know from the memoirs of that time. Investigation proved, however, that the ore, as it was called, was worthless black sand. I saw a bottle of it with the ill-fated Captain Hall of the "Polaris." It looked like the fine sand from a gravel pit.

Notwithstanding Frobisher's failure to find the passage, and the fraud, or delusion, of the gold mine, English hope still reached out to a north-west passage, and the chivalrous Sir Humphrey Gilbert essayed the work of reaching China to the westward and Davis followed him with no better success. Then Henry Hudson essayed the feat, and then Dearsly and then Parry and then Franklin.

The Continental powers, during all the years England was engaged in searching the north-west passage, were as busy searching for the north-east passage. The Dutch, Danes and French sent out expedi-

tions, all of which came to grief. The most daring and, in a measure, successful of all these navigators was Barentz. He left Europe for the last time two hundred years ago, and only within the last ten years was the whole history of his wanderings known. A walrus hunter named Carlsen discovered, on Novaya Zemlya, his last winter camp and his books and papers in a magnificent state of preservation. A chart and a manuscript book, in old Dutch, were among the effects found in a barrel. The crew of Carlsen's schooner went ashore to gather drift wood for a fire and found on the shore, above the tide-line, a barrel in which the ice had frozen solid and, on breaking off the staves, they saw these relics imbedded in the ice and so they were preserved. These papers are now in the possession of a Russian merchant in Lapland, named Finkenhagen, in whose house I inspected them. Among other relics of the great navigator he has a number of buttons, supposed to have been the personal property of Barentz.

While the other Continental powers were endeavoring to make the north-east passage, as it is called, from the westward, Russia essayed the same work at the other or eastern end of the route. Vitus Behring, in 1741, entered the Arctic, through the strait that bears his name, but could make no headway and was finally wrecked on the coast of Alaska, where he died of starvation. Shalaeloff, twenty years later, worked his way a little to the west, toward the New Siberian Islands, but was forced down on the barren shore and there died of hunger and cold. Von Wrangel and Aujon followed and attempted the same route but without success.

The interest of America in this Arctic problem ante-dates the War of Independence. As far back as 1754, when Shalaeloff was trying the Behring Strait route, Captain Swayne, as I find by the *Gentleman's Magazine,* made a journey in search of the north-west passage in the "Argo" from Philadelphia. Eighteen years later a party of Virginians, under the command of Captain Wilder, searched for the passage and failed.

Since ships are so frequently lost it has been asked by people not familiar with the subject, why some one has not attempted to get to the pole on sledges, and it will be well here to answer that question. In 1827, Captain Parry attempted to make a trip to the pole over the ice. He took his ship to the northern coast of Spitzbergen, there anchored her in a harbor and started on the ice for the pole. He was provided with two boats so set on runners that when it was impossible to sail he could draw them over the ice. He provisioned these boats with food for seventy days. He had about five hundred and ninety miles to go, and had he been able to do sixteen miles a day he

would have reached the pole with provisions enough to bring him back to his ship. For the first five days he only made ten miles. Difficulty faced him at every step ; first, the ice he encountered was too thick to sail through and too thin to support the sleds. His party started out with high hopes of reaching the pole, but, after a seven days' experience, the officers agreed that they would be contented with reaching the eighty-third degree of latitude. Each day the strange fact appeared, when the observation of the sun was taken, that there was a great discrepancy between actual distance traveled and the observed position, and the party finally discovered they were on a tread-mill, the ice was moving beneath carrying them south every hour. At 82° 45′ they gave up the journey, finding that, although they had actually traveled three hundred miles, they were only one hundred and seventy miles away from their ship. The effect of this failure was to depress enthusiasm on the subject of polar exploration. It reacted again, however, with renewed vigor.

Only two years after this failure Sir John Ross first introduced steam into the Arctic and again attempted the north-west passage. As an example of how this new force worked in the ice-bound sea, it is only necessary to state that Ross, in the "Victory," after he made Felix Harbor, progressed just seven miles in two years. James C. Ross, Sir John's nephew, made a sledge excursion westward and fixed the magnetic pole at 70° 5′ 17″ N., 96° 46′ 45″ W. Bach, King, Dease and Simpson followed Ross, and Franklin, greatest of them all, never returned from his last trip, the complete history of which was not written until Schwalka and Gilder made their search for the relics in King William's Land.

The melancholy calamity which obliterated brave Franklin and his sturdy crew for more than twenty years, made governments chary of sending out ships. In 1850, five years after he was last heard of, several expeditions having meantime failed to find him, no less than twelve searching vessels approached the ground over which he was supposed to have strayed.

To sum up the work, from the earliest effort to the last expedition in search of Sir John Franklin, there were, between the years 1496 and 1857, one hundred and thirty-four voyages, land journeys and trans-glacial expeditions to the polar regions ; of these, sixty-three went north-west, twenty-nine *via* Behring's Straits and the balance north-east or north.

Franklin's failure marks the conclusion of the long-continued effort of England to solve the northern riddle. For thirty years before Franklin was lost not the least portion of the activity of the British

Admiralty office was expended in efforts to solve this problem of a north-west passage. In 1853, eight years after Franklin left England, and six years after his death, the north-west passage was accomplished by Capt. Collinson, but, while it was practicable, it was not profitable, and it remains now a mere geographical solution.

The year 1869 marks the initiation of the era of purely scientific effort to attain the pole. In that year two formidable expeditions were fitted out, one by Germany, under the direction of the great geographer, Petermann, consisting of two vessels, the "Hausa" and the "Germania," and another under Swedish auspices under the command of Baron Nordenskjöld, the most successful of all Arctic navigators.

The "Hausa" and "Germania" took the route *via* the east coast of Greenland. The first-named vessel never made much progress after getting into the littoral ice there, and the "Hausa" was caught between two ice floes and crushed like the "Jeannette." Her crew were cast away on the ice, and after a drift of several months they were picked up 1,500 miles from where the ship went down, and taken to Frederickshaab on the southern coast of Greenland.

In that year Nordenskjöld brought with him to the northern coast of Spitzbergen a number of reindeer, with the intention of using them to make another trans-glacial attempt where Parry had failed. During a dreadful storm the animals (they having been put on shore) escaped and were never seen again, and then, as if to add to his discomfort and embarrassment, the crew of a wrecked walrus hunter came to him and demanded asylum. He had to keep them with him during the winter, and they consumed all his provisions. Mr. Leigh Smith, now himself lost in the Arctic, learned, before he left the Northern sea that fall, of Nordenskjöld's dilemma and hastened back the next spring to give him relief, which was so timely that Nordenskjöld pays him a glowing tribute in his book. In the case of the German expedition failure resulted from an ill chosen route, demonstrating that theory, so far as the Arctic world is concerned, is greatly at fault. The theoretical demonstration that this German expedition would succeed was uncontrovertible and yet it was a dismal failure. Payer was an officer on the "Germania" of this expedition, but in later years his experience did not do him much good, as I shall show.

Next in the order of time comes the Polaris expedition of Captain John Hall under the patronage of the United States, and memorable in history for the thrilling adventures of Tyson and his party on the ice floe. Personal rivalry and disagreement between the scientific and the executive branches of the expedition caused the failure of this most promising expedition. Hall died during this trip, but before he was

laid away in final rest amid the snows he loved, the possibility of success had departed. Some believed in Hall and others in Doctor Bissel, the meteorologist, and where there should have been union there was faction. This division of sentiment was symbolized in the calamity that marks the end of the expedition. At six o'clock on the night of October 15, 1872, the floe to which the "Polaris" was anchored in Smith's sound broke up with thundering noise. All hands were set at work to discharge the ship's store on the ice, for it was evident she would not survive the "nip" that was inevitable when the ice began to move. In a dreadful blinding snow-storm, accompanied by a tremendous northern gale, the work of unloading was in progress. One-half of the party under Tyson was on the floe, disposing of the stores, when with a detonation like a frigate's broadside the floe was wrenched asunder and the ship lurched out into the blackness of the night, leaving Tyson and his party compassless on a drifting cake of ice. The ship floated for some time, and those on board were picked up by a whaler and brought to Dundee, Scotland. Tyson and his party drifted southward on the ice floe for six dreary months through the Arctic night, and were finally rescued on April 30 of the next year. When the ship cast loose from the floe Tyson found himself on a floe piece about five miles square; his rescuers picked him off a cake about five hundred feet square. Gradually as he drifted southward with warmer water the ice had been melting, and had succor been another day late his story would never have been known. He had drifted through forty-six degrees of latitude, or about three thousand miles — almost as far as from New York to Liverpool.

Then came the English expedition under Sir George Nares. He reached the highest point yet attained, having passed the eighty-third degree of latitude only to report laconically: "The pole impracticable."

In 1872 Austria fitted out an expedition and sent it to Franz Josef Land under the charge of Weyprecht and Payer. They got as far as Franz Josef Land, and were there ice bound for three years. They finally made their escape much after the fashion of the "Jeannette's" crew, and reached Novaya Zemlya, where they were picked up and brought to Europe.

And now we come to the Jeannette expedition.

Unlike the other expeditions that had been sent to the pole this was a private enterprise. Mr. James Gordon Bennett, the rival of established governments in his munificent patronage of geographical science, bought from the English government the steam yacht "Pandora," in which Captain Allen Young had made a polar journey in

which he was accompanied by my lamented friend, Mr. J. A. M'Gahan, as *Herald* correspondent.

The "Pandora" was acknowledged by experts to be the finest vessel ever built for this work. She was taken to Havre and there given in charge of Lieutenant De Long, with instructions to take her around the Horn to San Francisco. She was put into dock at Marc's island, and strengthened and trussed with such expertness, that we now know that this strengthening saved her from wreck and loss during the first months of her voyage, while she labored in the ice off Herald island. The United States Senate and House of Representatives meanwhile passed a law changing the name of the "Pandora" to the "Jeannette," and in July, 1879, she sailed out through the Golden Gate into the unknown sea that circles the pole. All told there were thirty-one souls on board the little ship, and with high-born hopes of coming success they cheered in response to the noisy valedictory of the guns in the harbor. A bright sunny day marked the initial of that gloomy two years' voyage, that ended in blinding snow and merciless storm, off the barren coast of northern Asia. The "Jeannette" was officered by American naval officers, in order to give a national character to the enterprise, but the ship, her outfit and stores were a private contribution.

De Long was selected for this work for a number of reasons. He was a man of magnificent physique, iron will, and had a perfect knowledge of the problems to be solved by the successful issue of such a journey. He had been in the Arctic before. He went to Baffin's bay to look for the Tyson party, who passed on the ice floe the "Juniata," the ship with which he was. He had investigated the Baffin's bay route, and earned the commendation of his superiors on that trip for his daring, zeal and discretion.

He had had long and inquisitive conversations with Tyson after that hero's return to the States; he had met Weyprecht and Payer in Europe and learned from them that the Franz Josef route was impracticable, and so when he came into command of the "Jeannette" he decided on taking an untried way. In choosing the route by Behring's Straits, he was influenced by a number of considerations.

In the first place, it was a cherished theory of the great geographer Petermann, and one in which De Long himself had faith, that Wrangel Land was an extension in the Asiatic Arctic of Greenland, or Franz Josef Land, a theory, by the way, which was strongly supported by the analogies of physical geography. It would elucidate nothing of present interest to detail the analogies on which this idea was founded. They were sufficient to claim the respectful attention

of the scientific world, which has since been startled by the discovery of Lieutenant Berry, of the "Rodgers," who informed it last summer, having gone into the Arctic to look for the "Jeannette," that Wrangel Land, instead of being the projection of a pole-incumbent continent, is an insignificant island. This fact was, of course, discovered two years before by De Long, who had no way of communicating his discovery to the world. When De Long left civilization he intended to make for the coast of this supposed continent and, anchoring in some high latitude, proceed in sledges to the pole.

During the winter of 1880 and 1881, no news having meanwhile been heard of the "Jeannette," great anxiety was felt and a "Jeannette Relief Board" sat in Washington to devise means of helping the long unheard from explorers. The result of the deliberations of this Board was the forwarding of two expeditions to the relief of the "Jeannette," and in June, 1881, the "Rodgers" left San Francisco to follow the track of the "Jeannette" and search on Wrangel Land for some record of her; and the "Alliance," which I accompanied as the representative of the *Herald*, was sent from Norfolk, Virginia, on the Atlantic side, to search the polar basin between Greenland and Spitzbergen in the hope that, having reached the pole, De Long would make for Europe that way instead of returning to Behring's Straits.

The cruise of the "Alliance" to Northern Spitzbergen was such a phenomenal one as to excite world-wide comment, for with no preparation at all, and utterly unfitted for service among the mighty ice-floes, she penetrated to within five hundred and ninety miles of the pole — about twelve hours' railway traveling — thus attaining a higher latitude than any man-of-war ever reached. There were one hundred and ninety of us all told, and, had we been "nipped" in the ice, a tragedy more horrible than any since the loss of Franklin and his men would have been recorded. In all probability, if an accident had befallen us in the ice, not one would have survived to tell the story, for the ship was not bulk-headed, and had two floes closed on her and opened her wooden seams, she would have gone to the bottom when the "nip" eased and let her free. However, no such fate befell her, thanks to the skill and watchfulness of her commander, Captain Wadleigh, and so I am here to tell some of the experiences of the trip and speak of a phase of this Arctic world too little noted and, if noted, generally lost sight of in the tales of hardship and suffering. I will speak of the pleasant side of Arctic life as I found it, and if it jars with any one's established notions of what a "regulation" Arctic lecture should be, I hope he will have his difference out with the Arctic regions and not with me.

To the journalistic mind there is no spot on earth that has such attractions as the north. There the journalistic mind points with the fidelity of the needle itself. It is the one unknown and undiscovered place, the one spot yet to be attained before man shall know the footstool which is his heritage. That mind has penetrated the dark and tangled jungles of equatorial Africa; has preceded the imperial armies of England's Queen over the Himalayas into the mysterions heart of Asia; invaded Bulgaria, in the person of M'Gahan, to let light in on the barbarities of the unspeakable Turk, and make clear the way of Russia's war dogs through the passes of the Balkan into the swarming plains of Turkey.

To leave civilization and start into the circle which guards the secret of so many centuries was a work of honest love, made pleasant by the hope of meeting there a fellow who had written side by side with me for years, who had made his paper famous by the weather predictions he had announced through it, and who, even if one had not known him before, was worth going all that way to become acquainted with. So, happy in the hope of meeting my friend, Mr. Jerome J. Collins, who went with De Long as the accredited scientist of the expedition, I joined the ship at Norfolk, Virginia, and left its markets teeming with fruit for the uninhabited and barren north. But, before we arrived there, there intervened so many things of interest that I am tempted to linger and detain you with some short account of them. In a storm encountered off the coast of Nova Scotia, the "Alliance" suffered considerable damage and we put into St. Johns, Newfoundland, where we had the good fortune to fall in with another Arctic expedition, under the command of Lieutenant Greely. This gentleman, accompanied by Lieutenants Lockwood and Kisslingbury, was bound for Lady Franklin Bay, to make meteorological observations, according to the agreement of the United States at the International Meteorological Congress. A genial, handsome trinity they were, and during the week we were at anchor in the harbor, visits between the "Alliance" and the "Proteus," their ship, were frequent.

Finally, the day for parting came and we left them there behind us, as they were not ready to sail, and started for Iceland, where we arrived without mishap. I wish there were time and opportunity to tell you of all the wonders of this strange land, where they were trying men by jury when the Helvetii of Switzerland were living under tribal relations, and England was the theater of bloody strife between Britons and Englemen. To the ordinary traveler, Iceland is interesting chiefly because when he gets there he discovers that nine-tenths of what he has heard and read about the place is out of "whole cloth."

But this is not so much of a surprise, since every one who reads books of travel makes a liberal allowance for the expansion which travel is said to exercise on the human mind. When, however, a man is forced through stress of evidence to relinquish his faith in his primer lessons in history and geography, the shock and surprise are genuine. Of what use is it to one to have fixed in mind the departure of the Jews from Egypt (B. C.) under Moses, and the discovery of America (A. D.) by the figures 1492, when you go all the way to Iceland to find out that the A. D. association is of no use? When you go into the primary school at Reykjavik and ask the youngest scholar "who discovered America?" he promptly answers, "Eric the Red," and then, when you ask him in what year the discovery was made, he says, "In 984." Why, Christopher Columbus is so far back in their geography as to be quite a modern sort of a chap. There are more years between the time their man discovered America and the arrival of Columbus than between that arrival and the establishment of the United States government. They are a hale and hearty lot, these Icelanders, and more than half a century before the first European set foot on the shore over which the stars and stripes now float so proudly, they had demonstrated the practicability of a republic and maintained one in the Arctic ocean.

The natural wonders of Iceland are even greater and more interesting than its odd people. On the way from Reykjavik to Hecla and the geysers, the greatest objects of interest, one passes through the site of the ancient parliament of the Icelandic people called Thingvalla.

The site of this early parliament is a magnificent depression, about fifty miles in area, which seems to have suddenly dropped from a previous level down to its present grade. A variety of theories are advanced as to how it happened to be formed, and the simplest is that at a time when Iceland was still the scene of violent earthquakes and volcanic eruptions, when Hecla and Skapta Jokul were intensely active, and a dozen other volcanoes, now extinct, lent their streams of lava, a great river of molten stone and ashes flowed over this plain; that owing to sudden contraction the upper crust formed a roof under which the fiery stream flowed off; that of its own weight the upper mass then fell in, forming this great depression, when the flow of lava beneath ceased. In very general and unscientific terms this is what is supposed to have happened.

Thingvalla is eight miles broad. Its surface is broken up with deep crevices, and as irregular, except near the lake which reposes in it, as the most enthusiastic climber could wish. So clear is the lake that

shimmers in Thingvalla that you can see down at its bottom just such a bed as the surface of the valley. In the crevices throughout Thingvalla run rushing rivers, forming here and there islands and peninsulas. On one of these last-named, on which is a high hill called "Logberg," or "Hill of Laws," the Thing or Assembly deliberated. The isthmus connecting this space with the main ground is so narrow that three men could repeat the defense of Horatius and his friends "on either hand." Around it runs a chasm forty feet deep and too wide to be cleared at a jump. But tradition states that once, when hotly pursued and cut off from the causeway, a certain Flosi did leap the gap and gain the sacred ground, on which his person was safe from attack. These jumping places are to be found all the world over, and Washington Irving has kindly provided New York with something in the same line at Spuyten Duyvil. His was a swim, of course, but it provides one of the fixings of history without which no locality is well furnished. Here the Thing met until near the end of the thirteenth century, when, owing to internal dissension and the treason of one of the chiefs, who was subsequently murdered, Iceland passed under the sway of Norway.

It was at Thingvalla, amid the grandest and gloomiest scenery in all the world, where, standing alone, the soul recalls the plastic words of Genesis, "Let the waters under the heavens be gathered into one place and let the dry land appear," that the Gospel of the Nazarene was offered, amid ominous muttering of earthquake, to the Norsemen one thousand years after He had preached it to the Jews. Here one seems to live in the third day of creation, before his kind were called and all things made ready for their enjoyment. There is light, but from a leaden sky that is sunless and starless; no "grass and herb yielding seed after his kind" is there, and all about the earth and air are tenantless. The awful stillness of the place makes the ears ache. Here the terrible Odin was banished from men's hearts and deserted on his smoking fane of Hecla; here the Book of Eddas was replaced by the Bible. A more appropriate theater for such a function even Doré's creative pencil could not suggest. From the year 1000 until 1558 Iceland was Catholic and gave tithe and allegiance to Rome. But the thunder roll of Luther's voice found echo in the rock-ribbed valleys of the island on the confines of the frozen ocean, and Iceland was converted. That is the poetical way of saying it, but as a matter of fact Christian III, of Denmark, finding that the echoes only answered themselves, sent over a fleet to suppress the nine monasteries then flourishing on the island.

Like the vastness of the ocean, which so oppresses one when forced to a long contemplation of its limitless horizon, the barrenness and desolation of the interior of Iceland depresses one with a stupefying sense of gloom. Like a battle-ground of Titans, the plains are strewn with huge ragged rocks, that seem to have been hurled down from heaven and imbedded in the not softer lava. Disorder, grand and imposing, begets a sense of individual insignificance in all who behold. One seems to walk through cosmic primitiveness along the road from Thingvalla to the geysers, absorbed in a reverie of incomprehensibility. Here you seem out of time, out of place. The dreariness of the place is too great even to write about, and so I hurry on the geysers, a day's journey off. Of all the places in Iceland that have provoked magnificent enlargement, this great spring is the first. What is contained in the old books about the geysers is utterly unreliable, both as to the frequency and height of the water spouts. No doubt these books were true when they were written. Even the Bible has been revised, so I am without compunction in this self-imposed work of correction.

The geysers are dying out, like thousands of others whose remains are scattered around the field on which they now are active. To-day there are but two geysers, unless you dignify the dozen of little bubbling streams that struggle up through the brick-colored mud in the neighborhood. The region about the geysers is like an immense poultice and, viewed comprehensively, looks like a bad case of small-pox. Eruptions, great and small, pit and scar the whole surface. In some places the ground is baked hard, and in close vicinity to the great springs is covered with a vitreous coating like earthenware; in other places it is boggy and soft enough to sink waist deep in. I have said that the old stories about the geysers may have been true when written, for the guides and natives inform me that within their recollection the spoutings have grown less frequent year by year, and I heard of no one who witnessed the geyser active during '80 or '81. At all events I did not see it. From the pit or basin of the great geyser clouds of vapor are forever rising, and you can see them miles away as they float off in great banks driven by the wind. The crater of the great geyser is shaped exactly like a saucer, and in the center is the orifice out of which, when it is active, the water spouts up as high as eighty feet, they say. You can look down into it and see the water simmering, seeming to be every moment ready to leap into the air as it pulses up and down in the flue. By a wise provision of nature, things are so regulated here that those who go to see the great geyser are not entirely disappointed. The smaller geyser, called by the natives "Strokr" (the churn), can be made to vomit at pleasure. All

that is necessary is to gather a few lumps of mud and turf from the grass that luxuriates around the outer rim of the basins and throw them down into Strokr's flue. As soon as they are down he begins to grumble and give signs of uneasiness, and he grunts and groans in dire discomfort. He seems to make an effort to digest the stuff and then finally gives it up in disgust, throwing sods and turf up into the air, expending a great volume of steam and water in the effort. When the dose is particularly nauseating he throws up a column thirty feet high, and, after seeing this all you have to do is give Pegasus rein and you can say you have seen the great geyser. A few feet, more or less, in the matter of height does not in the least impair the story of any traveler, and, hence, it happens that so many people have seen the great geyser.

I feel competent to state that no one has ever seen the water thrown up by the geyser. All the illustrations published of this great natural wonder give distinctly lined pictures of the mounting water, but a few facts will show how impossible such a sight is. At the sea level, with the barometer at thirty inches, water boils at 212° Fahrenheit. Now, when water is exposed to that degree of heat, under ordinary circumstances, with the temperature of the air as high as 90°, it gives off great volumes of steam. How much more rapid and great would be the evaporation in an atmosphere at a temperature of 50° — the mean average in summer time in the region of the geysers. Now, the temperature of the water of the great geyser when it is expelled is far in excess of 212°, for Professor Tyndall, who exploded the valve theory, on which geyser action was explained, showed conclusively that it was to be accounted for on other and more scientific grounds. Fresh water, which requires 212° at the sea level to boil it, when taken up on a high mountain, will and has boiled at 195°, showing that pressure is an active agent in the operation. Water, under great pressure, is hard to boil, and, as the depth of the geyser hole is between seventy and ninety feet — variously estimated — the heat exercised on the water is tremendous. The degree of heat is ascertainable, and, as the process of arriving at it is simple enough to be comprehended by the general reader, I will go through it here. Accept for the purpose of this demonstration that the depth of the geyser is ninety feet.

$$90 \text{ feet} = 1{,}080 \text{ inches.}$$

According to Haswell, twenty seven inches of water equal one pound of pressure. To estimate the pressure of a 90-foot column water, divide twenty-seven inches into one thousand and eighty inches and you get as a result forty, representing the number of pounds pressure thus :

$$1{,}080 \div 27 = 40.$$

Turn over to the head of "Heat" in Haswell and consult the table showing the degrees of heat necessary to boil water at various pressures. He says that it requires 260.1° to boil water at forty pounds pressure. This, of course, is fresh water. As the density of water increases the degrees of heat necessary to boil it increase in a direct ratio, and the geyser water must be very dense, as it carries great quantities of salts in solution and silicate of alumina in sufficient quantities to coat its own basin with a glassy film, and finally, by gradual accretions, choke up its own outlet. Professor Tyndall's theory about the geyser is that the water rises in the tube until a little overflows, and with this relief of the pressure on the column the steam and heat that have been confined rush up into the air, forcing the water ahead of them, and so the geyser works. Now, when this boiling, mad water, with latent heat not to be measured by ordinary instruments, comes in contact with the air at 50° temperature, steam is made so rapidly and in such volumes, that the column of water has subsided long before the clouds clear away sufficiently to allow a view. So much for the minute descriptions of the geyser and its fountains of water. Finally, I tried to get a photograph of the geyser from a photographer who has plied his business here for twenty years and he told me that he had taken great numbers of instantaneous photographs of the geyser when active, but they were nothing more or less than great clouds of steam.

From the geyser there is a plain view of Mount Hecla, that awful volcano that has so often threatened the very existence of the people of this unfortunate island. It is interesting only on account of its history, and looks so much like other mountains that, unless you were a geologist, you could not tell it from hundreds of others. Being five thousand three hundred and sixty-four feet high, it has particular charms for Englishmen, who seem to be born with a hereditary propensity to climb, but as most of the ponies that have attempted to climb it came down with a rush over its treacherous pumice-lined sides no sane American has yet been up to its top. About the time they celebrate the next millennial here, when they put up a Jacob's ladder, as they have at Mount Washington, and introduce a railroad, with calcium light effects, as they have at Vesuvius, Americans, I have no doubt, will be quite frequent at the summit.

The reputation of Hecla is like many others — more than her due. She is heard of in all lands; yet Skapta Jokul has done twice as much in a volcanic way and little is known about her. Why these fierce and vigorous volcanoes should be of the feminine gender I know not, but so it stands in Norse, and when I go to Rome I do as the Romans do.

But notoriety is to be respected in this day, and so Hecla comes in for first mention. Since the introduction of Christianity there are recorded twenty-three eruptions of Hecla. The most violent of these was during the eighteenth century. On the 5th of April, 1766, a dense cloud of black sand mounted to the sky above Hecla and there were rumblings of earthquake; a jet of flame burst forth from the crater and the show was under way. Soon the sky was so overclouded by the dense masses of black clouds that rained sand and dust that the fishermen could not put to sea. Four days later the lava began to flow, covering the country to the south-west for a distance of five miles. An immense mass of magnetic stone was thrown fifteen miles away (and these Iceland miles are good big ones; once and a half as far as you can see), and a block of pumice six feet in diameter was thrown twenty miles. Within a radius of one hundred and fifty miles the country was covered with a layer of black volcanic sand four inches deep. It is said that during the eruption people one hundred and fifty miles away could not tell black from white ten feet away, so dense was the darkness. There was what was called a black snow. This recalls to mind some curious snow falls, of which Dr. Jacob S. Mosher, Registrar of the Albany Medical College, speaks. Concluding an analysis he made of a rain of flesh that fell here some years ago, he cites many and more curious falls. It is within the memory of all newspaper readers to-day the excitement that was created by a rain of flesh about five years since. Von Humboldt, in "Cosmos," speaks of a number of peculiar colored rain and snow falls, mostly found to be due to infusorial dust. They recently had a rain of flies in Canada, and I have somewhere read of a rain known as "the rain of blue silk" which fell in Silesia in the sixteenth century. Great showers of blue fibrous stuff fell from a clear sky, and it was supposed that the end of the world was at hand. It may have been a volcanic eruption, somewhere out of the limits of observation, that colored the snow red on what Kane calls "The Crimson Hills of Beverly."

In my reminiscences I was almost forgetting about Skapta Jokul. Skapta Jokul may be said to occupy the south-eastern portion of Iceland. She is no ordinary hill, for she has pre-empted a space bigger than Rhode Island for herself. It isn't that she is so big that she requires so much room for what she don't want. Skapta's greatest effort was performed in 1783, seventeen years after Hecla had done the best she knew how. The reading of the account of Skapta's work will invigorate the imagination, for she excels any thing the penny-dreadful author ever thought of. About the beginning of June,

of the year named, the usual preliminary noise began in the neighborhood of the mountains, and on the eighth of the month a great volume of smoke and ashes spread over the whole district of Sida, going in that direction *against the wind.* On the tenth the river Skapta overflowed with fetid water and then suddenly disappeared. Fire broke out on the mountain, and two days later a stream of lava came oozing down the dried bed of the river. Notwithstanding that the channel was six hundred feet deep and two hundred wide, the lava overflowed the banks and inundated the Meddalland country, lifting the grass as it went as water would float a film of oil. The stream finally flowed into the Meddalland lake, filling it up, and then divided into two streams, one of them again seeking the course of the river and finally leaping, maddened and hot, into the sea over the great cataract of Stapafoss, whose brink is three hundred feet above the sea level. The other stream, after traversing a wide section of lowland country, found a line of least resistance in the Hverfisfliot river bed. This last stream of lava, as far as it has been surveyed — there is much of it, how much no one knows, in a country over which no man has ever been — is forty miles in length and seven in width. That which went over the cataract is fifty miles long and fifteen broad. The lava ceased to flow in August, and the convulsion ended with a grand earthquake. For a whole year it continued to rain cinders and dust, and thousands of acres of grass land were buried and withered under the hot showers. It is estimated that 190,000 sheep, 28,000 horses, 11,000 cattle and 9,000 men died as a result of the eruption. So much for the wonders of Iceland. Having taken on a fresh supply of coal at Reykjavik we sailed away for Hammerfest, the most northern city in Europe, and on the way we had a view of the great North Atlantic sea serpent.

I have never, in all my experience of smooth water, seen such a calm sea as we steamed through on the morning of the twentieth of July in latitude 69° 32′, longitude 2° 30′ east. The surface of the sea was as smooth as the face of a plate of French glass; not a breath of wind ruffled it, and, standing on the bows, it was hard to believe that we were making our way to Norway at the rate of seven knots an hour. The sky was clear, without a fleck of cloud. This minuteness about the weather on this particular occasion is necessary in order that skeptical people may not say that what was seen from the ship's deck was the result of obscured sight, or what not else that may be convenient to interpose as an argument against belief. It was eleven o'clock; the breakfast table had just been cleared away, and all hands were settling down to enjoy such amusement as cards can afford, when

word was sent below that the great North Atlantic sea serpent was in full view making diagonally across our bows from south-east to north-west. An order to abandon ship could not have cleared the ward-room in quicker order, and in a jiffy all the telescopes and binoculars in the ship were in service. Sure enough, there ahead, moving in many a flowing curl, was the great sea serpent. There was no doubting that we were in the presence of this awful monster which has been a theme for Sagas since the days of Eric the Red. Suddenly the sea serpent changed his course. As I said, he was making a cross over our track diagonally when first sighted; but now, as if to give us a really first-class look at him, he came head on bearing down on the "Alliance." The Major of Marines rushed to the fo'castle, cast off the ratline stuff of the harpoon, flattened his iron and stood by to plunge the cruel steel into the bowels of the monster. As everybody knows when you see an object abeam it looks much larger than when it appears head on. Now, to the astonishment of everybody, the serpent seemed much bigger in his new aspect. The curving, fin-capped back of the serpent now appeared at regular intervals, apparently about one hundred feet apart, in a straight line right ahead of the ship. He appeared to be progressing in great loops, and as near as could be guessed in the excited condition of all the mathematical brains aboard he was about fifteen hundred feet long. The method by which this conclusion was arrived at was quite simple. Seven different parts of the serpent's back were seen at one time, and it was estimated that the distance between the parts seen averaged about one hundred and twenty feet. With these ascertained facts the fifteen hundred feet — that is, about fifteen hundred feet — was an obvious conclusion. These calculations were made in much less time than it takes to write about them. Some one who noticed a sad expression on the face of the representative of the Smithsonian Institution regretted that the ship had been provided with only five gallons of alcohol for preserving deep sea organisms. Already a section of the writhing monster was seen, in imagination, on the deck, and no alcohol in which to preserve him! All the while he approached noiselessly over the glassy sea; near and nearer he crawled. Some one forward cried out "The sea serpent!" and mustered all hands to the rail. Glasses and telescopes were of no use now; he who had eyes could behold the wonder. Skeptics, like drowning men who review their whole lives at a glance, recalled in this exciting moment how often they had scoffed at the mere mention of the monster which was now in plain sight on the port bow about three-quarters of a mile off. Excitement was at flood tide, and congratulations were exchanged on the rare luck that had befallen our

ship. To think that we should thus casually fall in with the serpent that had caused as much discussion as the origin of man and blasted more reputations for truth than any *Congressional Record* ever published. As a mere incident of our voyage we had been fortunate enough to see what the Norwegian government maintains an ample fund to discover. The unexpected does somehow or other always happen. If we had been looking for this serpent we would never have fallen in with him. But here he was, and in proportions that made commonplace the timid statements of the faint-hearted, truthful mariners who had heretofore reported him. He saw the ship when about half a mile away and sheered off, passing us at about that distance on the port side.

Alas for the frailty of human sight! So, now, instead of a sea serpent we are sailing with seven fin-back whales on our port quarter, and all hands are preparing to slink down into the bowels of the ship again. It is too bad, but the fact is that we had been admiring seven fin-back whales, which were swimming in Indian file, giving a perfect illustration of how the awful sea serpent is said to do it. I have read thirty-one different accounts at various times of how the sea serpent behaves at sea, and in no singular particular did these performing whales deviate from the life. Indeed we had seen the great sea serpent, and one of the seven modern wonders is knocked on the head. In all of the accounts I have read of this sea serpent he has never been seen so close at hand as we had him, and if Professor Sars, of Christiana, Norway, who, it is said, has been looking for the serpent for years at public expense, is really anxious to get the particulars of the view we had of the monster, he can be accommodated. Had we not been so close to these whales, and had the sea been the least bit rough, there is not a man on board but would have gone home so full of sea serpent that he could not even talk about the Arctic ocean. It does not matter in the least, so far as the existence of the serpent is concerned, that the late Professor Agassiz said he thought there might be such a thing; he never said he saw it. Before the sea serpent resolved himself into whales, I was convinced that there was indeed a sea serpent in the North Atlantic, for I had heard the great Ole Bull declare that he had seen it. He described it to me just as I saw it bearing down upon the ship, even to the curving motion, which looked as though a number of porpoises were in line rising and plunging with great deliberation. If any one thinks that the sea serpent is only the theme of Scandinavian poets and the idle talk of truthful mariners let him refer to the proceedings of the Boston Society of Natural History for 1874, and find out all about the expedition of 1839 fitted out to gather evidence about the serpent.

We remained just long enough at Hammerfest to get a supply of coal, and, but for the pestiferous swarms of mosquitoes that annoyed us, we would have had a pleasant time. The mosquitoes in the Arctic, during the perpetual day of summer, are a source of the greatest annoyance, and so insinuating are they that they drive even the thick-hided reindeer out of the mossy valleys of the mountains down to the sea shore. Finally we started north for Spitzbergen where our work was to begin.

On our way through the ice, which was made with slowness and caution, we had our first clear view of the midnight sun, whose altitude was 4° 33′ 40″. In the clear water astern several white whales sported about. The statements that whale fishing is no longer successful seems strange, in view of the fact that we were never a day without seeing them. We encountered whales of all kinds and in abundance. Subsequent to this we had, if possible, a better view of the midnight sun, without the distracting accompaniments of whales. We had forced our way north, after slow sailing in the ice pack, to within sight of Spitzbergen, and when again viewing the midnight sun we were quite near Horn Sound, the most southern fiord on the south-western coast of Spitzbergen.

The sun looked like a great disk of molten gold, which seemed through the smoked snow-glasses to throb and pulsate, sending waves of light from its center to its rim. These soft, rolling ripples of light seemed to depart from the periphery with irregularity, although they started from the center as if a pebble had been dropped there. Sometimes they would depart from the rim with the same regularity as they started, and then again they seemed to hurry off on one side and delay on the other, giving the sun, for an instant, an oval appearance. This midnight sun was not alone sensible to the eye; one could feel its rays, which burned the skin with the copper warmth of Indian summer days.

With Horn Sound begins the interest in Spitzbergen, as the place was the scene of as cruel a tragedy as was ever enacted. The story has in it all the dramatic elements of a thrilling novel of the old school and finds a fitting dénouement in the mines of Siberia. On one of the innermost islands of Horn Sound, a few years ago, was found a heap of nine skulls, said to be those of a Russian crew murdered by a party of English whalers. These murderers were never discovered, but another and still more remarkable discovery was made in the year 1853 by a Norwegian sea captain near this place. It is the commonest occurrence for ships that venture up here to lose one or more men a trip, and so when the other members of the small crews — say five or six men —

return home and report that they have lost comrades no particular attention is paid to the news beyond the little circle widowed by the lost men. It happened somewhere about 1849 that the crew of a Russian whaler made their way back to Arkangel and reported that they had lost their captain and two men on Spitzbergen, through an accident, full details of which were given. The captain and his men were mourned, and in a little while the affair was forgotten. In 1853, however, the Norwegian captain in question, while out hunting for reindeer, found three human skeletons, and beside them a gun from which the stock was rotting. On the barrel of the gun were scratched a number of inscriptions in Russian which the Norwegian was unable to make out. He brought the gun home with him and sent it to Arkangel, where it was found to contain the history of the captain and the two men previously reported as having been killed by accident. The inscriptions told how the owner of the gun and his two men had been basely deserted by the others of the crew, for whom they were out procuring food, and left to die of exposure. Those of the crew then still alive were arrested and sentenced for life to work in the mines of Siberia. The poor captain and his men must have suffered terribly, for from the dates on the gun, the last of which was March 3, it was learned that he had survived the greater part of the winter.

At Green Harbor we made a landing for the purpose of mining coal, there found in plenty. While tramping around beyond Green Harbor, I came upon several wrecked and rifled graves. The men must have been buried before the frost was out of the ground, for the coffins were not covered, but seemed to have been put into a slight depression scratched in the clay. The coffins had partially rotted away and broken, and the grinning skulls and bleached bones were strewn about in horrid disorder, indicating that the fox and bear had disturbed their rest. I spent some time in gathering the bones of these poor fellows into their original resting-place and covering them up with rocks and sods of moss. No history of these lonesome graves could be gleaned, but it is likely that they were those of Norse or Russian victims of the scurvy. It is possible that they fell in some of these bloody fights, legends of which are still current among the fishermen and hunters of Northern Europe. The tradition runs that more than two hundred years ago the Dutch and Russians, who came here to harpoon whales, divided their time in bloody combats in which no quarter was given. The whale fisheries were then very valuable and worth fighting about, so every ship sent out was fitted for offense and defense. Some attempts at colonization were stamped out in con-

sequence of this feud. If a colony of Russians managed to survive the scurvy for a winter and a Dutch ship arrived fresh from the South in the spring, the colony was sure to be obliterated, and the Russians treated the Dutch with the same kind consideration when they arrived first. The finding of unknown graves is quite common on the shores of all the bays and fiords of Spitzbergen. This dreary, inhospitable place might fittingly be called Deadman's Land, a name given to a small spot just outside of Green Harbor in Ice Fiord. In the valleys around Green Harbor are had excellent reindeer shooting and bear and fox hunting.

From here we went to Dane's Land, the north-west point of Spitzbergen, to make magnetical observations and establish tide-marks. We found here the record of Nordenskjold's polar expedition and placed another tide-mark there. These tide-marks are of curious scientific interest, for through them it has been ascertained that the land in the Arctic is rising at the rate of twenty feet a century. This previously-announced fact is verified by observations at the old Nordenskjold mark. Having finished these observations we went still further north and crossed the eightieth degree of latitude, penetrating to within five hundred and ninety miles of the pole, or about twelve hours' railroad traveling. Here the ice stopped us, for it was too thick and heavy for any ship to force through.

We were, in fact, five hundred and ninety geographical miles from the North Pole; but who that has seen this desert of ice, piled up in hummocks and forced into mountainous ridges by a force that the mind cannot comprehend, will venture an opinion as to the years of dreary endeavor yet to be endured before man shall reach that supreme spot? Of all the desolate sights the human eye has rested on, this desert of ice, stretched out like a gaunt, bleached beggar hand to Heaven, is the most subduing. Even the sea loses its music as it beats against the barrier. It moans monotonously all the dreary years, and frets against a hydra-like impediment that, in centuries flown, was overcome and overcome only to present itself again, season after season, rejuvenated and incorrigible. The dominion of the ice is not disputed here, for even the fierce ocean is always calm just beyond the pack, and, while gales sweep through the air and elsewhere lash the sea to fury, here both seem ineffectual and waste no force.

We returned to Lapland for coal and again went north, remaining at sea between Greenland and Spitzbergen until the 1st of November, when, the night coming on, we beat a retreat south to Iceland by way of Jan Mayen. On this return trip the "Alliance" was several times almost wrecked and we arived at Reykjavik considerably battered.

On the trip through the ice-ladened Arctic ocean we were afforded a first view of the aurora. All the illustrations I remember having seen of the northern lights give the impression that the bars of light shoot zenithward; but this early November aurora was quite unlike these, for the light shot oceanward from the zenith, and was quite unlike what one sees in north temperate latitudes. The wonderful regularity of form shown in pictures was wanting in this display on the night in question, and for a long time the light had no form —if one may use that term in connection with light. To attempt to give a pictorial illustration of so coquettish and fickle a thing as this northern light, as it first appeared to us, would be like trying to bottle sunshine. It can't be done, and so it happens that the pictures of it are rigid and incompetent. It may be that later in the winter the light displays itself within well-defined limits and then appears as an arc in the heavens, but this one came first like a faint ruddy gauze and then grew white looking, like the milky way,

'Close overhead,
Its awful adumbration passed,
A luminous shadow vague and vast,"

—and from faint beginnings it gradually, as darkness increased, grew into a real presence, and, as the hours waned, it became brighter and brighter until, standing on the ship's deck, one could read ordinary print. At first the light flashed from east to west for an hour or more, nowhere showing with particular brightness. Here and there the light appeared as light gossamer clouds through which, however, could be seen the coldly brilliant flashing of the stars. But there was not, even low down on the horizon, a single fleck of cloud to be seen, and these steam-like spots of color changed their location so suddenly as to keep one busy following them up. They seemed to be playing "tag" in the heavens, and the approach of one was the signal for the departure of others. Sometimes they met and, for a second, the point of conjunction was illuminated.

The second stage of the display was reached when these wandering messengers in the heavens became temporarily stationary. From being cloudlike the light changed into great bars. Now and then one of these bars of light would open out like a fan and spread through an arc of about thirty degrees and then suddenly contract again. During this stage the light did not expand at the point nearest the horizon; there it remained fixed while the top flew out and back again in fan-like sprays. In this stage, only, the aurora probably resembled the illustrations. The tips of the fan-like sprays were not of equal length,

and their departure eastward and westward was not equal. One pulsation threw the flashes far to the westward and only a short distance to the east, while several succeeding ones discriminated noticeably in favor of the east. So it went for an hour or more, gradually growing feebler and fainter until we thought the exhibition was over. But the most brilliant illumination was yet to come, and about ten o'clock the final phase began. It was the most peculiar and beautiful of all. Now the light appeared in long gauzy fringes that depended out of the star-lit sky trailing oceanward. They fluttered and waved from west to east like suspended flounces of lace. Some moments there was but a single flounce to be seen, and the next, heaven was crowded full of them. Sometimes they were wide apart and then again quite closely packed, threatening every instant to blend together. It was only a threat, though, for each preserved its individuality. When this phase of the illumination was at its height the starry dome was crowded full of these flounces of light, all radiating from the zenith down to the horizon on all sides, and looked not unlike a colossal mushroom of which we were afforded an under view. The light thus far had been either milk white or livid green, but when the mushroom form appeared, a faint red tinge suffused the sky. Finally, all this beauty of form faded and resolved itself into a single zone of light that seemed to be not five hundred feet distant overhead. This arched zone looked like a rainbow, its uppermost point was milk white, its center livid green, and the final fringe, nearest the ocean, pale scarlet. Unlike the flutterings I have noted in the early display, the flutterings in this last curtain ran from east to west, chasing each other in endless succession. Finally, a reaction toward the east set in and the on-hurrying pulsations from the east were checked for a second. It seemed as if two forces had met and were struggling for right of way. Finally the current from the west triumphed and, sweeping across the heavens like a flash, extinguished the last sign of the aurora.

We returned to the States without news of the "Jeannette" only in time to hear of her sad fate. Of that you are informed. I have been asked if, in my opinion, another expedition will ever be sent in search of the pole, and I must answer that expeditions will continue to be sent until the pole has been reached. The melancholy failure of the "Jeannette" will not even postpone activity in this regard, for even now Lieutenant Bove, of the Italian navy, is collecting funds for an expedition to the South Pole, and Lieutenant Hoovgaard, of the Danish navy, who accompanied Nordenskjold in his north-east passage trip, is meeting with flattering success in his efforts to organize a North Pole expedition. Before this time next year both will be at their work, I have no doubt.

THE ALBANY INSTITUTE

By GEORGE W. CLINTON, LL.D.

[Read before the Institute, November 21, 1882.]

A month or more ago our learned Secretary paid me a high but undeserved compliment by asking me to prepare a paper for our Institute, and I consented to attempt it. A week or so since he informed me that the meeting of this evening would probably be without a paper, unless I would engage to write one, and I at once told him that I would. Then I commenced a fitful inquiry for matter, and became aware that I could offer you nothing but an undigested mass of scraps. Our pertinaceous Secretary, some two or three days afterward, inquired by what name or title he should announce it. That set me seriously a thinking. At first I was inclined to adopt for its title MIGMA,—the heading "Our Continent," places over its medley of short paragraphs; but I soon found that the word, though a recent acquisition of our language, and meaning, in the general, *a mixture*, means, also, "special mixed food for brutes" (Worcester's dictionary), or "mixed provender for beasts" (Webster), and that it is used in the Vulgate as a proper name for superior food of horses and of asses. (See also our version of Isaiah, 30, 24.) Of course I rejected it contemptuously. I wish to present to this honored and honorable society some food that would be nutritious for men of strong intellects and noble hearts. And "Salmagundi" had been adopted by Irving and his associates for that little work which gave the world one of the first, faint foretastes of the wit and humor of our people. Other names of similar import seemed harsh and unsuitable. Hotch-pot is barbarous. And so I was led by love and not by a sense of any peculiar fitness to give it the name its bears.

And now, Mr. President and gentlemen! I confidently throw myself upon your indulgence, relying upon your belief in the assurance that I have been actuated throughout, in my rash undertaking, in the writing of this paper, and in the naming of it, solely by strong attachment to the Institute, and to the Albany academy, in whose building it has held its meetings for fifty years and more, and by pride in and love for our noble city, one of whose chief jewels the Institute is and always must be.

From my ninth year I was an Albanian until I had somewhat overpassed my majority ; in this academy I received the sound beginnings of a solid education. Of the Institute I became a member in 1826. After an absence of about half a century I returned last year full indeed of affection for Buffalo and for its people and for the institutions there which I had taken some little part in founding or sustaining, but with all my old and unabated love of our grand city, our venerable academy, and of our Institute. I have resumed my citizenship of Albany, and I have again taken an humble place in our society. O'Shaughnessy, and Dr. Shaw and Theodorick Romeyn Beck have ceased to serve science and gone to their reward ; but I am happy in the knowledge that the academy has maintained its old reputation for thoroughness and enjoys increased favor of the public. To Dr. Beck I am indebted for the beginning of an unperfected medical education. He was, in my time, the chief prop and ornament of the Institute. His intellect was acute and strong, his pen facile, clear and vigorous, his heart tender and true, and yet therewithal he had a reverence for order and discipline, which led him, as I once thought in anguish, to forget mercy in vindicating them, and become a mere avenger. He was a savage flogger — this room was a laboratory. Here have I watched Lewis C. Beck and Joseph Henry at their work. In the large room on the next floor — the room where the first University Convocation was had — I have seen these men play battledore and shuttlecock like true philosophers. The memories of these three men are very dear to me and it gladdens me to know that they were all my friends so long as they lived.

In our Manual of 1878 I am recorded as a resident member in 1826. In the list of 1878, of those who became members in and prior to that year, I find only six names free of the fatal asterisk. Glad indeed am I that my old friend, our honored president, is one of the six. Long may he survive to preside over the councils of the Institute, to animate and sustain it in its labors, and to add to your enjoyment. Of the five other names I find only that of Dr. Phillip Ten Eyck in the list of "acting resident members." In this populous city, of the hundreds and hundreds whom I knew and loved and looked up to with reverence, there are very few survivors, male or female. I cannot exhaust my fingers in counting them. The city itself has experienced many changes, and has had what, in slow-going Europe, would be pronounced a marvellous growth. The impetus which it received from the completion of our canals has been augmented by the railroads — the offspring rather than the creators of the prosperity of our happy country. As to the changes which time has wrought in the city there

is little, very little, if any, matter of just regret. I cannot mourn over the disappearance of out-worn buildings and ancient inutilities. When they become impediments to vivifying improvement let them perish. I do miss the *click-click* of the paving-stones as, in the good old time, they were borne down State street in the gutters by the floods of summer showers. The sooner all the cobble-stone pavements are replaced with granite and with asphalt the better for our reputation as a municipality. I am glad that trade has taken possession of North Pearl street, and that its private residences have been transmuted into or succeeded by stores. The Banyer house on the southeast corner of Pearl street and Steuben — perhaps more vividly by reason of its utter transformation — is for me suggestive of a host of painful, rapturous, and most sacred memories, but the loss of its old form and uses is but as a death in the common course of nature. The old freestone capitol is doomed, and I am sorry that it must go, although reason tells me that the personal associations and the memories which endear it to me are not shared by those of a younger generation and will have no influence with the next. As to the memorable events and acts which have occurred therein, the records of them will survive and their endurance cannot in the least depend upon the fate of the old and effete structure. From my youth up to this weary day I have loved the canals whose completion made our State illustrious and New York the chief emporium of the continent. I have always contended that the removal of any charge upon or unjust restraint of commerce was a substantial victory for right policy and a general gain, and need I say that I glory in the noble action of our people in making the use of their canals free from all burdens? But deep as is my love and trust in the canals, my love and confidence in commerce is deeper If they prove — as I am very far from believing they will prove — inadequate or inefficient as regulators and as instruments of commerce, they, like any other useless burden on the people, ought to be abandoned and filled up.

But, to return! "Let the dead past bury its dead," is to me a mere sounding folly, or as ambiguous as a Delphic oracle. Are we not to recall the past — the life, the deeds, the victories, moral and patriotic, of the dead, and the great sacrifices and sufferings which won them? If our memories of the past enfeeble and unfit us for just and vigorous action, dismiss them. But the past, whether for us replete with triumph or marked with failure and with mourning, the memory of our mishaps and successes and of the causes that led to them, our yearnings for loved ones whom we have lost, our regretful and tender, and abhorrent recollections, if we indulge them not in excess, do tend to invigorate and purify us. If the past is dead and we bury it out of

sight and mind, or leave it, all forgotten, to decay, and are to live only in present action, where is the possibility of repentance and amendment? If this dark saying have substance in it and be true, where are the uses of history, sacred or profane? The glory of the present is best seen in the light of the past, and so the recollection of the fitful struggle of light and darkness through cloudy dawn intensifies the majesty ineffable of the conquering sun. I too am an Albanian — an Albanian to the core — and can the young men among you realize the advance of Albany as I do? I who have gone down to New York in an Albany sloop — have swum from the dock across the river long before the pier was thought of, and have strolled, time and time again, through the Patroon's meadows, now covered and more than covered by the Lumber District, when I went to bathe or to botanize? How can the academy boy of this day admire and enjoy the charming park of the academy as I do — I who remember well when that park was a bed of clay, as naked as your palm, with one or two saw-pits in the southeast portion? I cannot tell you how proud I am of what you and your forbears have achieved in my long absence, and how confident I am that Albany is at the mere beginning of a long and glorious career. Progress is manifest in all directions — moral and physical, public and private — in the comfort and intelligence of its people, in its buildings, public and private, in all or nearly all the institutions which favor high culture, true taste and the amenities of life, or are demanded by patriotism and spring from heavenly charity. The innocent pleasure of the living has been borne in mind, and a fit depository of the sacred ashes of mortality has been provided. The Washington park is a perfect jewel. It is diversified and beautiful. It is dignified by its common enjoyment by all classes of worthy people. It is beautified by the happiness of children, by health-giving sports, by freedom from carking care and the sense of pleasures rightfully enjoyed. The Rural cemetery is far beyond my power to praise. It is a wonderful adoption and adaptation by true artistic taste and skill of a rugged and wildly beautiful site to holy uses. It is a fit station and resting place in the passage through death to life eternal. In its solemn loveliness it gives assurance that the dead are lying there in calm repose, awaiting the summons of the last trump to rise and enter, through the judgment, their houses, not made with hands, eternal in the heavens.

Such are some of the good works of our people, and while their charity has been exhibited so creditably in all public ways, I doubt not that their unrecorded and unpublished charities have been worthy of a generous and Christian people.

Albany has not been without distinction for the ability and ardor of its friends of literature and science. Candor compels me to say that the Young Men's Association has not among similar associations so high a rank as is desirable, and that it is very probable that a free public library would be of service to the people and creditable to the capital city of New York.

The Dudley observatory is a just monument of high personal worth and of the wifely appreciation of a generous, high-souled woman. Its perfection and utility are largely due — if my memory err not — to the gifts and personal services of gentlemen, whose names are graven on marble in the observatory itself, but of whom I can now recall the names only of the two whom I have especial cause to honor, and they are Thomas W. Olcott and Erastus Corning. I have no imagination; I cannot see the appositeness of the term "light-houses of the sky," applied by John Quincy Adams to astronomical observatories. But I do honor this benefaction of science as a proof of the munificence of Albanians and a source of true honor to Albany. That fruitful gift, the Dana society, and this honorable Institute, so far as I know, are all that this great, rich and favored city can point to to prove it a votary of science. Pardon me, my friends, for venturing to lay before you, in all simplicity and with true humility, some reasons why Albany ought to be more active than she seems in the diffusion of knowledge here, and in the cultivation and extension of the arts and sciences, true auxiliaries of Christianity, and therefore props of that civilization on which our liberties and progress do all depend.

In returning to Albany, how could I help thinking there was reason to apply to myself dear Goldsmith's lines:

> "And as a hare whom hounds and horns pursue,
> Pants to the place from whence at first he flew,
> I still had hopes, my long vexations past,
> Here to return, and die at home at last."

The notion that science and religion are, or can be, brought into opposition is absurd. Both are truth, but truth springing from different sources. As to religion, her source is heavenly, and "the eternal years of God are hers." Science is true, but her duration is measured by time, and her existence in time is dependent on the will of God. If it please Him, the laws which he has imposed upon matter and upon forces and all the affinities and powers of the elements may be wholly changed and yet life and order remain perennial. Science consists wholly and only of facts; they are the only truths in nature. Our efforts to group them, to connect them, and to deduce from their

connection theories of laws and historical and geological compound truths or facts, however sound and satisfactory they may seem to us, are attended with uncertainty. Figures cannot lie, but cyphering, however correct, does not always result in certainty of truth. To insure that, the starting figures must be true ones, and their perfect applicability to the investigation in hand be unquestionable. Even astronomy, so sublime in research, so magnificent in results, claims only to have achieved approximations to the heavenly distances of sun from earth, of star from star, and of the length of the earth's meridians. We cannot accept hypothesis for science. A theory, such, for instance, as gravitation even, is not assured truth, but simply an assumed law, or congeries of laws, with which every fact known to us as dependent upon law, accords. If a fact involved by it contradicts it — and we regard the existence of such a fact as utterly impossible — that theory would fall. Theories are accepted as science. If they be science, then, like religion, they are founded on truth. An hypothesis is a large conjecture, propounded for investigation. There is, in our day, a salient example of hypothesis in what is called evolution, or the Darwinian theory. To regard it as a theory, when no fact of an evolvement of a species from a species in our day, or in all the range of history, is recorded — when missing links in the progression of dead matter into the nomad, and of the nomad up to man, occur in numerous instances, and Mr. Darwin himself admits that there is at least one missing link between the ape and man would seem preposterous. Mr. Darwin rendered much actual service to true science, and on the hobby which he borrowed from Lamarck, caparisoned afresh most richly, and rode so gracefully through some new paces, he won high consideration. In my poor judgment, his hypothesis can never become a theory; but if it were to be raised to that far higher dignity — were unexpected discovery of new forms of life, and further disinterments of perished ones from the bowels of the earth to supply all the missing links — how could it shake Christianity? I am free to say that it would not impair my belief in the substantial truth of Genesis. It might weaken the faith of some. But our religion is not founded upon that sublime record. It rests upon the life, the miracles, the teachings of our Lord and Saviour. Religion belongs to a far loftier sphere, and may well hold herself aloof, in her inherent tolerance, from the disputes of wordy scientists. The wisest of them will, I am confident, inform us that science, grand and beneficent as it is, has not ever in any thing attained eternal truth; that in relation to that a theory is but an assymptote, which were it extended through all space could at most but continually approach, but never reach it.

Albany is not undistinguished, among other municipalities, for its solid wealth, and surely there is room here for its further use in the advancement of literature and science, of history and the arts. I have no notion that undue luxury prevails here. Indeed, I do not admire asceticism, and dare not inveigh against luxury. It must be injurious to the sensualist and the sybarite equally with the man, if such a man there be, who, not content with the due enjoyment of it makes beauty the subject of his worship. Such men seem to me miserable cumberers of the ground. But in the luxury of the rich I cannot but recognize a great source of public income, a stimulus to invention, a patron of the beautiful arts, a wide incentive to industry and a promoter of varied and honorable labor. Then, too, we must remember that it is a cause as well as the fruit of commerce — commerce that tends so strongly to the unification of the nations by making them interdependent, to the interblending of races and the introduction of universal peace. We must remember, too, that what many years ago were the luxuries of the wealthy have become common comforts and enjoyments of all our people. Indeed, the tendency of commerce, though it heap up wealth unequally, is to diffuse truth and pleasure and produce equality. I approve, while I do not envy, that luxury which consists in drawing unto itself the richest productions of the sculptor, the painter, and all the creators of beauty; that finds delight in the softest furniture, in the commodiousness and fit decoration of its habitations, in the perfection of its grounds, and in the æsthetic wealth of its possession; but I love the liberality of the possessor who makes those possessions fruitful by sharing their enjoyment with or giving them to the public.

But is there not something very noble in that ode of Horace [12, Book 2], in which he deprecates the luxury of his age, and concludes, in fervid indignation by reminding them of the simplicity of living, and the public spirit of previous ages :

"Non ita Romuli Præscriptum et intensi Catonis Auspicin veterumque norma" etc.

"Not thus did Romulus command;
Not such was bearded Cato's law;
The ancient worthies of the land
A rule of life far different saw;
Small was the cost they called their own,
But vast the public splendor shone."

"No colonnade of private men
Admitted wide the northern air;
The turfy hut was lawful then,
The city was the common care;
The fanes of God were there to shine
With marble chiseled from the mine."— ELTON.

The approval and respect of our family, our friends and neighbors are essential to our contentment; and the glory of our country, our State, our city, is among the most valuable of our possessions. The past of Albany is not only full of moving incidents, but it involves events and transactions which have, so far as we can judge, affected the whole course of the history of our State and country. In it have moved and acted and taken counsel together from the dawn of colonization unto our day, no small number of worthies whose names ought to be as familiar to us as household words. This Institute, I am glad to see, purposes the preparation of a "Memorial History of Albany," upon a most admirable plan. But you must pardon me for reminding you that Horatio Seymour, who has spoken so truly and so nobly of Albany, is, of all living men the one who is by knowledge and ability best fitted to write its general history — a history as fertile of incident and as important to mankind as that of Thebes or Sparta. May high heaven bless him, and give him strength and disposition to perform this noble service for us and for mankind.

Is it not becoming in Albanians to bear in mind the dignity which the people of the State have conferred upon it? It is the capital of the great State of New York. Here rises that majestic capitol whose gray and massive grandeur is a fit emblem of our institutions and their permanence. It is a splendid recognition by our people of the worth of liberty and law, a rich evidence of their deep sense of the dignity of the aggregated people, and a fit tribute to the glory of New York.

Here, too, the State has planted one of its normal schools, its invaluable library, its museum of natural history. Here, too it maintains two scientists at work — an admirable botanist and a geologist, who is justly famous the wide world over. Here, too, is placed the State entomologist, who is well known to you for his successful labors. And now, my friends, may I not say that from these facts flows a manifest duty on the part of Albanians to put all these benefactions to their proper uses, and by their own due use of the facilities and wealth the fostering favors of the State have in part created to brighten the reputation of Albany and advance the interests and augment the glory of the people of our State, by raising the Institute to the highest pitch of usefulness? I will add that, in my humble judgment, the study of natural history being one of the three purposes for which our charter was granted by the people, good faith requires that the Institute should be so organized and sustained as to pursue it with thoroughness and success. I am tempted to say something as to the importance and the charms of pursuits which make us intimate

with nature, soothe us with sights of beauty and attune the soul to love and praise of the Creator. But I forbear.

The age of chivalry is not gone. The fantasies have perished and woman occupies more nearly than in that age, her true place as the help-mate—the help and mate or equal of lordly man. His is the rougher work—hers the softer and more refined. She works as well as he. She shares with him in toil and in ambition. The winning of her love, if she be noble, confers the purest pleasure and most precious crown. She applauds him when he sings :

> "I could not love thee, dear, so much,
> Loved I not honor more."

She incites him to honorable effort, buckles on his armor and animates him in all life's battles. Without her seconding, man is like Samson shorn of his locks. No people has won liberty, repelled an invader and saved their country, unless they were moved to or sustained by the influence of woman. They are the most efficient promoters of all schemes of charity. On all questions of the highest moment the majority of women adopt the better side. Their approbation is essential to the success of your attempts to make the Institute more useful ; and, therefore, I could not close without requesting you to consider what measures, if any, can properly be taken to conciliate the esteem and win the favor of the good ladies of Albany.

APPENDIX TO JUDGE CLINTON'S PAPER.

Remarks by Henry A. Homes, LL. D.

As a sequel to the paper just read by Judge Clinton, I beg the privilege of adding one or two remarks. His topic and the honored writer's name suggest allusions to the changes wrought with the lapse of time, and to the growth of knowledge as regards the resources and the geography of the State. I hold in my hand the first printed annual report of the Albany Institute, made in the year 1825. It is not included in the first volume of its Transactions and is exceedingly rare. It appears from the list in this report, that of the sixty donors to the Institute up to that date, that only three are now living: Mr. O. Meads, Judge G. W. Clinton and Mr. W. H. Bogart. And of the resident members, only four are now living, Mr. O. Meads, Dr. T. Hun, Mr. W. C. Little and Dr. P. Ten Eyck. Judge Clinton did not become a member until after he had been a donor and had read his first paper.

Judge Clinton's first paper, which is printed in the first volume of our Transactions, was read in 1827, and was entitled a *Notice of the Graphite of Ticonderoga.* At the time when he visited the place where graphite or plumbago was found in Essex county, it was collected by the farmers of Alexandria and sent in the crude state to the amount, perhaps, of three tons in a year, to New York city to be refined and manufactured for various uses. Since that time and within a few years, graphite has been found associated with gneiss in quite an extensive district; a company has been formed which has at Ticonderoga an immense brick building, two stories high, and which employs over a hundred men in the preparation of the graphite for the market for the various uses for which it is employed — for crucibles, lead pencils, stove polish, paints, and especially a magically fine powder which successfully takes the place of the smoothest oils as a lubricator to obviate friction of machinery or of the wheels of railway cars. The company sends by rail on an average, a car load every week of the products of their works to the centers of commerce.

A further illustration of the increase of knowledge in this State is obtained from this same first volume of our Transactions. Prof. Joseph Henry, in 1829, being Professor of Mathematics and Natural Philosophy in the Albany Academy from 1826 to 1832, read a paper before the Institute entitled *Topographical Sketch of the State of New*

York, designed to show the elevations of its surface and of its mountains. It was illustrated with an engraved map attached to the volume, in the construction of which he was greatly aided by D. H. Burr. But of mountains whose height is over three thousand feet, only two are recognized as existing through the whole State, and these two were in the Catskills, High Peak, 3,718 feet, and Round Top, 3,804 feet high. In contrast with that statement, our geographers now report that there are in the Catskills alone thirteen peaks over three thousand feet high, and at least three of these are known to be 4,000 feet high. And our knowledge has so extended since then that, whereas, in 1820, the height of only a single mountain of the Adirondack group was given in Prof. Henry's tables, the height as given was exceedingly erroneous. It was that of Whiteface, which was stated to be 2,686 feet high; and not a single peak higher than that was recognized as existing in all the ranges of those mountains. Whereas, now, not only is Whiteface found to be even 4,918 feet high, but there have been measured thirty-four peaks over three thousand feet high, of which twenty-one are over four thousand feet high, and three of these latter are more than five thousand feet high.

But this ignorance may sufficiently be accounted for by a statement like this from Dr. Todd's *Letters frow Long Lake*, as late as 1845: "In the upper part of New York * * * * is an almost unbroken wilderness of perhaps one hundred and fifty miles long and one hundred wide."

It is a fact of still greater interest in illustration of the increase of knowledge in the State, and the discoveries of science since the period of this first Report of the Institute, that this same first volume of our Transactions contains the first paper which Prof. Joseph Henry ever put in print relating to his electrical researches, through which he ultimately gained so much renown. It was dated October 10, 1827, and was entitled *On some Modifications of the Electro-magnetic Apparatus.* And from the principles which he was then beginning to develop, discoveries made by him and by others have been gradually accumulated, until now, after half a century, the world is participating in the enjoyment of the perpetual daily miracles wrought by the telegraph, the telephone and the electric light.

THE OPEN POLAR SEA.

By George R. Howell.

[Read before the Albany Institute, January 16, 1883.]

Year by year the unexplored portions of the earth are growing less and less. Africa has been intersected from all directions by the tracks of the man of science, the man of traffic, or the man of the newspaper, until it has yielded up the secrets of its lakes and mountains. Remains alone the enterprise of penetrating an ice-pack barrier that fringes a circle of distance varying from seventy-two to eighty-three degrees from the north pole, and embracing an area of one and a half million square miles.

In all ages the distant north has had its place in early myths and European literature. It was the frozen north and the land of Cimmerian darkness to the old Roman; the home of the frost king and the frost giants of Teuton and Scandinavian. When traffic first began to inspire the sailors of Europe to the undertaking of hazardous voyages of discovery in the reigns of Henry VIII and his daughter Elizabeth, Barents from the Netherlands and Hudson from England, first sailed up against that formidable ice barrier and skirted it from Greenland to Novaya Zemlya. Their ships were not over one hundred tons burden, but they pressed as far almost to the north in them as we have done since in the same field of exploration with much larger vessels and ampler equipments. At the bidding of commerce they were struggling with the ice-pack to find a path over the north pole to China and the orient. And after these came Fotherby and Baffin and Scoresby and Davis and Ross and Franklin, and too many more to mention, of bold spirits from England and Holland and Russia and America, who one after the other have essayed this adventure and failed. The barrier erected by nature at the gateways of the Arctic basin has been impassable.

This barrier is one of floe ice broken up and the pieces piled on each other at times as high as a church steeple, sometimes mixed with bergs wedged and frozen in and the whole so broken and irregular that one might as well attempt to drive a carriage from the roof of Trinity church to Harlem high bridge as to drive a sledge over this mass of ice. But this barrier is not always in such a solid condition.

More than once open water has been found, up which navigators have sailed to greater or less extent. And once notably Capt. Hall in the Polaris might, it would appear from some accounts, have sailed right on to the pole if the vessel, for some as yet unexplained reason, had not been put on her return passage.

The belief in the existence of an open circumpolar sea, then, is a matter of logic only. No human eye has yet looked out over its expanse, no vessel ever broken its solitude. It is a case of circumstantial evidence, or, perhaps, rather of logical inference from isolated data accumulated from different explorers. Its existence, however, though itself never seen by mortal eye, may be demonstrated to the satisfaction of any man who will give due weight to the operation of natural causes, and not allow his preconceived opinions to override the evidence presented in support of the theory. This evidence in brief is as follows :

1. Nearly all Arctic voyagers unite in their testimony to the fact that with the coming of spring myriads of geese, ducks, plover and gulls are seen in the zone of the floe ice, say from about seventy-two to eighty-three degrees, migrating northwards for nesting and raising broods. Their regular return southward at the close of the nesting season has also been observed. This of itself proves the existence of a warm region there, and there is no escape from this conclusion, as these birds are as obedient to their natural instincts as the planets are to the law of gravitation. Greenland almost covered with perpetual glaciers could afford no land suitable for the breeding season of these birds.

2. The younger Symmes in support of his father's peculiar theory cites the narratives of Arctic voyagers which not only tell of the nesting of birds in these extreme northern regions, but assert that in the fall of the year many of these water-fowl, as well as reindeer, foxes and white bears, have been observed migrating to the north of Greenland to find milder winter quarters. In support of these statements it may be added that it is now the belief of science that the pole of greatest cold in Asia is at or near Verkoyansk, in Siberia, in about sixty-seven and one-half degrees latitude. The corresponding point of cold on the western continent is believed to be north-west of Parry islands in about seventy-eight degrees of latitude.

3. Dr. Hayes says that in the last days of November, while frozen up in his winter quarters at Port Foulke, he experienced a warm wind from the north-east that occasioned a thaw. No warm wind from the south could have passed over the northern portions of America or Asia, at that season of the year, and much less through the upper

regions, and returned south-west from the pole and remain still a warm wind. That warm wind was generated at the north pole or within ten degrees of it. Parry and Ross and other navigators have mentioned the same phenomenon, but not so emphatically, or with as much detail as Dr. Hayes, and therefore he has been cited.

4. All navigators record their having experienced at times furious gales during the long Arctic winter. This, of course, means the neighborhood of a portion of the earth's surface warmed by some influences to a much greater degree than the sub-polar regions. There is no wind without heat, and if the whole region inclosed in the Arctic circle in midwinter were subject to the same intensity of cold as the zone of hummock and floe ice to the south of it, then the calms of the equator would prevail within that circle for nine months of the year.

5. The testimony of Mr. Morton, of Dr. Kane's expedition, and of Dr. Hayes, to the fact that leaving the zone of floe ice behind and to the south of them, that they beheld a sea without a floe, or a berg, breaking upon a rock-bound coast, fringed with shore ice. This testimony is to a degree corroborative if not actual proof of the fact. It has reference, doubtless, to Kennedy channel, which skirts land on the east and on the west, still further to the north than Morton and Hayes were able to penetrate. But this Kennedy channel, there is every reason to believe, is really an arm of the open polar sea, and partakes of the warmth that keeps both sea and channel free from ice.

Notwithstanding these facts there may be some who will say that such a body of open water at that part of the earth's surface is contrary to natural law and to the natural condition of things in our daily experience. The common law is, the nearer the pole the greater the cold. This would indeed be true if there were but one law in operation in the domain of nature. But as her laws are manifold, and many natural forces are at work simultaneously on land and sea and in the atmosphere, we may still have the open water at the pole as a result of natural causes.

There is an ocean current generated by the unequal heating of the waters, or by winds, or by the motion of the earth on its axis, or by all combined, having its beginning at the equator and flowing for a while in a westerly direction. Before long it turns north, sweeps around the north-east coast of South America into the Caribbean sea and gulf of Mexico, whence it issues through the strait south of Florida, as the warm and rapid ocean-river, well known as the gulf-stream. It is now, and for over a thousand miles, a magnificent river in mid-ocean, bounded on the west by the sharp slope to the bed of the Atlantic. It is well known that the shore of the ocean

is, for about sixty to one hundred miles, a comparatively shallow and gradual slope, when it suddenly dips sharply until the bottom of what is called the telegraphic plateau is reached. This sharp decline leading to the ocean bed is the western boundary of the gulf-stream. Its surface and water boundary is a counter-current of cold water coming from the east of Greenland and from Davis strait, and one that washes the coast of the United States from Maine to Florida. As the gulf-stream passes Florida it has a maximum surface temperature of eighty degrees Fahrenheit, and a velocity of seventy to one hundred and twenty miles a day. It is here from 2,500 to 3,000 feet deep, forty miles wide and exceeds more than a thousand times in volume the Mississippi in its flood.* It gradually lessens its speed and spreads out in width in its northward passage until between New York and the Bermudas the temperature has lowered to seventy degrees and the depth diminished to between 400 and 500 feet. The Azores deflect a portion which bends around the north-west shore of Africa, inclosing the Sargasso sea, the same placid sea filled with ocean weeds and grasses that astonished Columbus and his men as they sailed slowly through it day after day. The main branch of the gulf-stream turns in a north-easterly direction carrying perpetual verdure to Ireland, and on to the north-western coast of Norway, so that garden vegetables may there be expected in their season, often stranding West India fruits on Spitzbergen, and so it moves on to Novaya Zemlya where hitherto it has been lost to human observation. Here knowledge from observation ends, and speculation or logic, if you please, begins. What becomes of it after it reaches the neighborhood of the ice barrier of berg and floe all cemented pell-mell together? There are two reasons now why the specific gravity of this gulf current is greater than the water fringing the ice barrier. First, the water of the Arctic region has been largely added to from rain and snow, from melted ice from the vast glacier system of Greenland, and, as it is well known, fresh water is lighter than salt. Secondly, water just before it reaches the freezing point loses some of its weight probably by expansion, but lose it, it does in some way. For these reasons the waters of the gulf-stream, as they pass the latitude of Novaya Zemlya, have a greater specific gravity than that bordering the ice barrier, and, consequently, the warmer and heavier current sinks. It dips and passes northward under the ice barrier as an undercurrent. And so it passes on northwards until it meets a similar current from the opposite side of the globe, or until it has lost its progressive velocity. Having at last given out all its remaining heat to the surrounding polar region, it returns

* Maury.

south as the cold Arctic current, before mentioned, by the coasts of Greenland, and so along the shores of the United States. It is true no such undercurrent has yet been observed on the north of Europe and Asia, but nothing else is adequate to explain what is really taking place in those regions. But several navigators have noticed such an undercurrent of the gulf-stream passing up Davis strait, west of Greenland, and one, too, indicating the passage of a large body of water. Lieut. De Haven, while attempting the northern passage through this strait, found himself drifting back to the south on a surface current. Noticing a large ice-berg drifting steadily north by means of this undercurrent, he made his vessel fast to it and in his own language, "was carried north like a shot." These two branches of the gulf-stream, and another through Behring's strait, temper the circumpolar region, and make it mild enough for birds and animals to live on vegetation through the long Arctic winter. As the lands must be free from snow to enable the reindeer to crop the grasses and lichens, so the waters would never be frozen. In short, we may ascribe to the waters of the circumpolar sea a temperature from forty to sixty degrees, and to the land a climate not far different from that of Alaska. We should expect to find there among the islands adjacent, grasses and lichens in abundance, and a moderate Alpine flora.

So far we have arrived at results by legitimate inferences from isolated facts brought together to show their relations to each other with reference to the land and water of the Arctic zone. Let us now see what we may learn of the atmospheric phenomena of the same region. It is a well-known fact that the circumpolar regions and a belt of land, including the equator and extending a few degrees both north and south of it, are the zones of permanent lowest atmospheric pressure. That is to say, that the mercury in the barometer, say at Spitzbergen, year in and year out, stands lower than it does in New York, owing to a greater amount of vapor in the polar regions. Now, then, as the waters of the gulf-stream give out their last remaining heat about the pole, the enveloping atmosphere would receive the radiated heat. But these are also just the conditions of vaporization from large bodies of water — a warm belt of water bordering upon a colder. This accounts for the vast amount of rain and snow that falls north of latitude seventy-two degrees, as shown by the extensive glaciers of Greenland, Spitzbergen and all the sub-polar lands. But this amount of heat in the circumpolar region would necessarily cause an ascending current of warm air. As it rose the currents of air from the south would flow in in all directions to the north pole. At the same time the motion of the earth on its axis would make this column of air to flow from the south-east to the north-west, and so give a spiral motion

to this current of air ascending in a north-westerly direction, and even cause it to gyrate in a certain stratum around the pole. To make this more clear, let us call to mind the manner in which the well-known trade-winds are produced. The atmosphere at the equator is being carried round by the motion of the earth on its axis at the rate of a little over 1,000 miles an hour. Forty-five degrees north of the equator the atmosphere adjacent to the earth is in like manner carried out about five hundred miles in the same period of time. Suppose a section of this atmosphere at forty-five degrees north of the equator be started on its course southward to fill the vacuum made by an ascending column of air from the tropics. As it goes south it takes with it its rotary velocity of only five hundred miles an hour, but it goes into a region where the earth has a rotating velocity of from seven hundred to a thousand miles per hour as it approaches the equator. The earth, therefore, slips on ahead to the eastward, causing the wind to blow west of a south direction. In other words the trade-wind north of the equator blows from the north-east to the south-west. A similar effect is produced, as it has been said, at the north pole, by the heat brought there by the gulf-stream, causing a current of air to ascend in a spiral direction. This current of air, after rising to a considerable height above the earth, would return southwards as a cold, dry wind, its moisture having been squeezed out of it in its ascent, still affected by the rotary motion of the earth, but now in an opposite direction, this time causing it to have a westward instead of an eastward deflection, and familiar to all in the north temperate zone as the cold, dry, north-west wind of winter. Hence a balloon might take advantage of this and sail over the circumpolar zone of hummock ice and reach the pole, or circumvolitate it at will; or, indeed, approach or retreat from the pole by taking the proper air current.

This of course describes the wind system of that region in its general tendencies. Storms and atmospheric disturbances would not unfrequently interrupt the regular course of the air currents, and are as truly a part of nature's law as the trade-winds of the Pacific.

Such are the logical results of what is known of the meteorological conditions of the northern polar regions. So far as we know of the Antarctic pole the conditions are widely different. Not only does the southern hemisphere receive somewhat less heat from the sun than the northern, but the greater amount of land in the vicinity of the south pole makes the climate much more severe. Nor is there a warm equatorial ocean current sending its heat there as at the north. Indeed, there is reason to believe that a large continent includes and surrounds the southern pole, which must be loaded down with glaciers that no summer's sun will ever melt.

LONDON STONE.

By Ernest J. Miller.

[Read before the Albany Institute, February 27, 1883.]

To the American traveler approaching London, it presents a very familiar appearance. For far off in the distance he sees the immense dome of St. Paul's and the turrets of the Tower of London; and so well known have they become, both by print and painting, that he needs no guide to point them out, but recognizes them at once as readily as he would any of the churches or public buildings of his native city. So that almost his first visit is made to these familiar buildings; not to examine them in detail or to study all the wonders they contain; but simply to verify his preconceived notions, and to know how nearly the representations he has seen of them agree with the reality. But in going from St. Paul's to the Tower by the almost straight road which is clearly seen on the map of Roman London, and which can be easily traced out even now, the traveler passes by one of the oldest antiquities of London, and one that is rarely visited by any of the tourists who roam over that old city. For the southerly end of St. Paul's churchyard is on Watling street, and passing down that street to Cannon street, you cross St. Swithin's lane. Near the lane is St. Swithin's church, and under the south wall of that church protected by an iron railing is a sort of stone monument with a large circular opening toward the spectator, and in that opening lies a small stone, but little larger than a man's head — that is London Stone, or rather all that is left of it. Every one can find out when the foundations of the tower were laid, but no one can tell when London Stone was erected in Cannon street. Every one knows who was the architect of St. Paul's, but no one knows who was the builder of London Stone. The reasons for the building of St. Paul's and the Tower are apparent at first glance, but why London Stone was built is only a matter of conjecture, and is not of absolute certainty. So to-night we propose to discuss a question of probabilities; for our subject can be nothing else, if we do not know why it was erected, or when, or by whom.

But before going further we ought to say that this venerable relic has not always occupied its present position. There was a time when it stood erect in the street, as one of the monuments of the city, and it has been sheltered and defended as it now is for only eighty-five years. When old John Stow made his survey of London at the close of the sixteenth and the beginning of the seventeenth century, it was standing in Cannon street, which is a corruption of Canwick or Candlewick street, and is so called from the multitude of candle-makers who lived there. In this street also were many weavers of woolen cloth brought from Flanders by Edward III, so that Stow says there were settled there "weavers of divers sorts, to-wit of drapery or tapery and napery." Lydgate in his ballad of London Lackpenny describes a countryman traveling through London. In Westcheape he was called on to buy fine lawne, Paris thread and linen cloths; in Cornhill to buy old apparel, and his own hood, which he had lost in Westminster Hall; in Eastcheape the cooks cried hot ribs of beef roasted, pies well baked and other victuals, and when he comes to Candlewicke street he says:

"Then went I forth by London Stone,
  Throughout all Canwicke street,
Drapers much cloth offered me anone,
  Then comes me one cried 'hot sheepes feete.'
One cried 'mackrel,' 'ryster grene,' another gangrete,
One bad me buy a hood to cover my head,
But for lack of money I could not spede."

Stow thus describes London Stone as it stood in this busy street: "On the south side of this high street, near unto the channel, is pitched upright a great stone, called London Stone, fixed in the ground very deep, fastened with bars of iron, and otherwise so strongly set that if carts do run against it through negligence, the wheels be broken and the stone itself unshaken." The cart-wheels must have been made stronger after his time to resist such perils as this; for certain it is that the stone has not always had the best of such encounters. He further says "that why this stone was set there, the time when or other memory hereof is none, but that the same hath long continued there." But about two centuries after Stow's time, on the 13th of December, 1742, it was removed from the south side of the street, where it had stood since it had been erected, to the north side, close to the edge of the curbstone. But even there the march of improvement voted the old relic to be a nuisance; and it would have been utterly destroyed had not Mr. Thomas Marden, a printer of Sherbourne lane, prevailed upon the parish officers of the church of St. Swithin, at the time the church was undergoing repairs in 1798, to

consent that the old stone should be placed where it now is. So to the antiquarian printer of London our thanks are due that any part, however small, of this old relic remains; and we can better appreciate his labor of love, since we know the value of the time-honored memorials of our comparatively young city, which have been preserved to us by the antiquarian printer of Albany.

I have spoken of this monument as old, but have only given a reference to the close of the sixteenth century; that might be considered old for this country, but it would be a misapplication to affirm age of any thing as modern as that in London. But we must admit that in this case the term is properly used, when we read that Ethelstan, who was king of the West Saxons, between the years 925 and 941, gave to Christ church in Canterbury a fair written Gospel Book, in the end of which was noted the lands or rents belonging to said church, one parcel whereof is described as lying near unto London Stone. So it must be even older than that time; since it was then well enough known to determine the location of land in its vicinity. But whenever it was erected it has, until the last one hundred years at least, been regarded by the Londoners with the greatest veneration, and watched over and protected with the most jealous care. Its origin, history and purpose were all unknown; yet each citizen guarded it as a part of his civic rights, and would resent its destruction as he would the abridgment of his personal liberty. Yet strange to say no one ever thought of giving us a description of how it looked in its early perfection, nor has even a print or drawing or sketch of it come down to us. We can find early pictures of London, of buildings celebrated in themselves, or made celebrated by celebrated persons living in them — even of fields and of trees, but nowhere a description of this antiquity, or any thing that would give us an idea of what it looked like. For any description of it at all — and it is a comparatively modern one — we are indebted to William Hutton, the Birmingham bookseller. He was a curious old antiquary, and had very much the same habit as old Pepys of noting every thing that happened to him; thinking, no doubt, that what concerned, amused or troubled him would be of like interest to posterity. So he puts down all he can remember, and what he does not remember he records what has been told him.

He went to London but twice on his own business he says; and when he went there in 1784 it was in obedience to a subpœna to give evidence at a trial in the Court of King's Bench. He wrote his journey to London at that time, and with his antiquarian knowledge would early make a visit to London Stone. His record of his visit is as follows: "There are situations justifiable in themselves in which a

man may be ashamed to be found. Every man acts in private what he ridicules in public. The error only consists in the discovery. It is not possible for the antiquary to pass by unnoticed so extraordinary an object as London Stone. It is not possible to find out its precise meaning. The small information received from history, and the smaller from tradition, prove its great antiquity. This curiosity is as little regarded as known. The numerous crowd of passengers take less notice of this stone than of those upon which they tread. My inquiries were answered with a supercilious smile, and all the intelligence I could gain was, it was a place of rest for the porter's burden. I was utterly at a loss, while I attentively examined this antique, how to face that world who considered it beneath their notice, and, instead of considering me in the same light, which I wished, might ridicule me for my attention. When a man looks ridiculous in his own eyes it is no wonder he looks so in those of others. This stone appears of a marble texture, near four feet high, two broad and one thick. An ornament at the top is broken off. In the front is an oval aperture or recess, two feet long, at the bottom of which is a broken fragment, which has supported perhaps an urn or image, expressive of the original design. Time seems to have destroyed the lower part of the oval and art has supplied the place with a patch."

This description is very short and unsatisfactory on that account, still it is the only description we can find, and has a greater value for us because it is a fact; and the prosecution of this subject further compels us now to leave facts and examine traditions, which, however interesting they may be, are always more or less lacking in the secure element of truth; and the source of our tradition is a History of Britain written in 1147 by Geoffrey of Monmouth, one of the most famous of the Latin chroniclers. This history at the time created a great sensation, and Geoffrey professed that it was a translation of a Breton work given him by his friend Walter Calenius, archdeacon of Oxford. In it Brutus, who was said to be a great grandchild of the famous Æneas, having fled from Troy because he had killed his father in hunting, came to Greece, and was advised by the oracle of Diana to steer toward Britain with his party of Trojans. After overrunning Gaul he came to the island of Britain, which was then inhabited by giants, and landed in Totness, in the county of Devonshire. Having conquered them together with Gogmagog, who was the greatest of them all, he gave the island his name in the year 1108, B. C. From this narrative, no doubt, arises the further tradition that he was the founder of the city of London, and that he brought London Stone with him from Troy and laid it with his own hands as the altar stone of the

Temple of Diana; and that it was at the same time the foundation stone of London and its palladium; and it came to be a popular saying "that so long as this stone of Brutus was safe, so long will London flourish," and, furthermore, that all the old British kings, on their accession to the throne, took their oaths on this stone, laying their hands on it, and until they had done so they were only kings presumptive.

Now if this history of Britain was reliable our task would be ended here, for we are shown why and by whom this monument was erected; but we are compelled to admit that although it was esteemed for more than one hundred years a true record of the events it narrated, it has to be considered as a work of genius and imagination rather than a truthful account of facts. For the first fact stated, that the Trojans ever came to Britain, is extremely doubtful. Cæsar, whose correctness as a historian is undisputed, says that the inland parts of Britain were inhabited only by the ancient natives, and that there were no foreigners there; and so impressed have more recent writers been with the fact that Cæsar and his legions were the first foreigners who made any abiding stay on the island, that the date of his landing has been made the subject of mathematical calculations from the slight premises derived from his history; and it is proved as nearly as such things can be, that he landed near Romney Marsh, about half-past five o'clock on Sunday afternoon, the 27th day of August, fifty-five years before the birth of Christ; whereas if the Trojans were the first foreigners, the landing of Brutus at Totness antedates Cæsar's landing at Romney more than 1,160 years; and it is strange, to say the least of it, that no record of the fact should be preserved save in this history. Again the fact of a Trojan descent is looked upon with a great deal of suspicion, because to be considered to be of Trojan race was a common vanity in these early times. And as one Francis, a son of King Priam, was considered at one time to be the founder of the French nation, and had given his name to the French people, in order that the Britains should not be outdone in descent by a people they equaled in valor, Geoffrey gratified them by inventing Brutus not only of Trojan but divine extraction, as the founder of the British nation. Why the ancients should have had such a curious vanity it is difficult to determine; but it is supposed to be that as the Romans pretended to a Trojan descent, the various nations that they subdued were induced to set up the same claim through an ambition of emulating their conquerors. It is an historical fact, however, that when Edward I in 1301 desired to establish the supremacy of the English crown over Scotland, he gravely uses as an argument before the Pope the fact of

the Trojan descent of the British. But as if these objections were not sufficient to cast doubts upon the truth of this history, another is presented; and that is that there never was such a person as Brutus — that no one of the learned authors who wrote about these early times ever mentioned him — that the facts of his birth and early life, as related by Geoffrey, are not in accord with the facts of the Roman history of those times; and as the Abbot of St. Albans, who wrote many years ago on this subject, has said "the whole relation concerning Brutus is rather poetical than historical, and upon several accounts rather fanciful than real." But in dismissing Geoffrey's book as a veritable history, we cannot agree with William of Newbury that he "forges every thing saucily and barefacedly and that he and his fables should be straightway spat out by us all," for there is no book, excepting the English Bible, that has exercised so great an influence on English literature, or furnished so great an amount of material for English writers. The early writers Wace, Layamon and Robert of Gloucester drew largely from it; the first English tragedy of Gorboduc, or Ferrex and Porrex (1565), was founded upon it; the Faerie Queen is filled with it; Milton's History of England was greatly influenced by it; Shakespeare derived his tragedies of King Lear and Cymbeline from the stories contained in it; and the effect of it is still seen in Tennyson's Idyls of the King. So that, unreliable as he no doubt is as an historian, he was an inventor of a new literary form, which is represented by the romances and novels of later times.

William Camden in his Brittania was the first one to gather together all the arguments which are now considered as proving the fabulous origin of Brutus and his connection with Britain and London, and the subject of this paper; and when he comes in his valuable work to the matter we are now considering, he speaks of it in connection with a little river flowing through London, called Walbrook, as follows: "It — that is the river Walbrooke — is not far from that great stone, called London Stone. This I take to have been a mile stone (such a one as they had in the forum at Rome), from which all the journeys were begun, since it stood in the middle of the city as it run out in length." It will be noticed that he does not say it *was* a Roman milestone, but only that he "takes it to have been"; and this opinion, so cautiously expressed, has in time been changed to a positive assertion on his part, and future statements have been founded on that assertion, and the whole matter has been considered settled. And there is no great wonder in this; for Camden was a man of great learning, good judgment and conceded accuracy in his statements; but when he does not affirm any thing positively, he ought to have the

benefit of his own well-considered and careful views. It will be noticed, too, that he gives no reason for his opinion other than that it "stood in the middle of the city as it run out in length;" and modern investigation drawing the map of Roman London shows him to be correct. He also no doubt founded his opinion on two other facts: the first that Antoninus, who wrote his famous "Itinerary" about the end of the third century, gives London as the goal or starting point of seven out of the fifteen great central Roman roads in England; and the other fact that Watling street, of which Cannon street is a part, is supposed with great probability to have been one of the military roads of Roman London. Now, the old writers mention four roads that passed through the southern portion of the island extending to different parts of Britain, and they were no doubt originally the ancient British roads by which communication was maintained between one district and another. Tacitus would seem to be speaking of these ante-Roman roads when he tells us that Agricola, in preparing for one of his military campaigns, caused a survey of the country to be made, because it was feared that the roads were infested by the enemy's forces. The roads can still be traced and were known as the Fosse — so called as some think because it was ditched each side — Watling street, Ermine street — now in the parish of Stoke Newington, London, and the Ichenild which began in the country of the Iceni. We will understand better the direction of these roads by the description of them given by Robert of Gloucester, who flourished about the year 1300. The quotation is taken from his Chronicle of England:

Fair ways many there beeth in England,
But four most of all their beeth I understand
That the old kings made where through we may go
From the one end of England forth to the other end:
From the south leads into the north, Eningestret,
And from the east into the west, Ikenildestret.
From Dover into Chester leads Watlingestret;
From the south-east into the north-west and that is some deal great.
The fourth is the greatest of all that leads from Tottenais (Totness),
From the one end of Cornwall even to Catenays;
From the north-east into the south-west into England's end.
Fosse, I call this way that by many good town doth wend.

Now these old British highways may well be considered Roman roads, for they were widened, drained, paved and kept in order by Roman engineering skill; and Camden says that at the end of every mile along these roads there were erected pillars by the Emperors with figures cut in them to signify the number of miles, so that Camden's conjecture assumes the form of a logical syllogism after this

fashion ; the old Romans were accustomed to erect upon their roads pillars to designate the miles ; London Stone was without dispute on an old Roman road ; therefore, it was a pillar to designate the miles. But after Stow and after Camden, came the great fire of London, and that revealed many things that had been concealed for ages ; and among other things it brought to light the foundations of this old relic. Sir Christopher Wren was employed to rebuild many of the churches burned down in the fire, and his opportunities to examine London under ground were exceptional and well improved. In his improvements he uncovered the foundations of London Stone, and so vast and extensive were they, that he was forced to the opinion that they must have supported a building or monument more extensive even than a central milliarium ; and because of this extensive foundation it is stated in the Parentalia "that it might in some degree have imitated the *milliarium aureum* at Constantinople, which was not in the form of a conical pillar as at Rome, but an eminent building ; for under its roof, according to Cedrenus and Suidas, stood the statues of Constantine and Helena, Trajan, an equestrian statue of Hadrian, a statue of Fortune, and many other figures and decorations."

But it will be noticed that in all these surmises, no reason whatever is given for a very curious state of facts ; the Londoners have reverenced this old stone for years, and even now protect the small piece that remains with a jealous care ; does the fact that it is an old milestone, whether patterned after the one at Rome or Constantinople, account for this? they do not so reverence the Roman Bath in the Strand, nor do they preserve under cover the piece of the old Roman wall discovered on Tower Hill. Shakespeare in his history of King Henry VI throws some light on this matter, and we need not fear to quote him, because he has in this instance followed the history of Holinshed who was a Londoner and knew whereof he affirmed. It was in 1450 when Jack Cade arrived in England from Ireland and put himself at the head of the great popular movement, at the time when the excitement against the government was at its highest pitch. He assumed the name of Mortimer and claimed to be a descendant of the Duke of York. The men of Kent followed him and he led fifteen or twenty thousand of them toward London. From the fields of Blackheath he sent letters to many of the Londoners who favored his plans; and after much correspondence the king sent a detachment of the royal army to attack the rebels. Defeating this detachment he made himself master of the right bank of the Thames, and from Southwark he sent to demand entrance into the city of London. This was freely granted to him by the Lord Mayor, and on the 3d of July Cade

marched over the bridge and led his followers into the capital. Shakespeare lays this scene in Cannon street: Jack Cade and his followers enter and he strikes his staff on London Stone, saying "Now is Mortimer lord of this city, and here sitting upon London Stone I charge and command that of the city's cost, the conduit run nothing but claret wine this first year of our reign. And now henceforth it shall be treason for any that calls me other than Lord Mortimer." Now you will observe here two things; first, that Jack Cade proclaims himself lord of London after he has struck London Stone; and, second, sitting on the stone he issues his first proclamation. He was surrounded by a large body of followers, and they were all engaged in a desperate undertaking — a rebellion against the crown, and if unsuccessful they would pay the penalty with their lives. This then would be no time for an idle ceremony, and besides, before his followers he would not have gone through with an idle and senseless form; for we must not forget that he was a man of considerable ability, and Holinshed says of him that he "was sober in talk and wise in reasoning;" and this same historian who has related every fact with the greatest particularity, would not, I think, have failed to tell us if this address had only been unmeaning words. We are therefore compelled to admit, that his action and his words had a definite and intelligent meaning; nay more, that they conveyed an assurance to his mind that they would be accepted and understood by all present. No doubt there were citizens of London there at that time, and if his followers from Kent did not understand what he did, it is certain that *they* could not have misapprehended him, for he used a tradition that must have originated within the walls of London alone; and as no objection or comment is recorded, we cannot doubt as to the truth of his remark, which would otherwise be absurd and unintelligible. There must have been, therefore, some tradition or fact, which connected London Stone with the liberty of the city; and the man who appropriated the stone secured for himself the lordship of the city.

If we can show any thing tending to prove these facts, we have discovered why the citizens of London should preserve so carefully and revere for so many years this old monument.

Mr. Henry Charles Coote, in a learned and valuable paper read before the London and Middlesex Archæological Society, connects the tradition of London Stone with a lost charter of the city of London; and I avail myself of the line of argument he presents in support of his theory. And to understand this, we shall have to examine a little into the history of the temporal government of London, as connected with the privileges which the kings of England have from time to time

granted to its citizens. After the city had been ruled by the Britons, Romans and Saxons it fell into the hands of the Danes, who devastated it. Alfred, king of the West Saxons, brought the whole realm into one monarchy, and committed the care of the city to his son-in-law, Adhered, Earl of Mercia; and after the death of Adhered the custody of the city returned to King Edward, the last king before the conquest. The city was then in the king's hands and was governed under him by portgraves or portreeves — this word is composed of two Saxon words —*porte*, meaning town, and *gerefa*, signifying a ruler or keeper; so that the chief magistrate of the city, so far as regards his appointment to office, was a nominee of the crown, holding the place in the king's name. When the city of London was surrendered to William the Conqueror, he confirmed, by a charter which is still extant, all the municipal rights which the citizens then enjoyed, in the following words: "William, king, greets William, bishop (that is the bishop of London who was the Norman chaplain to Edward the Confessor), and Godfrey, portgrave, and all the burgesses within London, French and English. And I grant that they be all their law worth that they were in Edward's days, the king (that is, that you retain all the laws you were possessed of in the time of King Edward").

This charter did not grant any new privileges, it only confirmed the ones previously granted. These privileges were no doubt great, but the right of the citizens to elect their own chief officer or mayor was still denied, and that was needed to make their civic rights complete. And the kings who followed the Conqueror fully understood how much power they held over the pockets and persons of the Londoners and would not willingly relinquish it. The subject was mooted in the reign of Henry II, but from what we know of his exactions from the Londoners, but little favor would be granted to any such proposition; in fact he both feared and hated them so heartily that he would do nothing to strengthen them against the crown. They had espoused the cause of his predecessor Stephen against the better title of Matilda and her son, doubtless hoping that the usurper would yield to the wishes of his friends; but in this they were disappointed. When Henry II died, his son Richard not only succeeded to his throne, but also succeeded to his hatred of the Londoners; and the aversion of these two kings to the granting self-government to London is gauged by a contemporary in an observation for which he must have had authority, "that neither would have granted the mayoralty to the citizens for even a million marks of silver."

When Richard ascended the throne his thoughts were not given to his duties as king, but rather how he could raise money to go to Pal-

estine with an immense army. To obtain this end, places of trust and honor, even the highest offices in the kingdom, were sold to the highest bidder. A recent writer says "that his presence chamber was a market overt in which all that the king could bestow, all that could be derived from the bounty of the crown, or imparted by the royal prerogative, was disposed of to the best chapman."

The chief justiceship was sold for 1,000 marks; and in consideration of 20,000 marks, received from the Scottish king, he granted him a release from all the obligations that had been extorted from him and his subjects, during his captivity, and returned to him all the charters and documents of his servitude; and when some of his friends remonstrated with him, he swore that he would sell London itself if he could only find a purchaser. He nominated a regency to govern the kingdom during his absence, but he did not appoint his brother John one of the regents. On the contrary, he gave him, in addition to the earldom of Moreton in Normandy, earldoms in England, forming altogether not less than one-third of his kingdom, on the condition that he should stay out of England for three years. As soon, however, as Richard had sailed for the holy land, John appeared in England and began those intrigues which resulted in his displacing the regents Richard had appointed, and assuming the government himself. History tells us that the citizens of London assisted him in carrying out his designs; and doubtless between him and the city there was a well-understood and well-defined bargain. When he became king, he granted to the citizens the first extant charter which allowed them to appoint a mayor — to elect him from among themselves and to keep him in office for a year. This was in 1214, and then was completed the municipal edifice which the citizens of London had for so many years been laboring to erect.

Now the fact is that for twenty-four years before the year 1214 the citizens had elected their own mayor. Henry, the son of Aylwin (or Fitzaylwin), was elected mayor in the year 1189 by the citizens, and he continued to be elected every year for twenty-four consecutive years, and held the office until his death. If the charter was granted by King John in 1214, he held the office during the twelve or fourteen years of John's reign before the granting of the charter. In fact he only lived a year or two after the granting of the charter; and the rest of his mayoralty dates from the beginning of the reign of Richard I, and about the time when John was intriguing for the kingdom. It is hardly to be supposed that the citizens would appoint a mayor for the first time in 1189 or 1191 — for there is a little discrepancy as to the date — and continue to reappoint him for twenty-four years, and yet do this without a royal warrant; the feeling of the kings toward the

Londoners shows that they would not have permitted it willingly, and the supposition that it could have been done against their will cannot be entertained for a moment; yet the fact remains that it was done, and the further fact remains that London does not possess the original of that charter, nor is any copy or abstract of it known, nor has any ever been found even among the enrolments or old charters preserved at the record office. It is clear that the city records of mayors pro-pounds a question which the civic authorities are not able to answer when it is asked, if King John gave you a charter to elect a mayor for the first time in 1214, where is the charter that gave you authority to elect a mayor for the first time in 1189? The charter was lost; there is no other answer to be given; for that there was such a charter the honest and faithful historians of the time whose works still remain abundantly record. Walter of Coventry, Roger of Hovedene, and Benedict of Peterborough, all contemporary, who testify to the fact of the grant, use precisely the same words in describing the details, as follows: "The Count of Mortagne," you will remember that that was one of Earldoms of Normandy given to John by Richard, "the Count of Mortagne and the archbishop of Rouen and the king's other justiciaries granted to the citizens of London, to have their commune, and the Count of Mortagne and the archbishop of Rouen and almost all the bishops and earls and barons of the realm swore that they would most firmly maintain it so long as it should please the king." Ralph de Diceto, dean of St. Paul's, says "that all the before-mentioned magnates (that is John, the archbishop, the bishops, earls and barons) swore that they would maintain the commune of London;" and further tells us that "this parliament was holden in the chapter house of St. Paul, London." Richard of Devizes, another contemporary, gives an account of the affair, which is the more valuable because he was evidently hostile to the pretensions of the city. He says: "On that very day was granted and instituted the commune of the Londoners, and the magnates of the whole realm, and even the bishops of the province itself, are compelled to swear to it. London learnt now for the first time, in obtaining the commune, that the realm had no king, for neither Richard nor his father and predecessor Henry would ever have allowed this to be done, even for a million marks of silver. How great are the evils which spring from a commune may be understood from the common saying 'It puffs up the people with arrogance and frightens the kings.'" And Geraldus Cambrensis in his life of Geoffrey, archbishop of York, describes the event as follows: "All the citizens having been assembled as a body the commune was granted to them and was sworn to by all."

The explanation of the use of the word "commune" I will give in Mr. Coote's own words. He says: "The historians quoted concur in using the continental word "commune" to express what the citizens of London desiderated and obtained. In the case of London, which had acquired all other things, this word expressed for its citizens the mayoralty only. Nothing else was asked or desired by them, for it was the sole privilege which was wanting to their burghal independence. They were fortunate enough as an old borough to possess all other necessary rights. The proceedings on the part of the city to ask under the name of commune for a *desideratum* only — not for all that was comprehended in this extensive term — was agreeable to the practice on the continent. Whether the king gave altogether for the first time all municipal rights to a new town or borough, or supplemented in an old city that which was wanting only in the way of self government, the royal charter was in either case called indiscriminately a grant of commune. It has been considered that the grant and institution of the commune meant only a confirmation of the existing constitution of the city, but this view falls very far short of the reality. The charter of October 8, 1191, rightly understood was what contemporary account without a dissentient voice describes it. The citizens needed no such prop to their municipal edifice as is here suggested; they had long since obtained that at the hands of the great conqueror, and his charter is still extant and was known to all."

The charter then granted by John was never revoked by Richard on his return from the holy land. Perhaps he was actuated by his great love for his unworthy brother; or more likely the war in which he engaged immediately upon his return, occupied his thoughts to the entire exclusion of other matters, and his death following his return so soon, all reason for repealing the charter was removed.

We do not know much about Fitz-Aylwin who was so signally honored by his fellow-citizens, by being placed for twenty-four years at the head of the city government. Presumably, he was a man of wealth, a man of ability, a man of great personal popularity. He must have been of the great burghers whom Fitzstephen, in Henry II's time, so proudly commemorates, a gentleman of landed estate, living upon his rents, and who, while he had his house in the country, lived for the most time in a stately house in London. At the time of his election and through his life he resided in a stone built capital house, situated in the city and called London Stone. Indeed, Riley in his ancient laws, thus describes him: "In the same year (*i. e.*, the first regnal year of Richard), Henry, the son of Aylwin of London Stone, was made mayor of London." These words can only be understood as de-

scribing his place of residence; for the word "stone" in its secondary sense was used to signify a stone-house, and it had the same acceptation in medieval Germany. Indeed, it is claimed that the early reference I have before given to the use of "London Stone" as a boundary, in Anglo-Saxon times, referred to a stone-house, and that such meaning was still in use in Fitz-Aylwin's days. But why should his house be called "London"? This is accounted for by the fact that before the great fire in London, during King Stephen's reign, which destroyed almost the whole city, all the houses were built of wood, and the citizens warned by this calamity began, as far as they were able, the erection of stone-houses, and that Fitz-Aylwin's was the first or the largest which was built after this disastrous fire; so that the conclusion arrived at is, that London Stone, as we now see it, is a portion of the stone-house of its first mayor, Henry Fitz-Aylwin, and that it is endeared to the people because of the high municipal privilege they obtained in being permitted to elect a mayor from among themselves.

I have now presented you with all the theories showing what London Stone is: that it is the altar stone of the temple of Diana, brought by Brutus from Troy; that it is the central milestone of the Roman roads of Britain; and that it is a piece of the house of London's first mayor. Whichever theory you choose to adopt, you have the satisfaction of knowing that there are arguments in favor of it.

But I prefer to go further than any of these theories, and leaving undecided the question as to what it is, found the title to the reverence in which it is held upon its connection with the open air assemblies of the Britains, the primitive folk-moots of the people; and in this view we will consider it simply as an old monument. And first of all it must be admitted that there is no positive record that any meetings were held in the open air; the records of the assemblies and councils are given, but nothing is said as to where they were held, or the form and ceremonies connected with them. There is no view of English history so primitive as to show us these open-air meetings in full force and with their true surroundings; and upon reflection this will not appear strange. In our daily reports of the meeting of the legislature, nothing is said as to *where* the legislature meets; it is unnecessary, every one knows it; nor does our national legislature mention in its record the building where it holds its sessions. And some twenty centuries from now, when our State Capitol may be in ruins, it may be difficult to show — if we leave the written history of the time out of the question — except as the records of the legislature make

allusion to it, that we ever had a Capitol. Certainly its cost of more than fourteen millions has not imposed so large a tax *per capita* on the citizens of this State that it would be always kept in remembrance from that fact alone. And so it was no matter of surprise to the historians of this early day to see a large meeting around a stone, or on a plain or hill, or by the side of a running stream; they made no record of it, because every one knew they met in some such place; there was nowhere else to meet. And when an Anglo-Saxon chronicle mentions specially that a meeting was held in the upper part of a house, we may naturally infer that it was not usual to hold meetings under the cover of a roof. We must look at these things, as far as possible, with the eyes of those who saw them; as a modern writer has well observed, "Old records and strange customs that have no meaning when judged from the usages of modern times, are seen in altogether a different light when the student has placed himself, as it were, in ages long before the events chronicled in the old records, or the strange customs had passed away from ordinary life. He is then looking down the stream of time, not back upon it, with a vision dulled by the influences of civilized history and present surroundings."

But if we have no positive record of the open air meeting in Britain we can draw an example from the history of our own State, and very properly assume that the customs of the primitive man were the same and unchanged in all places. The Iroquois Indians were at one time separate and hostile bands, and were drawn together in council to deliberate upon the place of a league, which a wise man of the Onondaga nation had proposed. This council fire was kindled on the northern shore of Onondaga lake, and the open air meeting was there held, attended by the chiefs and wise men of the several nations combined to form the league. The influence of this first council place was never destroyed, and although the place of meeting was not always confined to Onondaga lake, yet the custody of the "Council Brand" and also of the "Wampum," into which the laws of the league had been talked, was given by an hereditary grant to the Onondagas; and the council fire in the Onondaga valley became in effect the seat of government for the league.

Such an assembly was not an assembly of a State as we understand the term State; it was only a primitive community, sovereign within its own bounds, but it gave birth to a State by being aggregated with other sovereign communities; nor as a popular assembly is it the same as is now understood by this term; the "people" then were not what the "people" are now. The unit of society was not the individual but the family; and every family possessed the same rights and poli-

tical status as every individual does now. But every family did not represent itself on State occasions by all the persons composing it, that is, by the chief of the household and all his children and grandchildren, attendants, slaves and servants; but for all State purposes the chief was the only one considered, and as he was responsible to the State for the conduct of his household, and to him was relegated their punishment and their reward, so to him alone was given the honor of attending the State assembly — the council of his village, his tribe or his nation. This assembly of the people was both legislative and judicial, for in those early days there was no clear division between these different branches of government; and the law's delays were unknown, for when a judgment was rendered it was at once carried into effect, particularly if it was a judgment of death; for many of these law hills are closely associated with another hill called Gallows Hill, and the two are in such close proximity that a man was hurried from one to another with a rapidity appalling to this generation, educated as we are to questions of appeal and pleas of insanity. And perhaps justice was as fairly meted out then as it is now.

Our Anglo-Saxon ancestors would not hold their courts in any other place than the open air; that was freedom, and at the same time there was the fear of the magic spell inclosed within the four walls of a building, and they must judge in the open air that this magic might have less power over them. And, besides, we do not find in the large cities any remains of large halls or buildings, where the Witan might have met, nor are any such structures found in the villages or places mentioned as the meeting places of the local or national assembly.

All old nations have left some record of this open air assembly; but we gather from Bible history an example connected intimately with our subject. It is recorded that when Joshua came to resign the trust that had been committed to him, "he gathered all the tribes of Israel to Shechem and called for the elders of Israel and for their heads and for their judges and for their officers," *i. e.*, he called an assembly of the people and it was unquestionably in the open air. The object of this meeting was to decide a very important question, whether or not they would adhere to their national religion. This the people decided in the affirmative; and after they had decided "Joshua made a covenant with the people that day and set them a statute and ordinance in Shechem and wrote these words in the book of the law of God and took a great stone and set it up there under an oak, and said 'Behold this stone shall be a witness unto us, for it hath heard all the words of the Lord which he spake unto us; it shall be a witness unto you lest you deny your God.'" And when Adonijah would usurp the king-

dom he summoned the popular assembly by sacrificing by a stone; and when King Joash was crowned he stood by the pillar "as the manner was;" and in the same connection with pillars of stone as places of assembly, there is some evidence relative to ancient pavements as seats of judgment; one illustration will suffice; when Pilate brought our Lord forth and sat down in the judgment seat in a place that is called the Pavement; this was undoubtedly an open air court of justice.

We think that it has been sufficiently shown from the history of other nations, that the open air assembly and open air court, were the usual gathering of the people for legislative and judicial business, and it is claimed with a good show of reason that London Stone was, as other great stones were, the place where the suitors of an open air assembly were accustomed to gather together to legislate for the city. There is some traditional evidence of this fact. At the Lord Mayor's Court, the summons was orally made, and the defendant was bidden to appear in court, which is supposed by some to have been at London Stone, which has been considered to be the spot where all public proclamations and general summonses were made, where money was tendered and debts were paid, and where the merchants met to transact business. And besides, this stone was used as the public place where notices were to be affixed; so that any notice placed there gave official information to the people as to its contents. We gather this from a quarto published in 1589 by Thomas Nast, where we read "Set up this bill at London Stone. Let it be doone sollemnly, with drum and trumpet, and looke you advance my cullour on the top of the steeple right over against it." And again, "If it please them these dark winter nights to sticke uppe their papers uppon London Stone." And parallel to this traditional evidence of London Stone, it is observed, that the justices itinerant in the time of Edward sat at the Stone Cross, opposite the Bishop of Worcester's House (near Somerset place) in the Strand. This Stone Cross was even then ancient and was mentioned by Stow as standing headless in 1598.

These stone crosses which are met with all over England, may be, perhaps, identified with the ancient meeting places of the local assembly; but their origin is greatly obscured by the Christian significance of the term. There were probably not less than five thousand such crosses in England at the time of the Reformation, and they were sometimes preaching places, sometimes places for collecting tolls; but in connection with these uses were places of proclamation of the rules and judgments of the village court. In one instance we find recorded, representatives called "Sixteens," were sent to the court.

The land was divided into sixteen hides, and each hide of land could send its representative; hence they were called "Sixteens." They had the power to make orders, amerce suitors for non-appearance, make presentments, choose officers, etc., and their orders, *if proclaimed from the Town Cross,* are binding on the inhabitants.

But there is no manner of doubt that Paul's Cross in London was a place of general assembly of the people. Henry III, about the beginning of the year 1258, pretending to have found in the royal wardrobe at Windsor a roll of parchment filled with accusations against the lord mayor and aldermen of London, commanded one of his chief justices to summon a folk-moot at Paul's Cross, upon one day's notice. The record does not say whether or not this was a revival of the old, but treats the matter as if it was no new or unheard of thing to call the people together at that place for such a purpose. But in addition to this fact we find that when in 1321 the dean and the chapter of St. Paul's had taken possession of a plat of ground at the east end of St. Paul's church adjoining the cross, the citizens made complaint, that the possession was illegal, because that piece of ground was the place where they were accustomed and ought to hold the court, which is called the folk-moot; and that the great steeple or campanile of St. Paul's, which adjoins it, "was their common bell and situate there for that use; which being there rung, all the inhabitants of the city might hear and come together." The same complaint was again made in 1603, for there is in existence a letter from the lord mayor to the chancellor of the Duchy of Lancaster, touching the city's right to a room of two square yards of ground or thereabouts at Paul's Cross, which the city had enjoyed time out of mind.

I am well aware that none of the illustrations I have given, or shall give, prove that London Stone was used either as an open air court or place of assembly; this cannot be shown, and if it could be, my remarks would be useless. It is only claimed that these meetings around stones, taken in connection with the reverence in which London Stone has been always held, raise the presumption that it was used for the same purpose.

We have a couple of illustrations from the Orkney islands: one Nicoll Fraser, having sold some land which was challenged by his brother, the sale was affirmed for the reason that the said Nicoll "at divers and sundry times came to the said Alexander and offered him the buying of all his rights, and his father's heritage before any others, and he refused it at all times; and thereafter he came before the best and worthiest in the country, and divers and sundry times in courts and

'heid stones'"; that is standing stones. And again, another manuscript gives us the following proclamation by a man and his wife, concerning some land of which they had been unlawfully deprived, as follows: "Then it is that I, the aforesaid Edward, to make known that I and my spouse, Jonet of Ska, at *ting and stone*, divers days and years in the borough of Kirkwall, and in and to land where it effected, we made it known that Barnet of Kamsto and his heirs and had taken and violently possessed and one-half of the profits these many years, pertaining to my said wife's mother, Katherine of Papley." Now, these extracts go to prove that the sale of land was made in the tyng or head court; and that it was also necessary that notice of the seller's intention should be given at the stone, in the parish in which these lands were situated; and it is further evident that these courts had been held at the "Heid stone," or standing stone, and that one was so intimately associated with the other that a "court" and a "stone" became synonymous terms.

Coming now to Scotland we must notice the famous moot hill of Scone, which was an oval-shaped rising ground or hillock, having on the top a flat area of about one hundred yards by sixty, and situated near the palace of Scone. Here the kings held their parliament; for history tells us that Robert II was crowned at Scone on the 26th of March, 1371, and on the following day convened the prelates, earls, barons and nobles before him, "the king sitting as use is, in the royal seat upon the mount of Scone." And another parliament was held by Robert III in the same place. These parliaments consisted of what were called the two estates of Scotland, the barons and the higher clergy. The stone, as you all know, is in the coronation chair at Westminster Abbey, and in it all the kings and queens of England, since the time of Edward I, have been crowned. Without placing full credence in the tradition that it was the identical stone upon which Jacob laid his head, on the night of his memorable dream, we may acknowledge that it was brought to Scotland by Fergus, king of Ireland, some three hundred and thirty years before Christ, and that from an early period it was certainly used in the coronation of the Scottish kings. It was the custom of all the Celtic tribes to inaugurate their kings upon a sacred stone, which was supposed to symbolize the monarchy. And when Edward carried this sacred stone to England, he committed the worst outrage he could possibly commit upon the feelings and hopes of the people. And so intimately was it connected with the idea of a national independence that its loss was considered as equivalent to a loss of their independence; and they would

willingly have left their king in captivity if by so doing the old stone could have been restored to them, for they believed in the old inscription that was on it to the effect —

Except old saws do fail,
And wizard's wits be blind,
The Scots in place must reign
Where they this stone shall find.

In Warwickshire, on the old coach road from Birmingham to London, stands what remains of an old wayside cross. It is situated on a mound of artificially raised earth about thirty-five feet square, with the sides running parallel to the road. The part of the cross remaining is thirty inches square at the top, with a hole in the center to receive the shaft. At this stone was collected for the Duke of Buccleugh by his steward on Martinmas Eve, at sun-rising, what is called "wroth," or ward money, from the various parishes in the hundred of Knightlow. This money has been collected from time immemorial, excepting for a few years at the beginning of the present century. The Scott family, who were entitled to this tribute money, determined to revive this old custom, or as it was locally called, "keep up the charter."

Accordingly on the eve of St. Martin, November 11, 1879, the annual custom was observed at 6:45 o'clock in the morning and the wroth money was collected. There were thirty-four persons present to witness the ceremony; and the steward having invited the party to stand around the stone — the original custom was to walk three times round it — proceeded to read the charter of assembly which opens thus: "Wroth silver collected annually at Knightlow Cross, by the Duke of Buccleuch as lord of the manor of the hundred of Knightlow." The next thing was the calling over the names of the parishes liable to the fee and the amount due from each parish; and thereupon the representatives of the parish present cast the required sum into the hollow of the stone. Seven parishes paid one penny each; seven paid three half pence each; seven paid two pence each; four paid four pence each; one paid twelve pence; one paid two shillings and two pence, and one paid two shillings three and one-half pence; and the total amount paid by the twenty-eight parishes was nine shillings three and one-half pence. The fine for non-payment in the olden times was one pound for every penny unpaid, or else the forfeiture of a white bull with a red nose and ears; this fine has not been paid within man's memory, probably from the difficulty of procuring a bull of a white color with habits so intemperate that he would have a red nose and

ears. No one appears to know — not even the duke or his steward — for what purposes this money is collected, or why one parish should pay more than another. This is an imperfect example, but it is valuable as showing a primitive assembly; it was probably a court, but all the judicial ceremonies have been lost and it has dwindled down to the payment of the lord's dues; and the fact that the parish in which the stone cross was situated was exempted from the payment of dues, is in accordance with the custom of the Indians and Icelanders of conferring in this way an honor upon the place where the meetings were held.

It would seem also that in Shakespeare's time the courts of justice were held in the street. You all remember the breach of promise case of Dame Quickley against Sir John Falstaff; her averments were "thou didst swear to me upon a parcel gilt goblet, sitting in my Dolphin chamber, at the round table, by a sea coal fire, upon Wednesday in Whitsun week, when the prince brake thy head for liking his father to a singing man of Windsor, thou didst swear to me then as I was washing thy wound, to marry me and make me my lady, thy wife;" and that promise the fat knight had failed to keep. Now Shakespeare not only lays this scene in a street of the city of London, but the lord chief justice appears upon the street attended and hears the case then and there. This he would not have done had it not been the custom. Again, when Hermione, who is charged with high treason, is brought into court it would appear from the complaint she there makes, that the court was held in the open air; for she says that she was

> "hurried
> Here to this place i' the open air before
> I have got strength of limit"

that is a degree of strength that a woman should have before she was permitted to go abroad after sickness.

I shall close with an account of the Lawless Court held on King's Hill, in Rochford, Essex. It is called lawless because it is held at an unlawful or lawless hour, meeting at night time instead of day time. The tradition is that it was so held because the feudal lords were adverse to free open courts, and the tenants had to take the best steps possible to evade the lords' laws and still keep up their old institutions. The steward and suitors whispered to each other; they have no candles or any pen or ink but use a coal instead; and he that owes suit or service thereto and appears not, forfeits to the lord double his rent for every hour he is absent. This court is not obsolete even now; for in 1868 Mr. W. H. Black attended its meeting and gives an account of it,

which is published in the proceedings of the Society of Antiquaries. Before the court opened the following lines were spoken, which Mr. Black translates from the hopelessly corrupt Latin of the court rolls:

The court of the lord the king
Called the court without law,
Holden there
By the custom thereof
Before sunrise,
Unless it be twilight,
The steward alone
Writes nothing but with coals,
As often as he will,
When the cock shall have crowed,
By the sound of which only
The court is summoned.
He crieth secretly for the king
In the court without law;
And unless they quickly come,
They shall the more quickly repent;
And unless they come secretly
Let not the court attend.
He who hath come with a light,
They are taken in default,
The court without care —
The jury of injury.

I have mentioned this court in order to give Mr. Black's description of the place of meeting and his conclusions thereon.

He says: "The ground is flat and on a level with the market place of Rochford, but it stands higher than that part of the town where flows the river Roche, to which there is a considerable descent southward from the central part of the town. Erected here is a post of wood, painted white, and standing five feet above the ground; its top is wrought with mouldings and finishes in a sharp pyramid. Its shape is that of a candle, with wick and flame, only it is quadrilateral in its whole length and the edges are planed off."

No one ever knew of this post until Mr. Black published his account of it; and he considered it to be a Roman landmark belonging to the series of measures to and from London Stone; and furthermore that the chief object of Lawless Court was the preservation of that post, and the post was preserved because it represented in a meeting place the freedom of the people.

As I stated in the beginning of this paper this question was one of probabilities. We have gone over the whole ground as carefully as possible and yet we are in as great darkness as ever as to the main

question, who built London Stone? why was it built? Camden may be right that it was a Roman milestone; and Roman landmarks may have become Saxon landmarks too. But I trust that I have established a strong probability that the esteem and reverence in which it is held is due, not to the fact that it was Roman or used for military or geographical purposes, but because it was used as the meeting place of the primitive assembly for judicial and legislative purposes; and so becomes the foundation of the "government of the people by the people and for the people."

BIBLIOMANIA.

By Irving Browne.

[Read before the Albany Institute, October 24, 1882.]

Of all the desires that from time to time have taken possession of the souls of men, none has been more engrossing and enduring than the hobby of collecting books. Other passions have had their day. The Dutch tulip craze raged fearfully while it lasted, but was of ephemeral duration; postage stamps, autographs, clocks, pipes and walking sticks seem declining in interest; mulberries have long since gone to seed; the cackle of fancy hens is scarcely heard; numismatic madness has faded away with the Pillars of Hercules; china, pottery, rugs, bric-a-brac are having their little day; but Bibliomania, after a period of comparative inaction, is now breaking afresh into that feverish extravagance which marked its prevalence more than half a century ago.

Certainly there is no pursuit in which the fancy takes wider or more diverse ranges, or in which more reckless expenditure is incurred; and it is equally certain that no outlay is regarded by the world at large as quite so foolish and unremunerative as that in books. A rich man fills his stables with horses at fabulous prices, and a stockbreeder pays $30,000 for some cow with a royal name, and nobody thinks these things strange. But when a gentleman of literary tastes expends $17,000 for a copy of the Mazarine Bible, the first printed book, as happened a few years ago in England, the other gentlemen, whose tastes incline to natural history, regard him as a lunatic. Why, it is difficult to say. Blood-stock may die to-morrow, certainly will die sometime, and their remains are worth no more than those of the plebeian kind; while a rare book, with proper care, will outlast the life of empires and grow more valuable every day.

Book collectors, in the true sense of the term, are never agreed except in one particular: they all value the outside more than the inside; they regard the volume more as merchandise, than as a vehicle of thought. It is the paper, type, ink, binding, date and publisher, rather than the contents, that are the criterions of desirability.

One Bibliomaniac once said of another: "He knows nothing at all of books, I assure you, unless perhaps of their insides." And in one of the dialogues of Dibdin's *Bibliomania*, "I will frankly confess," rejoined Lysander, "that I am an arrant Bibliomaniac — that I love books dearly — that the very sight, touch, and mere perusal" — "Hold my friend," again exclaimed Philemon, "you have renounced your profession — you talk of *reading* books — do Bibliomaniacs ever *read* books?" There is one class who buy solely on account of the paper; of these, one collects only books on thick paper, another only those on thin; one acquires only those of ample margins, or technically speaking, large paper; one prefers coarse, another fine, one drawing, another India paper; while the *ne plus ultra* in this direction is vellum.

Another class prize the book only on account of its binding; of these one dotes on full-bound books, with gilt edges, while another tolerates nothing but half-binding, gilt tops, and rough or uncut edges; and another and very slovenly species care nothing for the leather, provided only the edges of the leaves are untrimmed. Another genus look only to the name of the binder, and still another to that of the publisher; to the first, a tome clothed by Hayday, Riviere, Capé, or Matthews, and to the latter, a volume printed by Aldus, Elzevir, Pickering, or Munsell, has peculiar charms. One person seeks only ancient books; another those of limited editions; another those privately printed; a fourth wants nothing but presentation copies; yet another only those which have belonged to famous men; and still another, illustrated or illuminated books. There is a perfectly rabid and incurable class, of whom the most harmless are devoted to pamphlets; another, rather more dangerous, to incorrect, or suppressed editions; and a third, stark mad, to play-bills and portraits. One man affects folios, another searches for *bijou* editions, and another, quite sensible, will tolerate neither folio nor quarto. Another class, especially rabid, accept mainly nothing but first editions, technically known as *principes;* or sometimes only *fifteeners*, alias *incunabula*,— that is books printed in the fifteenth century, the first century of printing. Others, styled Rubricists, have a rage for books with the contents and marginal references printed in red ink. One patronizes the drama, one poetry, one the fine arts; another books about books and their collectors; and a very *recherché* class devote themselves to works on playing cards, angling, magic, or chess, or the jest-books and *facetiae*. We have reserved for last mention those unhappy beings who run up and down for duplicates, searching for every edition of their favorite authors. Of course tastes differ as to the size of the collection. One seeks to form a small and select library, an-

other a large and comprehensive collection. Among the latter was Richard Heber, who possessed a collection whose numbers could not be expressed in less than six figures, holding that one needed three copies of every book, one for use, one for show, and another to lend his friends. Finally the struggle among all these persons always is to get something that no one else has acquired, which is then called *unique*, or to procure a more sumptuous copy than his neighbor's.

The mania for book collecting is by no means a modern disease, but has existed ever since there were books to gather, and has infected many of the wisest and most potent names in history. Euripides is ridiculed by Aristophanes in "The Frogs" for collecting books. Of the Roman emperor Gordian, who flourished (or rather did not flourish, because he was slain after a reign of thirty-six days) in the third century, Gibbon says, "twenty-two acknowledged concubines and a library of sixty-two thousand volumes attested the variety of his inclinations, and from the productions which he left behind him it appears that the former, as well as the latter, were designed for use rather than for ostentation." This combination of uxorious and literary tastes seems to have existed in another monarch of a later period — Henry VIII, the seeming disproportion of whose expenditure of £10,800 for jewels in three years, during which he spent but £100 for books and binding, is explained by the fact that he was indebted for the contents of his libraries to the plunder of monasteries. Cicero, who possessed a superb library, especially rich in Greek, at his villa in Tusculum, thus describes his favorite property: "Books to quicken the intelligence of youth, delight age, decorate prosperity, shelter and solace us in adversity, bring enjoyment at home, befriend us out of doors, pass the night with us, travel with us, go into the country with us."

Petrarch, who collected books not simply for his own gratification, but aspired to become the founder of a permanent library at Venice, gave his books to the Church of St. Mark, but the greater part of them perished through neglect, and only a small part remains, which may now be seen. Boccaccio, anticipating an early death, offered his library to Petrarch, his dear friend, on his own terms, to insure its preservation, and the poet promised to care for the collection in case he survived Boccaccio, but the latter, outliving Petrarch, bequeathed his books to the Augustinians of Florence, and some of them are still shown to visitors in the Laurentinian library. From Boccaccio's own account of his collection, we must believe his books quite inappropriate for a monastic library, and the good monks probably instituted an *auto da fé* for most of them, like that which befell the knightly ro-

mances in Don Quixote. Perhaps the naughty story-teller intended the donation as a covert satire. The walls of the room which formerly contained Montaigne's books, and is at this day exhibited to pilgrims, are covered with inscriptions burnt in with branding-irons on the beams and rafters, by the eccentric and delightful essayist. The author of *Ivanhoe* adorned his magnificent library with suits of superb armour, and luxuriated in demonology and witchcraft. The caustic Swift was in the habit of annotating his books, and writing on the fly-leaves a summary opinion of the author's merits; whatever else he had, he owned no Shakespeare, nor can any reference to him be found in the nineteen volumes of his works. Military men seem always to have had a passion for books. To say nothing of the literary and rhetorical tastes of Cæsar, "the foremost man of all time," Frederick the Great had libraries at Sans Souci, Potsdam, and Berlin, in which he arranged the volumes by classes without regard to size. Thick volumes he rebound in sections for more convenient use, and his favorite French authors he sometimes caused to be reprinted in compact editions to his taste. The great Condé inherited a valuable library from his father and enlarged and loved it. The hard-fighting Junot had a vellum library which sold in London for £1,400, while his great master was not too busy in conquering Europe not only to solace himself in his permanent libraries, and in books which he carried with him in his expeditions, but to project and actually commence the printing of a camp library of duodecimo volumes, without margins, and in thin covers, to embrace some three thousand volumes, and which he had designed to complete in six years by employing one hundred and twenty compositors and twenty-five editors, at an outlay of about £163,000. St. Helena destroyed this scheme. It is curious to note that Napoleon despised Voltaire as heartily as Frederick admired him, and gave Fielding and La Sage places among his traveling companions; while the Bibliomaniac appears in his direction to his librarian: "I will have fine editions and handsome bindings. I am rich enough for that." The only thing that shakes one's confidence in the correctness of his literary taste is that he was fond of *Ossian*.

Southey brought together fourteen thousand volumes, the most valuable collection which had up to that time been acquired by a man whose means and estate lay, as he once said of himself, in his inkstand. Time fails us to speak of Erasmus, De Thou, Grotius, Goethe, Bodley, Hans Sloane, whose private library of fifty thousand volumes was the beginning of that of the British Museum; the Cardinal Borrommeo, who founded the Ambrosian Library at Milan with his own forty

thousand volumes, and the other great names entitled to the description of Bibliomaniac. We must not forget, however, Sir Richard Whittington, of feline fame, who gave £400 to found the library of Christ's Hospital, London. The fair sex, good, bad and indifferent, have been lovers of books, or founders of libraries; witness the distinguished names of Lady Jane Gray, Catherine de Medicis, and Diane de Poictiers. It only remains to speak of the great opium-eater, who was a sort of literary ghoul, famed for borrowing books and never returning them, and whose library was thus made up of the enforced contributions of friends — for who would have dared refuse the loan of a book to Thomas de Quincey? The name of the unhappy man would have descended to us with that of the incendiary of the Temple of Diana at Ephesus. But the great Thomas was recklessly careless and slovenly in his use of books; and Burton, in the *Book-hunter,* tells us that "he once gave in copy written on the edges of a tall octavo *Somnium Scipionis,* and as he did not obliterate the original matter, the printer was rather puzzled, and made a funny jumble between the letter-press Latin and the manuscript English." We seriously fear that with him must be ranked the gentle Elia, who said: "A book reads the better which is our own, and has been so long known to us that we know the topography of its blots and dog's-ears, and can trace the dirt in it to having read it at tea with buttered muffins, or over a pipe, which I think is the maximum." And yet a great degree of slovenliness may be excused in Charles, because, according to Leigh Hunt, he once gave a kiss to an old folio Chapman's Homer, and when asked how he knew his books one from the other, for hardly any were lettered, he answered: "How does a shepherd know his sheep?" The love of books displayed by the sensual Henry, and the pugnacious Junot, is not more remarkable than that of the epicurean and sumptuous Lucullus, to whom Pompey, when sick, having been directed by his physician to eat a thrush for dinner, and learning from his servants that in summer time thrushes were not to be found anywhere but in Lucullus' fattening coops, refused to be indebted for his meal, observing: "So if Lucullus had not been an epicure, Pompey had not lived." Of him the veracious Plutarch says: "His furnishing a library, however, deserved praise and record, for he collected very many and choice manuscripts; and the use they were put to was even more magnificent than the purchase, the library being always open, and the walks and reading-rooms about it free to all Greeks, whose delight it was to leave their other occupations and hasten thither as to the habitation of the Muses."

Hear the gentle Elia on this topic: "Rummaging over the contents of an old stall, at a half book, half old iron shop in Ninety-four alley, leading from Wardour street to Soho, yesterday, I lit upon a ragged duodecimo, which had been the strange delight of my infancy; the price demanded was sixpence, which the owner (a little squab duodecimo of a character himself) enforced with the assurance that his own mother should not have it for a farthing less. On my demurring to this extraordinary assertion, the dirty little vendor reinforced his assertion with a sort of oath, which seemed more than the occasion demanded. 'And now,' said he, 'I have put my soul to it.' Pressed by so solemn an asseveration, I could no longer resist a demand which seemed to set me, however unworthy, upon a level with his nearest relations; and depositing a tester, I bore away the battered prize in triumph."

Bindings occupy the same relation to books that clothing does to the human body, except that the clothing of books does not change until worn out, and looks the better for being old fashioned. There is the same temptation toward gaudiness and extravagance in the one case as in the other. Charles Lamb had some sensible ideas on bindings. "To be strong-backed and neat-bound is the desideratum of a volume; magnificence comes after. This, when it can be afforded, is not to be lavished on all kinds of books indiscriminately; I would not dress a set of magazines, for instance, in full suit; the dishabille, or half binding (with Russia backs ever) is *our* custom. A Shakespeare, or a Milton (unless the first editions), it were mere foppery to trick out in gay apparel; the possession of them confers no distinction. The exterior of them (the things themselves being so common), strange to say, raises no ticklish sense of property in the owner. Thompson's Seasons, again, looks best (I maintain it) a little torn and dog's eared. In some respects the better a book is, the less it demands from binding. Fielding, Smollett, Sterne, and all that class of perpetually self-reproductive volumes — great Nature's stereotypes — we see them individually perish with less regret, because we know the copies of them to be 'eterne.' But where we know that a book is at once both good and rare — where the individual is almost the species, and when that perishes,

> 'We know not where is that Promethean torch,
> That can its light relumine,'

such a book, for instance, as the life of the Duke of Newcastle by his Duchess — no casket is rich enough, no casing sufficiently durable to honor and keep safe such a jewel. Not only rare volumes of this

description which seem hopeless ever to be reprinted, but old editions of writers such as Sir Philip Sidney, Bishop Taylor, Milton in his prose works, Fuller — of whom we *have* reprints, yet the books themselves, though they go about and are talked of here and there, we know, have not endenizened themselves (nor possibly ever will) in the national heart, so as to become stock books — it is good to possess these in costly and durable covers."

"To view a well-arranged assortment of block-headed encyclopædias (Anglicanas or Metropolitanas) set out in an array of Russia or morocco, when a tithe of that good leather would comfortably re-clothe my shivering folios; would renovate Paracelsus himself, and enable old Raymond Lully to look like himself again in the world — I never see these imposters but I long to strip them and warm my ragged veterans in their spoils."

Leigh Hunt, too, held similar views: "I confess my weakness in liking to see some of my favorite purchases neatly bound. For most of these I like a good plain old binding, never mind how old, provided it wears well, but my Arabian Nights may be bound in as fine and flowery a style as possible, and I should love an engraving to every dozen pages."

Here then we have the true theory of binding books; good and rare books deserve a costly dress, none beside.

One may find precedents on either side of the question of rich binding, for Adam Smith was a dandy, and Dr. Bethune a sloven, in respect of this point.

In view of the whimsicalities of Bibliomaniacs it has occurred to me that it would be useful to endeavor to render the binding of books suggestive of the contents. Thus as to colors: one might appropriately dress military treatises in red, theological in blue, gastronomical in claret or salmon; books on magic in black, and a history of pugilism in blue black; instructions for actors and singers in yellow, and guide-books and travels in orange. Again: one might bind Lamb in pea-green; the History of the Friends in drab; of the Popes in scarlet, and Cicero de Senectute in gray; while Magna Charta should always be preserved in violet. When one considers materials he naturally looks for an account of the Crimean war in Russia, a History of the Barbary States in morocco, accounts of intestine convulsions in vellum, works on arboriculture in tree-calf, Bacon in hog-skin, biographies of celebrated women in muslin, statistics of the lumber trade in boards, a description of Saxony in sheep, and all love tales in plain calf with clasps. One's collection of criminal trials should be in full gilt, and accounts of famous sculptors in marbled sides and edges. Any History

of the Baptists should *not* have sprinkled edges. All books relating to those of defective vision should be blind-tooled. Books about the deaf and dumb should be in quiet colors. Of course, books on similar subjects should be similarly bound; for example a description of Noah's Ark and on the art of preserving pears; the Complete Angler and a geometry; a demonology and a spelling book; the Curtain Lectures and a History of the Gunpowder Plot; statistics of the fever and ague and a history of earthquakes and so on. Time will not suffice to speak in detail of the Bibliomaniacs who reprint rare books from their own libraries in editions of limited numbers; of authors, like Walpole, who print their own works, and whose fame as printers is better deserved than their reputation as writers; of novelists, like Thackeray, who design the illustrations for their own romances; of illustrators who pull to pieces dozens of books for the pictures, in order to insert them in some favorite volume, whose text they serve to explain or depict; of amateurs who bind their own books; of lunatics who yearn for books wholly engraved, or printed only on one side of the leaf, or Greek books wholly in capitals, or others in the italic letter; or black-letter fanciers; or tall copy men; or missal men; but we must give a word of praise to those who gather books on special subjects. These, provided the subjects of their labor are useful or interesting, may be regarded, like physicians who adopt specialities of practice, or scholars who illustrate peculiar branches of knowledge, as public benefactors. Thus Shakespearian collections are of immense value and convenience to commentators and students of the great dramatist, and form their place of resort, while classical libraries are the Mecca of scholars engaged in the solution of disputed linguistic questions. How much of early English poetry was preserved by the exertions of antiquarians, delvers like Ritson and Hazlewood, and found a safe repose on their shelves? And even if the subject is not necessarily useful or practical, it may yet serve for pleasant relaxation and harmless amusement.

In nothing is the Bibliomaniac more plainly discernible than in his fastidious care of his books. The historian Prescott, it is recorded, "would often stop before the books, especially his favorite books, and be sure that they were all in their proper places, drawn up exactly to the front of their respective shelves, like soldiers on a dress parade, sometimes speaking of them, and almost to them, as if they were personal friends."

Luxurious cases, with glass doors, and cloth-lined shelves, cushioned tables, print-stands, and outer morocco cases for specially gorgeous volumes, all attest the bookman's tenderness for his adopted children. How the wretched man suffers at seeing a favorite volume in the

clutch of one unused to handling such wares, as a bachelor to dandling babies! How he groans when his pet's joints are cracked, and when the visitor wets finger in mouth to turn the leaves, how the sweat runs off his brow! For those barbarians who lay a book down upon its face, or mark a place by turning down a leaf, or write notes upon the margins, or pull it down from its shelf by the foretop, rather than by indenting the books on each side, or cut open its leaves with the finger, or rub the palm of the hand over the smooth morocco — for all such there must be peculiar and terrific punishments in store in the future state. Let not a satirical smile light up the countenance of the unbeliever when the book-possessed draws forth a choice missal from its velvet envelope; is not a rare book to be as well cared for as a meerschaum pipe?

From what has been said, it will be inferred that it would be insane to expect a Bibliomaniac to lend a choice volume, unless, like Heber and Grollier, he possessed a duplicate copy especially for that purpose. It was doubtless to guard against thieves that the ancient books were chained up in the monasteries, but the practice was effectual also against borrowers. De Bury, in his *Philobiblon*, has a chapter entitled "A Provident Arrangement by which his Books may be lent to Strangers," in which the utmost leniency is to lend duplicate books upon ample security. Not to adopt the harsh judgment of an ancient author, who says "to lend a book is to lose it, and borrowing but a hypocritical pretense for stealing," we may conclude in a word, that to lend a book is like the Presidency of the United States, to be neither desired nor refused.

Of a class but little more unconscientious than borrowers of books are book-thieves. Book-stealing is a trade, and its successful pursuit requires high literary qualification. We are not now speaking of infractions of honor and courtesy made possible by the absence of an international copyright law, but of manual pilfering. Possibly the offense should not be regarded as any thing more than venial. Courts of law would perhaps pronounce it *damnum absque injuria,* upon the same reasoning that the rape of the Sabine women has ever been leniently looked upon in history; the Romans needed wives, and so stole them. How much more judicious had they simply stolen books! But inasmuch as human nature is fallible, a stranger, visiting the Bibliomaniac's library, must not feel offended by finding his entertainer at his elbow, when he is rummaging among the small volumes, however much he may be left to himself when busy with the folios and quartos.

To constitute a Bibliomaniac in the true sense, the love of books must combine with a certain limitation of means for the gratification

of the appetite. The consciousness of some extravagance must be always present in his mind; there must be a sense of sacrifice in the attainment. In a rich man the disease cannot exist; he cannot enter the kingdom of the Bibliomaniac's heaven. There is the same difference of sensation between the acquirement of books by a wealthy man, and by him of slender purse, that there is between the taking of fish in a net and the successful result of a long angling pursuit after one especially fat and evasive trout. To haunt the book stores; there to see a long desired work in luxurious and tempting style; reluctantly to abandon it for the present on account of the price; to go home and dream about it; to wonder, for a year and perchance longer, whether it will ever again greet your eyes; to conjecture what act of desperation you might, in heat of passion, commit on some more affluent man, in whose possession you should thereafter find it; to see it turn up again in another book shop, its charms slightly faded, but yet mellowed by age, like those of your first love, met in later life — with this difference, however, that whereas you crave those of the book more than ever, you are generally quite satisfied with yourself for not having, through the greenness of youth, yielded untimely to those of the lady; to ask with assumed indifference the price, and learn with ill-dissembled joy that it is now within your means; to say you'll take it; to place it beneath your arm, and pay for it (or more generally order it "charged"); to go forth from that room with feelings akin to those of Ulysses when he brought away the Palladium from Troy; to keep a watchful eye on the parcel in the car on your way home, or to gloat over the treasures of its pages, and wonder if the other passengers have any idea what a fortunate individual you are; and finally to place the volume on your shelves, and thenceforth to call it your own; this is indeed a pleasure denied to the affluent; so keen as to be akin to pain, and only marred by the palling which always follows possession, and the presentation of your bookseller's account three months thereafter.

It is customary to ridicule the expenditure of money in books, beyond the few volumes "which no gentleman's library should be without," and which are usually the very books which any gentleman's library can best dispense with. The wise man will caution his book-loving friend against this vice, and at the same time knock the ashes from his cigar, not reflecting that he himself is burning up the price of a neat little library every year. Another sagacious adviser will give similar counsel and at the same moment crack his whip over a thousand dollars' worth of horse-flesh, which is eating up large paper and rich bindings at the rate of several hundred dollars annually. Another

of these comforters is an inveterate billiard-player, or is a member of a boat-club, or wastes his evenings at an idling club. The wife even will look sober when the express-man stops at the door, and heave a sigh that agitates the husband's heart and a very brilliant set of diamonds on her own breast. Moneyed men hardly remark on these extravagances, but they deprecate any considerable expenditure in books. Now it is a mere matter of taste, but a man is not lightly to be blamed for preferring to spend an evening in his book-room to yawning at a club, or being spattered with mud or snow behind a span of fast horses; or for investing a year's cigars and oats in a folio Cæsar or a wide-margined Dibdin, especially when he thus not only gratifies his hobby, but has his stores intact at the year's end. It must be said too in defense of the Bibliomaniac that his habits are almost invariably praiseworthy and his morals irreproachable. While one is in company with Bacon and Shakespeare and Milton, he is in little danger of committing any undignified or immoral act.

Burton in the Anatomy of Melancholy quotes Heinsius as saying: "I no sooner come into the library, but I bolt the door to me, excluding lust, ambition, avarice, and all such vices, whose nurse is idleness, the mother of ignorance, and melancholy herself, and in the very lap of eternity, among so many divine souls, I take my seat with so lofty a spirit and sweet content, that I pity all our great ones and rich men that know not this happiness." And Becatello wrote to Alphonso, King of Naples: "One thing I want to know of your prudence, whether I or Poggius have done best; he, who that he might buy a country house near Florence, sold Livy, which he had writ in a very fair hand; or I, who to purchase Livy have exposed a piece of land to sale?"

It is doubtless a good thing to be worth a million of dollars, although I confess I never tried the experiment, but there are some things better than money. I would rather have the capacity and inclination to converse with Shakespeare and Dante, for example, than to have a million of dollars; and in looking forward to the occupations of the future life, I would rather fit myself to commune with such souls than with Crœsus and Midas. He was one of the wisest of mankind who said the only earthly immortality is in writing a book.

A miser having died, one said to the dead man's lawyer, "So old so-and-so is dead? Did he leave much?" "Oh, yes," was the reply, "He left every thing,—didn't take any thing with him."

I would like to take something with me.

It remains to add a few practical hints on the collecting and adornment of books. Usefulness in some sense ought always to be at the

bottom of book-collecting — usefulness either in art or letters. Nobody ought to collect books merely to show them or say he has got them. Mrs. Potiphar had a library of standard authors in wood and leather, and lost the keys of the book-cases. That is a resource sufficient for a good many men, and even for some who have large and fine libraries. The fundamental rule is to buy only such books as you want to read and to read more than once. A man does not sit down at table unless he wants to eat, and he should not purchase books unless he is hungry to read. Collecting books should spring from the feeling that one cannot get along without them. There are some books, however, that are useful as monuments of the arts of printing, engraving, illumination and binding, and one is excusable for acquiring them for study in these respects, as well as for perusal. The books of the fifteenth century, the first century of printing, are mainly desirable in this view, although, of course, many of them are valuable to scholars, especially in the study of the classics.

To a man who reads, the buying of one book entails the purchase of others. To instance my own experience, my first purchase was Prescott's Historical Works, at the age of eighteen. After reading Prescott, I felt that I must read Wilson's "Conquest of Mexico," in which Prescott's authorities and statements are seriously impugned. Prescott also necessitated the biography of Las Casas, and finally Squier's "Peru." My early acquaintance with Prescott led me at length to "illustrate" a copy of his life by Ticknor. This, it seems to me, is the way in which libraries should originate and grow. One should buy books as he wants to use them. To take another example: it is impossible to read Ruskin's "Modern Painters" intelligently without constant access to the illustrated editions of Rogers' "Italy" and "Poems," Turner's "Liber Fluviorum," Campbell's "Poems," Finden's "Illustrations of the Bible and of Byron's Life and Works," and the like. Therefore when one gets Ruskin he must have these others. So a library should be like Topsy, not born, but should grow. Nothing more clearly stamps the hollowness of the pretensions that many people make of a love for books than two fashionable modern customs; one, to speak of a library as a room in a house without any books in it; the other to put the books into the front and most public room in the house, instead of a retired and quiet apartment where one can read and write. Mrs. Potiphar doubtless had her library in her reception-room.

If one can afford it he should buy none but the very best editions at the start. Better, of course, have cheap editions, like the Tauchnitz, than none, but there is health, comfort and economy in the best.

The largest type is the best for the eyes and the brain, and the best editions, even of standard common works, will always be worth some money. There really is no economy in cheap books to those who can afford better ones. Many people seem to have conscientious scruples against buying books unless they can get them for a song, and books bought in this way usually go in the same way, with a constant diminuendo to the song.

For ordinary private uses a good library need not exceed 1,000 or 1,500 volumes. If it does not exceed these bounds the owner may read it and know it. There is a great deal of sheer vanity and vulgar display among book-collectors of wealth. I have been in many a superb private library whose owners knew little of books, except as merchandise.

A few words, in conclusion, upon the adornment of books, which, inasmuch as I have already spoken of bindings, must be confined to "illustration." This consists in adding to the books engravings of portraits, scenes and characters, and drawings and autographs, descriptive or reminiscent of persons, places and events alluded to in the text. There are tradesmen in the large cities who keep stocks of prints expressly for illustrators, and in London a number of these men issue frequent catalogues of their stocks. There are also a great many publications exclusively composed of portraits, views and scenes, sometimes all pertaining to a single author, which it is not extravagant to buy for this purpose; for example, Shakespearian illustrations; Lodge's and Knight's and the "Physiognomical" portraits; Longhi's superb Italian portraits; Worlidge's "Engravings from Ancient Gems," and Williams' "Select Views in Greece;" Finden's and Turner's views, of which I have spoken; Harding's "Views in Italy," and many others. If they are not all needed for the particular book in hand, they will "slop over" into some other. Thus "illustrating" breeds itself. Occasionally it is necessary to buy a book solely for a portrait or a view which it contains. One instance in my own experience, I recollect, was the very rare portrait of George Psalmanazar, the Formosa imposter, who deluded Dr. Johnson; and another was George Barrington, the famous English pickpocket, who was transported and became governor of New South Wales — of whom the saying was originally made, "he left his country for his country's good."

As to the *modus operandi* the first thing is to read your book. As you read it, make a list of the pictures it requires. If possible, get a copy in sheets, unbound, but if not, carefully take the book apart, and having procured the requisite pictures, lay them in at their proper places. If they are too large there is no resource, except the very ex-

travagant one of having the pages mounted or "inlayed" to the necessary size. Sometimes special editions of limited numbers are printed on large paper for illustration. If the pictures are too small they can be easily and cheaply "inlayed" to the proper size. This is an operation of a good deal of nicety and rather beyond the skill of amateurs, but there are artisans in the large cities who do it.

The hunt for pictures is sometimes very exciting and engrossing. There are two singular things about it. One is, the moment you have your book bound, some rare picture you wanted is sure to turn up. The other, when you find your rare print, you are pretty certain to find one or two duplicates; such prints, like accidents and crimes, seem to come in cycles. Some pictures which you would think quite common are difficult to get. For example it was a long time before I found a satisfactory "Bluebeard," and I have not yet got a "Lady Godiva."

There are three modes of illustration. Let me illustrate the first and simplest by an example. In a memorial of Edward Everett, published by the Massachusetts Historical Society, there is a passage quoted from Bulwer, to the effect that the "love of mankind" may be called forth "by a Socrates to-day, by a Napoleon to-morrow; while even a brigand chief, illustrious in the circle in which he moves, may command it no less powerfully than the generous failings of a Byron, or the sublime excellencies of the greater Milton." Now for this passage I had a group of three busts of Socrates, the ugliest man of ancient times; a rare picture of Napoleon at the bridge of Lodi incorrectly representing him on *horseback;* a group of five Byrons; a Milton and a portrait of Bulwer. In the same volume was a reference to Master Everett's teacher in penmanship, Master Tileston, and to the neat hand that the precocious lad acquired under his tuition; to illustrate this I had the original manuscript of a school composition written by Everett, at the age of 11, on the "Importance of Public Education." The next method is to use instead of a mere portrait, a representation of some famous event or incident in the life of the man whose name is mentioned. The Napoleon above-mentioned is an example of this. Suppose, in the life of Titian you find an account of the Emperor Charles V. picking up the great artist's brush, which he had dropped; I should put in a picture of this incident. The third, and best mode, is the illustration of *ideas,* especially in poetry. For example, in the poem "To Ennui," in Halleck's "Croakers," for the line, "The fiend the fiend, is on me still!" I found a picture of an imp, sitting on the breast of a man in bed with the gout. It took me years to find that. In the same stanza is the line, "Like a cruel cat that sucks a child to death." I found for this a picture in a children's magazine of a cat on the breast

of a child in a cradle. And speaking of cats reminds me of the line in another "Croaker," "and like a tom cat die by inches." For this I had a picture of a cat caught by the paw in a steel trap. These are things it would be almost impossible to duplicate. But the best thing in the "Croakers" is an illustration in the poem "To Simon" of the line: "Buy a new eye-glass and become a dandy and a gentleman." "Simon" was a gentleman of color, the favorite pastry cook of New York half a century ago. In my copy I had here inserted a print from La Fontaine, representing a gallantly dressed man viewing his figure in a mirror, and I had got a friend to blacken his face and hands in water color, but he has no "eye-glass." I have been some years illustrating another copy of the same work, which is still unfinished, and for this passage I have now a fine print of a colored gentleman, dressed in "tights" and a ruffled shirt, viewing a lady of African descent through an eye-glass. It would be impossible to improve on that. I recollect I once wanted to illustrate the phrase "seeing the elephant," and found what I needed in a picture of Pyrrhus trying to frighten his captive, Fabricius, by suddenly drawing the curtains of his tent and showing him an elephant with trunk uplifted in a threatening attitude. You remember the Roman General "didn't scare worth a cent." Among the hardest things to find were a treadmill and a drum major; I got the latter out of Frank Leslie's newspaper and the former from a pamphlet published many years ago on the proposed use of the tread-mill in our State prisons. I have also found apt illustrations for the following queer subjects, all in "The Croakers:" Korah, Dathan and Abiram; "Miss Atropos, shut up your scissors;" "Albany's two steeples high in air;" Reading Cobbett's "Register;" "Bony in His Prison Isle;" "Giant Wife;" "Beauty and the Beast;" "Fly Market;" "Tammany Hall;" "The Dove from Noah's Ark;" "Rome Saved by Geese;" "Cæsar Offered a Crown;" "Cæsar Crossing the Rubicon;" "Dick Ricker's Bust;" "Sancho in His Island Reigning;" "The Wisest of Wild Fowl;" "Reynold's Beer House;" "A Mummy;" "A Chimney Sweep;" "The Arab's Wind;" "Pygmalion;" "Danaæ;" "Highland Chieftain With His Tail On;" "Nightmare;" "Shaking Quakers;" "Polony's Crazy Daughter;" "Bubble Blowing;" "First Pair of Breeches;" "Banquo's Ghost;" "Press Gang," etc. To illustrate those ideas requires a knowledge of history, biography, mythology, local typography, romance, the drama and the Bible.

Discrimination should be used in selecting a book for illustration. The book should not be a mere vehicle. It should be a favorite author, or a classic, or the life of a famous man, or a book peculiarly

elegant in itself. Byron's "Childe Harold," Walton's "Complete Angler," Grimm's "Life of Michael Angelo," are examples of proper subjects of illustration. But common and prosaic books, like histories, should not be adopted.

What I have said in regard to books proper for illustration is applicable to those which it is desirable to have in large paper. Only books intrinsically valuable for their artistic execution, or somewhat rare, or editions of a classic or favorite author are appropriate in this form. To such the elegance of wide margins is a proper belonging. The "slender rivulet of text, running between the wide meadows of margin" is peculiarly grateful to the Bibliomaniac's senses. But the issuing of common histories, speeches, biographies, and the like, on large paper is ridiculous. A volume in large paper stands in the same relation to the rest of the edition that a proof engraving occupies toward the prints; it should be the earliest impression, struck off before the type and plates are worn. Otherwise it has no value and issuing it is a mere trick of the trade. The most elegant books ever issued in this country in large paper, to my recollection, are the Boston editions of Walton's Angler and Ticknor's Life of Prescott. Such issues are peculiarly fit for illustrations, as they accommodate prints of all sizes better than the small paper copies.

Is there any use in this hobby? — it may be asked. In answer I may say, it keeps one out of mischief and cultivates the taste. Moreover it gives an exact knowledge of the book itself, and unconsciously teaches a great deal of biography, history, art, mythology, and the like. I do not know why one is not as well justified in thus adorning his books as in adorning his house or his stables.

LITERARY PROPERTY AND INTERNATIONAL COPYRIGHT.

By HORACE E. SMITH, LL. D.

[Read before the Albany Institute, March 13, 1883.]

What is the meaning of the term *property?*

In its primary legal sense it signifies *ownership;* but it is used to express both the *ownership* of a thing, and *the thing* owned; to signify the *right* and *interest* which a person has in any subject of property, and, also, whatever things constitute *the subjects* of property. In its conventional use it is not restricted to corporeal things; and in legal terminology it embraces all subjects of property, whether corporeal or incorporeal.

In the sense of ownership, property is variously defined — "the exclusive right of possessing, enjoying, and disposing of a thing;" "exclusive dominion over a thing,' and "the right and interest which a man has in lands and chattels to the exclusion of others."

Either of these definitions is sufficiently accurate for ordinary purposes; but the one best suited to the present discussion is that of "exclusive dominion over a thing."

But, whence the idea of property? What is the origin of the right of property? These, and cognate questions, have elicited much learned discussion and developed divers theories. A review of this discussion is unnecessary for our present purpose, but it may safely be premised that the *idea* of property was implanted in the human consciousness by the Author of our being. This, doubtless, is the genesis of the idea, and the true origin of the right of property.

Says Ahrens, a distinguished German writer: "For every man property is a condition of his existence and development. It is based on the actual nature of man, and should, therefore, be regarded as an original absolute right, which is not the result of any outward act, such as occupation, labor or contract. The right springing directly from human nature, the title of being a man, is sufficient to confer a right of property."

In every age, and among all nations and peoples, from the rudest and most barbarous to the highly civilized and polished, there has

existed a *natural sense of property*—an intuitive conviction of a natural right to acquire, possess and enjoy external things.

But how is this primal idea, this abstract right to be *actualized?* How does an individual acquire *exclusive* title to and dominion over a particular thing? It is mainly to this question that attention has been directed by writers on natural law. Chancellor Kent wrote: "The exclusive right of using and transferring property follows as a natural consequence from the perception, and admission of the right itself." Grotius and Pufendorf base the right on social compact; holding that there must have been a previous implied assent that the first occupant should become the owner. But Locke, Blackstone, Barbeyrac and others insist that such implied assent or tacit agreement is not essential; that the right is created by the act of occupancy, or that it is the fruit of labor. This may be regarded as the prevailing and correct view.

The full recognition of this exclusive right, both as it respects the *use* and the *substance* of things, was the result of growth and development. Referring to the germinant period of legal ideas, we find that he who first began to *use* a thing acquired a property therein, by common consent; but this property was understood to continue so long as the exclusive *use* or *occupancy* continued, and no longer.

This rule was well adapted both to the *capacity* and the *wants* of man in a rude and undeveloped condition of the race. His nature was largely sensuous; he lived mainly in the *outward,* the *material;* he could not grasp abstract ideas. Hence the truth of the saying that "*property* without *possession* was too abstract an idea for savage life." And hence, also, the fact that mere *occupancy* or *use* of external things was ample for the few and simple wants of man in the childhood of the race.

But when the population of the earth and the wants of man increased; when social relations became more complex, and the interests of individuals began to clash, the necessity of a more complete title to and dominion over subjects of property became apparent. It was seen that the possessory owner ought to have a right, not to the immediate *use* only, but to the very *substance* of the thing used. This advance idea was a corollary from the primary, natural sense of property, as well as a social necessity; but the perception and recognition of the idea was principally due to the necessity.

Next, in the natural and logical order of development, came the right of transferring both the *use* and *substance* of a thing from one person to another. Ownership of the substance carried with it the right of transfer.

Finally, the fabric of property rights was completed and crowned by the doctrine that no man can be deprived of his property, except by authority of law, without his consent.

Thus, gradually advancing slowly step by step as the exigencies of society demanded and enlightened reason dictated, grew up the enlightened and just system of rules and principles which now constitute the law of property. First, the intuitive idea of the right of property, the natural right of man to exercise dominion over external things; second, the exclusive right of the individual to the *use* of a thing or subject of property while in possession; third, exclusive right not only to the *use* but to the *substance* of the thing; fourth, the right of transferring both the use and substance from one person to another; and, fifth, the doctrine that a man cannot be deprived of his property, except by authority of law, without his consent.

Thus much has been said — and perhaps more than was necessary — to clear the way for an intelligent discussion of *literary property.*

And what is *literary property?* No better definition can be formulated than that furnished by Mr. Drone in his excellent treatise on Copyright. "Literary property," he says, "is the exclusive right of the owner to possess, use and dispose of intellectual productions. An intellectual creation without material form may exist in the mind of the author. But it is only when embodied in written or spoken language that it can possess the attributes of property; for it is only by language that it can have any being out of the author's mind, that it can be enjoyed by others, that it can be identified. There can, then, be no property in a production of the mind unless it is expressed in a definite order of words. But the property is not in the mere words alone — not alone in the form of expression chosen by the author. It is in the *intellectual creation*, which language is merely a means of expressing and communicating."

As the term *copyright* is often used synonymously with *literary property*, and indifferently to signify both the *common law* and the *statutory* right of the author in a literary composition, it should be noted that there is an essential difference between the two rights.

The *common-law* right is the right or property of an author in his brain work before publication, and may appropriately be termed *common-law copyright*, it being a natural right wholly independent of statute, which is recognized and protected by the common law. The *statutory* right is the right of an author in his literary work after publication, and may properly be characterized as *statutory* copyright. It is the *exclusive* right of the owner to multiply, and to dispose of copies of an intellectual production — a right secured by statute.

The next question in the logical order of discussion is, Has the author a natural proprietary right in the products of his brain? In other words, is there such a property-right as *common-law copyright?* Varying the question still, has the literary creator a natural right to, and property in, his creatures?

Such creations, it is confidently affirmed, have all the attributes of property. Adopt the theory that exclusive property orignates in *labor*, and who, of all earth's toiling millions, has a clearer, or better title to the products of his labor than the author?

True, his labor is primarily and mainly *intellectual;* but it is often severe, protracted and exhausting. No kind of labor is more exacting and relentless in its demands, or more consuming to the vital energies.

If the origin of exclusive property in a thing be referred to *pre-occupancy* the title of the author to his intellectual creations is equally clear, for he, certainly, first has possession of them.

Sir William Blackstone, speaking from the bench, said: "A literary composition as it lies in the author's mind, before it is substantiated by reducing it into writing, has the essential requisites to make it the subject of property. While it thus lies dormant in the mind, it is absolutely in the power of the proprietor. He alone is entitled to the profits of communicating, or making it public."

But, strange though it may seem, jurists, publicists and statesmen are sometimes met with who repudiate in toto the idea of property in literary productions, as a natural or common-law right. Their line of reasoning is substantially this: First. *Material substance* is an attribute of property, and nothing can be the subject of ownership which is not corporeal; second. That *identity* is essential to exclusive ownership; and, third. That *materiality* is essential to identity.

That *identity* is essential to exclusive ownership is quite true; but that *materiality* is essential to identity is not true — it is simply a bald assumption; and therein lurks the vice of the reasoning.

In the celebrated case of Millar vs. Taylor, decided by the Court of King's Bench in 1769 — the subject of which was a piratical issue of an edition of Thomson's Seasons — Mr. Justice Yates took ground against literary property, and defended his position with much spirit, and considerable plausibility. He said, among other things: "But the property here claimed is all ideal; a set of ideas which have no bounds or marks whatever, nothing that is capable of visible possession, nothing that can sustain any one of the qualities or incidents of property. Their whole existence is in the mind alone; incapable of any other modes of acqusition or enjoyment than by mental possession or apprehension; safe and invulnerable from their own immateriality;

no trespass can reach them; no tort affect them; no fraud or violence diminish or damage them. Yet these are the phantoms which the author would grasp and confine to himself; and these are what the defendant is charged with having robbed the plaintiff of."

Lord Mansfield, and Justices Aston and Willes maintained the right with a strength of argumentation, and wealth of learning, rarely equaled in forensic discussion; and the judgment of the court was in accordance with their views.

The *opinion* alone of Lord Mansfield, unsupported by his cogent reasoning, is entitled to great consideration. He was, in the language of Lord Thurlow, "a surprising man; ninety-nine times out of a hundred he was right in his decisions and opinions; and, when once in a hundred times he was wrong, ninety-nine men out of a hundred would not discover it."

Mr. Justice Thompson, of the Supreme Court of the United States, speaking from the bench of Justice Yates' view, said that it "would hardly deserve a serious notice, had it not been taken by a distinguished judge."

It seems hardly credible that a distinguished judge should have taken the ground in a solemn judicial utterance, that *corporeity* is essential to property. The merest tyro in law knows that there is a kind of property, quite extensive in range, which is *wholly incorporeal* in its nature; and yet it is distinctly recognized, well defined, and fully protected *as property* in every enlightened system of jurisprudence in the world.

Subjects of this class of property are denominated "*choses in action*," and sometimes "*rights in action;*" and they are defined by approved law-writers as "*personal property of an incorporeal nature.*"

Speaking of this kind of property, Chancellor Kent says: "By far the greatest part of the questions arising in the intercourse of social life, or which are litigated in the courts of justice, are to be referred to this head of personal rights in action."

Literary property, it should be remembered, consists in *the intellectual creation;* it may be embodied in characters which express and convey to others the author s thought, and "imprisoned upon the printed page;" but this embodiment is not the essence of the author's property, but only the vehicle which conveys it.

This incorporeal property may exist as perfectly when expressed in *spoken*, as when communicated in *written* or *printed* language. A poem recited, a lecture delivered *memoriter*, a song vocalized, an acted drama, may have the attributes of property, without a written or printed word. Says Mr. Drone: "That greatest creation of ancient

genius, the Iliad, has not only preserved its identity through nearly thirty centuries, but, according to Jacobs and other Greek scholars, it was recited from memory at the Greek festivals for ages before it was 'imprisoned in written characters.'" This fact alone refutes the objection, that an intellectual creation is incapable of identification, and hence lacks an essential requisite of property. It is idle to affirm that the literary productions of genius cannot be distinguished from each other by persons versed in the *belles-lettres.* It is a well-known fact, that the individuality of a literary composition may be so marked, its identity so complete and enduring, that it will live intact for ages in the memory alone, without writing or print, pass from one generation to another, and, borne upon the wings of fame, encircle the earth.

When viewed in the light of reason, nothing can be more absurd than the doctrine that a man cannot have property in the product of his brain work. Scarcely more unreasonable is Proudhon's motto that "Property is robbery." With a very small investment of time, labor and skill, a man may grow a cabbage to feed his perishable body, and it becomes his property, sacred as such in the eye of the law, and to the protection of which the whole power of government is pledged. But, according to Mr. Justice Yates and his disciples, if a man of transcendent genius creates a grand poem, which ministers to the immortal mind, and becomes itself immortal, he has no rights in it which the public are bound to respect; it is an outlaw from birth, and falls a prey to the vandalism of mercenary pirates and literary ghouls.

In the view of such law and logic, Homer's Iliad, Dante's Inferno, Milton's Paradise Lost, or Shakespeare's Hamlet, is nothing in comparison with a cabbage.

With a small piece of bass-wood, a twenty-five cent jack-knife, and an hour's whittling, a boor may manufacture a rude wooden porridge-spoon, which is immediately clothed upon with the attributes of property, and becomes his by the force of natural law. But, let a man of extraordinary ability, by years of toil and a large expenditure of money, produce a literary work which shall contribute much to the sum of human knowledge and greatly benefit the race, and it is at the mercy of a selfish world or the caprice of an unappreciative legislature. Such is the logic and such the fruit of the doctrine of no property in brain-work.

As a pertinent commentary upon the doctrine, and a fair illustration of its injustice, may be mentioned the experience of Sir Archibald Alison in the preparation of his History of Europe. In a petition to

Parliament for protection, he says among other things, "That, with a view to the collection of the materials and the acquisition of the local information requisite for a work of such magnitude, it was unavoidably necessary for your petitioner to visit in person the principal countries in Europe, and purchase the works, in all its languages, bearing upon so extensive a subject.

"That during the last twenty-five years your petitioner has, with this view, six times repaired to the Continent, and repeatedly visited the principal parts of France, Italy, Switzerland and Germany; that the cost of these journeys has already exceeded £1,500, and the expense of the books found to be necessary for the compilation of the undertaking has amounted to above £2,000. If your petitioner lives to complete his undertaking, his total expenditure on account of it will be about £4,000."

Yet, according to the doctrine now under treatment, Sir Archibald Alison, after twenty-five years of hard labor, during the best portion of his life, and an expenditure of $20,000, to produce a great historic work, acquired no property in it, and was entitled to no protection at the common law.

Inasmuch as a common-law property in *unpublished* works is quite generally recognized, and protection for a limited period *after* publication is accorded by statute, it may seem unnecessary to discuss the abstract question of literary property. Such discussion, however, will serve to characterize some extraordinary features in the judicial history of literary property, and point to a just and rational solution of important questions involved in the subject.

The distinction between *common-law* right and *statutory* right has already been noticed. The former is a right existing in literary productions before publication, which possesses the same attribute of perpetuity as any other species of personal property; and it is thus recognized and protected by the courts both in England and the United States. The latter exists only in works which *have been published*, within the meaning, and according to the provisions of the copyright law. The statutory right is limited to a term of years; in England forty-two years, or during the life of the author, and seven years after his death, in case this should be a longer period; in the United States, to the term of twenty-eight years, with the privilege to the author, if living at the expiration of the term, or to his widow or children if he be dead, of having the right continued for the further period of fourteen years.

The most extraordinary feature in the whole matter is that, as the the law is held, the two rights cannot co-exist in the same work; when

the statutory right begins, the common-law right ends, and ends forever. When a composition is published in print, the common-law right of the author is lost; and if the publication do not conform to the provisions of the statute, he secures no statutory right, and is left without protection.

A brief review of the judicial history of literary property will aid the discussion; but such review must necessarily be very general under our limitation of time.

The first distinctive copyright statute enacted in England was what is known as the "statute of Anne," passed in 1710. There is clear evidence that property in literary productions had then been recognized by the English courts for a period of at least fifty years; and a strong probability that such recognition extended back to the latter part of the fifteenth century, when printing was introduced into England.

The ante-statutory existence of this right must, of course, have been due to the common law.

The statute of Anne was enacted on the petition of proprietors of copies praying for more effectual protection of their property, and a more adequate remedy for infringement of their rights than was afforded by the common law. They asked, among other things, that *confiscation of the counterfeit copies* might be made one of the penalties. Their prayer for relief assumed the existence of a common-law right; and they never once dreamed that the answer to their prayer would deprive them of that right.

Between the passage of this act, in 1710, and the decision of Millar v. Taylor there were not less than five solemn adjudications by the English Court of Chancery, sustaining the common-law right, notwithstanding the statute of Anne. These causes were decided by such jurists as Sir Joseph Jekyl, Lord Talbot and Lord Hardwicke.

Then came the case of Millar v. Taylor, in which, after elaborate argument, and full consideration, it was adjudged by the Court of King's Bench, against the opinion of Mr. Justice Yates, that copyright had its foundation in the common law, and was not destroyed by the statute of Anne, which was enacted for its more complete protection.

Five years later, the same question came before the House of Lords, on appeal, in the case of Donaldson v. Becket. The lords, as they might do, ordered the opinion of the twelve judges upon the questions of law involved. Ten of them answered that at common law the author of an unpublished literary composition had the right of publishing it for sale, and might maintain an action against any person who should publish the manuscript without his consent. From this view one judge dis-

sented. Eight maintained that at common law the author's exclusive rights were not prejudiced by publication, while three were of opinion that publication was an abandonment of the common-law property. Seven maintained that the ownership of literary property was perpetual by the common law. Five were of opinion that the statute of Anne did not destroy, abridge, or in any way prejudice the common-law property in a published work, and did not deprive the author of his common-law remedies. Six made answer that the common-law right after publication was taken away by the statute, to which alone the author must look for protection. Lord Mansfield, being a peer, from motives of delicacy, refrained from giving an opinion; but it was well known that he adhered to the opinion which he so ably maintained, while sitting as chief justice of the King's Bench. The twelve judges were, in fact, evenly divided upon the important question, whether the statute of Anne had abridged the author's common-law right or left it perpetual like other proprietary natural rights.

Thereupon, Lord Camden, moving the judgment of the house, made a most extraordinary harangue against the doctrine of literary property. His attack was vigorous, almost ferocious, and specious, but — it must be said — marvelously sophistical. And, strange phenomenon, chief among his supporters, with speech and vote, was Lord Macaulay. The decision of the court below was reversed, and the doctrine established that the common-law right of the author after publication was taken away by the statute. So the law remains, in England, to this day.

It has been suggested, as an explanation of Lord Camden's course on this occasion, that he was influenced by a rivalry between himself and Lord Mansfield; and color of truth is given to this explanation, by the language of Lord Campbell in his "Lives of the Chancellors." It is represented by him, that for a long time "these great men had contended for the supremacy as law lords in the upper house;" and that in one scene, which occurred about four years before the discussion of the question of literary property, they had a personal controversy of a very disagreeable character, in which Lord Camden seems to have triumphed by the exhibition of more nerve than belonged to the "silver-tongued Murray."

Mr. Justice Yates, while at the bar, had been engaged in the first controversy that arose under the statute of Anne, and contended that copyright was a monopoly. It is just possible that this circumstance may have influenced, to some extent, his judicial opinion; it does not always happen that the prejudices of the barrister are put aside with his gown when he dons the ermine.

It is not strange that the judgment of the House of Lords caused surprise and alarm among men of letters, and especially among booksellers who had large investments in copyrights, which they had understood to be perpetual but which now were outlawed. They had asked for a fish, and, in the judgment of the House of Lords, Parliament had given them a scorpion.

In this exigency an appeal was again made to Parliament for relief which met with favor from the House of Commons, but failed of success through the hostile attitude of the House of Lords. Efforts to secure favorable action by Parliament were renewed from time to time till 1842, when they resulted in the present law, which is more liberal in its provisions than any prior statute. The last movement, which thus resulted, was led in the House of Commons with consummate ability by Sergeant Talfourd, whose efforts were aided by petitions from some of the most distinguished British authors, including Sir Walter Scott, Prof. Wilson, Archibald Alison, Sir David Brewster, Thomas Carlyle, Thomas Campbell, Charles Dickens, Robert Browning, Douglas Jerrold, Leigh Hunt, Mary Russell Mitford and Thomas Hood.

A petition of Mr. Hood, not actually presented to Parliament, is so full of mingled truth, wisdom and wit, that the temptation to quote a few passages from it in this connection is irresistible. It runs thus: "The humble petition of the undersigned, Thomas Hood, sheweth —

"That your petitioner is the proprietor of certain copyrights which the law treats as copyhold, but which, in justice and equity, should be his freeholds. He cannot conceive how Hood's Own, without a change in the title-deeds as well as the title, can become Everybody's Own hereafter." * * *

"That cheap bread is as desirable and necessary as cheap books; but it hath not yet been thought just or expedient to ordain that, after a certain number of crops, all cornfields shall become public property."

* * *

"That when your petitioner shall be dead and buried, he might with as much propriety and decency have his body snatched as his literary remains." * * *

"That your petitioner hath two children, who look up to him not only as the author of the Comic Annual, but as the author of their being. That the effect of the law as regards an author is virtually to disinherit his next of kin, and cut him off with a book instead of a shilling.

"That your petitioner is very willing to write for posterity on the lowest terms, and would not object to the long credit; but that, when

his heir shall apply for payment to posterity, he will be referred back to antiquity.

"That as a man's hairs belong to his head, so his head should belong to his heirs; whereas, on the contrary, your petitioner hath ascertained by a nice calculation, that one of his principal copyrights will expire on the same day that his only son should come of age. The very law of nature protests against an unnatural law which compels an author to write for anybody's posterity except his own."

The judicial history of literary property in the United States may be given in few words.

Prior to the adoption of the Federal Constitution, which was framed in 1787, copyright laws were passed in several of the States; and most, if not all, of these laws recognized the common-law right.

In order to secure adequate and uniform protection throughout the United States to literary property, inventions and discoveries, a provision was inserted in the Federal Constitution empowering Congress "to promote the progress of science and useful arts, by securing for limited times to authors and inventors the exclusive right to their respective writings and discoveries."

Under this power, Congress has, from time to time, enacted copyright laws. The first, passed in 1790, was substantially a copy of the then existing English statute — the one used by the House of Lords as an instrument for the destruction of common-law copyright.

In 1834, this act came before the Supreme Court of the United States for construction, in the case of Wheaton v. Peters, reported in 8 Pet. 591, which presented substantially the same questions adjudicated in Donaldson v. Becket, and our court, in its judgment, followed the English precedent. The judges, however, were divided in opinion; Mr. Justice McLean delivered the opinion of the court, three of his associates agreeing, two dissenting, and one being absent. The dissenting opinions of Justices Thompson and Baldwin are regarded as masterly expositions of the true principles underlying and governing literary property.

If the views now indicated are sound, it follows inevitably that the common-law right of property in brain-work has been unjustly stricken down by judicial construction.

The will and caprice of the Legislature is substituted for a God-given right. Under the adjudications in England and the United States, if the Legislature, not sympathizing with "them literary fellers," should refuse all protection, property in literary productions would cease with publication in print. Even under the most liberal copyright statutes, the author's right is abridged; for if it be a com-

mon-law right, it is as much entitled to recognition and protection as any other species of property. But the true and righteous rule will not prevail until an enlightened and thoroughly aroused public sentiment shall have compelled just legislation, or a second Mansfield shall have come to judgment, and broken the shackles of precedent.

In the meantime, and under the circumstances, authors must seek all available remedies, and this leads to the consideration of *international copyright.*

Our government, it must be confessed, does not occupy an enviable position, either in respect of its own copyright legislation, or in its attitude toward international copyright.

Our copyright laws are more illiberal than the English toward aliens, and this country has never cordially responded to England in her efforts to secure international copyright. As early as 1838 an act was passed by the British Parliament, enabling the author of a book, first published in a foreign country, to obtain copyright in England, on condition that the like privilege should be extended by such country to English authors. A similar act on the part of the United States would have settled the question on just and liberal principles. But such reciprocity would not advance the real or fancied interests of American publishers, and their influence was potent to prevent it. England has always manifested a willingness, nay, a *desire* to make with the United States, as with other nations, some just and liberal arrangement upon the subject, either by legislation or treaty. She has established international conventions with Russia, Saxony, Brunswick, Thuringian Union, Hanover, Oldenburg, France, Anhalt, Hamburg, Belgium, Spain and Sardinia. But, hitherto, all efforts to effect an arraugement with the United States have failed.

In 1837 the subject came before the Senate of the United States, on a petition of British authors presented by Henry Clay. The subject was referred to a select committee, consisting of Messrs. Clay, Preston, Buchanan, Webster and Ewing, of Ohio. A report from this committee — framed presumably by Mr. Clay — soon followed, urging the passage of a law which should secure to foreign authors their copyright in this country. The report contains this language:

"That authors and inventors have, according to the practice among civilized nations, a property in the respective productions of their genius, is incontestible; and that this property should be protected as effectually as any other property is by law, follows as a legitimate consequence. Authors and inventors are among the greatest benefactors of mankind. They are often dependent exclusively upon their

own mental labors for the means of subsistence; and are frequently, from the nature of their pursuits or the constitution of their minds, incapable of applying that provident care to worldly affairs which other classes of society are in the habit of bestowing. These considerations give additional strength to their just title to the protection of the law.

"It being established that literary property is entitled to legal protection, it results that this protection ought to be afforded wherever the property is situated. A British merchant brings or transmits to the United States a bale of merchandise, and the moment it comes within the jurisdiction of our laws they throw around it effectual security. But, if the work of a British author is brought to the United States, it may be appropriated here, and re-published, without any compensation whatever being made to the author. We should be all shocked if the law tolerated the least invasion of the rights of property in the case of the merchandise, whilst those which justly belong to the works of authors are exposed to daily violation, without the possibility of their invoking the aid of the laws."

The direct and immediate effect of the delinquency of our government in this matter is, not only to deny justice to foreign authors, but to deprive American authors of all protection for their works beyond the limits of their own country. It is said upon reliable authority that, according to the statistics of 1878, ten per cent of the works issued in England in that year were American reprints.

There are, also, incidental evils of a serious nature resulting from the want of an international copyright law. Under the present *status* there is very little encouragement for young and unknown American authors. Publishers find it much cheaper to steal and reprint works of popular foreign authors, than to pay this class of American authors even a moderate compensation for their productions. Mr. Charles Reade says that he is informed by American authors, "that the publishers keep copying machines, and the rejected manuscript often bears the marks of the machine; and the subject-matter is, in due course, piratically used." In his nervous style he draws a graphic picture of the young victimized author, which, unfortunately, wears too many lineaments of truth. He says: "It becomes the old to feel for the young; let me trace that poor young author's heart. He is young, and the young are sanguine; he is young, and the young are slow to suspect cold-blooded villainy and greed in men that are rich, and need not cheat to live, and live in luxury. He takes his manuscript in good faith to a respectable man. He is told that it shall be read. There are delays. The poor young man, or young woman, is hot and cold by turns; but does not like to show too much impatience.

However, in time, he begins to fear he is befooled. He calls, and will have an answer one way or other. Then a further short delay is required to re-peruse, or to consider. That delay is really wanted to copy the manuscript by a machine. The manuscript is returned with a compliment; but the author is told he is not yet quite ripe for publication; he is paternally advised to study certain models (British) and encouraged to bring another manuscript improved by these counsels. Ods Nestor! it reads like criticism, and paternal advice. The novice yields his own judgment; sighs many times if he is a male, if female has a little gentle cry that the swine earth is tenanted by, are not asked to pity nor even comprehend; and the confiding American youth, thinking gray hairs and grave advice must be trustworthy, sets to work to discover the practical merit that must lie somewhere or other at the bottom of British mediocrity and "decent debility"; he never suspects that the sole charm of these mediocre models lies not in the British platitudes and rigmarole, but in the Latin word *gratis*. While thus employed, he sees, one fine day, some sketches of life in California, Colorado, or what not, every fact and idea of which has been stolen from his rejected MS., and diverted from its form, and reworded and printed; while he, the native of a mighty continent, has been sent away, for mundane instruction, to the inhabitants of a peninsula on the north coast of France."

The late Mr. Emerson, in his calmer style, wrote thus:

"There are men in this country who can put their thoughts in brass, in iron, stone or wood; who can build the best ships for freight, and the swiftest for ocean race. Another makes revolvers, another a power press. But scarcely one of our authors has thrown off British swaddling clothes. The great secret of the world-wide success of 'Uncle Tom' was its novelty; it had something peculiarly American in it. The works of American authors have been smothered under English authors in the American market. Not only has the wholesale system of mal-appropriation most injuriously affected the interests of living American authors, but it has a tendency to dwarf down the original literature of the United States to a servile copyism, and to check the development of the national mind."

It should be stated in justice to some of our leading publishers, that they deny the charge of piracy, and assert that they have been in the habit of paying foreign authors for reprints. It appears from letters addressed by them to "The Critic," in 1882, that the Appletons had paid a ten per cent royalty on the retail price to Herbert Spencer, Darwin, Huxley, Tyndall, Lubbock, and others; that J. B. Lippincott & Co. paid Ouida £300 for each of her novels, and as much for some

of George McDonald's books; that Dodd, Mead & Co. paid Mrs. Charles, author of the Schonberg-Cotta Family, thousands of dollars for her earlier works, and had continued to pay for her later and less popular writings; and that other publishers had paid, more or less, for reprints.

But, these defensive allegations omit two important facts which materially affect the case: First, they do not state that these payments were voluntary, not made in response to any legal obligation which the author could enforce; indeed, the helpless author had no voice in the amount paid, and only enjoyed the poor privilege of withholding his sanction to an "authorized American edition," at the hazard of losing all by sheer robbery. Secondly, the payments thus gazetted as a vindication of our publishers were made upon condition of receiving the author's assent to the issue of an "authorized American edition," which practically gave them the exclusive right of reprinting in this country under the protection from competition afforded by what is known as the "courtesy of the trade;" which is near of kin to the moral and high-toned rule of "honor among thieves." That the privilege of publishing an "authorized American edition" with the author's sanction was, at one period, of considerable value to the publisher under the courtesy-of-the-trade rule, may be inferred from the fact that Wiley's Sons offered Mr. Ruskin $5,000 for the privilege of publishing such an edition of his works.

It is not, therefore, entirely clear to ordinary perception, that the payments in question were wholly disinterested.

But this class of publishers have found that the "courtesy of the trade" does not always protect them in their reprints against the rapacity of unscrupulous parties. For example, Messrs. Roberts Brothers, of Boston, in 1880, issued a circular in reference to unauthorized and cheap reprints of Jean Ingelow's poems. It seems that, seventeen years before, they had published the first American reprint of her poems, paying her, as they alleged, as though she had been an American author legally entitled to it. For a long time no other publishers interfered with their monopoly. They had made large expenditures by advertising and otherwise, and had paid Miss Ingelow the aggregate of $18,000. At length a pirate seized upon the unprotected property, issued a cheap reprint, which compelled Messrs. Roberts Brothers to sell their superior edition at a greatly reduced price, thus inflicting a severe blow upon both publishers and author. In this particular case, the pirate was an Englishman, who, it seems, had been stimulated by the success of American enterprise in this field of activity.

Until within a comparatively recent period, American publishers had opposed international copyright, and for no other reason within the bounds of knowledge or reasonable conjecture, than the damaging effect such an arrangement might have upon their morally contraband traffic in the poor author's brain-work. But, experience like that of Messrs. Roberts Brothers, in the case named, so affected some of our leading publishers as to produce in them a "change of heart." Finding that the prestige of their "authorized American editions" was destroyed, and their enormous profits greatly reduced by the action of parties who cared as little for the "courtesy of the trade" as they did for the rights of authors, these publishers came to the front and magnanimously asked for an international arrangement.

But the work of sanctification was not yet perfect. They were not willing, nor are they yet willing to accept the fair and honest scheme proposed by England, which is, in effect, that English copyright be recognized and protected in the United States, and American copyright in Great Britain; so that a work published in either country shall be protected in the other without reprinting, which doubles the original cost of manufacture, and thus imposes an extra burden upon the reader. On the contrary, they insist that, to entitle an English book to protection in this country, it must be reprinted or manufactured here by a subject or citizen of the United States. What they ask is, not protection and justice to authors, but monopoly and protection to American publishers. In the language of Mr. William Appleton, in a letter to the *London Times*, they claim that the arrangement offered by England is "but a kind of legal saddle for the English publisher to ride his author into the American market."

It cannot be denied that their treatment of this question gives some color of truth to the epigram that "publishers drink their wine out of authors' skulls."

There are other interesting and important phases of the subject which must be wholly omitted from the present discussion, the proper limits of this paper having already been exceeded.

The only plausible thing that has been said in justification or palliation of our national attitude in this matter is, that it furnishes the people with abundance of cheap literature.

There is room for grave doubt, whether the great volume of cheap literature which floods the land is, in truth, a blessing to the people. Nor is it by any means certain that international copyright would seriously diminish the supply of reasonably cheap editions of works that are worthy of publication. Different classes of readers would require issues suited to taste and purchasing ability; and the interest

of publishers may, it is believed, be safely trusted to adjust the supply to the demand.

But, whatever the truth may be in these particulars, no claim of American publishers for protection, or demand of the public for cheap literature, however plausible or urgent, and no question of expediency which conflicts with right and justice, is entitled to a moment's favorable consideration. "Justice," it has been well said, "is the highest expediency."

LOCUTIUS IN FABRICA.

By GILBERT M. TUCKER.

[Read before the Albany Institute, Jan. 6, 1885.]

"Words are those Channels, by which the Knowledge of Things are conveyed to our Understandings: and therefore, upon a right Apprehension of them depends the Rectitude of our Notions; and in order to form our Judgments right, they must be understood in their proper Meaning, used in their true Sense, either in Writing or Speaking: For, if the Words of the Speaker or Writer, though ever so apposite to the Matter, be taken in a wrong Sense, they form erroneous Ideas in the mind concerning the Thing spoken or written of; and if we use Words in a false and improper Sense, this causes Confusion in the Understanding of the Hearer, and renders the Discourse unintelligible." — *Introduction to Bailey's Dictionary.*

In an office-building which I occasionally visit, is a dingy little room occupied as a shop by one of those useful men who can turn their hands to almost any mechanical task, from repairing a fine clock to building a cow-shed, and do it well. To the casual observer, the place is far from beautiful, and has a "cluttered-up" appearance suggestive of habits the reverse of orderly. The floor — where not occupied by benches, lathes, horses, and a rusty stove surmounted by a glue-kettle — is nearly concealed by bits of timber, shavings, and miscellaneous debris. The walls are lined with shelves and racks of many shapes, sizes and colors, obviously put up at different times, and constructed of odds and ends, with no thought of symmetry or harmony in their arrangement. And when one examines the tools themselves, they are found to form a collection almost equally promiscuous. No two have handles alike or look as if they came from the same maker. They are disposed in rude stands, boxes and cases of irregular forms, which seem to have been hastily adapted to their present purpose in default of anything better. Nothing could be more unlike the finely finished and ingeniously arranged "gentlemen's tool chests" that fascinate the eye of mechanically disposed visitors in hardware stores.

Yet the occupant of this little shop can lay his hand in a moment on any article in it, by day or by night, and knows the contents as you know the alphabet. And when he puts any implement into service, it is found to answer its purpose to very perfection. The chisels cut like razors; the saws follow the line without the deflection of a hair's-breadth; the lathes run exactly true; the vises and clamps hold like a

bad habit. For all their rude appearance, it would be hard to suggest any improvement in the practical working of this collection of heterogeneous apparatus.

Now I have often thought, while watching this mechanic at work, that his position (barring of course any question as to relative degrees of skill) is in some respects not unlike that of a member of the Institute preparing a paper for your consideration. Is not the English language, too, a seemingly disordered and inharmonious assemblage of implements, appliances and raw material? Our vocabulary is made up of importations from every country under heaven; our present tenses and their preterites, our individual terms and their significance in idiomatic phrases, our spoken words and their representatives in writing, have in scores of cases about as much seeming congruity as my mechanical friend's delicate watch-making lathe with the dirty table on which it stands and the rough box that covers it. And yet, what work can be accomplished with the English language! What distinction so fine, what conception so grand, what mental creation so lovely, that this unsymmetrical and in many respects unbeautiful tongue is inadequate (if one only knows how to use it) for putting it into permanent form for preservation? As a means for the expression of thought, our modified Anglo-Saxon in the hands of a master excels the comparatively regular languages of antiquity and of many savage peoples, as the mechanic's unattractive tools excel for practical purposes the handsome but untrustworthy contents of the "gentlemen's tool-chests." Less sonorous than German, less sparkling than French, less musical than Spanish, less logical and systematic by far in its structure than Latin, less flexible than Greek, how it surpasses them all for meeting the varied necessities of mankind!

And does not this parallelism suggest a useful lesson to certain hypercritical critics whose wont it is to act the part of grand inquisitors as to the legitimacy of the new terms which are constantly appearing in our language, often to supply real and important wants? A great hubbub was made by this class of people on the introduction of the now well established noun *starvation*, which even Mr. Skeat, notwithstanding his usual liberality of judgment, condemns as a "ridiculous hybrid." Hybrid of course it is — an Anglo-Saxon root with a Latin suffix, as if one were to fit a rough hickory handle into a highly polished lignum-vitæ mallet. But consider the circumstances. The implement was badly needed; the materials of which it was constructed were the best at hand at the moment, or the best that were thought of; and it answers its purpose well. Can we afford to discard it because it is not handsome in appearance? *Reliable* has fallen under the ban of the same class of thinkers. It is badly formed, no

doubt; but so, for that matter, is its parent, the universally accepted verb *rely*, and still more so the unchallenged noun *reliance*, consisting as this does of an English root with a French prefix and suffix, like an old, well-worn spoke-shave with a pair of bran new handles. (As to the other objection to *reliable* — that we do not *rely a thing* but *rely upon it*, and therefore the adjective ought to be *rely-upon-able*, any comment may safely be deferred until people begin saying *laugh-at-able* instead of *laughable;* the principle is the same in both cases.) Fault is perpetually found with *talented*, on the ground that participles ought not to be formed from nouns; and perhaps they ought not, in a strictly logical and regular language; but a tongue that already includes *diseased, gifted, lettered, bigoted, turreted, landed, towered, blooded, cultured, acred, steepled, mitred, coped, tippeted, booted, spurred, horned, unprincipled* and *widowed*, will hardly suffer much by admitting one more formation of the same anomalous kind. *Stand-point, wash-tub, shoe-horn, cook-stove* and *go-cart* (*boot-jack* might have been added) are set down as abominations, "slovenly and uncouth," by a popular writer on correctness in speech, because they do not conform in their structure to a somewhat complicated canon which he lays down as the law for making "compounds of this kind." His argument is a complete non-sequitur. The laws relating to the development of a language are to be deduced from the history of that development, just as the so-called laws of nature are merely generalized statements of observed facts. And in regard to these expressions, which our acceptance of his canon would require us to condemn, it must be noticed that they are not only briefer (always an advantage) but actually clearer than those which the critic would substitute for them. The meaning of a *cooking-stove*, to be sure, is not greatly liable to misapprehension; nor perhaps is that of a *washing tub;* but *booting jack* is open to the manifest objection that it is not for booting but for un-booting, so to speak, that the implement is designed, while *shoeing horn* suggests an entirely wrong idea — we do not speak of the process of dressing our feet as "shoeing" them; and what sort of a description of the well known nursery machine would it be to call it a "going cart"?

The fact of the matter seems to be that while of course it is desirable that the development of the language should proceed on regular lines and in conformity with logical principles, yet it is by no means essential to the usefulness of a word that it should be thus formed; and if only the word is useful, we can well afford to admit it to our already heterogeneous vocabulary, the vocabulary being all the more serviceable in many ways on account of the variety and lack of unity among its constituent parts. The important question in all such

cases, looking at them from the mechanical point of view, is, have we need of this tool, and is it the best we can readily procure? If so, we shall be just so much the poorer for rejecting it on account of its uncouth appearance.

It ought to be remembered indeed that our list of words, numerous as it is, is yet not comprehensive enough to fulfill the highest ideal of a perfect tongue. We need more tools, a good many of them, and it sometimes seems a pity rather that we cannot manufacture and introduce them when the need is perceived than that some of those we have, offend in their composition the strict requirements of congruity. We badly need, for instance, epicene pronouns in the singular answering to *they*, *them* and *their* in the plural. True it is, one can often use *he*, *him* and *his*, expecting hearers or readers to remember that "the brethren embrace the sistern." True it also is, one can often get around the difficulty by rearranging a sentence; but there *is* a difficulty, for all that. A man wishes to say that each of his two children, a boy and a girl, has the exclusive use of a bedroom. He naturally begins: "Each of my children has a room to"— how shall he finish? It is not quite right to say that each has a room to *himself*, or to *herself*, and it is certainly far from grammatical or pleasing to say *themselves*. What shall he do? The problem is of daily occurrence, as any one will find who will take pains to watch for it.

We need, too, a preterite for the verb *ought*. We are compelled to say, "you ought to have done such and such things"— which is by no means what we really mean. One cannot possibly be under obligation to *have done* anything — the phrase is absurd; all obligation is *to do*, and it would be an important gain in the direction of clearness and conciseness if we might say, when speaking of past time, "you oughted."

We need, again, a word almost synonymous with *many*, but having a slightly different shade of meaning — a lack which is often supplied, awkwardly and incorrectly, by the use of *numerous* with a plural noun. People say, "there are numerous books on that subject"— which is clearly ungrammatical; there may be a numerous *list* of book, but that expression, correct in syntax, does not seem quite to express the idea; and to say there are *many* books may be rather too strong a statement.

We need, once more, a verb for which *replace* is commonly substituted, there being nothing better at hand. One removes a painting from his wall and hangs up an engraving in its stead. For a brief statement of this action, we have at present nothing better than to say that the painting was replaced by the engraving. Yet this is really nonsense. To replace a thing is to put it back where it was before.

Here, as in the case of *numerous*, we may be said to lack a gimlet and find ourselves compelled to bore holes, blunderingly and unsatisfactorily, with the blade of a pen-knife.

Then there are not a few adverbs which one meets in foreign tongues and finds so useful that he wonders at himself for never having noticed the absence of corresponding words in English. Familiar examples are *freundlich* and *hoffentlich* in German. One cannot say in English, "He received me friendlily," convenient as it would sometimes be to do so, neither *kindly* nor *cordially* quite answering the purpose. Nor can one say: "The doctor has hopeably given the right medicine." If you presume he has done so, you may say *presumably;* if you are sure of it, you have *undoubtedly ;* but if you only desire to express a pretty strong hope, you must cast your sentence in another mould.

At the same time, we have certainly bad words enough — bad, not because they are irregular in form or composed of incongruous elements, but because they are for some other reason (adopting Noah Webster's sententious expression) nonsensical. *Helpmeet* is one of these monsters. The result of a stupid blunder in running together a noun and an adjective that stand separate in the familiar verse in Genesis, it can hardly be called a word at all; it means nothing in particular, and is worse than useless. *Dissever, disannul, unravel, lesser,* and similar feeble attempts at unnecessary emphasis, are other instances; *sever, annul, ravel, less,* answer the purpose completely, with the advantage of smaller bulk; the addition of the extra syllable is like giving a screw-driver two handles. Equally useless for the most part is the school-ma'amish insistence upon indicating, by the addition of *ess,* the feminine gender in a number of nouns indicative of occupation or position. Sometimes of course the sex of the person referred to has a direct bearing upon her relations to her calling, as in the case of an actress, whom it is often doubtless well to discriminate, in speech as in thought, from an actor. But it can hardly be maintained that any such necessity exists in the case of a woman who may happen to be an editor, a postmaster, a manager, or a poet. Yet we read not unfrequently of editresses and postmistresses; the dignified Westminster Review finds *poet* not sufficiently distinct when the poet is a woman, and gives its sanction to *poetess ;* and the Illustrated London News, which often devotes a considerable portion of one of its most entertaining departments to discussions of colloquial English, its meaning and its proprieties, is actually guilty of *manageress!* . Here as before the extra syllable is merely an incumbrance; we could not only get along just as well without it; we should actually do better.

Another class of bad words — bad because they do not mean what they are supposed to mean — is exemplified in *gasometer.* The fact

that it consists of a term invented in Belgium not much more than two hundred years ago, and a word from classical Greek, welded together, nobody knows why, by the letter *o* — is of no consequence; but what is of consequence is, that it means a measurer of gas and is understood as indicating a reservoir of gas. In the name of common sense, when one means a gas-holder, why not say so? *Hydropathy,* too, is a disgrace to the language. *Homœopathy* (similar sickness) is correct, indicating as it does a method of treatment based on the belief that "like cures like"; and *allopathy* (different sickness), though of course rather a nickname than a scientific term, may pass muster as designating the practice that commonly relies on agencies which are found to *reverse* the symptoms of the patient. *Hydropathy* (water sickness) can only be accounted for by supposing that the inventor of the word imagined that it might mean water-*cure*, which of course it cannot.

But by far the most important suggestion offered by the analogies of the little shop, relates to the folly of *misusing* our verbal tools; and just here is the one great point of dissimilarity between the English language and the equipment of my friend's work-room. A mallet may be highly polished as to its head and rough-hewn as to its handle, and yet give entire satisfaction. But it would hardly work well on chisels, if the owner were in the habit of using it to drive nails. That is exactly what we not unfrequently do in speech, and the natural result follows; the nails are not driven straight, and we presently find that we have spoiled our mallet. We speak for instance of *preposterous* statements, meaning only that they are *incorrect* or *absurd.* Now *preposterous* is not properly synonymous with either of these adjectives, but has a definite meaning of its own which can be expressed by no other word, signifying as it does the putting of something first which ought to be last — the getting of the cart before the horse, as it were. We are badly compensated for losing the power of expressing this idea in a single word, by gaining a new and hardly distinguishable synonym for *absurd.*

A mallet which has been so persistently used as a hammer by the legal profession, without sense or necessity, as to be pretty effectually ruined, is *enjoin.* It can hardly be necessary to remark that to enjoin a course of conduct is to urge that it be followed; the lawyers, oddly enough, have so perverted the meaning as to reverse it completely; in their dialect, to enjoin an act is to forbid it! Thus I read in the Albany Law Journal (vol. 28, page 43) that "in *Leete* v. *Pilgrim Church,* St. Louis Court of Appeals, the ringing of church chimes between 9 P. M. and 7 A. M. was enjoined. The court refused to enjoin the ringing for worship on Sunday or in the daylight hours, and con-

tinued: 'But the striking of the clock at night must, we think, be relegated to the category of useless noises. * * * We therefore think that the striking of the hours upon the largest bell between the hours of 9 P. M. and 7 A. M. ought to be enjoined'"! Of course this means that while the court declined to order the ringing of the church bell on Sunday or by daylight during the week, it did command that the chimes should be faithfully operated between nine at night and seven in the morning. Of course also the writer of the paragraph, and the learned judge who prepared the opinion, intended that their words should mean the precise opposite. The mallet in their hands is absolutely spoiled for its legitimate purpose, and to what possible profit? Meaning *forbidden*, why could they not say *forbidden?* Or if it is considered desirable to have a special word to signify the formal forbidding of an action by a writ, far, far better would it be to raise to respectability a term which is now ranked with the vilest newspaper slang, and say that the action is "injuncted." It may be answered that this horrible word, if it means anything, must be synonymous with *enjoin;* but the fact is, it has never been used except to signify *forbidden by injunction;* and as for its irregular formation, one who cares more for the substance of the language, its real serviceableness in expressing thought, than for the refinements of grammatical science, will easily disregard that objection. The nail must be driven; the only hammer we have is "forbid"; this it seems will not answer; then for heaven's sake let us pick up even a shapeless stone like "injunct" rather than spoil our excellent mallet "enjoin."*

* A portion of this paragraph was printed in the Albany Law Journal (with editorial commendation) shortly after the presentation of the paper to the Institute, and elicited a number of indignant letters from lawyers, not one of which really attacked the position above assumed. Their chief burden was to maintain that a man may properly be *enjoined from* doing a certain action — which nobody disputed; the question (if there can be any question) is, whether one may say that "*the action* is enjoined," meaning that the action is forbidden. Another stated that "neither the verb 'to enjoin' nor its substantive 'injunction' is *exclusively* used, even in legal phraseology, in the sense of prohibition;" nobody said it was — the point is, that it ought *never* to be so used. Another solemnly quoted — of all authorities in the world, on a question of verbal accuracy — *Webster's Dictionary!* — as if everybody did not know that all kinds of error in speech which have obtained any sort of respectable currency can be defended by citations from that useful but bloated compilation. The editor of the Law Journal, closing the discussion, summed up the whole matter thus: "What Mr. Tucker complains of is that the same word is used to mean two exactly opposite things — to do and not to do. This verbal blowing hot and cold in the same breath is certainly indefensible. It is 'overworking' the verb — to quote Rufus Choate. We have plenty of good words to express the desired meaning — 'prohibit,' 'restrain,' 'forbid.' There is no need of corrupting and vulgarizing the language by this double and ambiguous use. When we want to prohibit the ringing of bells, for example, let us not say it is 'enjoined,' *i. e.*, commanded; nor worse yet, 'enjoined and forbidden,' *i. e.*, both commanded and prohibited; but let us say just what we mean in the correct use of the language, forbidden and prohibited. We are no purist nor 'philological fancier,' but we think that this use of the word 'enjoin' is radically wrong."

Then there is *aggravating* for *exasperating*. The distinction has been pointed out a thousand times. Everybody knows that to aggravate is to make worse. A man's crime may be aggravated by the circumstances; to say that the man himself is aggravated, means, not that he is annoyed, but that, being an evil at best, he is made a greater nuisance than he has been. Yet it is surprising how many influential writers, especially in England, insist on confounding the terms. Dickens does so over and over again in Great Expectations: "The Romans must have aggravated one another very much with their noses;" "Mr. Wopsle's Roman nose aggravated me;" "This was so very aggrávating, the more especially as I found myself making no way against his surly obtuseness;" "Words cannot state the amount of aggravation and injury wreaked upon me by Trabb's boy." I read the other day in the Mark Lane Express of persons who "jerk the reins in that aggravating manner." A pamphlet, lately published in London, and relating to a certain class of books in the British Museum, is entitled "Aggravating Ladies." Most surprising of all perhaps is the following, from the Westminster Review (October, 1881, p. 284, Scott edition): "The selections from the Giaour are exceedingly aggravating." It must however be admitted that the blunder is not exclusively British, for whoever reads that excellent book, "The Calling of a Christian Woman," issued only last year by the Rev. Morgan Dix, S. T. D., rector of Trinity Church, New York, will find on page 22 a reference to "the words of St. Paul, peculiarly aggravating to the ears of modern revolutionists."

Among the great number of other verbal mallets which are often foolishly misused as hammers, the following may be mentioned — the list might be indefinitely extended, but it is the present purpose merely to illustrate the principle:

Executive for *secret*, in the phrase "executive session." It is generally understood that when the Senate engages in what is properly enough called "executive business," as the consideration of appointments or treaties, spectators are excluded; and from this has arisen a ridiculous custom on the part of various voluntary associations and committees of resolving to "go into executive session" when it is only meant that private business is to be taken up with closed doors. The blunder is doubtless largely due to the usual preference of ill-trained minds for fine and high-sounding words.

Restive for *uneasy*.—Here is a word which shares with *enjoin* the remarkable bad fortune of having been completely reversed in meaning by bad usage. A restive horse is a lazy horse that wants to rest, and by no means, as sometimes seems to be supposed, a nervous horse that wants to go.

Fabulous for *very great.*—One may properly speak of the fabulous wealth of an impostor, meaning the property that he falsely pretends to have. But what nonsense it is, when one thinks of it, to say that a lady's jewels are of "fabulous value," meaning that they cost a great deal of money!

Impertinent for *insolent.*—An impertinent remark is one that has no connection with the matter under discussion. But the use of the term ought not to imply any censure on the good manners of the person referred to.

Temperance and *Protective.*—Without expressing any opinion as to the advisability of indulging in alcoholic beverages, one may properly denounce, from grammatical considerations only, the absurdity of speaking of a man who abjures them entirely, as "strictly temperate;" how can one be temperate in the use of that which he does not use? And similarly, without expressing any opinion as to the wisdom of a national policy of limiting importations from foreign countries, one may point out that the name "protective tariff," as applied to a tariff by which this result is brought about, is objectionable, for the reason that it begs the whole question at issue. Such a tariff *restricts, limits.* Whether it really *protects* anything, in any proper application of the term, is disputed.

Dividend.—It may be worth while to call attention to the obvious fact that a dividend is that which is to be divided. A railroad's dividend, for instance, is a certain share of the profits, set aside by the directors for division among the stockholders. It is sometimes convenient, of course, and perhaps not highly censurable, to speak of one of the proprietors as receiving "his dividend," meaning his *share of* the dividend; but it should be remembered that this expression is only justifiable as a rough sort of contraction, much like saying "governments" and "railroads" when one means government bonds and railroad securities; and it is to be regretted that the definition of *dividend* in each of the two English dictionaries most in use in this country is so worded as apparently to confuse *dividend* with *quotient.* Webster's, as usual, is a little worse than Worcester's.

Circumstance for *event.*—We continually hear people say that they will "relate a circumstance" that occurred under their own observation. A circumstance occur! They might as well speak of the motionless scenery at a theatre as performing.

Demean for *debase.*—This blunder seems to have arisen partly from an imagined relationship between the verb *demean* and the adjective *mean,* and partly from the fact that the verb is used in a good many rather familiar passages in old and standard writers, in such connection that *debase* would have made equally good sense. A rec-

ollection of the noun *demeanor*, which is certainly not synonymous with *debasement*, ought to be a sufficient correction of the error.

Merchant for *tradesman* or *shopkeeper*. — In the older and better use of the first word, it was strictly confined to persons who carried on foreign traffic. To call retail dealers "merchants" is to multiply synonyms uselessly, at the cost of losing a very convenient distinction.

Sustain for *receive*. — Chiefly in daily-paper language; "the victim sustained a trifling bruise on his arm." Well, it would have been remarkable if he had *not* "sustained" a wound of that description. The writer was, of course, trying to say that the person *received* the wound. How hard it is, sometimes, to be simple!

Liable for *likely*. — A wrongdoer is liable to punishment. To say that he is "liable to escape," meaning that he is *likely* to escape, is to commit an error that is really comical in its absurdity, when one compares the true meaning of the sentence with the idea intended to be conveyed.

Monopoly. — The frequent and glaring misuse of this term is of no little importance, as it leads to confusion of thought and sometimes to very ill-advised political action. A monopoly is, of course, an industry that is protected from competition by legal enactment. Demagogues of the Dennis Kearney stripe are doing their best to lead the unthinking multitude to apply the term to industries which are perfectly open to competition but in which, for one reason or another, nobody cares to compete — a very widely different thing. The owner of a patent has a monopoly; but the notion that railroading, banking or gas-making can be a monopoly, as long as all the world is at liberty to engage therein if it pleases, is at once grotesque and dangerous.

The list stretches out indefinitely; one knows not where to stop. It seems that on this subject, as on some others, there is verily need of line upon line, precept upon precept, here a little and there a good deal. Yet one word of caution must be added. The doctrine that words should not be used to convey ideas foreign to their real meaning, ought never to be so perverted as to interfere with their employment in a secondary, derivative or figurative sense, the legitimate outgrowth of their primary significance. A single illustration will make this clear. The verb to *endorse* means to put on the back of; and the United States post-office department takes a mallet for a hammer with a vengeance when it informs the senders of registered letters, by a placard displayed in many post-offices, that such letters "require the name of the sender to be endorsed on the face of the envelope!" Endorsed on the face! The writer of this notice — who doubtless imagined that *endorsed* was merely a more elegant synonym for *written* — might as well speak of hoisting a load down. But no small

quantity of what I venture to think rather wooden-headed criticism has been expended on the use of the same verb to signify *approve* or *sanction*, as in the common expression, to endorse a candidate or a movement. It seems to be forgotten that in the usual application of the term — the endorsing of a note or a check — we have always in mind, not only the fact that something is actually written on the back of the paper in question, but also and chiefly the far more important fact that the writer of the endorsement, in putting down his name, agrees to warrant and defend the holder of the document against loss resulting from his confidence in it. In other words, he may be said to *back up* the original maker. And just as it is indisputably good English to speak of a man's friends as backing him, so is it absolutely good English to speak of a lawyer endorsing a layman's opinion about a legal question, or a scholar endorsing the positions maintained in a book on classical subjects. To object to such use of language as this, is to push grammatical criticism to an extreme that is likely only to render it ridiculous, though if the critics could persuade the people to follow them, it would result in a senseless limitation of our choice of words — a real and by no means inconsiderable injury to the language.

THE ALBANY LANCASTER SCHOOL.

By Theodore V. Van Heusen.

[Read before the Albany Institute, November 27, 1883.]

Let me regard this as a family gathering, and myself as one of the boys, for a long time absent from the school-room, coming home to tell you of things I have seen, heard and experienced in connection with the old Lancasterian school of Albany. If my pen shall play truant and tell of things incidental to my youthful days, it will be to remind the younger members of the Institute of the changes that have occurred since then, especially in our city. "As I muse, the fire burns," and my thoughts are crowded with the memories of persons and events. How changed is our city in its appearance, population, habits and business methods! Having lived my whole life here, these changes have been so gradual as to cause in me no great wonder; but could I bring to your view this city as it was in 1830 and earlier, what interest it would excite in us all.

It is no part of my purpose to give a history of Albany. I will merely recall a few points concerning it that I deem of especial interest. We know that it was settled by the Dutch in 1614; that it was an important trading post; and that it is the oldest chartered city in the United States, receiving its charter from England in 1686 under Governor Dongan.

Think with me now of our city as I call it to mind. All the vicinity of the blast furnaces, foundries and the like on the south was known as the "goose pasture." None too pleasant now to look upon, it was very forlorn then. On the north and in the vicinity of the "Patroon's manor house" there was a considerable settlement. The most wealthy built their dwellings along the river front; and on Montgomery, Steuben and Columbia streets, near the river, were the settlements of the aristocracy.

On South Pearl street there was the finest estate in the city, owned and occupied by the brothers James and Oliver Kane. Near the capitol and on the south side of State street was one of the worst localities in the city, covered by the cheapest buildings, and occupied by people of the "baser sort" both black and white. Where the Cathedral now is, on Madison avenue, was a very rough country, broken by hills, valleys and diminutive ponds. Later on these hills

were dug away, and the earth used to fill in the "goose pasture." Where our beautiful Washington park is, were the burial grounds owned by the different churches. The active business center of our city was along the river, and in South Market street and State street. What is now known as Broadway was then North and South Market streets, State street dividing them. South Pearl street had some small shops; on North Pearl street I recall only Mr. McCafferty, the baker, and Mr. Pemberton, the grocer.

In the realm of invention, the changes from the customs and methods of the last half century have been especially marked. Steam, electricity, photography and other inventions have materially altered the manner of life of the civilized world.

The completion of the grand Erie canal, extending from Albany to Buffalo, also took place during my life-time. I recollect seeing a small boat covered with flags, called a packet boat, bearing DeWitt Clinton and others who had made the first trip from Buffalo to Albany. The building of the pier, which separates our basin from the river proper, I can also remember.

I call home my wandering pen, as I have kept you too long from the Lancasterian school. Mr. Joseph Lancaster was an Englishman residing in England, and seems to have been a philanthropist — a man devoted in heart and soul to the cause of educating his fellows. His system of teaching was founded on the idea that one who has learned should transmit his knowledge to another, and thus in his system of schools, teachers would be evolved from the scholars themselves. The "Monitor" system was not original with Mr. Lancaster, but he adopted and amplified it after Dr. Bell had shown its value in 1795. It is well to remember that at this period the State, especially in Europe, was not particularly friendly to the general education of the masses, regarding it as dangerous to the government to have the people liberally taught.

I am indebted to Munsell's "Annals" for the following:

In 1818 Mr. Lancaster visited Albany on his tour in the United States. The trustees of the Albany Lancaster school presented him with the following address:

SIR — The trustees of the Albany Lancaster School society avail themselves of your unexpected appearance in this quarter of the world to show you a young scion from that tree which you have planted, which is rapidly spreading its branches over every region and imparting its blessed fruit to every nation.

You, sir, have devised and matured and brought into universal

practice a system of education by which the knowledge of letters, science, morality and religion can, with comparatively little effort and expense, be communicated to millions of juvenile minds, who by the ordinary established means of education would not have become partakers of its invaluable benefits. Accept, sir, this tribute of our respect which we tender to you as one of those rare benefactors of mankind whose services merit such peculiar public acknowledgment as cannot be withheld without incurring the justly deserved imputations of public ingratitude.

"SIMEON DEWITT, *President.*"

There are some who remember this visit of Mr. Lancaster to Albany and saw him at the school. Our respected townsman, Mr. George W. Carpenter, was then a pupil twelve years old. Mr. Carpenter tells me that his recollection of Mr. Lancaster is, that he was a large man, dressed in a suit of brown cloth cut in a style to indicate the Quaker. I have also a pleasant letter from a long-time member of the institute, whose voice we have listened to with pleasure and profit in our meetings. It is as follows:

AURORA, CAYUGA LAKE, *4th October*, 1883.

THEODORE V. VAN HEUSEN, Esq.:

MY DEAR SIR — My friend, Mr. Pratt, the secretary of the Institute, kindly sends me the notices of the seances of the Institute. For successive years while I was in Albany, during the winter, I enjoyed and appreciated the excellent work done by the Institute.

I observe that you are to give the history of the old Lancasterian school. I am very much gratified at such an announcement, for I know that in Albany history *that* should be preserved. I recollect seeing Mr. Lancaster in Albany, and quite likely it was at the academy where your paper will be read. He was, I think, a full-sized man, perhaps more so, as that would give point to the clever anecdote that when Joseph Lancaster was at Washington he was called to preside at some meeting held in the house of representatives, and Henry Clay said he never before saw the chair so well filled; and Lancaster brightly answered that he who filled it best was no better than Clay. Albany took up the Lancasterian idea, and for years the school was a feature of the new and progressive education.

It is quite agreeable to me to think of the young men in Albany showing their intelligent love for the old city by rescuing its history from oblivion.

Respectfully yours,
W. H. BOGART.

You will notice that I am recognized, by Mr. Bogart, as one of the young members of this Institute. I make no complaint of this however.

Of the original organization of the Lancasterian school I find this: In the year 1810 the common council had under consideration the project of establishing a free school on the plan of Joseph Lancaster. As yet there were no public schools in the city. The Mechanics' Society had, a number of years previous, erected a building on the corner of Chapel and Columbia streets and maintained a school which was not altogether confined in its privileges to the children of its own members. On the 26th of May, 1812, the Legislature passed a law incorporating the Albany Lancasterian School Society, which had then been some time in operation. The petition stated that Philip S. Van Rensselaer, John Lansing, Jr., Simeon DeWitt and others had associated themselves for the laudable purpose of establishing a school in the city of Albany for the diffusion of common education, and presented a petition to the Legislature setting forth the benefits that would result to society from such an institution, by implanting in the minds of children the principles of religion and morality, and by assisting the parents in providing suitable situations for them where habits of virtue and industry may be acquired; and that it would enable them more effectually to accomplish the benevolent objects of that institution, if their association was incorporated. The trustees named in the law to serve the first year were Philip S. Van Rensselaer, Simeon DeWitt, Stephen Van Rensselaer, Elisha Jenkins, Archibald McIntyre, John M. Bradford, William Neil, Timothy Clowes, John MacJimpsey, John Lansing, Jr., James Kent, John V. Henry and Charles R. Webster. The members of the common council were made members of the society by virtue of their office, and any person contributing $25 to its benefit was entitled to send one child to be educated gratuitously. The school was conducted in the upper part of the building of the Mechanics' Society until the completion of the school-house on Eagle street in 1817. Mr. William A. Tweed Dale was appointed preceptor. His report of the business year of 1814 was as follows:

Salary of the teacher	$700 00
Rent of school-room	82 50
Putting up Pettibone stoves and ventilating	91 00
Incidental expenses	331 03
	$1,204 53

The income of the society arose from the following sources:

Allowance by the corporation out of the excise receipts ...	$500 00
School fund appropriation	487 66
Tuition fees from scholars	400 00
	$1,387 66

The number of scholars instructed during the year was 400, one-half of whom were new scholars, or such as had not previously attended the school.

On April 5, 1817, the ceremony of opening the new school-house — the building now occupied by the Medical College on Eagle street — took place. The house was built by order of the common council, at an expense of $23,918.93. It was capable of accommodating 400 children, and a large infant school. It also afforded a residence for the principal. At its inauguration the services were impressive. A procession consisting of the trustees, principal, and 400 children, formed at the house of the president of the society, Mr. Philip S. Van Rensselaer, corner of State and Chapel streets (now occupied by Mr. Erastus Corning), and moved to the capitol where it was met by the governor of the State, mayor and recorder of the city, and the clergy and citizens, whence it marched to the school-house. The exercises there consisted of a prayer by Rev. Dr. Bradford, an address by Dr. T. Romeyn Beck, and prayer and benediction by Rev. Mr. DeWitt.

In the year 1834, for reasons that I am not able to give you, this excellent school was broken up. I only find in the records that Mr. Dale, who superintended the school from its foundation — a period of twenty-three years — had become old; also that he had been a pupil of both Dr. Bell and Mr. Lancaster, prior to his coming to the United States; and that he was spoken of as able and learned. In 1832 the first visitation of Asiatic cholera in the United States took place. In Albany, as elsewhere in our country, it caused the deepest gloom. It was a reign of terror. All business was suspended, and all who could do so, left the city for the country. The Lancaster school building, being owned and controlled by the city, was devoted to the purposes of a hospital, and cholera patients were taken there for treatment. This broke up the school temporarily, and this fact, in connection with the advanced age of Mr. Dale, and probably the increased demand for larger school accommodations, will account for the passing away of an institution that in its life-time was cared for by trustees who were the foremost and best men in the city.

I find in other years the names of different trustees, and in all cases

they are representative men, many of whom I knew personally. Among them, in 1830, I find the Rev. B. T. Welch, the wonderfully gifted and eloquent Baptist preacher, and Rev. E. W. Kirk, who fired the whole city by his fervid preaching in the Fourth Presbyterian church.

As I call to mind the school building, it was convenient and admirably adapted to its purpose. The main room was arranged to seat 450 pupils, and there was not an obstruction in it to prevent the teacher's seeing every scholar in the room. The two stories were thrown into one. Starting from the center, on either side the desks were placed row after row, each one higher than the preceding, so that at the extreme ends the last row was only about eight feet from the ceiling. The desks were arranged for nine pupils each, and for each a permanent seat was fixed; while at the head of each class there was a seat for the teacher. Down in the center a large black-board was placed, extending nearly the entire width of the room. On this the writing lesson of the day was plainly written — some good maxim or thought it was sure to be. On the east side of this black-board the teacher's desk was placed, and all business was done there. On the opposite side of the room, a high pulpit labeled "Honor. Reward. Merit.," was placed for the declaimers. Demosthenes, Cicero, Clay, Webster, and others were murdered there. I only confess to the slaughter of Daniel; and if I did more, I hope to be forgiven.

One side of the room was for boys, the other for girls; but in 1830, when I was there, a few of us had to sit on the feminine side, as there were more boys than girls at the school. At either end of the building there was a play-room — the north end for boys and the south end for girls — and in each of these rooms there was a dungeon, for the punishment of horribly bad boys and girls. I prefer to believe that there were none such in the school, as I do not call to mind one who suffered from solitary confinement. The word "pendulum" was early impressed on my school-boy mind. At the place of exit on each side of the school, a good sized ball of wood was pendant from a cord, and so placed that the child could reach it and give it a swing, and this was to govern the length of his absence from the school-room, So long as the ball moved he might stay, but no longer. I was so fond of that pendulum that I distinctly remember how I practiced the art of making it swing a long time. In the building the principal had comfortable living apartments, so that he might be always on hand. And I am sure he was sometimes too much on hand. I do not think his happiness was promoted by such close proximity to the school-room, and I am confident ours was not.

The machinery that worked this large school was simple and, I am

sure, economical. There was a principal teacher and two assistants, one male and one female. Only these received pay, and small pay it surely was — $700, as I have read to you, per year — I assume this paid all. To aid these teachers there were two monitor-generals, one for the boys and one for the girls. Over each class a pupil, selected from among the brighest scholars, was placed to act as teacher. The system of school training was full of incentives to get on; to be the foremost scholar. At every stage in the school gradation there was a reward offered, and the successful competitor was known throughout the school. In the writing class, the youngest class were provided with sand placed in a box before them. Here they commenced to make letters and figures. The next higher class used slates, and the most advanced were allowed pen, ink and writing books. In all these studies, "Excelsior" was the prevailing thought. To be a teacher was coveted; to be a monitor-general was even more of an honor; but to obtain a free scholarship in the Albany Boys' Academy was the most desired prize. This provision was made for only *four* pupils at a time. I know two of our valued citizens, who now occupy prominent positions in our city, who had the benefit of this last honor. The school was free to all comers, but those parents who could afford to do so were expected to pay a small tuition fee.

Of William Anderson Tweed Dale, the principal, I have only grateful and pleasant recollections. That he had much learning and was "apt to teach" is well known. He was an unique character — strong, mentally and physically; decidedly religious, and of the Baptist faith. He was never rich in this world's goods, except, it may be, as the owner of two wigs, which I well remember. One was black; the other something different. I think it had been black, but the hand of time and exposure to the elements had changed it to a dingy brown. It came to be known in the school that when the brown wig put in an appearance it was a "storm signal" — a sign of heavy weather, a caution to look out for squalls; whereas the black one said, "all is calm and serene." Perhaps I should add that the brown wig was only worn when the weather was disagreeable, when something had occurred down stairs (he had a wife), or when visitors were not expected.

Mr. Dale possessed in full measure the characteristic good qualities of his native race — the Scotch. A good many in our city remember him, in the last year or more of his life, as a conspicuous figure on our streets, dressed in a gay colored calico wrapper, and riding astride a small donkey. I presume this was done to promote his waning health — possibly in imitation of "the meek and lowly One" whose example

in all things he strove to follow. I mention only one other teacher who is well remembered by many in our city. Mr. Steele's long life was devoted to teaching, and he died in the harness. He possessed sharply defined qualities; indeed he had almost the monopoly of some. He was very mercurial in temper, and Argus-eyed in vision. He seemed to have eyes behind and before — it was a dangerous gift, for he saw too much for his own peace of mind. Alas, for the pupils! This Steele became the "iron to enter the soul" of many a pupil, not only in the Lancaster, but other schools. Still I feel sure that he was a faithful, conscientious teacher, and well deserved honorable mention.

More than a half century has passed since these school-boy days, yet there are many other recollections of the Lancaster school that I might give you; but time forbids any further relation of personal experiences.

If this rambling sketch conveys to you some idea of Albany's first free educational institution, or recalls from possible oblivion the efforts of the good men connected with it, my purpose will be carried out, and my object attained.

HERALDRY IN ENGLAND AND AMERICA,

By GEORGE R. HOWELL, M. A.

[Read before the Albany Institute, January 21, 1884.]

As you cannot speak or think of American history without thinking of the history of all the ancestral nations back of our brief national existence, so we must understand heraldry in Europe to appreciate its transatlantic namesake. Not all symbolism is heraldry. If the tribes of Israel adopted emblematic devices to distinguish one tribe from another on their tribal ensigns, standards, coins or monuments, it was not therefore any thing corresponding to modern heraldry. No more were the fanciful devices Homer describes on the shields of Hector and Achilles, of any generic connection with the heraldry of London or New York. The totems of the Six Nations that were once masters in the valleys of the Hudson and the Mohawk were emblems, but they were not armorial distinctions. All of these are characteristic of times of ignorance, of times when unlettered men needed a picture to identify a man, a family or a nation. Whoever saw a beaver scrawled at the bottom of a birchbark letter written in the picture language of the Indian would understand the writer to be a chief of the nation that used that animal as its totem. This use of the symbol or picture of some object, animate or inanimate, to represent either royal authority, or to authenticate the message of a private individual, was as common in the world's history during the past 4,000 years, as it is to-day. The seals of the kings of Assyria and Egypt are no uncommon sight in the great museums of the world. But all this is not the heraldry of the Plantagenets, nor of the Herald's colleges of London and New York.

Planché, in his introduction to his work on this subject, says "Heraldry has been contemptuously termed the 'science of fools with long memories.'" But this may be set down as the malicious utterance of some evil disposed person who searched but failed to find his name in Burke's General Armory.

Modern heraldry as a system begins no further back than about the commencement of the twelfth century, and was perhaps born of the crusades, the first of which dates from the year 1095. The fact is, heraldry pure and simple as a useful art is an anachronism in all the world's history to the present time, except during the feudal ages. Whether we say it grew out of the crusades directly, or that one succeeded the other chronologically, it remains true that an age of personal combat in body armor implies the necessity for the elements of heraldry. The knight's face being invisible under a close helmet, a picture or some device on his shield followed as a matter of course to identify him, and in the field to distinguish friend from foe. And the son of one who had made a certain device known by gallant feats in the tournament or field of battle, would be proud to retain such an honorable symbol for his own advantage. The feudal age was a time also when leaders of armies, even kings themselves engaged in personal conflict on the battle-field, and in the melee were often in imminent personal danger. That was the opportunity for the nearest man to win his spurs and his coat armor, by interposing his shield between the steel of the enemy and his sovereign's body. Thus at the battle of Hastings a shield of one William several times saved the life of a greater William, the Norman duke and the English king. After the battle the king said to him: "Forte scutum salus ducum." Whereupon he assumed the name of Fortescue and was granted a coat of arms with a shield for a crest.

Sometimes the peril came to the king or liege lord in the hunt. As when David II, king of Scotland, was hunting with a few followers in Stocket forest, in his eagerness to attack a wolf that had been the terror of the neighboring shepherds, becoming separated from his men, he was suddenly confronted by the beast. The wolf with a powerful spring seized the throat of the horse with such fury that after rearing and plunging violently it rolled over upon its master. The king was now helpless and would have fallen an easy prey to the beast had not help been at hand. A young man coming up succeeded by a vigorous use of the skene or dagger, after a desperate fight, in killing the wolf. After releasing the king he was asked his name. "Robertson," said the man. "Henceforth then," answered the king, "be thou called Skene, in memory of the weapon which thou knowest so well how to use." In addition to lands, the sovereign granted him to bear on his shield, wolves' heads and daggers to commemorate this event.

When the arms are not thus connected with some historic event in the field, there are those that were taken after the time when the sur-

name was in use and founded upon it. Thus the shield of Mr. Bell is charged with a bell, that of Mr. Lamb with a lamb, of Mr. Cannon with a cannon. Still others were derived from the office or occupation of the individual. As a Mr. Butler may bear three covered cups; a Forester or Forster would have bugle horns as a badge of his office; the Fletchers or arrow-makers would preserve the memory of their occupation in the use of pheons or broad arrow heads. It does not appear in any ancient or modern work on the science of heraldry, that in England, at least, a coat of arms was ever obtained by way of purchase. The wars were numerous enough, and frequent enough the opportunities for distinguishing oneself on the field of battle or in the thousand critical moments of human life and experience to afford a ground for the bestowment of these family distinctions during the past five hundred years. But the same cannot be said of the continent. It is generally understood that to some extent in the German states and more largely in France and Italy, money has long been able to buy coat armor and in many cases even a title of nobility, irrespective of all other qualifications for that honor.

It may be remarked that as a rule the simpler the arms the more ancient they are. Crests came into use a considerable time after arms were common, and were never considered an essential part of the family arms. The motto also was a matter of minor importance and could be changed or omitted at will.

It must always be kept in mind that heraldry in its palmiest days was an exact science. It had its laws and limitations defined with as much precision as Touchstone's codification of the law of "a lie seven times removed." These laws demanded that the strict right of ownership to any given arms should be everywhere respected, so that no man might use another's arms any more than he could use his clothing or his purse without trespass. They defined the manner of arranging colors and emblems to some extent on general principles —as for instance that color should be put on metal and not on color. They spoke out point blank when they had to define the persons who were to be of the favored number to put themselves under the guardianship of a rampant lion or a flying dragon.

"Gentlemen," says Guillim, "have their beginning either of blood, as that they are born of worshipful parents; or that they have done something in peace or war whereby they deserve to bear arms, and to be accounted gentlemen. But in these days (1679) he is a gentleman who is commonly so taken. And whosoever studieth the laws of this realm, who studieth in the university, who professeth liberal sciences,

and to be short, who can live without manual labor, and will bear the port, charge and countenance of a gentleman, he shall be taken for a gentleman; and if need be, a king at arms shall grant him a patent for a new coat, if there is none that appertain unto him from his ancestors; and if so, confirm that upon him."

But the investiture with new privileges and honors brought new duties on our newly-made gentleman. It is further said of him: "If he be called to the wars, whatsoever it cost him, he must appear well accoutered, have his attendance, and show a more manly courage and tokens of a generous education, by which means he shall purchase a greater fame."

The law was lenient and disposed to lend a little assistance to a well-behaved aspirant to the honors of coat honor; for in time of Elizabeth it was held that a yeoman born who had deported himself as a gentleman and was known as such among the people might have that title added to his name in a legal document.

But if a gentlemen is sued as husbandman although such may be his occupation, yet the claim cannot be maintained, because he must be sued under his most worthy appellation. A gentleman, even if he go to manual labor, yet in legal proceedings he must be named as such and not by the title of yeoman, husbandman or laborer.

"If a gentleman be bound an apprentice to a merchant or other trade, he hath not thereby lost his degree of gentility." "If a *capias* go against A. B., yeoman, and if the sheriff take A. B., *gentleman*, an action of false imprisonment lieth against the sheriff, but if A. B., yeoman, be indicted, and A. B., gentleman, be produced, being the same man intended, it is good." This shows that even the laws of heraldry were not to supersede common sense.

If a falcon be lost, and the finder be a simple man, that is, under the rank of gentleman, he must carry it to the sheriff, who shall keep the hawk if the owner be not discovered. If a gentleman, however, should find the hawk, then, the owner remaining unknown, he may retain it as his own property.

At first the children of gentlemen only were permitted to enter the legal profession. "If a churle or peasant do detract from the honour of a gentleman, he hath a remedy in law;" but if one gentleman injures another, the combat was the ancient mode of settlement.

"In equal crimes a gentleman shall be punishable with more favour than the churle, provided the crime is not heresy, treason or excessive contumacy."

"In giving evidence, the testimony of a gentleman is more authen-

tick than a clown's." "A gentleman condemned to death ought not to be hanged, but beheaded, and his examination taken without torture." "To take down the coat-armor of any gentleman, to deface his monument, or offer any violence to any ensign of the deceased noble, is as to lay buffets on the face of him if alive, and punishment is due accordingly."

"A clown may not challenge a gentleman to combat."

And now I come to something which I treat with bated breath; but for fear of doing any injustice to those grand heraldic times I quote the very words from Guillim, as before; speaking of what constitutes a gentleman by blood, he says: "To make that perfection in blood, a lineal descent from *atavus, proavus, avus* and *pater* on the father's side was required: and as much on his mother's line; then he is not only a gentleman of perfect blood, but of his ancestors too." This law keeps a family a long time in suspense after a yeoman has succeeded by vigorous efforts in developing into a gentleman, before full blood can be obtained. Four generations of gentlemen must die before the perfect blossom of gentility appeared. But as we are now eight generations removed from the Argonauts of the Mayflower, what fearfully blue blood, according to this law, must be in the veins of the present living descendants of the gentlemen that made part of that company! Or indeed of any of their contemporaries for the sixty years England was peopling the north with her best blood.

Seals and Arms.

The necessity of a town's possessing a seal to authenticate its legal documents made it easy to follow the example of private individuals and shape its symbol of civic authority in a charge upon a shield. Accordingly most of the old towns and cities on the continent and many in England show on their standards and their seals their individual coat of arms. The most of these have as armorial bearings, with various modifications, a castle, fortress or tower, as an appropriate symbol ot protection. Looking over the arms of some English towns, we meet some items worthy of mention. Okeham, a town in Rutlandshire, has arms with a history. Here is, or was, in the palmy days of Don Quixote, a privilege or custom which permitted the inhabitants to claim of any nobleman who should happen to enter their precincts the tribute of one of his horse's shoes, unless he redeemed it with an equivalent in money. Guillim, who is authority for this, adds as a proof of the custom, that many horse-shoes may be seen nailed up on the shire-hall door. The charge on the town's armor was, of course, a horse-shoe proper.

The arms of the city of Oxford were a red ox crossing a ford.

Litchfield commemorates its fires of martyrdom on its arms, which are a landscape with divers martyrs in several manners massacred.

The arms of Peterboro seem to point to the apostle to whom were committed the keys of the church, as the source of the name of the town itself. The arms are two large and massive keys crossed, like the letter X with four crosslets between the extremities.

The university town of Cambridge has for its arms a bridge with three wall towers thereon over three boats on a river, and above it in chief a fleur-de-lis between two roses.

In this country but few of our cities have adopted a coat of arms. Among those that pretend to this distinction are New York, Albany and Schenectady in this State, and Canton in Massachusetts. In 1654 the city of New Amsterdam received from the directors of the West India Company in Holland a seal which may be described as follows: the back ground of the shield silver, on the center third perpendicularly red three silver crosses in shape of the letter X and on each side of this a narrow strip in red. [Heraldically, Argent, between two endorses three crosses saltire on a pale gules.] Crest a beaver proper, surmounted by a mantle on which is a shield arg., bearing the letters *G. W. C. Under the base is the legend, Sigillum Amstellodamensis in Novo Belgio. This was surrounded by a laurel wreath.

In 1686 a new seal was granted to the city by the crown of England. It was: Sable, mill-sails in saltire, a beaver in chief and base, and a flour barrel on each side. Surmounted by the crown of England. Supporters two Indian chiefs proper; the dexter holding a war club in dexter hand, the sinister a bow in his left hand. In the dexter corner over the Indian's head is a cross patriarchal, as emblematic of the gospel to which he is subject. On the scroll, Sigill: Civitat: Nov: Eborac. The whole surrounded by a wreath of laurel.

About the time of the closing of the revolutionary war the city modified these arms so far as to substitute for the crest the eagle rising from a semi-globe, and for the Indian as supporter on the dexter side was placed a sailor with lead and line in his dexter or right hand. As it now stands the sailor and Indian as supporters symbolize the products of the west and the traffic of the oceans bearing tribute to build up the metropolis of the State. But the patriarchal cross also disappeared with the Indian.

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* Geoctroyeerde West Indische Compagnie, or Chartered West India Company.

The Arms and Seal of Albany.

There is no history extant of the arms and seal of Albany. The charter of the city given by Gov. Dongan, in 1686, empowers it to have a seal, and as Beverwyck had been its earlier name, the beaver was probably the charge upon the seal. The earliest mention of a city seal I have been able to find is an order of the common council Nov. 1, 1740, that it should not be "affixed to any deed or other instrument except in common council." Mr. Munsell gives an engraving of the city seal of 1768. It is a rough picture of a beaver with "Albany" above, and the date "1762" below it. The arms, as displayed on the west front of the new city hall, are patterned after the seal now in use in the mayor's office. In the upper half of the shield is a tree prostrate, but where it still clings to the stump, an industrious beaver is finishing his work of gnawing off the last fibres of wood and bark. In the lower half on a red ground are two sheaves of wheat in their natural colors. The crest is a sloop under full sail, and under the shield on a scroll is the motto Assiduity. We see here plainly enough symbols of industry and its rewards to man and beast on land and sea. [Heraldically, party per fess argent and gules. Above, a beaver gnawing at a stump of a tree prostrate, both proper; below two garbs as the last. Crest; a sloop under sail proper.] Motto, Assiduity. Note. The sloop has the mainsail, topsail and jib set, and the bows are turned to the sinister corner of the shield.

There is in the city surveyor's office a map of the city, made by Simeon De Witt in 1790, which in one corner contains the same coat of arms, with variations, first of having the bows of the sloop turned in the opposite direction; and secondly of showing supporters. There are for the dexter, a farmer whose left hand supports the shield, and whose right rests on his hip with a sickle hung on his waist. The sinister is an Indian, his right hand supporting the shield and his left sustaining a bow, one end of which rests on the ground. There is also a large pretentious picture in the mayor's office substantially the same as these just given; but the artist has embellished the upper half of his shield with a landscape, having hills in the background, then three beaver dams, and two beavers, one gnawing as before described and the other pulling down the top. The supporters are unheraldically represented as seated. Taken as a whole, this painting is of little worth with its exuberant inaccuracies.*

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* The bronze plate of the city arms placed on the city hall in August, 1886, by the Bicentenniai committee on monumenting the city, contains the arms correctly delineated.

The city of Schenectady probably adopted its arms at the time of its incorporation in 1798. They are simply a sheaf of wheat on a red ground. [Gules, a garb proper.]

Other towns and cities there are that have seals with some kind of picture upon them, but are not probably intended to conform to any known laws of heraldry. The various States in the Union have all adopted some device for their great seal. If these have all been intended as coats of arms, it has been according to some American system of heraldry not recognized in the Herald's office at London. Many of them consist of mere pictures of something animate or inanimate, or perhaps a landscape or emblems of industry or abundance, within the circular disk of the seal. A few of them are constructed in conformity to the customs and laws of the science as known in Europe. It is somewhat remarkable that a landscape is so often selected as the charge upon the shield, that at least fourteen States or Territories have followed the example of New York, in inserting the rising sun as a portion of the charge. Of the sixty counties in our State five have on their seal regular armorial bearings, twenty-seven have contented themselves with a picture or a landscape, and twenty-eight have merely the legend of the county's name, and the word "seal" added.

The various guilds of London that have existed for several hundred years have been permitted by royal grant or otherwise, to set up their coat armor. Most of the bearings of these companies are suggested by their several occupations. Thus the arms of the Company of Grocers is argent, a chevron gules between nine cloves sable.

Those of the Mercers are not so clear; they are gules, a demi-virgin, her hair disheveled, crowned issuing out of and within an orle of clouds.* Now whether this is a barefaced piece of flattery to the fair sex, telling them that this virgin is taken as their representative to be a presiding deity over, or patron of their guild; or whether it acknowledges that from this half of the human race they look for customers for their goods, or whether it is intended to express a disheveled and clouded state of mind of the damsel who once finds herself surrounded by the stuffs of every nation in a large dry goods store, there is no one to explain.

The Company of Fishmongers, incorporated in 1536, bore azure three dolphins naiant in pale between two pair of lucias (pikes) saltire ways, (crossed) proper, crowned or, on a chief gules three couple of keys crossed, as the crowns. Here the keys may again refer to the apostolic fisherman to whom were intrusted the keys of the church.

The company of Salters bear for their armor, per chevron azure and gules three covered salts (salt cellars) or, sprinkled argent.

The Company of Ironmongers, incorporated 1464, bear argent on a chevron gules between three gads or pieces of steel, azure, as many pair of shackles or manacles or. If the chronological order of institution of the guilds of Vintners and Ironmongers is sufficient to determine the question, then Englishmen began to drink wine before they worked in iron. It was about 1329 that were incorporated the company of Vintners. They bear sable a chevron between three tuns or wine barrels argent.

Neither were the Company of Dyers above their business, for their arms were sable, a chevron engrailed between three madder bags argent, banded or corded or.

The Company of Brewers began operations also previous to the Ironmongers, showing the early predilection of our ancestors for their beer, and also that the brewers were not ashamed to make conspicuous the symbols of their occupation. Their arms were gules, on a chevron argent between three pair of garbs saltire-ways, or, three tuns or barrels sable. All these may not be as high-toned as flying dragons and rampant lions, but then, a coat of arms is a coat of arms.

We come now particularly to the

Family use of Heraldry in America.

We must remember that the English who settled in New England and New York reproduced here exactly the state of society that they left in their old home. All the traditions and social customs and sentiments that prevailed there also ruled here for the first two or three generations. Now there were many in New England and New York who, according to the laws and customs of England before alluded to, were then known and styled gentlemen of coat armor. Their social rank appears everywhere on the old records, and evidence of the same appears in the old faded parchment coats of arms or in seals engraved in London, or on old tombstones whose sculptured arms and memorial lines were cut in England and brought across the ocean and set up in our old cemeteries. In the fires of the revolution, by the ubiquity of the district school and the attrition of the struggle for life under freer skies, these old social distinctions have disappeared. Now "one man is just as good as another, and if any thing a little better." Now aristocracy or no aristocracy, money or no money, the man who has learned to limit his wants by his income is king. Self-contained, self-respectful he calls no man master. But for all this I suppose a man

never regrets that his ancestor among the Puritans of New England used coat armor and was styled gentleman. Still if he pastes the old arms in all his books, say a thousand or two, and has them stamped on all his correspondence paper, and has a few specimens of the same on his harness and carriage panels, and a few dozen spoons engraved with his crest or arms as the case may be, and sprinkles them around elsewhere as chance may offer, there is always somebody mean enough to accuse him of vanity and ostentation. But if the world is censorious regarding the use of arms by a lineal descendant of a Puritan gentleman of coat armor, what must it say of one who can trace his arms no further back than 1776, when a certain painter of Boston was turning them off to every applicant; or to later heraldic painters of the same city and of New York (and perhaps Albany also) who furnished scores of these arms daintily painted after the blazonry of the English books. These heraldic painters never fail to find arms, or if the name of the applicant should not be found in Burke's general armory, they have only to issue them of their own fabrication. Price $10. But some people search for themselves. They assume that if any one of their name in the "heraldry book" is credited with a coat of arms, it belongs to the family in the broadest sense, and that every one throughout the world bearing the name is entitled to use it. It has also been noticed that when the American college of heraldry was applied to for arms and a family, the family was as sure to be found as the arms, and the connection generally reaches high up among the nobility. There is therefore no good ground for complaint of those who choose to use their family arms when everybody can get one so easily or can even fabricate one for himself, hang it up in the parlor and say nothing, and the next generation will never know the difference.

Arms in the Capitol

In the center of the New Capitol now in process of erection is a large open court placed there to give light to the surrounding rooms and corridors. Above the six dormer windows that open on the court and that are in the story above the chambers of the Senate and Assembly are sculptured the arms of six families that have become more or less distinguished in the history of the State. The vertical length of these arms as sculptured is about four feet, and as they are placed so high from any possible point of observation this is none too large to enable one to distinguish their several devices. It may be difficult to make on stone such a carving as will indicate the color or tincture of the various objects employed

in coat armor, and to preserve their proper and relative proportions. This may account for some variations between the arms as they are sculptured and as they are engraved on book plates, or blazoned in works of heraldry. The carving, so far as a good field glass enables one to inspect it, appears to be admirably well done.

The names of the families that have been thus commemorated in the lofty court of the capitol are Stuyvesant, Schuyler, Livingston, Jay, Clinton and Tompkins. Members of three of these families, the Clintons, Jays, and Tompkins have filled honorably the highest State office in the gift of the people. The Clinton family gave New York her first governor who had the helm of State in the stormy period of the revolution. A brother of the governor was also a major-general in the same war, and to a son of this military leader, De Witt Clinton, the State of New York is mainly indebted for her system of canals which have brought to her seaboard cities the wealth and the produce of the west. All through the struggle for our independence John Jay was one of the foremost men in the formation of the State government and in the councils of the Nation. He was a member of the first American congress in 1774–5, of the State legislature, 1776, chief justice of the State, 1777–9, then successively president of the federal government, chief justice of the United States and governor of New York. Governor Tompkins will be remembered not as vice-president of the United States, but as the New York State war governor, during the war with Great Britain in 1812. With all New England apathetic and the federal government dilatory or inefficient, it was our sturdy governor who more than all others defended our northern frontiers from the attacks of the enemy. The Livingstons gave the State its first chancellor, the Schuylers one of the most efficient generals of the revolutionary war, and the Stuyvesant arms fitly represented the leading character of the early Dutch period in the history of the State. Had there been one more window we doubtless would have seen over it the arms of Hamilton, to whom perhaps, more than to any one man, we are indebted, for the strength of the form of our National government. Of the first five of these there is no doubt that the arms here sculptured more or less correctly, were actually used by the several families in this country. There is some doubt, however, whether Governor Tompkins ever used, or ever claimed the right to use the arms credited to the family of that name in England by Burke in his General Armory, and which have been (with a difference) sculptured above one of the dormer windows.

The Stuyvesant arms are on the north side, west. The carving is as follows: Party per fess argent and gules; in upper a hunting hound in pursuit of a hare; in lower a stag current. Crest. A demi-stag issuing from a royal crown. Motto. Jovi praestat fidere quam homini.

The arms of Peter Stuyvesant as given in the manual of the common council, of New York, for 1852, are: Azure party per fess; in upper a hunting hound in pursuit of an antelope; in lower an antelope current. Crest, a demi antelope springing from a royal crown. The tinctures (or colors) of the charge in both cases it is impossible to determine.

The Schuyler arms are on the north side, middle. The carving is as follows: Vert, a cubit arm habited issuing from the sinister base point holding a falcon proper. Crest, a falcon proper gorged with a fillet, strings reflexed. The arms as used by the family on a book plate have the arm issuing from the dexter base point.

The Livingston arms are on the north side, east. The carving is: Quarterly, first and fourth quarter argent three gilliflowers; second quarter, quarterly first and last gules a chevron argent, second and third azure three martlets; third quarter or, a bend argent between six billets. Crest, a demi Hercules with club in dexter hand and the sinister strangling a serpent. Motto, Si je puis. These arms are substantially those given in Sedgwick's life of William Livingston, and the charges of the second and third quarters are there said to be the arms of Hepburn and Callender, probably intermarried families.

The Jay arms are on the south side, west. The carving is: Argent, a chevron gules, in chief a demi sun in splendor, between two mullets argent below, in base a rock proper surmounted with a large bird close. Crest, a cross calvary.

The arms as engraved on a book-plate vary in the tincture, and are: Azure, a chevron or, and the remainder of the charge being the same as the sculptured arms of the capitol.

The Clinton arms are on the south side middle and are carved as follows: Argent, six cross crosslets fitchee, three, two, one, on a chief two mullets, pierced. Crest, a plume of six ostrich feathers on a ducal crown. The only variation noticeable between this and the book-plate is that the book plate has a plume of five ostrich feathers and this has the sanction of Burke.

The Tompkins arms are on the south side, east. The carving is: Argent, on a chevron gules between three birds close, as many cross crosslets. Crest, a unicorn's head armed and maned and gorged with a chaplet laurel.

The arms of Tompkins, of Mornington in county of Hereford, England, are given by Burke as follows: Azure, on a chevron gules between three moorcocks close or as many cross crosslets sable. Crest, a unicorn's head erased per fess argent and or armed and maned of the last, gorged with a chaplet laurel vert.

Now summing up, in one sentence, I would say heraldry might well have been a necessity in one stage of our civilization; it is always of use in tracing genealogies back say of 1700, when employed with the precision and honesty of the multiplication table, and is, in our day and generation, a harmless luxury in which all may participate at their will and pleasure as hereinbefore explained.

MEMORIAL MINUTE ON THE OCCASION OF THE DEATH OF ORLANDO MEADS, LL. D., PRESIDENT OF THE INSTITUTE.*

By LEONARD KIP, ESQ.

[Read before the Albany Institute, at a memorial meeting, February 19, 1884.]

When upon the tidings of the death of our lamented President, Orlando Meads, I was invited by the executive committee to prepare a memorial paper for our minutes, at first I would have declined; there were many members who had been in much more intimate relations with him, and it seemed as though the duty might more properly have been delegated to one of these. But then again, I considered that my acquaintance with Mr. Meads, though not as close as that of some others, had extended over very many years and under two-fold circumstances. Thirty-six years ago I had entered his office as a student; and the attention and interest with which he had then surrounded me had never since abated, though, of course, as time passed on, assuming different conditions. And I felt that my pleasant recollections of so many years of pupilage and friendship should lead me rather to rejoice at any opportunity to add my grateful tribute to his memory.

President Meads was born in Albany, in the year 1806. In 1826 he graduated at Union College, immediately began the study of law, and three years after was admitted to practice. At first he pursued his profession alone, but afterward became associated with James Edwards, an older practitioner. Within the two following years the firm of Edwards & Meads gained the accession of Samuel Stevens, one of the most distinguished lawyers in the State, and until it was dissolved by the death of Mr. Stevens, was for many years in successful practice under the name of Stevens, Edwards & Meads. Not long after Mr. Stevens' death, Mr. Edwards relinquished the profession; and Mr. Meads being once more alone, thereafter formed two successive partnerships of less extended duration, the later connection con-

* Prepared by request of the Executive Committee.

tinuing until advancing years, with their ever increasing burdens, warned him to retire. Thenceforth he led a quiet, unambitious life; enjoying his many friendships, and surrendering himself more fully to those artistic and literary tastes in which he had always taken pleasure, but in which, during the absorption and cares of his professional career, he could allow himself only a limited indulgence. Four years ago he was elected President of our Institute, having been for a long while previous the president of one of the subordinate departments; and filled the office with such ability that his election was afterward renewed for four additional terms. During the past year it was noticed that his health was rapidly failing, but decrease of bodily strength was attended with no loss of mental vigor, or of that cheerfulness of disposition which marked every moment of his intercourse with others. Last week the long anticipated termination came. While on a visit to New York he was seized with paralysis, and after a few hours of unconscious stupor breathed his last, falling asleep almost painlessly under the ministering and loving care of his only remaining child. The funeral services were held in Albany, at All Saints Cathedral, and his remains now rest in the Albany Rural Cemetery, beside many loved kindred who have gone before.

This brief recital of birth, professional career and death might be all that it would be necessary to set forth, in the case of many men. But in several respects, President Meads was no ordinary member of our Institute, having been endowed with certain qualities of head and heart, which, during his long life, had steadily advanced him not only in the esteem and affection of all his friends, but also in the knowledge of many who had never chanced to meet him. It seems appropriate, therefore, that our minutes should contain a somewhat more extended notice of him, adding to the final registry of life's mile-stones some mention of those peculiarities and tastes that eminently distinguished him.

In his professional career, Mr. Meads became well known not only as an able and trustworthy practitioner, but also as one of the most deeply read lawyers in the State; more especially in certain branches of study which, though up to the last half of this century still considered requisite for completeness of legal education, were beginning all the same to lose the tenacity of their hold, and to show signs of passing away as necessary acquirements, preparatory to taking their places simply as legal history. He was in many respects a lawyer of the old school, enjoying his Chitty and Blackstone beyond all other profes-

sional treatises. The change from their supremacy came while he was in middle life; and when after long agitation, the courts of equity were merged into those of law, he never fully gave his adhesion, but lovingly retained as much of the old forms and traditions of practice as was allowable, feeling at times even uneasy under the new dispensation, as though he had somehow outlived his most available period of professional usefulness, and was out of place. This, of course, was error, for his acquaintance with the old practice must have given him a much more comprehensive knowledge of the new; and in fact, there is no lawyer, however familiar with the present law, who will not be better for a proper understanding of what has gone before. But all the same it must be conceded that Mr. Meads was far from satisfied, and from the time of the great change in legal practice he never quite enjoyed his profession as before.

Doubtless, however, this spirit of dissatisfaction was not without advantage to him, since when the time came for leaving the profession it must have enabled him to do so without so much of that lingering regret that men are apt to feel when, for even the most sufficient reasons, they abandon a well-trodden path. And in the case of Mr. Meads, it was not a change from activity to idleness, but was the surrender of a pursuit which had become uncongenial to him, in favor of tastes which had already long engaged him, and which now awaited his increased leisure to become more intimately a portion of his daily life. For to him was given a quality of mind not often found in lawyers — the faculty of turning from practical occupations, which merely lead to worldly advancement, and of throwing himself into æsthetic studies, which, though often requiring closeness of examination and analysis, and, therefore, much labor of the intellect, can offer for their sole reward merely the enjoyment of their pursuit. In the case of President Meads, the same habit of thought which had so constantly led his attention from legal practice to legal history found much to interest him in the study of the arts. None who have ever conversed with him can have failed to mark his devotion to those pursuits, a taste so well developed in his nature that in many departments of art it constituted him a recognized authority. It was fostered by him, not as a mere amusement or indulgence of the eye, but also as a close and comprehensive study. And even in this taste, as in the law, he was a student of the old school, finding his principal delight more in the contemplation of the great works of the past than of the present; reasonably enjoying modern art, it is true, but discerning still

more abundant charms in the mediæval. He would travel very far for the opportunity to gaze upon a painting or a piece of statuary which had come down to us under the seal of centuries; and so diligently did he thus carry his researches that it is questionable whether there are many well-known works of art extant which he had not seen, or about which he could not have told us something, or for his opinion of which he could not have given a logical and satisfactory reason.

This, then, in brief, was the life of our late President — the life of a lawyer who, untroubled with the restlessness of the age, quietly lived out his allotted span in the city of his birth, attaining high excellence and appreciation in his profession, and mingling with its needful study an earnest and thoughtful devotion to those arts which, when intelligently improved, do so much to add zest and pleasure to existence. Judged from the ordinary standpoints of the day, it was not a far-reaching life. It does not speak of political popularity or of chairs of State filled; of legions led successfully to battle; of forensic displays in great causes that live in legal history; or even of individual triumphs in the productive fields of art or literature. But if not wide spreading, it was, in all respects, a full, well-rounded life. It tells of a quiet professional career, that from its beginning held its own in honorable, unselfish competition; and which bears its highest proof of success in the fact that, through all, it excited no burning jealousies or bitter hatred. It tells of a life devoted, as far as possible, to art; and which was not content with gaining personal enjoyment from the pursuit, but accomplished much in educating and aiding popular taste in the same direction. It tells of a life adorned with the ungrudging appreciation of his fellow-men, shown in the unsolicited bestowal of such trusts and honors as most naturally adapted themselves to his tastes. And far better than all else, perhaps, it tells of a life more abundantly blessed with earnest friendships than usually falls to the lot of man; for though all of us believe that we have our friends, and hope that there will be no period of our lives without them, they too often come and go, suffering easy change and substitution, as, in our passage by the way, our altering tastes seem constantly to require newer associations. There are not many men who, like President Orlando Meads, could so nearly reach the sixteenth lustrum and find still at their sides the companions of early youth, warm as ever in their attachment, and elate with the consciousness that more than half a century has never cast a shadow upon their bright friendship.

And, in conclusion, it befits the time and circumstances that we

should consider him not merely in his relations with professional duties or artistic study, but in his connection with our Institute. We can all bear witness to his merit as our presiding officer, not only for his executive ability and his unfailing tact in ruling, but also for his unvarying courtesy and kindness in his individual communication with our members. Upon this it is not necessary to enlarge. But it often happens that in the course of any prominent connection with a body or association such as ours, certain memories will grow up, standing apart from any suggestion of ordinary duty or routine, and marking more distinctly than in any thing else the individuality of the member. There are two such occasions which will always be associated with the membership of Orlando Meads.

One was the time, not many years ago, when he was chosen to deliver our annual address. It will be remembered by all who heard it, as a masterly paper. It told the history of the Institute as no one else could tell it, who had not lived in its contact and spirit for over half a century, as well as been able to bring to the task such trained habits of research. It spoke of our early struggles, common, perhaps, to all societies ; and mainly from his far reaching recollection of personal association, it evoked the names and services of long-dead members so distinguished in their several walks that many societies might wait for generations to pass away before being able to muster upon their rolls a record of equal talent. The preparation of this paper was, perhaps, Orlando Meads' most valuable service to the Institute, for it was a full and exhaustive compendium of our progress, — in the treatment of his line of subject leaving nothing of value unsaid, and so abundantly covering all the ground, that half a century must elapse, bringing its new accessions of distinguished memberships, before the work of our history can again be carried on. Our only care henceforth must be to note the qualities and services of our future members, as one by one they come and go; so that when the time approaches to collect their names in a new compilation of our progress, they can readily be found and judged and given each his proper place.

The other occurrence to be remembered was only four weeks ago. At the opening of the meeting of that date, Mr. Meads arose and thanked the Institute for his fifth election to the presidency. That he was gratified with the honor as an acknowledgment of his long services and of appreciation of them, was to have been expected , but I think the occasion gave him greater pleasure because it chanced so significantly to mark an era in his life. He had joined the Institute just

sixty years before ; and in looking back over such a long membership, it would certainly have been singular if he had not felt somewhat moved. We rejoiced with him in the occurrence of such a pleasant anniversary ; had we foreseen that it was almost the last of his meetings with us, we would have been saddened indeed. Sixty years of active participation in any career is most unusual ; a connection of sixty years with a learned society or institution so rarely falls to the lot of anybody, that when it happens it cannot fail to gain recognition. Not merely that it speaks of a long life : the art of continuing existence is one that cannot be learned even through much study, and when long life comes to any one, it is from the bountiful favor of nature, to whom alone must be the praise. But to have lived for sixty years in active communication with one's fellow-men, and through all that time to have given up the mind to steady and successful culture and development, — year by year through study and example to have exerted a beneficent and extending influence upon one's day and generation, — to have practiced a profession stainlessly, and to have gained in it such honors as most surely show the kindly regard and influence of others, and to have gone through life without a friendship broken or grown cold ; this is one of those careers which must surely mark a man as worthy to be revered and honored. As such, the Institute now seeks to put on record its just appreciation and loving memory of Orlando Meads.

FERTILIZATION OF FLOWERS.

By Chas. H. Peck, A. M.

[Read before the Albany Institute, April 15, 1884.]

The fertilization or pollenization of flowers is the application of proper pollen at the proper time to the stigma of the pistil and the consequent transfer of the pollen contents to the ovules. The process is twofold. First, the pollen grains must be transferred from the anthers, where they are produced, to the stigma; second, the pollen contents must be conveyed from the stigma to the ovules. The first is a mechanical operation and is chiefly effected by agencies external to the plant, the second is a kind of vegetative or natural process, and is carried on by the plant itself. By proper pollen we mean that which is capable of germination. It implies that the pollen must be mature and well developed, and generally that it must belong to the same species of plant as the stigma to which it is applied. The proper time for the application is while the stigma is in a receptive condition. If the pollen is applied before the stigma is mature, or after it has become dry and withered, no fertilization will result. The floral organs immediately and necessarily concerned in fertilization are the stamens and the pistils. They are indispensable and are therefore called the essential organs of the flower. The other parts of the flower, the calyx and corolla, are merely accessory or aiding and protecting organs, and may not always be present.

The office of the stamens is to produce the pollen. This is regarded as the male element, and flowers which bear stamens but no pistils are called male flowers or staminate flowers. They are always sterile, that is, they never produce seeds.

The office of the pistil is to produce the small cells or incipient seeds called ovules. These are developed in the swollen base or ovary of the pistil and are regarded as female cells. Hence those flowers which bear pistils but no stamens are called female flowers or pistillate or fertile flowers. Many flowers have both stamens and pistils, and are therefore considered bisexual or hermaphrodite. They are called perfect flowers. Flowers with but one kind of the essential organs are called imperfect. If both kinds of imperfect flowers occur on the same plant, the inflorescence is said to be monœcious. If the two

kinds occur on different plants, that is, the staminate on one plant and the pistillate on another plant of the same species, the inflorescence is diœcious. With this explanation of the principal technical terms immediately connected with our subject, the process of fertilization may be more fully described.

When the pollen grains have been placed upon the receptive stigma, they soon germinate under the influence of the moisture supplied by it. Each protrudes a slender tube or filament which grows downward through the tissues of the pistil, carrying within itself the contents of the pollen cell. Upon reaching the ovary, the advancing apex of the tube enters the aperture of the ovule, into which the contents are transferred. Then the ovule begins to develop its embryo and to grow into a perfect seed. Without the influence it receives from the pollen it develops no embryo and does not become a seed. In such a case, the plant is sterile. Should fertilization wholly fail in any species, the plant could not be propagated by seed. In most cases, if fertilization does not take place not only seed fails to develop, but also the ovaries or seed vessels; consequently no fruit is produced. In a few instances, the ovaries grow for a time, but at length, as if becoming aware of the uselessness of their development, they wither and drop from the plant prematurely. In some cases, as in the banana, pineapple and other seedless fruits, they develop sufficiently to answer the purposes of man, who makes use of them for food, but they are valueless for the purposes of reproduction.

How is the pollen transferred from the anthers to the stigmas? The agents chiefly employed are water, gravity, birds, winds and insects. Of these, winds and insects are by far the most important if we have regard to the number of species whose pollen is transferred by them. Plants which depend on the wind for the transmission of their pollen are called anemophilous or wind-loving plants; those which depend on insects are called entomophilous or insect-loving.

Examples may be given illustrative of the action of these agents. The eel-grass, *Vallisneria spiralis*, grows in ponds and sluggish streams. Its flowers are diœcious. The pistillate flowers are raised, by long slender flowering stems to the surface of the water where they float, lying upon their sides and having their stigmas just at the surface. The staminate flowers are produced on other plants and are held by their short stems near the bottom of the water. Just before the buds open they break from their support, rise to the surface, expand and shed their pollen on the water. This is carried by the current or wafted by the winds till it comes in contact with the stigmas of the

pistillate flowers. Thus the water is the transferring agent, but it is sometimes aided by the winds.

In Indian corn, *Zea Mays,* the flowers are monœcious. The staminate flowers are in the tassel that terminates the stem. The pistillate flowers are closely placed in rows in the ear and are concealed by the husks, but each one sends its long filamentous style and stigma upward and outward till they project in a silken tuft at the apex of the ear. Thus the pollen is far above the stigmas and must descend to lodge upon them. This it does under the influence of gravity, often acting, it is true, in conjunction with the wind. When the pollen, which is dry and dust-like, is mature, it falls from the anthers by the least agitation and is carried about by the winds in its descent, and scattered over the stigmas of the neighboring plants. Much of it also lodges on the leaves and on the ground, but enough is produced to insure fertilization of the flowers, notwithstanding this loss. And here is one of the many wonderful facts connected with this subject; facts which not only challenge our admiration of the perfection of nature's works and processes, but which also sometimes almost stagger our comprehension. I suppose on an average that each ear of corn may be said to produce ten rows of flowers, of forty each. This would make four hundred flowers to an ear, and consequently, four hundred silken stigmas in a cluster. A tuft of the "silk" is scarcely more than an inch in diameter, and in order to bring about complete fertilization of the flowers of the ear, each stigma must receive its pollen-grain. It seems almost incredible that, in the apparently haphazard way in which the pollen is transmitted, four hundred pollen-grains should fall on such a small space. Yet, when we examine the mature ears we generally find that every flower has developed its kernel of corn. We must, therefore, admit that every flower was fertilized, and that nature's methods, however rude they may appear to us, are really perfect and effectual. It may here be stated, as a general principle, that those plants which depend on the winds to transport their pollen produce a great abundance of it and thus provide against the dangers of great loss. They also produce it in a dry, dust-like condition, that it may be easily scattered.

Probably you have all seen the humming bird darting from one flower to another and thrusting its long slender beak into the corolla to obtain a sip of nectar. In doing this, its beak or the plumage of its head becomes dusted with pollen and some of this is brushed upon the stigmas of the flowers next visited. Thus the humming bird is made the unwitting agent in the fertilization of these flowers. Some flowers appear to be specially constructed for fertilization by humming

birds, and a good botanist can generally tell by the structure of a flower whether it is designed for fertilization through the agency of birds or of insects. The "touch-me-not" and the "cardinal flower" are visited by both humming birds and insects.

Some of you may have watched a field of grain just after the heads or spikes have become fully developed. Placing the eye nearly on a plane with the heads of grain and looking over its surface early in the day when the breezes begin to play across it, you have seen clouds of fine dust wafted along before your eyes by each successive breeze. This dust is the pollen of the flowers of the grain and the wind is fulfilling its mission as pollen carrier. It is wafting the pollen about in clouds and sprinkling it wholesale upon the feathery stigmas of the blossoming grain. In most of the grasses and cereals the stigmas are plumose and are well adapted by their form and broad surface to catch the pollen as it flies.

In almost any vegetable garden bumble bees are often to be seen visiting one after another of the large yellow flowers of the squash plants. Their hairy bodies soon become dusted by the copious yellow pollen grains of the staminate flowers and whenever they enter the corolla of a pistillate flower, some of this pollen is sure to be rubbed from their bodies and left upon the stigmas. In this case it is easy to see that pollenization would not take place without the aid of insects. The corollas are upright and deep, the stamens and pistils are short and situated in the bottom of separate flówers. The stamens are therefore sheltered from the wind and only as bees or other insects convey their pollen on their hairy bodies is it transferred to the stigmas at all.

The examples now given serve to illustrate the action of the principal agents in conveying pollen from flower to flower. As already stated, winds and insects are by far the most common and the most noticeable agents. It might be interesting here to note some of the more obvious characters which favor one or the other of these agencies. If we find plants growing in large tufts or extensive patches and bearing many very small flowers in loose clusters or panicles or in racemas and spikes and having either no corollas at all or very small and inconspicuous ones with versatile anthers on long capillary or slender filaments we can say at once that these plants depend on winds to transport their pollen. These characters exist in nearly all the sedges, grasses and cereals. Hence they are comparatively independent of insects. We can also see the wisdom of this arrangement in the case of the cereals especially. We plant whole fields with wheat or other grain. Suppose there are but ten acres in the field. It is large enough to contain

thousands of wheat plants and very many more thousands of the flowers. If it were necessary for insects to transfer pollen to every one of these flowers it would require swarms of them to accomplish the work during the time the plants are in bloom, and it is very evident that we would either be overrun by insects or that many of the flowers would remain unfertilized and there would be a very short wheat crop. Hence it is for the advantage of man that the cereals on which he depends so largely for his sustenance are anemophilous instead of entomophilous.

Many of our forest trees produce clusters of small inconspicuous flowers with exserted stamens, as in the maples and elms, or their flowers, and especially their staminate flowers are in aments whose scales are much shorter than the stamens, as in the poplars, oaks, hickories and birches. These characters indicate very clearly that such trees are anemophilous. The indications are strengthened by the fact that such trees usually put forth their flowers before they do their leaves, or at least before their leaves are fully developed, an arrangement which clearly favors the dissemination of the pollen by winds, for the breezes play among the branches more readily and freely while the leaves are yet unexpanded than they do afterward.

In the tulip tree, *Liriodendron tulipifera,* the flowers are large and highly colored and do not appear until the leaves are well expanded. In the bass wood, *Tilia Americana,* and the horse chestnut, *Æsculus Hippocastanum,* the flowers are conspicuous by their colors, but they are of small size. This, however, is remedied by their growing in clusters and making up in numbers what they lack in size.

In the flowering dogwood, *Cornus florida,* they are not only in clusters, but also a large and showy involucre is added; evidently for the purpose of making them more conspicuous, and in aiding in attracting insects. The design in all these cases is so evident that one could say with perfect confidence, upon seeing such flowers for the first time, and without knowing that insects ever visited them, that they were not fertilized by the agency of winds, but by some agent that could be attracted by conspicuous colors. When to this is added a decided fragrance, especially in such cases as the bass wood, whose flowers are apt to be partly concealed by the foliage, the evidence of design becomes stronger. If now we examine these flowers more closely and find that deep down in their colored cups they secrete drops of honey or sweet nectar, the natural and eagerly-sought food of many insects, the evidence is complete. The botanist can assert positively that insects are the pollen carriers for such flowers. He sees here the means by which the flower secures the services of insects. It baits them with food.

It virtually says to the insect, "you serve me and I will feed you. If you will carry a part of my pollen from the anthers to the stigmas you may have another part to eat and a drink of nectar besides." What bee could refuse such an offer, especially when to such an offer there is added the use of a most beautiful dining-room in which to take its meals and pleasant odors and lovely colors to attract and direct it to the table of dainties.

We have thus far treated the subject in a general way. It is necessary to be more specific. There are two kinds of fertilization. Self-fertilization is the term employed to indicate that the pollen and the stigma to which it is applied are produced by one and the same plant. Cross-fertilization indicates that they are produced by different plants of the same species.

It would be natural to infer that self-fertilization takes place in all plants that bear either perfect or monœcious flowers, and that cross-fertilization is reserved for diœcious plants only. It has been found that this is far from being the truth, that many contrivances and structural peculiarities exist in perfect and monœcious flowers whereby cross-fertilization is secured. Professor Darwin, the eminent scientist, advanced the fundamental principle that nature abhors perpetual self-fertilization. By his investigations he not only established the truth of his proposition, but by long and patiently-conducted experiments he also found that cross-fertilization was, as a rule, far better for the plant than self-fertilization. He found that the descendants from cross-fertilized ancestors grew more rapidly, attained a larger size, had a more healthy and vigorous appearance, resisted drought, cold, excessive moisture and the encroachments of rival plants better than the descendants of self-fertilized progenitors. They also generally surpassed the others in the number, weight and productiveness of their seeds. Such a result might have been anticipated by any one who had carefully observed the numerous contrivances and curious floral structures whose evident design is to favor or secure cross-fertilization. It is reasonable to suppose that such care would not have been taken to effect cross-fertilization if self-fertilization would have answered as well.

Let us consider some of the methods by which cross-fertilization is accomplished.

The simplest and most obvious means is by a diœcious inflorescence. Since the stamens in this case are all on one plant and the pistils all on another, it is very clear that there can be only cross-fertilization in these plants. If by any chance this fails the plant is surely and hopelessly sterile.

Closely allied to this are those cases in which the flowers are perfect

indeed, but by certain peculiarities of development they are rendered practically diœcious. Thus in certain varieties of strawberries, the flowers bear stamens, but these are small and imperfect and fail to develop proper pollen, so that the flower is practically pistillate and the plant virtually diœcious. In many flowers, as in species of lily, the stamens mature in advance of the pistil, and by the time it has become receptive, they have discharged their pollen, so that it must be fertilized by pollen from some other flower. In other flowers, as in the common parsnip, the pistils become receptive before their accompanying stamens have ripened their pollen, and in this way cross-fertilization is likewise favored. It often happens by a little retarding of the maturity of the earlier developing organ or a little hastening of the later one that provision is also made for self-fertilization. Thus nature, ever intent on the preservation of the species, sometimes generously allows a chance for self-fertilization in case cross-fertilization should by any mishap be a failure. Many plants are thus known to be capable both of self and of cross-fertilization.

In some plants both stamens and pistils are perfect and synchronous in their development, but the pollen absolutely refuses to germinate on the stigmas developed on the same plant with itself. Thus it has been found that a single chestnut tree isolated from any others of its kind by a distance of four or five miles, rarely bears any fruit, although it may bear an abundance of both kinds of flowers and its pollen may be abundantly scattered over its foliage and pistillate flowers.

Cross-fertilization is often favored and secured by differences in the relative length of the stamens and pistils. In the vast family known as the Compositæ, of which the sunflower is a familiar example, the stamens are much shorter than the pistils, their anthers are united, forming a tube through which the pistil passes, bearing its two stigmas above with their receptive surfaces turned away from the anthers below. If self-fertilization had been desired how much more surely would that result have been attained if the relative position of the two organs had been reversed. Put the anthers above and the pistils below, with their receptive surfaces directed upward toward the anthers, and how naturally the pollen would fall on them by the action of gravity. But as they now are, it is almost impossible for the pollen to reach the stigmas except as it is carried there by insects. With insects as pollen carriers, how admirable the arrangement. The projecting stigmas are just in the right position to act as brushes and sweep down upon themselves the pollen from the hairy bodies of insects settling upon or walking over them.

In the flowers of the sage the corolla is two-lipped. The sta-

mens and pistil ascend beneath the upper lip. The connective of the anthers is very long, somewhat curved and attached to the filament at a point near its center. It bears a pollen producing cell at its outer extremity and a sterile cell or no cell at all at its inner extremity which projects backward and downward and partly closes the throat of the corolla. An insect, seeking food, alights on the lower lip of the corolla and perceiving that there is honey in the tube, thrusts its head within to reach it. In so doing the head comes in contact with the inner extremity of the connective and pushes it backward and upward, it swinging on the filament as on a fulcrum. This tilts the pollen bearing cell at the other end downward and it striking on the back of the insect the pollen is dashed upon its hairy body and carried away in its flight to another flower on whose stigma it is deposited as the insect enters to renew its repast.

In the flowers of orchids a singular structure exists which may well be called wonderful. Its purpose is inexplicable except on the theory of cross-fertilization. The pistil and stamens are united in and supported by a single pedestal called a column. The pollen of each cell is in a single mass, the grains adhering to each other as if held together by a viscid substance. These masses are called *pollinia*. Generally they have a downwardly projecting stem or caudicle which terminates in a small viscid disk. The position of these disks is such that when an insect visits the flower and seeks its nectar it is almost sure to strike its head or antennæ against this viscid disk, and as sure as it does, the disk sticks fast to whatever part comes in contact with it.

When the insect flies away it draws the whole pollen mass from the anther cell and carries it all along with it. In a few moments after the pollen mass has been drawn from the anther cell there is a deflection of the caudicle obliquely downward, so that by the time the insect visits another plant the pollen mass projects forward in just that position in which it is most likely to strike against the stigmatic surface of the pistil and leave its pollen in contact with it as the insect seeks another sip of nectar. This is the general outline of the structure and process. Of course, it varies in some of its details in different genera and species. In some, the pollinia are ejected from the cells (as if fired from a gun), when a bee settles on the lip of the flower, and ejected, too, in such a direction that they are sure to hit the bee and stick fast to it. In others, as in species of ladyslipper, *Cypripedium*, the honey is secreted in the large cavernous or sac-like lip of the flower. The bee enters this through the aperture in its upper surface and having feasted on its sweets it finds it impossible to retrace its steps and pass out at the same door by which it entered, on account of the

incurved margin of the aperture. But there is a small place of exit on each side at the base, just beneath the anther cells, and in creeping out here it brushes against the viscid surface which causes the pollen to stick to and go with the bee in its flight.

Although the structure of most of these flowers is so clearly designed to secure cross-fertilization, and indeed to render self-fertilization impossible, in a few species the design is just as clear to reverse this arrangement. But these are the exceptions which prove the rule. We find them almost everywhere in nature as if to make us cautious in drawing conclusions from insufficient data.

The question might be asked, why the peculiar structure of the pollen in orchids? Why should it cohere in masses and all go together? Surely there must be some design in such a strange departure from the general character of pollen? The answer is this: The seeds of orchids are very minute and very numerous. Darwin estimated that a common English species produced about 6000 seeds in one capsule. In another species Muller estimated them as high as 120000 in a capsule. One pollen grain being necessary for the fertilization of each ovule, it is evident that a vast number of pollen grains must lodge on the stigma of such a plant in order to fertilize all its ovules. It is easy to see, if the pollen did not cohere in masses, that it would not be likely to be applied in sufficient quantity to fertilize all the ovules and the ordinary number of seeds would be greatly diminished.

A more familiar but no less interesting example of singular structure is afforded by the flowers of the Indian turnip, *Arisæma triphyllum*. Its unusual style of inflorescence has excited the curiosity of many botanists and even of some who are not botanists. Its long tubular spathe, with its inflexed roof-like summit and its longitudinal stripes of alternating colors, its small flowers situated almost at the bottom of the tube and the long smooth club-like and apparently useless prolongation of the spadix above them, have each in turn been the objects of admiration and curious wonderment. Yet each part of the flower has its duty to perform and each is indicative of an intelligent design. All work together for the common good of the species and aid in securing cross-fertilization. The flowers are commonly diœcious, but occasionally a plant occurs in which both stamens and pistils occur on its spadix. In this case the stamens are just above the pistils and both are near the base of the spadix. In the diœcious state the pollen must be brought from a staminate to a pistillate plant. An insect allured by the prospect of food settles upon the outside of the spathe. Having found the entrance at the upper part of the tube the broad

purple and white stripes act as guide boards to direct its way to the bottom of the tube. Suppose it to be a staminate plant. The body of the insect is soon dusted with pollen. It now turns to retire and naturally walks up the central column, the sterile prolongation of the spadix, which aids its retreat and safely conducts it to the open door whence its flight to and descent into a pistillate flower is an easy matter. There its load of pollen is soon brushed upon the receptive stigmas while it is feeding on the food prepared for it. In the case of the monœcious flowers there is a reason for the relative position of the staminate and pistillate flowers. The insect having partaken of the nectar turns to climb the column toward the place of exit, and in so doing passes over the stamens and becomes dusted with the pollen just before leaving this plant to visit another. The roof-like summit of the spathe serves well to prevent rain from beating down the pollen to the stigmas below, in monœcious plants and from spoiling the nectar in diœcious ones.

There are many flowers whose structure is such that at first sight it appears to be favorable to self-fertilization, but when more closely observed it is found to be really designed to secure cross-fertilization.

In our species of Kalmia, which genus includes the mountain laurel or calico bush and the sheep laurel, the filaments of the stamens are elastic and the anthers are imprisoned each in a small cavity or depression in the cup-shaped corolla. As the corolla expands the upper part of the stamen is drawn back as far as possible from the center of the flower and the filament is held in a high state of tension. If now the flowers are subjected to any sudden jar such as may be produced by a blast of wind or a bird settling on the branches, the anthers are liberated and the elasticity of the filaments throws them with a sudden jerk toward the opposite side of the flower, and the pollen is dashed out and flies in small cloud-like masses in every direction. This looks like a contrivance for self-fertilization. But now suppose an insect settles on the flowers. By its motions it liberates the anthers and the pollen is freely dashed over its body whereon it is carried to the flowers of neighboring plants and cross-fertilization is secured.

The mode of fertilization of some of our lobelias has been investigated by Professor W. Trelease. In these flowers the anthers are united very much as they are in the flowers of the Compositæ. They form a kind of tube whose apical aperture is closed by a tuft of hairs until the pollen is mature. The style is at first nearly equal in length to the stamens and its two-lobed stigma is inclosed in the anther tube. Just below the stigma it is girt by a circle of radiating hairs which

form a bottom to the tube. This appears to be a structure designed to secure self-fertilization. What more could be asked? There the stigma is, shut up in the anther tube and surrounded on all sides by an abundance of pollen. What hinders self-fertilization? When the pollen is mature the tuft of hairs at the apex of the anther tube becomes deflexed leaving the aperture open and allowing the pollen to escape. If now a bee settles on the lower lip of the corolla and crowds its head into the throat to get at the nectar, the upper part of its head or its back brushes against the deflexed tuft of hairs and jars down some of the pollen which lodges on its body. About this time the pistil elongates, pushes out the pollen and emerges from the apex of the tube. It is now seen to be two lobed and these lobes are closely pressed together, being receptive only on the inner surfaces. They therefore have not yet been able to receive any pollen. But now they begin to separate and the terminal part of the style curves downward and soon the stigmatic surfaces are exposed in just the right position to brush the pollen from the back of a visiting insect. We see in this example how admirably all these structures are adapted to work together to bring about cross-fertilization and how necessary it is to examine the whole arrangement carefully in order to interpret the design correctly.

There are some plants which bear dissimilar flowers. In the "bladder campion," *Silene inflata,* some individuals have flowers whose pistils are longer than the stamens; others have flowers with stamens longer than the pistils. An inexperienced botanist finding one of the latter kind of plants would be likely to think that he had an example of a flower designed for self-fertilization. The pollen would so easily and naturally fall from the anthers above to the stigmas below.

To what other conclusion could he come. But suppose he next finds a plant of this same species with flowers whose stamens are shorter than the pistils. Certainly in this case the pollen is not likely to fall upward from the anthers below to the pistils above. Here must be a contrivance for cross-fertilization, and it throws a doubt on his former interpretation, unless he concludes that the plant is capable of both kinds of fertilization. Investigation has shown that the pollen in the two kinds of flowers differs. That of the short stamens does not readily germinate on its associated long pistils, nor does that of the long stamens germinate on the stigmas of the short pistils. Each must be transferred to pistils corresponding in length to its own stamens. Hence the conclusion is inevitable that this again is a contrivance designed to secure cross-fertilization. If perchance fertilization does take place between these organs of disproportionate

length the progeny from seeds thus produced is nearly always weak or sterile, thus showing that the fertilization was illegitimate and not for the good of the species.

Not only floral structure, but also floral arrangement combined with successive expansion of flowers are found to be conducive to cross-fertilization.

Many plants have their flowers in elongated clusters, spikes or racemes, the single flowers being generally small and opening successively from the base toward the apex of the cluster. Moreover, they generally mature their pollen before the stigmas are receptive. If now a bee or other insect visits the raceme of a cardinal flower or a door-yard plantain when the flowers have just begun to open, it finds the pollen in good condition but the stigmas of such flowers are not yet receptive. Its body becomes dusted with the pollen but it must fly to another earlier flowering plant to deposit it on the stigmas. If the raceme has been in blossom sometime, the lower flowers have their stigmas receptive and their stamens withered, while the upper flowers have their stamens in good condition but their stigmas not yet receptive. Bees usually settle on the lower flowers first and work upward, thus passing from the uppermost flowers of one raceme to the lower of another, a practice favorable to cross-fertilization. They likewise manifest a good knowledge of species. Having commenced working on a certain kind of flower they do not like to leave it for some other. They are not given to mixing honey or pollen of different kinds together. But should pollen by any chance be brought from one kind of flower to the stigmas of another species it is not likely to do any harm. The probabilities are entirely against its germination in such a foreign position. Nature appears to have placed two limitations on this process. She manifests her displeasure with too close fertilization and with too distant fertilization. As a rule she forbids a union between the essential organs of the same flower on one hand and of flowers of different species on the other. She would avoid incestuous deterioration as well as inextricable confusion and hybridization.

It might here be stated that certain floral structures favor the visits of certain insects to the exclusion of others. Ants are fond of honey but they are generally wingless and consequently are poor pollen carriers. Many plants, therefore, present obstacles to their visits. In some, like the shooting star, *Dodecatheon Meadia*, the calyx is strongly reflexed, in others it is bristly with rigid setæ, or clothed with viscid glandular hairs. In others still, as in some of the catch flies the internodes of the stem are girt by a glutinous band, which serves to

exclude wingless insects that can only visit the flowers by ascending the stem. In some of the borrage worts the entrance to the throat of the corolla is closed by small scale-like appendages, in some flowers tufts of hairs perform a similar office, thus excluding small insects which are poor pollen carriers, but admitting the beak or proboscis of larger ones which are good pollen carriers. Some flowers, like the columbine, have long narrow spurs which secrete their nectar in the remote extremity, thus favoring the visits of insects with long proboscs, but effectually keep their nectar from those with short ones. But occasionally this exclusiveness is resented. Insects with stout mandibles, finding the nectar beyond their reach, eat holes through these long spurs or long corolla tubes and thus get at the nectar surreptitiously. To guard against such thieves some plants have inflated calyces or inflated bracts which clasp the base of the corolla tube and thus protect it. But time will not permit us to extend our examination of this subject any further or to examine more minutely its details. Enough has been said to indicate that even a moderate knowledge of it must add greatly to the interest with which we view the almost endless variations in floral structures. All the beautiful forms of flowers, their curious and occasionally grotesque shapes, their singular appendages and strange markings, in the light of this subject, have a deep significance. We see in them a meaning and an adaptation to an end which would otherwise escape us and leave them in our estimation as mere curious shapes and whimsical or unmeaning colors. We learn from it the explanation of many phenomena which would otherwise be inexplicable. Plants kept in houses or in conservatories are often sterile. They are excluded from the visits of pollen carriers and are therefore infertile. The question is sometimes raised why seedlings raised from the seed of a single apple tree should bear fruit so diverse from that of the parent tree and from each other. It is very common to find a half dozen different varieties of apple trees in a single orchard. The blossoms of any one tree in an orchard are likely to be fertilized by pollen from half a dozen different kinds of apple trees. Is it any wonder then that the fruit of seedlings thus produced should vary greatly? The natural tendency to variation is in such a case much aided by inherited variation.

When the squash was introduced into the Sandwich Islands it was found impossible to raise squashes unless the pollen was transferred by hand from the stamens to the pistils. There were no natural pollen carriers in the islands. At length a ship loaded with logwood arrived in port and in one of the hollow pieces of wood there happened to be a nest of humble bees. These escaped to the islands and soon stocked

them with the necessary pollen carriers for the squash vines and thus relieved the gardeners from that duty. In this way an accident supplied what a proper knowledge of this subject might have suggested and a little care might have furnished long before.

Fruit growers have sometimes found it profitable to keep honey bees, even though they cared nothing for their honey. Their grape vines have borne fuller clusters by reason of the presence of the bees in greater numbers.

By a knowledge of this subject gardeners have been able to fix and maintain any desirable variety of their cultivated plants. In like manner also they have sometimes succeeded in modifying or improving undesirable varieties. Even the crossing of reputedly distinct species has been made to contribute to desirable varieties. Also a plant of feeble constitution may sometimes have its progeny rendered more hardy and vigorous by a judicious application of the principle of cross-fertilization. On the other hand seedsmen are obliged to guard against the natural tendency of cultivated varieties of plants to cross and intermix with each other if they would have their varieties "come true to seed." Either ignorance or negligence in this matter may lead to serious disappointment and has more than once been the cause of annoying and expensive litigation. Darwin says that those who raise seed for sale are compelled by dearly bought experience to take extraordinary precautions against intercrossing.

Finally this very suggestive chapter in botanical science seems well calculated to lead our thoughts from the evident design in these wonderful structures to their Designer, from the creature to the Creator. To my mind these evidences of design are as manifest as are those exhibited by the mechanism of a watch. They are as clear as if written in letters of light. And it seems to me impossible to conceive of a design apart from a designer. Small and generally unnoticed though these beautiful contrivances may be, yet they point as clearly and as unmistakably to the Great Designer and Creator of all things, as do the most stupendous works of the Universe.

ARENDT VAN CURLER, FIRST SUPERINTENDENT OF RENSSELAERWYCK, FOUNDER OF SCHENECTADY, AND OF THE DUTCH POLICY OF PEACE WITH THE IRIQUOIS.

By Wm. Elliot Griffis, D. D.,* Domine of the Reformed [Dutch] Church, Schenectady, N. Y., from June 1, 1877, to April 5, 1886.

[Read before the Albany Institute November 18, 1884.]

In the report of the Special Committee on Archæology of the Albany Institute on the proposed erection of local historical monuments presented April 26, 1881, and printed in volume X, the following paragraph occurs:

"Our respected neighbor, the city of Schenectady, has a university whose success is gratifying to us — has an historical scholar in whose honor we speak, but it is sadly faithless to its most interesting history. It has no monuments of the great raid of 1690, whose narrative was the theme of interest across the great sea — it has no memorial of Corlær, who, going out of Albany to find the still more remote frontier settlements, by his sagacity and estimable qualities so won the hearts of the savages that thereafter they gave his name as the equivalent of Governor, and who died while *en route* to Montreal, where his excellence had won him an invitation from the French ruler." (Transactions of the Albany Institute, vol. X, p. 143.)

If not with "the stern joy that warriors feel," it is with a patriot's grateful appreciation that we pick up with our pen, the gauntlet thus thrown down, and hand it back on our nib, with a determination to wipe out the reproach of Dorp. The "University"—"old Union" [College] — fathered by Domine Dirck Romeyn, endowed by the Dutchmen of the Schenectady Church, made national by Dr. Nott, having nobly reared her sons in the past, will I doubt not, despite a season of reverses, regain vitality in head as well as body, and yet send forth many sons to fame and honor. Our historical scholar, Professor

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Jonathan Pearson, still hale and wise in sunny old age, has spoken for himself in goodly volumes of priceless lore.

These are realities.

The monument to the martyrs of 1690 is yet in the loins of the future, and the pockets of subscribers; but its local habitation is selected, and the spirit is willing. In due time, I doubt not, will appear a child of art and memory, which shall perpetuate the virtues alike of the founder and the forefathers of the village in the pine woods, once spoken of as in "the far West," and made the theme of grave debate between London and Versailles. To add a further memorial of a man who was great in goodness, as well as renowned in statecraft, is the purpose of this paper.

It usually happens in history that the thunders of battle, the noise of the drum, and the shoutings of great captains drown the still small voice of truth. Through the dust and smoke of war, the more substantial victories of peace are discerned not at first, but later. Of the eccentric, the belligerent, and testy in church and state, the military on horseback, and the patroon on his manor, we have heard much; and epauletted and cloaked statues are beginning to be numerous. On history's sober page, or in Irving's classic jest, many names are famous or notorious; but, we maintain that of the Holland pioneers who laid the foundations of this commonwealth, and made it the Empire State, there is too little known. There is room for more monuments, as the true perspective of history retires some names to shadow, and brings others into the foreground. Of these, in my modestly submitted opinion and in the estimation of historical critics who note the effect while apparently shortsighted as to the cause, none more deserves honor in some enduring token, than the yeoman, Arendt Van Curler, the first superintendent of the Colony of Rensselaerwyck, and the founder of Schenectady.

Yet no letters on a sculptured monument or in written essay can equal the noble expression of admiration from the uncivilized Indian. The first treaty of peace made between the Iriquois and the Hollanders at Norman's kill near Albany — classic ground by a historic stream, yet to be sung in epic verse — was and is called by them "the Covenant of Corlær." For over two centuries the red men between the Hudson and the Niagara addressed the governors of New Amsterdam and New York as "Corlær." When leaving their native hunting-grounds to follow their religious teachers to Canada, the Mohawks of Caughnawaga, though changing their faith, their allegiance, their habitation

and their climate, yet carried with them as a potent talisman the cognomen of their benefactor. The name of Curler is now honored and fragrant in one American tongue, and in three European languages and civilizations. Two years ago, on the publication in Montreal of a *Lexique de la Langue Iriquoise*, by Father J. A. Cuoq, one of the missionary priests of Saint Sulpice, I sent for a copy. Among other nuggets of linguistic lore, I met with a word embalming his memory in the daily speech of the Indians of Caughnawaga. This fragment of the Mohawk tribe has been domiciled in Canada since 1670, when they left their ancestral seats on the Mohawk. Tourists down the St. Lawrence, past the Lachine rapids, will remember their pretty village on the river bank, with its church enriched by the gifts of many a sovereign of France from Louis XIV to Eugenié. Those who read the sporting items in the newspapers will recall that last spring those same Caughnawaga Indians, born almost with a racket on their feet, and a lacrosse web in their hands, beat with ease, at New York, the champion American team just returned from their victories in Europe. Again some of those red men came into notice when Sir Garnet Wolseley, transporting them beyond Egypt, availed himself of their skill in moving his boats through the cataracts and rapids of the Nile.

Cuoq's Iriquois Lexicon, under the word KORA, says: "Monsieur, the abbe Ferland (in his history of Canada) points out the true origin of this word, in making it come from the name of the celebrated Arendt Van Corlær. But it should be added further that from the Dutch governors of Orange and New Amsterdam the title of *kora* passed from them to the English governors of Albany and New York, and thence in course to all the governors of New England. As a matter of fact, the governor-general of Canada finds himself invested with this title of honor, and for Her Majesty, the queen of Great Britain, they are accustomed to exalt more highly her glory by adding the epithet *kowa*, that is, 'the great.'"

When the Canadian Indian of to-day would express in his own tongue the divinity that doth hedge about Victoria Regina, he says *kora-kowa*, "the great Corlær." The splendor of the empress of India shines among her red subjects by borrowed light. Fair as the moon and terrible to the red man as an army with banners, as is her imperial majesty, the sun that supplies the glory of her prestige is the name of Van Curler — the original Mohawk Dutchman. Herein is fulfilled the wise man's prophecy, "Seest thou a man who is diligent in his business, he shall stand before kings."

*While on this subject of titles, let us note further the term "Onontio" used by the Iriquois before the time of Van Curler, and down to the conquest of Canada by Wolfe, and familiar to all readers of Colonial documents or Indian eloquence. On this word Cuoq remarks: "This name [Onontio] was given for the first time to the successor of Champlain to the government of Canada, Charles Hault, De Montmagny, Chevalier de Malte. We have seen the origin of the title of Kora given to the kings and queens of England, and to the English governors of Canada. This title is, if we may so speak, of purely Iriquoise creation, since it is no other than that of the Hollandish governor Corlær, pronounced by a savage. But it is otherwise with the title Onontio, first conferred upon the chevalier of Montmagny. They translated his name, and to this the missionaries must have lent their assistance, without which the savages could not even have suspected the meaning of Montmagny, the *great mountain.* It is noteworthy that in rendering the name of the French governor by Onontio, they have given only a free translation — the Iriquois word meaning literally 'the beautiful mountain,' and not the great mountain. From the chevalier of Montmagny the title of Onontio passed to his successors until the title of the conquest (1760). For the kings of France they add the adjective *kowa* [the great]."

I have been particular thus in summoning testimony to the worth of Van Curler citing from the aborigines, the first historic occupiers of the soil, because they stood between the rival nations contesting for the possession of this continent, and largely by their attitude decided its occupancy. And the one man who, more than any other, secured and maintained for the Dutch and the English the friendship of the Five Nations of the Iriquois, the most nearly civilized Indians, and who were advanced above all others in political knowledge, against the French and the Algonquin Indians, north of the St. Lawrence, was Arendt Van Curler. Bancroft, Parkman, Higginson, Hildreth, O'Callaghan, Shea, Stevens, Brodhead, and, neither last nor least, our own historical scholar Pearson — name ever honorable to our city — agree in this one thing, viz.: That "the most momentous and far-reaching question ever brought to issue on this continent" — namely, that of

*When, at the bi-centennial celebration of the city of Albany, in July, 1886, a delegation of these Indians from Canada stood in Pearl street awaiting the start of the great parade, I asked one of the young braves how they spoke of Victoria, the queen of England. He answered at once, "Kora." An older Indian corrected him merely to add, "Kowa." The first one inquired of, assenting, rejoined, "Kora, Kowa."

its possession by a Germanic or a Latin race—hung largely upon another question, which side should win and hold the friendship of that powerful confederation of red men, who overawed or held in tribute the Indians from the Mississippi to the Atlantic, and from Lake Champlain to the Chesapeake.

This was the question unanswered for a century and a half.

In the first place, this mighty confederacy of tribes held, as their "long house," that wonderful portion of this continent which seems by nature created for empire, whether in the stone or the iron age, the Empire State it was then, the Empire State it is now. It holds the keys to the water-ways between the fresh and the salt seas, for its rivers run to the Atlantic, the St. Lawrence, the Mississippi and the Gulf of Mexico. Its land routes, fitted for trail, pike, plank, iron or steel roadways, are smoothed ready for foot or wheel, moccasin or tire by nature. Nowhere along the mountain-ribbed Atlantic coast is there such another long, level, natural roadway as that of the Iriquois trail between the cataracts of Cohoes and Niagara, now banded by the steel rails of two mighty corporations.

From Champlain to Montcalm, the French by diplomacy, religion, threats, flattery, and all the resources of Gallic wit, force, and address endeavored to gain over the Iriquois to their king and cause; but ever loyal to "the Covenant of Corlaer," they adhered to the Prince of Orange and the Sovereign of Great Britain. They acted as a stone-wall, a breakwater, against the storm and tide of French aggression, while the English colonies nourished their strength, and won this fair land, first from the Gaul, from Latin ideas and civilization, and then from King George and monarchy.

What began that struggle which from a backwoods raid became a clashing of empires? What part did Van Curler bear? Was he "a Dutch clodhopper," or a far-seeing statesman?

Let us go back twenty-one years before his arrival on this continent:

In 1609, Champlain, in company with a war party of Hurons and Algonquins, proceeding against the Mohawks unwarrantably interfered in their tribal quarrels, and decided the scale of victory. The Mohawks were defeated by the power of gunpowder and invisible missiles. Again, in 1615, this Frenchman in glittering armor with five belching weapons went along with the Algonquins to the Mohawk country to besiege their castle. These proceedings aroused a spirit of hatred against the French, and to counterpoise the odds against them, the Iriquois sought alliance with the Dutch. Powder and ball were their

first desires. Their motives were utterly selfish, when in 1617, two years after Champlain's second filibustering interference, they came to Fort Orange, and made a formal treaty with the Dutch.

A compact made between two alien races on the basis of their mutual hatred to a third party is not likely to last, when the once enemy turns friend, or the old friend falls on adversity. Why was it, that the cruel, selfish savage kept inviolate for over a century this covenant sealed only with the sacrament of wampum belts, amid all temptations to rupture? Why did Dutch and British alike keep with even more faithfulness their word with the weakening savages, even when they had exhausted the benefit of their service? Why, amid all vicissitudes was their treaty negotiated with less fuss, ceremony and spectacular display than Wm. Penn's with the Lenni Lenapis — observed with better faith, too, than was the Philadelphia compact.

In the painting of Benjamin West, by fascinating but uncertain legend, and by the praise of Voltaire, who, to sneer at religion, wrote a lying epigram, the Quaker's treaty has been given world-wide fame. The witty Frenchman said of it "never sworn to, and never broken." History, however, demonstrates, that while Penn and the Friends kept their word, the people of Pennsylvania did not. In New York, the promises on either side were kept, until Americans and British themselves came to blows, a calamity which fell heavily upon the Iriquois, and from which they never recovered. If it be objected that the raid and burning of Schenectady in 1690, and the five years Indian war under Kieft appear to militate against our statement, we have only to mention that the Schenectady massacre was by the French and proselyted savages from Canada, not of New York, while the five years war under Kieft was waged by Indians not Iriquois. This war, by the way, was healed nominally by Stuyvesant, but actually by Van Curler in 1660.

I am glad that a distinguished gentleman of the legal profession asked me "Who was the founder of Schenectady? Was he any more than a Dutch clodhopper?" I can safely answer that he was a scholar and a gentleman, fluent with his pen, possessing a gift by no means to be despised — the mastery of languages. He was a man of systematic mind, and so faithful to his trust and vow, as to recall a Roman of classic days. Withal, he was so kind of heart, so full of deep conviction of conscience along with a power of rising above the narrowness of sect and nationality, as to suggest a Christian indeed. Brave as a lion, he feared neither round-robin conspirators, nor the schem-

ing lawyer who used his profession mainly to molest honest men, nor crafty savages, nor perfidious French. Further, he had the eye of an engineer and strategist, with the foresight of a statesman.

Arendt Van Curler was the first cousin of Kilian Van Rensselaer, and came to this country in 1630. Of the original company of ten members, or "co-patroons," all on the same footing to plant colonies in America, Kilian Van Rensselaer seems to have been the most successful, and we shall see why. Others formed colonies along the Hudson in New Netherlands. Others disagreeing, or thinking more profitable ventures could be made in the East Indies, gave up America and tried the Spice Islands, Formosa and Japan. Vries became the famed navigator who left his name on the large island near the bay of Yedo. Hendrick Hamel went out as supercargo to Nagasaki, and was wrecked in Corea, kept a prisoner, and escaping, got home to Holland, to find his old friends Kilian Van Rensselaer, dead, and Van Curler, drowned, in far off America; but Rensselaerwyck had prospered, Why? The patroon never visited the colony, but confided all to his agent, Van Curler, the first superintendent. Hear what L. P. Brockett says: "The administration of justice, and the management of its financial affairs, he committed to a commissary-general. Fortunate in the selection * * * his colony prospered much more than that at New Amsterdam, and it was to the good offices of Van Curler, or Corlaer, the first commissary that the colonists at New Amsterdam were indebted more than once, for their preservation from destruction at the hands of the savages" [during Kieft's mal-administration]. This excellent man cultivated the most friendly relations with the Indians, and so strong was their affection for him, that ever after they applied the name Corlaer to the governors of New York, as the highest title of respect. "So too, from the date of the settlement of Albany, the county was never invaded by these sons of the forest. The Schuyler family, for several generations carrying out the policy inaugurated by Van Curler, exerted a powerful influence over the Indians. Unfortunately, Van Curler left no descendants to keep alive the memory of his services.

Van Curler's jurisdiction, as superintendent and justice of the colony, extended from Beeren Island in the Hudson to the mouth of the Mohawk, and he was also colonial secretary until 1642. He provided food and sustenance for the immigrants, promptly bringing them up from Manhattan Island, enrolling them, arranging for their houses and assigning their farms, while guarding against famine, dis-

order, and the foes of the forest and from Canada. He took every right means to increase honest trade. His devotion to his master brought him into collision with the traders "in the bush." A protest against him was fomented by Van der Donck; and his enemies put their names to the paper in a circle, so that it should not be known who had first signed it, or in other words, who was the ring leader. Their activity brought him into such temporary unpopularity that some were for driving him out of the colony as a rogue. Others wished to assassinate him.

Evidently life in a frontier settlement in the woods was then very much what it is now, and the characters much the same. The firmness, courage, fair play, and unwavering good nature and honesty of Van Curler carried him safely through the crisis. By degrees, the popularity of the superintendent returned, and Van der Donck left the settlement. Van Curler's prayer, if it were identical with Job's, was answered, for his rival did "write a book" in 1655, which is still valuable as a literary photograph of colonial New York, the Netherlands in America. Van Curler, according to orders, had "concentrated" the immigrants into a *Kerck burte*, a parish or church, neighborhood, near the Beaver's creek or Greenbush ferry. He built a church and parsonage. This was the first protestant church edifice built as such and so consecrated on the continent of America.

The domine* Megapolensis began his work among the people, morals improved, home life began to be more stable and retired, and prosperity was laid on a sure foundation. Van Curler and the parson were always good friends, the layman ever taking counsel with his clerical brother, and receiving his advice with respect. Thus the unseemly war between bench and pulpit, which disgraced Manhattan island, was unknown in Rensselaerwyck. Through all the stormy administration of Governor Kieft, and the five years' war which wiped out so many Dutch settlements on the Hudson, and nearly annihilated Manhattan,

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* There is no other way of spelling the title of a pastor of a Reformed [Dutch] church in Holland, America, South Africa, or the East Indies, but that in which it is invariably spelled in the Dutch records. It is always domine and not "dominie." The Dutch title is the unaltered Latin. "Dominie," in English and Scotch *may* mean a parson of some kind; it *does* mean a teacher or schoolmaster. This orthography of domine is the usage in Corwin's "Manual of the Reformed church in America," in Pearson's "Schenectady First Church Memorial," in *The Christian Intelligencer*, and in the writing of *all* critical and careful writers (except where printers tamper with their MSS.), who write concerning ministers of the Reformed churches in the Netherlands, or their offspring. Further, to join a Scotch term savoring of cant or slang to a Latinized form of a Hollander's name is to do something which scholarly Hollanders would never approve of.

Van Curler's firm hand in the colony and unbounded influence over all the Indians, kept the advancing prosperity of the colony of Rensselaerwyck in the safe path. It was in the midst of danger of infectious lawlessness and savage irritation, that he made his first journey into the Mohawk country. Of this wonderful valley he was not the original explorer, though he was probably the first white visitor who described and fully appreciated it.

Humanity prompted him to this westward errand. News came to his ears that two French priests were in the hands of the Mohawks near Caughnawaga, now Fonda. Like tigers with their prey, the savages intended to enjoy the torture of their victims before burning or tomahawking them. Van Curler was a Dutch patriot and a Protestant of Orange dye, but he was more — a Christian and a man. "Why risk life among the bloodthirsty savages, and intermeddle to save a papist and a Frenchman," some doubtless may have said. Van Curler, without argument or reservation, quickly collected ransom to the value of 600 guilders equal to $250 then, or perhaps $500 now. He rode up the valley, in September, 1642. It was then dressed in the gorgeous livery of autumn, and bright with many an acre of ripening maize. He called it "the fairest land that the eyes of man ever rested upon," but the moral beauty of his own act exceeded even that of nature. He did not succeed in ransoming or rescuing the priest, Father Jogues; but he secured a promise from the savages not to kill or further torture him. Afterwards, Van Curler assisted Jogues to escape from Albany to France, where at the imperial court at Versailles the scars of his fingers which the savages, like wild beasts, had chewed and from which they had torn out his nails, were kissed by proud lords and lovely ladies as of those of a saint. Again this devoted missionary returned to America, and was again captured by the insatiate Mohawks. This first Roman Catholic missionary on the soil of our state, and the discoverer of the Lake of the Holy Sacrament, now ignobly named George, finally suffered martyrdom at Ossuerenon, near Auriesville. On the hills overlooking the station of the West Shore railway, he yielded up his life. In his honor, a shrine to the Virgin, "Our Lady of Martyrs," is now erected. Yet with nearly equal propriety, is the name of Van Curler the exemplar of noble humanity linked to the spot.

This was but one of the many visits which Van Curler made to the Indians at their homes and council-fires. Having mastered their vernacular, he was able to hear from their own lips, their side of every

question. Hence, he had never to trust to interpreters, or to rely upon, hearsay or uncertain information. When in 1646 Stuyvesant arrived, and began his administration by settling the Indian difficulties which had afflicted the lower settlements, he sent first of all to Van Curler, for advice and direction. Later at a great convention of chiefs of all the non Iriquois nations, held at Esopus in 1660, an agreement of peace was made. In this work, Stuyvesant was the figure-head, and Van Curler the real diplomatist and peace-maker.

One of the many journeys made in carrying out the policy of justice and peace with the Indians brought him to the house of Jonas Bronck, who has given his name to one of the rivers and villages — Bronx and Bronxville — of Westchester county. Here, after punishment inflicted on the actual murderers, peace was made with the Wickwaskect tribe, at the house of the burgher whose widow Antonia afterwards became Van Curler's wife. They were married in the autumn of 1646, and settled down in one of the best houses of the settlement of Rensselaerwyck, for she was deserving of it, being as her husband states, "a good housekeeper."

Having now the prospect of domestic happiness, desirous also of possessing a farm, the affairs of the colony withal being settled, Van Curler leaving his bride behind him, visited Patria (Holland) to report to his lord the patroon, and get a lease for his "bowerie" which was near Cohoes.

The patroon Kilian Van Rensselaer died in 1646, leaving the colony in the hands of his son Johannes.

Van Curler returning to America went to live on his farm, and there enjoyed the pleasures of unofficial life. Yet his days were far from inactive. He seized every opportunity to educate and benefit the Indians, rescue Christian captives, and cement the bonds of friendship with the red men. Van Curler owned a brewery in Rensselaerwyck and believed that beer was good for Christian and savage; but the use of brandy, rum, whiskey, and the various concoctions of "fire-water" he condemned. He attempted, in vain, however, to influence the Indians against drunkenness, and to prevent the traders from selling strong liquors. At one time, when, on account of troubles largely occasioned by liquor, the relations of the settlers and the Mohawks were strained, we find Van Curler leading twenty-five of the chief men of the settlement and proceeding to Caughnawaga. There on the 17th of September, 1659, after the calumet had been smoked with the sachems Van Curler made a forcible speech, pointing out firewater as

the potent cause of their troubles. His arguments and eloquence were satisfactory and successful, and the links of the covenant chain were forged anew.

Now came the time for another of the great achievements of our hero's life. Largely through his acts and character, the way was paved for the peaceful settlement of the Mohawk valley by the whites. Food had become scarce near Fort Orange, farmers wanted homes, but were not willing to settle at Rensselaerwyck under semi-feudal restrictions. Having left Patria, they wished to hold their land in fee simple, and when dying to bequeath the fruits of their toil to their children. This, under the patroon, they could not do. Van Curler sympathized with them, and himself longed to possess land not as a fief, but as a holding forever. Accordingly he applied, June 18th, 1661, to Gov. Stuyvesant for permission to purchase "the great flat" of the lower Mohawk valley from the Indians, called by them Schonowe, including the site of one of their villages, Schenectady. Owing to influences emanating from Rensselaerwyck, the privilege of trade was not granted until 1672, and at first the little frontier settlement was wholly agricultural. Van Curler for years vainly protested against this churlish and illiberal spirit which savored of the dog in the manger, and so long hindered the growth of a true commonwealth. Van Curler's plea was for unshackled commerce, free trade and farmer's rights, as against monopoly, semi-feudalism and whiskey.

Here note the liberal principles on which Van Curler founded his settlement; they were justice, temperance, and liberty. Wm. Penn has been lauded for buying the land of the Indians. Van Curler did the same. He fought the whiskey-sellers whose fiery liquid destroyed the red men as did small pox, and turned reasoning men into murderous brutes. He pleaded for the rights of trade to actual settlers on wild lands as against monopoly, and for the privilege of holding land in fee simple, and bequeathing it to children. Here, having taken the subject of my sketch beyond the boundaries of Renssalaerwyck, it is proper for me to postpone the continuance of my story. In a further and more elaborate study, I hope to present the life and works of Van Curler in befitting dress. Suffice it to say that in 1664, on the conquest of New Netherlands by the English, one of the first acts of Colonel Nicholls was to send for Van Curler to consult as to his policy with the Indians. Two years later, the French expedition of Courcelles was saved from starvation and probable annihilation by Van Curler. Hastening from Schenectady with provisions he succored his famishing

fellow Christians who had fallen into ambuscade, while also warning them off English ground. Had the founder of the settlement lived, the frightful massacre of 1690 would, doubtless, never have been consummated. In 1667, while on a visit to Canada, by invitation of the French Governor Tracy, Van Curler was drowned during a squall in Lake Champlain. "In the middle of the Lake where Corlaer was drowned," reads the old chronicle, but the exact spot we do not know. For a half century or more this sheet of water was named and known to the English only as "Corlaer's Lake," while "Corlaer's Bay" is still on the maps.

Craving pardon of my hearers, and of this honorable Albany Institute for presenting so fragmentary a paper, pleading shortness of notice, and press of imperative duties as my excuse, I beg leave to state that life and leisure being given, I hope to do fuller justice to a name most noble among those who laid the foundations of the greatness of the Empire State.

THE VARIATION OF THE NEEDLE AND THE LOCATION OF THE ISOGONIC LINES IN NORTHERN NEW YORK.

By VERPLANCK COLVIN.

[Read before the Albany Institute, February 3, 1885.]

The first paper in the first volume of the transactions of the Albany Institute is entitled a "Table of variations of the magnetic needle, from data in the possession of Gen. Schuyler;" and was prefaced by some brief, but interesting remarks by the Hon. Simeon De Witt, then Surveyor-General of New York. This paper was presented on the 27th day of April, 1825, probably a short time after the actual consolidation of the parent associations — the Society for the Promotion of the Useful Arts, and the Lyceum of Natural History — that carry the history of the Albany Institute back into the previous century.

In this paper the Surveyor-General refers to his settling in Albany, in 1785, at which time, he says, "I established a true meridian, on which I occasionally set a compass for the purpose of observing the variation of the needle; and from these observations I found no reason for departing from the old rule until 1807; when, to my surprise, I found that a sudden change had taken place in the direction of the needle."

Mr. De Witt then proceeds to tell of his discovery of the change of direction of the annual movement of the magnetic needle, from an easterly to a westerly variation at Albany in the year 1807, and states that at the time of the writing of his paper, his observations showed that the amount of what he terms the "retrograde" motion of the needle, was found to be two minutes of arc per year. To make the meaning more plain, we may say that the "retrograde" movement, as he calls it, was a gradual movement of the north point of the needle to the westward, a change in the annual resultant of magnetic force, which had previously been tending eastward.

It is an interesting fact that the first practical steps toward the application of even proximate scientific principles in the use of the magnetic needle on the land surveys of our State originated in the halls of the Albany Institute, and was the work of a State officer who

was the first to systematize and organize the land surveys of our infant government, inaugurating, as he did in Western New York, what is known as the "rectangular system," and the township and section allotments, which form the basis of the modern system of surveys of the territories of the United States. The name of Simeon De Witt must ever recall to our minds a careful and conscientious officer whose intellect and genius have thus left their impress advantageously upon almost every section of our country.

Yet interesting and valuable as is the record left to us, in this first paper of the Albany Institute, it shows that even in the days of Simeon De Witt, while the Surveyor-General's office of the State was yet in great activity, either the means or the men were lacking to secure all the scientific information which was desirable, and the survey department was dependent upon the few observations made personally by Mr. De Witt, and his afterward famous friend Prof. Joseph Henry, then occasionally engaged, when school duties permitted, in "surveying farms in the town of Coeymans." *

These observations, combined with others, furnished by John Winthrop (Hollis Professor of Mathematics in Harvard College), appear to have formed the only basis available to the then Surveyor-General in his investigation of the variation of the needle.

Yet the "variation," or rather variations of the magnetic needle, had elsewhere been studied for centuries, and a multitude of observations had been taken both on land and sea, and had already been made the subject of profound mathematical investigations, that rank as classical in the earlier literature of magnetism. Probably this literature was scarce and little known in the time of Simeon De Witt, for few, if any, of the old and crumbling text-books of that time give any reference to magnetic variation.

Nevertheless it had been known for centuries, perhaps even for a thousand years, that the magnetic needle did not indicate the direction of the true meridian, or true north, or true south. It had been known to mariners that the magnetised needle did not point constantly the same angle with the true meridians of the different places they visited in their journeys. Closer study had taught critical investigators that this same useful needle did not even stay constant in its pointing from year to year in the same place, and still later science proved that in most localities the needle changed its position from hour to hour — and further that it sometimes worked eastward and sometimes westward to the extent of several minutes of arc during the

* Same paper.

same day. Then came the discovery of magnetic storms, and a knowledge of the large oscillations of the needle that they occasion, and of the effects induced by local attraction and atmospheric electricity. Yet during probably more than one-half of this entire period we find little attention paid by practical men to this important matter, and the records of both the colonial and earlier State surveys contain hardly any references even to the amount of the declination of needles of the compasses used in surveying the public lands, and no study seems to have been made of the annual, monthly, diurnal or hourly variations or movements, any one of which would tend to introduce errors in the direction of lines run for the subdivision of property.

In the tracing out of ancient lines in this vicinity many a skillful surveyor has been perplexed by the *probable* eastward and positively certain westward movement of the needle to an unknown extent since the time of the ancient survey. Yet it must be remembered that, imperfect as the magnetic needle is, with all its singular peculiarities of movement, it has, nevertheless, been of inestimable service to the human race, for without it America had never been discovered, Sir Francis Drake would never have sailed around the world, nor Hendrick Hudson brought his ship to the mouth of our river and made known to our ancestors the rich territory of New York.

When Chinese caravans traversed the sandy deserts toward Tibet, guided by the "magnetic carriages," whose floating needles pointed out the way to the rich commerce of the south-west; when the clumsy junks that had hitherto crept along the Asiatic shores, ventured out to sea and brought back to the land of Confucius the spices of Java and the wealth of India, the foundation was laid for that great commerce which feeds the millions of the present, and without which all our boasted civilization and knowledge would be as limited as our communications with foreign countries difficult or inconvenient.

It is not material whether Marco Polo first brought the magnetic needle into use among Europeans or whether Flavio Gioja originated the compass of the mariner. It is not important whether we owe its introduction from the east to the Arab sailors of the Mediterranean, although it may be said, in passing, that the word azimuth, or properly it is claimed *assumût*—still so much used in surveying—is Arabic, its eastern origin substantiated by its reckoning all bearings from the south. However it came, the magnetic needle is with us, and has long been with us, and has affected in a most important manner nearly all the boundary lines of property in the older States of our Union.

If we no longer use it in Government work for the original subdivisions of the public lands, we nevertheless find hundreds of local practitioners of surveying who believe religiously in the "compass" so reverenced by their fathers, and employ it in private work with the implicit faith which is often given to the ancient and time honored. Thus the courts, at the present day, behold the compass surveyor giving testimony as to chain and needle, distances and bearings, side by side with the skilled engineer with transit and steel ribbon.

At the present time when modern methods and instruments of precision are employed upon the State work in the tracing out, restoration and monumenting the important ancient boundaries, there is constant occasion for practical study of the magnetic needle, and its variations in order to accurately re-discover the direction and location of the boundaries that are to be restored, and it is thus that I have been led to important and interesting discoveries believed to be worthy of record as a contribution to our knowledge of terrestrial magnetism.

In order to recall to mind the principal facts established in regard to terrestrial magnetism, so that the direction and scope of the present discussions may be better understood, a brief statement of the principal conclusions reached by scientific investigators is desirable, and may be best given in the order of their discovery.

Historical Memoranda.

Eleven hundred years before the Christian era, the embassadors of Tonquin and Cochin China, guided across the vast plains of Eastern Asia by the floating needles, probably studied and discussed beside their camp-fires, under star-lit skies, the changes in the pointing of the needle; and they were too wise and thoughtful to have attributed the cause to magic or enchantments. Indeed, while Constantine the Great was founding the Empire of the East, Kuopho, a Chinese writer, thoughtfully recorded his opinion that electricity and magnetism were controlled by one and the same force; which, "like a mysterious breath," thoroughly permeated the substances affected. Later, we learn that the Chinese used the suspended needle, and with it observed the declination from the true north, but passing rapidly on to the year 1492, we reach the striking discovery of the line of no variation, found by Columbus on the 13th of September in that year less than 150 miles west of the Azores, traversing the Atlantic Ocean in a northerly or north-easterly direction. This, first of Agonic lines, Columbus, as its discoverer, proposed as the boundary between the dominions of the Kingdoms of Spain and Portugal, which, enforced by a decree from the Vatican, aroused the greatest interest among

practical men,(navigators, geographers, merchants, courtiers and politicians) in the variation of the magnetic needle, and led to the construction of a variety of instruments for facilitating the necessary astronomical and magnetic observations. Solar compasses are spoken of among the instruments then devised, and we hear for the first time of "variation charts," for Columbus had also found that on either side of his line of no variation there were easterly and westerly declinations, increasing as this line was departed from. As the interest increased and the investigation of the phenomena was extended, another great line of no variation was discovered in the eastern hemisphere; the dip or vertical inclination of the magnetic needle was observed by Norman, and the great work of Gilbert, *De Magnete Nova*, replete with information and valuable suggestions and inferences, gave stimulus to the study of this branch of physics.

Then the Astronomer Halley, after scientific voyages around the world under the auspices of the British government, brought together a vast amount of information from many climes, and gave to the world the first reliable magnetic charts of its oceans; while his critical discussions of the data obtained enabled him to indicate, with remarkable closeness, the location of the magnetic poles of the earth, proving them to be far distant from the geographical points. Improvements in instruments, methods and the manner of observation rapidly followed, and hundreds of names — memorable in science — are now met with, while the invention of apparatus keeping pace with discovery, the hitherto small but important variations came to be studied as well as the intensity of the magnetic force, and its increase and decrease. Then came the establishment of magnetic and meteorological observatories, and we are to-day reaping the profits of thousands of original investigations in the varied magneto-electric devices of utility and convenience, which the study of this branch of physics has so greatly furthered.

Our time will not admit of even a brief account of the great magnetic observatories of the world, or of the toilsome journeys into distant lands made by scientific men, in order to discover the cause and extent of these variations in the earth's magnetic force. The names of Gay Lussac, Humboldt, Bache, Parry, Ross, Hansteen, Oersted, Scoresby, Sabine, Erickson, Arago, Gauss, Faraday, Airy, Lefroy and Thompson remind the student of a thousand magnificent discoveries, which cast a lustre upon each name, as bright as the dazzling rays of the electric arc itself. Thus the magnetic observatories of Europe*

* Followed at a later date by the work of the U. S. Coast Survey.

supplemented by those at the Island of St. Helena, and at Hobartown and Toronto, as the result of years of cautious and critical observation, afforded proofs that the earth's magnetism is governed by certain general laws, while the observations of the amateur astronomer Schwabe, covering a period of forty years, proved the magnetism of the earth to be, to a certain extent, an induced condition, dependent upon the variations in the energy of the sun. But the correspondence of the periods of unusual solar energy with simultaneous magnetic disturbances upon the earth's surface, and indeed all the laborious years of work at the great magnetic observatories only teach us that each locality has its own law of variation of the magnetic force — declination, inclination and intensity — expressible by algebraic formulæ, and that the time of maximum and minimum movement in declination, etc., and the amount of movement at one station (save only in the case of "magnetic storms") differs more or less from that at some other point upon the world's surface; proving that local observation is the only method by which the local co-efficients of the magnetic force can be determined.

The magnetic storms that traverse the earth at times, disturbing almost simultaneously the terrestrial force at every magnetic observatory are cosmical phenomena synchronous with similar solar disturbances, a possible jarring and quaking of the universe, abnormal and only indirectly related to the particular class of phenomena under discussion, which is the more permanent resultant known as the declination, or horizontal variation.

The chief service of the magnetic observatories, to field observers, is that their constant series of observations afford a knowledge of the times of maximum and minimum declination at localities nearest the new points of observation, indicating to the explorer the most appropriate period for observation, and thus economizing much of the labor of field work, while by recording the occurrence of magnetic storms, they render it possible to avoid the introduction of such abnormal disturbances into the data of practical work.

This will explain why, notwithstanding the existence of superb magnetic observatories in different parts of the world, the greatest scientific importance is attached to all local observations of the directive force of terrestrial magnetism, as a means of ascertaining not mere theoretic locations for the isogonic lines, but positive observations, showing the exact location of these lines in a manner to clear up and simplify all practical questions dependent upon such data.

The location of the theoretical isogonic lines, as shown upon declin-

ation charts, is of unquestionable value as they confirm, enforce and verify the opinions we may form as to the magnetic conditions to be anticipated in any local work of observation; but the closer the stations are located the more exact becomes our charting of these theoretic representations of the magnetic force, and the more wonderful, elegant and valuable are the results both in the increased accuracy of the information conveyed and the corresponding practical advantages, so important in some of the special surveys which I have had recently to conduct on behalf of the State.

Such must be the explanation of the utility of these special local observations of the declination of the magnetic needle from the true meridian. I have only to regret that the limited means and restricted objects of the work did not permit the observation of all the elements, into which mechanical contrivances have divided the sum of the magnetic forces; yet will hope that, in future, broader views may enable us to secure much scientific data without any loss to the purely practical and utilitarian part of our work.

Before giving an account of the results of observation in Northern New York, some mention of the methods employed will be appropriate.

The True Meridian.

A knowledge of the location of the true meridian is, of course, the first essential element in the study or investigation of the closeness of the indication of the magnetic needle of the direction of true north, or of its declination to the eastward or westward from the direction of the geographical pole.

A new meridian line is only to be determined by astronomical observations; but when one such true meridian has been established, other secondary meridians may be located by triangulation to the east or west, and thus the azimuths of a great primary triangulation make the true meridian easy of reference at all the signal stations of the work.

Of the great astronomical meridians, those of Greenwich, Paris and Washington are familiar examples, but modern geodesic work is generally carried on at a distance from the National observatories; and although the observatories are connected with the base-lines of the great geodesic surveys by telegraphic determinations of differences of time, or by triangulation, etc., in order to obtain the longitudes of the initial stations of the survey; yet the *direction* of the meridian, in each locality under survey is invariably determined by local astronomical observation made in the field with portable instruments.

Telegraphic longitudes, and time determinations between any two stations are liable to peculiar and uncertain *local errors* — chief among which is the disleveling of the astronomical instruments at each terminus caused by the local differences in the direction of the theoretical vertical from the actual lines of gravitation, so that time stars are not observed similarly (that is, under similar conditions), while the resultant deflection of the horizontal plate of the transit instrument from the symmetric geodesic horizon occasions uncertain deviations in azimuth which cannot be corrected when the observations are not tied together by accurate triangulation — the only precise method of linear measure of great distances.

On this account, therefore, surveyors determine their meridian lines by observations in the field, and not by deduction from the differences of longitude between some observatory and the extremities of the base-line.

The *longitudes* of stations are determined after much careful and difficult work, and adjusted by complicated computations, but the local azimuths of the triangle sides, and the local meridian lines determined in the field are essential in the adjustment of the longitude of base-line termini, and the local meridian is the line from which each declination or variation of the magnetic needle is measured.

It is not here necessary to describe the methods employed in geodesic work in locating the prime meridian of a triangulation.

With the larger forms of the portable transit, with the alt-azimuth instrument, and the twenty and twelve-inch theodolites, the direction of the true meridian is determined with the exactness requisite for the computation of the *geodesic azimuths, latitudes* and *longitudes.* By the observations of stars with the telescopes of high power, with which these large instruments are provided, the astronomical co-ordinates of each geographical position are determined with a high degree of precision, and at such stations it is merely necessary to place the zero point of the magnetic instruments, used, in the true meridian determined, and the differences then observed in the direction of the magnetic needle are the variations sought — the declination being the pointing of the needle to eastward or westward of the true meridian — reduced to the instant of diurnal magnetic quietude.

The primary meridians of a great survey are often twenty miles apart, and in order to obtain the true direction of the boundary lines in the dense forest, intermediate between the mountain peaks, and to trace them successfully over iron ore or any line of local attraction, so that their *true* location can afterward be shown upon the maps, frequent

determinations of the direction of true north must be made. These meridian lines are often detached from the main system of triangulation, and upon the surveys of the public lands under the superintendence of the writer are located for the purpose of testing the compasses of the local land surveyors, and ascertaining the true azimuths of the lines run. For such work, over rough and difficult country, where there are no roads, and rarely any paths or trails, the large and ponderous theodolites are rarely available, and always inconvenient, requiring much night work and delay. Their weight and cumbersomeness usually prevent their employment on the township and lot lines in the forest, and a desire for convenience and rapidity in work has led to the use of other instruments, light enough to be carried by one of the surveyor's assistants, and so made as to be readily adjusted and available for work at almost any time.

Life is so short, and time so much an element of utility, that these portable instruments, furnishing the necessary information within the limits of accuracy required on township or lot lines—and, by careful use, yielding valuable scientific information in regard to terrestrial magnetism at hundreds of localities from which we should otherwise have no information whatever—are found to be of the greatest convenience.

Field Methods of Observation.

While the time at disposal will not admit of my giving an account of all the instruments that have been devised to facilitate the determination of the declination of the needle upon land-line surveys, it is believed that a brief sketch of the growth or evolution of the instrumental forms now in use will assist the unprofessional to an understanding of the work to be done, and the way in which the results are obtained.

Disregarding the vague descriptions of the more ancient instruments and the delicate torsion instrument, and dealing only with those in practical use in the daily work of navigators and engineers, the first form of declinometer that we meet with in general use is the azimuth compass, a nautical implement with which the greater number of observations of the "variation" at sea have been taken.

The azimuth compass of the navigator is a large instrument, hung in gimbals, yet its sights are easily turned in any direction so as to aid in taking magnetic bearings to any object. The true bearing or azimuth of any such magnetic sight-line is usually obtained at sea by the "amplitude of the sun," that is its bearing near sunrise or sunset, or the azimuth and altitude of the sun (the altitude being taken with

sextant), a simple computation then giving the direction of the true meridian closely enough for purposes of navigation. The difference between the magnetic and true azimuth of the sun would, of course, be the declination of the needle. It is evident that such observations cannot be as accurate as those taken on terra firma, but as they are sufficiently correct for navigation, these methods will probably always be used at sea.

The form of azimuth compass employed on hydrographic surveys from boats will give some idea of the larger instrument and is here exhibited. It is quite convenient when magnetic bearings are desired from a float that is rising and falling with the waves, the needle carrying a circle divided to degrees of arc read by reflection in the line of sight by means of a prism possessing magnifying power.

Whether the azimuth compass and the frequent use of the sun in connection with it, as an astronomical signal, suggested the solar compass, cannot be told, but the absence of a clear unobstructed horizon has prevented the use of nautical methods inland, and land surveyors have in former years to a great extent made the pole star their point of reference.

Tables, published in text-books on surveying, give the mean solar time when that star (*a Ursa Minoris*) is on the true meridian; and, if this occurs at some inconvenient hour of the night — or in the day-time when the star is invisible — other tables in the same books give the times of elongation of the star, its easting or westing from the meridian and the azimuth angle between it and the true meridian at various latitudes. The trouble with such tables is that in time they become obsolete, as even the fixed stars are less permanent in their apparent positions than most people imagine.

Yet local surveyors often continue to use the tables long after the periods for which they were designed, believing the contents of their text-books to be indisputable authority, and the "fixed stars" to be immovable.

To remedy this source of error I have taken occasion in my reports on the progress of the Adirondack survey to publish new tables of the time of upper transit of Polaris, and of its eastern and western elongations, which have been regularly computed in the survey office for each year, and printed and distributed to the assistants on the survey needing them.

It requires patience and time however to observe the pole star either on the meridian or at elongation, and surveyors usually do not attempt other methods of star-work when using the small forms of engineer's

transits. When it is considered that after waiting at one place for a day or two for a clear night to observe the star, a single cloud flitting across the sky will often prevent observation at the instant that it should be taken, we shall not be surprised that inventive and thoughtful men have made efforts to discover other methods for determining the true meridian which should be sufficiently accurate, and be available at different hours, and particularly during the natural time for work, during the day.

The great equatorial telescopes of observatories make the stars visible even when the rays of the sun fill the sky with polarized light; and it must be believed that this fact and the peculiar mounting of this form of instrument led to the construction of the first real solar compass, which may be regarded as a species of portable equatorial instrument.

The solar compass was invented and patented by Mr. William A. Burt, an American surveyor, in 1835.

The horizontal limb, sights, declination and hour arcs, are essential parts of this useful instrument, which has been so extensively employed in the United States Government surveys of the public lands.

The success of the solar compass as a practical implement in surveying led to many attempts at its improvement, but the patents held by the inventor covered most of the devices proposed and prevented the combination of the improvements until the expiration of the patent a few years since. Many surveyors , also, who were unfamiliar with the instrument, and from old habits could not be brought to see the utility of frequent determinations of the true meridian, still made annual or even less frequent observations of Polaris, in accordance with the old tables, when they desired to orient a survey; and believed that the constantly changing declination of the sun, and its large size as an object of observation, made it an inaccurate signal. They were not as familiar as navigators, with the reliable nature of our great luminary, and did not consider that in land surveys the roughness of the ground traversed requires more frequent determinations of the direction of the meridian than is convenient to obtain by observations of the pole star. Every few miles in land surveys the direction of the lines run requires testing and adjustment to the true meridian to the degree of closeness that is read upon the limb of the surveyor's instrument.

They were not aware that this necessary information could be obtained within certain practical limits when the data for observation were carefully arranged and computed in advance for the time of observation; and it was not until the so-called "solar attachment" for

engineer's transits was devised; and its great utility, in localities where local attraction is met with, demonstrated; that surveyors in the eastern States came to regard this instrument as a valuable convenience. No sooner, however, was the utility of this new device admitted than various forms of solar attachments to transits made their appearance, and even a form of "pocket solar" was contrived. Almost all these forms of apparatus are before you this evening and I shall take pleasure, a little later, in exhibiting and explaining the use of these instruments. Among them will be seen the original form of Burt's solar compass, the Gurley and Holmes' solar transits, Stackpole's solar attachment, Sagmuller's solar telescope, the pocket solar, etc. The general principle of these instruments is nearly the same. A determination of the latitude of the place of observation is first made. The declination of the sun (or star, if a star be observed),* is then laid off on a declination arc, centered over the instrument upon a polar axis, and the instrument thus set with its hour circle in a plane parallel to the plane of the earth's equator, the sun (or star) can only be observed through the declination telescope, when the instrument is in the meridian, so that the bringing of the instrument into the meridian is then readily accomplished by a few turns of the tangent screw.

Recent Observations in Northern New York.

As the result of my personal observations of the magnetic declination in the northern district of New York, during a long period of years, I am able to place before you the first map that shows with any minutiæ the location of the isogonic lines, or lines of equal magnetic declination in the Adirondack wilderness region and adjacent settled districts.

Some of the more recent of the magnetic observations that I have made are among the most interesting, as they have enabled me to ascertain what the declination of the needle of the compass surveyors was at periods prior to the Revolution. Not only the error of the pointing of the needle used more than one hundred years ago is thus obtained, but at times valuable evidence indicating the date of the change in the directive motion of the controlling magnetic force at that distant period is found with accuracy. This information is an element of the greatest value in the study of terrestrial magnetism, and the method, although indirect, is not so obscure as to be difficult of comprehension.

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*In the most improved forms, the telescope of the attachment can be used to observe stars at any declination and hour angle.

The process followed in securing these recent observations of ancient phenomena consists in searching out long sight-ranges on the boundaries of the ancient land patents, where the dates of survey with magnetic compass are known from authentic records. The range of such an ancient line having been found, its astronomical azimuth or bearing is determined by observation and the true bearing of the line thus becoming known, the difference between this permanent azimuth, and the ancient magnetic bearing recorded, is the variation or declination of the needle at the time that the first survey was made. A study of a number of these ancient lines marked at various dates gives the date when the easterly movement of the needle changed to a westerly movement, or *vice versa.*

The Isogonic Lines.

At more than two hundred stations, distributed over the ten counties of Northern New York, which are included within the limits of the State survey, under my direction, the declination of the needle has been found, and the results of these observations have been plotted upon the map of the district, in the form of isogonic lines, or lines of equal declination of the needle.

Four of these great lines have been especially studied. These are the lines of nine, ten, eleven, twelve and thirteen degrees of equal declination.

The line of nine degrees of equal westerly variation has been the least studied, and is given approximately. The line of ten degrees, originating in the north-westerly part of Fulton county, traverses the westerly portion of the county of Hamilton, with singular curves and deflections, and entering the county of St. Lawrence, bends suddenly eastward into the county of Franklin, coming nearly, if not quite, into contact with the isogonic line of eleven degrees, and is then as suddenly deflected westward across the county of St. Lawrence into Canada. The line of eleven degrees is broad and irregular, ascending the westerly bank of the upper Hudson from Saratoga county to the central part of the county of Warren, where it crosses the Hudson eastward above the town of Warrensburg, crossing also the Schroon river and extending eastward beyond Lake George only to return again westward over the northern portion of Warren county to the west bank of the Hudson; thence entering Essex county, it passes with many fluctuations and curves eastward over the magnetic ore beds in the town of Moriah, where it is apparently almost merged in the line of twelve degrees. Disentangled from this net-work of magnetic iron ore, the eleven degree line suddenly diverges to the north and west,

crossing the county of Essex, enters Franklin county near the Saranac lakes, extending thence almost to the Raquette river, when it again diverges north-eastward toward the St. Regis lakes, where it is again deflected north-westward and reaches the Canadian boundary near the north-westerly corner of the county of Franklin.

The isogonic line of twelve degrees traverses only a small portion of the territory of New York. Leaving Vermont, and crossing Lake Champlain, it enters our State — apparently — in the central portion of the county of Essex, at or about Mineville and Elizabethtown in that county (where a number of observations of 12° westerly declination were had). The line then appears to be deflected eastward again over Lake Champlain, but is soon found traversing the valley of the Ausable river, whence, with a broad sweep to the northward and eastward, it passes through the county of Clinton into Canada, making a detour into the northerly portion of the county of Franklin.

The isogonic line of thirteen degrees, crossing Lake Champlain from Vermont into New York, near the south end of Valcour Island, runs north-westward across the easterly part of the county of Clinton, and soon enters Canada.

Thus we have a first detailed presentation of the isogonic lines of the northern portion of our State, and cannot fail to notice their singular resemblance to irregular belts or zones rather than lines, nor can we avoid entertaining a deep interest for such a remarkable manifestation of localized magnetic force, so complex in its nature; and, considering the various and complicated curves, we must continue to desire a more extended and more detailed knowledge of the location of these belts of equal variation of the needle, feeling sure that such knowledge is necessary to surveyors and of the greatest interest and importance to science.

Local Attraction.

The description of the location of the isogonic lines has shown how greatly they are divergent from any apparently symmetric form.

Considering terrestrial magnetism as a cosmical phenomenon, the lines of magnetic force should be perfectly symmetrical with regard to the magnetic poles and meridians.

That they are not symmetrical but contorted, curved and recurved is an evidence that the general magnetic force is, at the surface of the earth, affected by local influences.

This is popularly called *local* attraction, and exists everywhere upon the earth's surface to a greater or less extent, and every inflection of

the isogonic lines is in one sense attributable to "local attraction.' In other words, the isogonic line — as traced — is the resultant declination element of the magnetic force, a figure which represents the influence of the solar energy controlled by atmospheric, aqueous and mineral matter in conjunction with central terrestrial forces.

Local attraction, however, as commonly understood, is a much more simple matter, being usually some large deflection of the compass needle caused by the presence of magnetic iron. The lines crossing the famous iron-dam of the upper Hudson at Adirondack, is a remarkable example of this kind. I here located a meridian line and at short distances along it took magnetic readings and found that if this true meridian line were to be platted by the bearings of the compass, the magnetic (and false) representation would be a reversed curve not unlike an S. At this point a movement of a foot or two in station was sufficient to cause a change from westerly to easterly declination, which at times amounted to eighty degrees of arc. The absolute worthlessness of the magnetic compass as a surveying instrument in such localities thus becomes apparent.

Ancient Landmarks — Their Use.

The great variations which are thus shown to exist in the magnetic force prove how important it is that, when boundaries have once been located, the greatest care should be taken to preserve them and render them permanent. When the forest trees, on which the original lines were marked, are cut away or removed by fire, the entire system of lines is destroyed and obliterated, and can only be very approximately restored by survey, inasmuch as the old compass stations can never be found, so as to be re-occupied. The serious defect in the ancient system then becomes glaringly evident, for the lack of substantial stone monuments, set when the boundaries were indisputable, every thing is now thrown into confusion. The remedy consists in the immediate restoration of boundaries that are becoming ruinous or indistinct throughout the country, and the insurance of their permanence by the setting of substantial stone monuments at every important land corner.

If this work be well done, and a thorough system of records made, the ownership of property will be placed upon a substantial basis, convenience in conveyancing and real estate business will be insured, and valuable scientific data obtained which will be in the future a means of still more closely investigating the interesting phenomena we have considered, and may be the means of revealing secrets of elec-

tricity and magnetism which, when developed into future arts and industries, will add much to the comfort of the human race.

Local Observations.

Reverting to the very valuable observations given us by Simeon De Witt, in the first paper of the Albany Institute, we find the records of the *actual observation* of the important local period, when the easterly movement of the magnetic needle ceased, and the westerly variation in declination commenced.

The true meridian line to which Mr. De Witt refers, in his paper, as having been drawn "across the public square of this city," is now only recoverable by his line of reference, which he locates as extending from the westernmost corner of the base of the Albany Academy, southerly to a point eleven feet and nine inches south-east from the corner of the "brick house of John Van Schaick," in 1818.

It was probably at the southern extremity of this line that Mr. De Witt observed a declination of 5° 44′ to the west of true north on the 4th of October, 1817, and where another observation which he made on the 1st of August, 1818, showed that the needle had moved slightly to the westward. It was here on the 24th of April, 1825, he found the westerly declination of the needle had increased to 6° 00′, upon which he bases his estimate that the local movement of the needle at that time was two minutes of arc westward per year.

But these are not the only records left by this watchful observer. He has given us also the magnetic bearings of two of the oldest avenues of our city, at different times, and these data aid us in ascertaining what the declination then was, and by recent observations I have obtained the present direction of these lines, and consequently the total change in the declination and the amount of the average annual variation of the needle in these localities since his time.

The magnetic bearings of the lines of the Schenectady turnpike, and the great western turnpike were observed by him on July 30, 1805, and again on September 4, 1807, and in each case a difference was found of 45′ variation in the direction of the needle to the westward in two years and one month. This exceeded the amount of the annual change which Mr. De Witt estimated from subsequent observations to be the normal rate, and he ventures (in his groping after the

possible cause of this sudden change) to ask whether the eclipse of the sun in 1806 may not have been the occasion of this phenomenon.

The coincidence of sun spot periods with disturbances in terrestrial magnetism was not then suspected, for the observations of the sun by Schwabe were not commenced until 1826, and the demonstration of the sun's *immediate* influence did not come until Carrington's happy observations of the 11th of May, 1860, when the sudden out-bursts of solar energy were discovered to be immediately followed by magnetic disturbances at the surface of the earth. Yet before the commencement of Schwabe's observations the keen intellect of one of the most talented members of the Albany Institute had been led to suspect some such instantaneous transmission of the solar force, and had suggested the line of research which has brought us the proof of the origin of this force.

The genius of Mr. De Witt is admirably exhibited in this fortunate suggestion, and it is highly probable that his surmise may have led to the study and collection of some of the data on which the proof of the accuracy of the solar spot theory is built.

In pursuing this investigation I have taken occasion to examine the present magnetic bearing of two of the lines, to which Mr. De Witt refers in his paper, and found (November 29, 1884) the bearing of one section of the Schenectady turnpike to be N. 30° 11′, west, which is 4° 24′ less than the value observed by Mr. De Witt, while the bearing of the Western turnpike was found to be N. 56° 34′ west, showing a similar change of 4° 26′ variation of the needle to the westward since 1807.

This would show an annual movement westward of the magnetic needle of $3\frac{4}{10}$ minutes at Albany since 1807. The present declination of the needle at the locality in this city last mentioned is 10° 09′.1 West from the true meridian, as determined by my observation on 27th January, 1885.

The value of Mr. De Witt's watchfulness over the movements of the magnetic needle in his time is shown by the evidence which it affords of the moment when the needle actually commenced its change of direction of variation in the year 1806; a movement which is believed to have a period of centuries even.* Had it not been observed we might have been left in much doubt as to the time when this important local change commenced.

In the western part of northern New York the time when the needle was on the true meridian has been recorded by old surveyors as 1797.

* In this locality this period is probably long, possibly extending over two or three hundred years.

In other localities the time assumed has been the year 1795, and in the eastern part of Northern New York the year 1800 and 1801 are supposed to more nearly give the time of its occurrence.

The examination of a great number of the ancient boundary lines of marked trees in our northern forests has however shown me that almost all of these estimates are at fault, and that it is very rare indeed the magnetic needle has ever in any locality pointed along the true meridian at the dates above mentioned.

On establishing the true meridian, at any of these localities, and turning off the anciently recorded deflection angle as the direction of magnetic north ; the ancient magnetic meridians prove, by this indisputable evidence, to be usually deflected far to the westward from true north at localities where the lines were run at or about the years 1795, 1800 and 1801. Although at times easterly declinations are met with —attributable to local attraction —yet the most rare condition encountered has been that of a close approach of any ancient or modern magnetic meridian to the true north and south line. The closest approximation that I have recently found has been in the county of St. Lawrence and township of Granshue. Here a line, run as a magnetic meridian in the year 1800, was retraced, and differed but one degree and sixteen minutes from the true meridian. This single exception only shows how rare has been the occurrence of the coincidence of the magnetic and true meridians in this section of our country.

Time fails me to give you in detail all the observations which I have taken in Northern New York on the newly determined meridian and azimuth lines of the Adirondack survey, and I believe that you will be better able to grasp the facts by an inspection of the maps and diagrams, on which the results of some of these observations have been plotted, than by a recital of the bare numerical results.

Theoretical Considerations.

When we come to the consideration of the abstract scientific result of such investigations, and desire to understand the origin of the power which causes the declination of the needle, and the source of all the variations which have been alluded to, we reach one of the most interesting questions in physics.

The result of a close examination will show that the apparently different forces are but conditions of one and the same force; and that the evidences of correlation are but the proofs of the manner in which *this elementary force* controls the particles of matter, and by

different degrees and kinds of motion, communicated from molecule to molecule, shows its energy in light, heat, electricity or magnetism.

The cause of magnetism, therefore, is a condition of vibration of matter, occasioned by cosmical forces.

The observations of Schwabe and Carrington show that this force originates in the sun, and that the time and degree of vibration, of the sympathetic material of our earth, corresponds with occasions of great disturbance of the solar surface.

To produce the evidences of a magnetic or electrical condition in either iron or steel, no extensive paraphernalia of apparatus is necessary. We are surrounded at all times by a diffused vibratory force greater in its total quantity than the combined power of all the artificial apparatus in the world. The earth and the atmosphere are full of it, and I cannot but believe that each instant every molecule of matter of inorganic or organic nature, the upper air and the firm ground beneath our feet is more or less under the influence of the little apparent forces that create what we call terrestrial magnetism.

As a proof of this I have purposely chosen an article familiar to every one, an article which cannot be made a permanent magnet, which is not in itself magnetic in the sense of polarized force and which few would believe could be made to exhibit all the phenomena of a magnetic needle without battery or magnetized steel to affect it or induce in it, by contact, the form of power whose laws we are engaged in studying.

This is nothing more than a bar of soft iron. That it has no permanent magnetism is shown by the magnetic needle which I now approach to it, having either pole equally attracted at either of its ends, and in no case repelled, as it would be if any portion of this bar were possessed of permanent magnetism.

Some other implements that I have are equally simple and as easily understood. They are bits of soft iron; common nails, likewise without permanent magnetism, and without the power of retaining magnetism, except as long as it may be induced in them by contact with permanent steel magnets, or by inclosure within a wire helix in the circuit of a battery affording electric or electro-magnetic force.

Simple as the present apparatus is, and without either battery power or steel magnet, or wire conveying electricity, I am able to show you some of the important facts in terrestrial magnetism, so as to explain to some extent the cause of the declination and the variation of the magnetic needle.

To make a theory intelligible, it is best to demonstrate the funda-

mental facts by experiment; and the simplicity of the means employed will, I trust, render them very evident, however novel the views advanced may seem.

In the first place I will suspend an ordinary soft-iron nail, such as is commonly used by carpenters, from this unmagnetic support, by a thread. It is easily proved to have no magnetism and no polarity, but when the bar of soft-iron, held in the plane of declination at the angle of the magnetic dip is approached to this suspended nail a magnetic action at once becomes apparent. The soft iron bar and the common wrought iron nail each appear to have polarity and act precisely like magnetic needles. This is solely the result of the position in which they are placed. There is no magnet near them, neither is there any electrical battery to affect them. They are simply under the influence of the earth's own magnetism (or rather the pervading cosmical force) which becomes apparent in them when these otherwise inert bits of iron are placed in the exact position in which this force can act upon them.

Thus we learn that what seems to be a single force, limited to peculiarly treated bits of steel, is really only an evidence of an all-pervading force; a force that is not only with us everywhere but which is traversing or affecting every particle of matter, atmosphere and ocean, granite, brick and mortar, the iron-rods of our machinery and the very nails that secure the floors, all continuously vibrating under the influence of this mysterious force which — in its widest earth-influence — we term terrestrial magnetism.

The variation of the needle is not, therefore, a merely technical and professional matter. It is an index to most important physical changes in the constitution of the planet upon which we live. Every thing which tends to give us a better or more correct idea of the nature of the invisible forces which control our destinies is of interest and value; for, in the midst of such investigations, like the patient observer of the sun, we may suddenly discover nobler and more glorious things, revealing higher truths of the greatest benefit and importance to mankind.

NOTE. — **The paper was illustrated by experiments with a variety of instruments, but the remarks were informal and have not been preserved.**

APPENDIX.

DECLINATIONS OF THE MAGNETIC NEEDLE

BASED UPON

Field Observations at Meridian Line Stations of The New York State Land Survey,

VERPLANCK COLVIN, Superintendent.

Computed declinations of the needle based on observed azimuths of ancient boundary lines from the true meridian as determined during 1884 and compared with recorded original magnetic bearings of said lines in the years (1766, etc.) given.

NOTE.—The magnetic observations were generally taken upon the subdivision or patent lines and not at the trigonometrical stations. The latitudes and longitudes of the magnetic stations are, therefore, deduced positions of stations in the vicinity.

STATION.	L. and M. of Station.		Time of Observation.				Declination of needle observed. (Variation West.)	Remarks.
	L.	M.	Year.	Month.	Day.	Hour.		
	° ′	H. M.					° ′	
Morehouseville, Hamilton County	43 20.1	4 59.0	1883	Aug.	5th.	5 P.M.	8 24.0	Observations by Mr. Colvin.
Piseco Lake P. O., near Courtney's	43 24.0	4 58.2	1883	Aug	6th.	5.30 "	11 01 73	Hamilton county.
Upper Saranac Lake	44 18.7	4 57.0	1883	Aug.	15th.	10.30A.M.	10 47.0	Franklin county.
St. Regis Lake, near Paul Smith's.	44 24.0	4 56.9	1883	Aug.	16th.	9.30 "	10 09.0	Franklin county.
Malone, Low's Pinnacle	44 49.5	4 57.0	1883	Aug.	17th.	3.30 P.M.	12 30.0	Franklin county.
Moosehead mountain, near Seavey's	44 14.0	4 58.5	1883	Aug.	22d.	5.41 "	9 25.0	Franklin county.
Bog mountain, near Fenton's	44 23.0	4 58.9	1883	Aug.	23d.	4 "	5 59.2	Franklin county.
Foot of Bog. Munger's at Raquette R. Station 166	44 25.0	4 59.0	1883	Aug	23d.	5.45 "	10 08.0	Franklin county.
Colton Village Raquette R. S., Farnsworth m't. 44	44 31.7	4 59.6	1883	Aug.	24th.	8.30A.M	9 29.7	Franklin county.

St. Regis, Indian Village	44 59.0	4 58.6	1883	Sept.	10th.	4 P. M.	10 31.2	Franklin county.
Mt. Azure	44 27.5	4 57.9	1883	Sept.	16th.	4.58 "	9 40.0	Franklin county.
Ragged Lake	44 42.0	4 56.0	1883	Sept.	22d.	10.38 A.M.	14 59.2	Franklin county.
Johnsburgh	43 36.0	4 55.8	1883	Aug.	4th.	11 "	10 45.6	Warren county.
Near outlet of Schroon Lake, Chester	43 41.0	4 55.2	1883	Aug.	5th.	10 "	9 46.2	Warren county.
Near Warrensburgh	43 30.0	4 54.9	1883	Aug.	8th.	5 P. M.	11 01.2	Warren county.
Starbuckville	43 38.5	4 55.0	1883	Aug.	8th.	2 "	10 37.5	Warren county.
Horicon	43 36.5	4 55.0	1883	Aug.	8th.	1 "	10 38.7	Warren county.
North Creek	43 49.5	4 55.9	1883	Aug.	4th.	2.30 "	11 38.75	Warren county.
Riverside	43 37.5	4 55.5	1883	Aug.	4th.	8 A. M.	9 49.37	Warren county.
At the Glen	43 33.0	4 55.4	1883	Aug.	3d.	3.30 P.M.	13 10.00	Warren county.
Station south of Thurman	43 24.5	4 55.3	1883	Aug.	3d.	9 A. M.	11 26.87	Warren county.
Stoney Creek Station, Adirondack R. R.	43 22.75	4 55.4	1883	Aug.	1st.	5 P. M.	11 10.62	Warren county.
Luzerne	43 16.75	4 55.3	1883	Aug.	1st.	10 A. M.	10 55.00	Warren county.
Thurman Depot	43 27.0	4 55.2	1883	Aug.	3d.	10.30 "	11 20.62	Warren county.
Clear Pond, North Elba	44 10.0	4 55.8	1883	Sept.	26th.	.....	9 50.0	Essex county.
Jerseyfield Lake	43 16.0	4 58.9	1883	July.	8th.	6 P. M.	8 20.0	Herkimer and Hamilton Co.
Jerseyfield Lake	43 16.0	4 58.9	1883	July.	8th.	6 "	8 10.0	Herkimer county.
Mt. Jerseyfield	43 15.8	4 58.9	1883	July.	9th.	4.30 P.M.	8 57.3	Herkimer county.
Station on West Shore of Jerseyfield Lake	43 16.1	4 59.0	1883	July.	10th.	10 A.M.	9 12.0	Herkimer and Hamilton Co.
Station on East Shore of Jerseyfield Lake	43 16.1	4 58.9	1883	July.	10th.	4 P. M.	9 02.0	Herkimer and Hamilton Co.
Long Point on Jerseyfield Lake	43 16.0	4 58.9	1883	July.	10th.	6.30 "	12 36.5	Hamilton county.
Myers' Hill, near Forestport	43 25.6	4 00.8	1883	July.	16th.	6 P. M.	7 00.5	Oneida county.
Gommer Hill	43 36.7	5 01.7	1883	July.	17th.	3.30 "	8 55.2	Lewis county.
Myers' Hill	43 25.6	5 00.8	1883	July.	19th.	6 "	8 09.6	Oneida county.

STATION.	L. and M. of Station.				Time of Observation.				Declination of needle observed. (Variation West.)	Remarks.
	L.		M.		Year.	Month.	Day.	Hour.		
	°	′	H.	M.					° ′	
Northeast corner of Servis' Patent	43	16.2	5	00.3	1883	July.	20th.	3.30 P.M.	9 27.5	Observations by Mr. Colvin.
High Dune, Shore West Canada creek	43	15.15	5	00.3	1883	July.	21st	10 A. M.	9 26.7	Herkimer county.
North bank of West Canada creek opposite Baxter's	43	17.0	5	00.3	1883	July	22d.	3.30 P.M.	9 43.7	Herkimer county.
Hill Station, Service's Patent	43	16.2	5	00.3	1883	Aug.	3d	5.30 "	10 33.0	Oneida county
Le Rayville	44	01.0	5	02-9	1826	June.	13	....	5 45.0	Jefferson county.
Keene Valley	44	10.0	4	55.1	1883	.....	.....	.....	11 32.6	Essex county.
Declinations deduced from observations of bearings of ancient lines.										
West of Jerseyfield Lake	43	15 5	4	58.9	1768	July	... .	.....	6 14.9	Hamilton and Herkimer Co's.
Crossing of Jerseyfield Lake	43	16.0	4	58.9	1768	July	.....	.....	5 56.7	Herkimer county.
Station Westward on north line of Service's Patent	43	16.3	5	00.4	1795	.....	.. ....	.....	4 40.0	Oneida county.
Northeast corner Service's Patent	43	16.2	5	00.3	1795	.....	.....	.....	4 19.5	Oneida county.
East line of Oneida county	43	16.2	5	00.3	1802	.....	.....	.....	5 00.1	Oneida and Herkimer Co's.
West Canada Lakes	43	36.0	4	58.4	1772	.....	.....	.....	6 54.2	Hamilton county.
Keene Valley	44	10.0	4	55.1	1817	.....	.....	.....	8 02.6	Essex county.
Malone.	44	49.5	4	57.0	1799	.....	.....	.....	9 15.0	Franklin county.
St. Regis Indian Reservation	44	59.45	4	58.6	1799	.....	.....	.....	7 16.0	Franklin county.
St. Regis Lakes	44	24.0	4	56.9	1799	.....	.....	.....	6 54 0	Franklin county.
Saranac Lakes	44	18.7	4	57.0	1799	.....	.....	.....	7 32.0	Franklin county.
Granshue Township	44	23.0	4	58.9	1800	.....	... .	.....	1 16.2	Franklin county.

TABLE OF THE VARIATION OF THE NEEDLE.

For use in the Land Office at Pierrepont Manor in Jefferson County, New York, in Lat. 43° 43′ 45″ N., and Long. 75° 56′ 57″ W.; and to apply to Great Tracts Nos. 4, 5 and 6 Macomb's Purchase, which were surveyed and allotted from 1795 to 1803.

Made 1823, September 18, and 1856, November 25:

By William C. Pierrepont.

Variation: Yearly, 5′ 14″. 4367: Daily, 0″. 86107.*

			°	′	″
1797.	October 1, no variation.				
1797.	November 25, var. W....		0	00	48.24
1801.	do	do	0	21	45.99
1802.	do	do	0	27	00.43
1803.	do	do ...	0	32	14.87
1804.	do	do ...	0	37	29.30
1805.	do	do	0	42	43.76
1806.	do	do ...	0	47	58.17
1811.	do	do . ..	1	14	10.35
1816.	do	do	1	40	22.54
1820.	do	do	2	01	20.30
1821.	do	do	2	06	34.74
1822.	do	do	2	11	49.19
1823.	do	do	2	17	03.62
1824.	do	do	2	22	18.06
1825.	do	do ...	2	27	32.05
1826.	do	do	2	32	46.94
1827.	do	do	2	28	01.38
1828.	do	do	2	43.	15.82
1829.	do	do	2	48	30.26
1830.	do	do	2	53	44 70
1831.	do	do	2	58	59.14
1832.	do	do ...	3	04	13.58
1833.	do	do	3	09	28.02
1834.	do	do	3	14	42.46
1835.	do	do	3	19	56 90
1836.	do	do	3	25	11 34
1837.	do	do	3	30	25.78
1838.	do	do	3	35	40.22
1839.	do	do	3	40	54.66
1840.	November 25, var. W....		3	46	09.10
1841.	do	do	3	51	23.54
1842.	do	do	3	56	37.98
1843.	do	do	4	01	52.42
1844.	do	do	4	07	06.86
1845.	do	do	4	12	21.30
1846.	do	do	4	17	35.74
1847.	do	do	4	22	50.18
1848.	do	do	4	28	04.62
1849.	do	do	4	33	19.06
1850.	do	do	4	38	33.50
1851.	do	do	4	43	47.94
1852.	do	do	4	49	02.38
1853.	do	do	4	54	16.82
1854.	do	do	4	59	31.26
1855.	do	do	5	04	45.70
1856.	do	do	5	10	00.14
1857.	do	do	5	15	14.58
1858.	do	do	5	20	29.02
1859.	do	do	5	25	43.46
1860.	do	do	5	30	57.90
1861.	do	do .. .	5	36	12.34
1862.	do	do	5	41	26.78
1863.	do	do	5	47	41.22
1864.	do	do	5	52	55.65
1865.	do	do	5	58	10.10
1866.	do	do	6	03	24.54
1874.	do	do ..	6	44	00.00

NOTE.—The only actual observations preserved are

1823,	September	18..	2°	16′ 05″
1847,		18..	4	23
1856,	November	25..	5	10
1860,	July	15..	5	36
1863,		15..	5	44
1864,	April	12..	5	50
1865,	May	4..	6	00
1874,			6	44

Theodolite records only to minutes .....

* Regents' report.

A large amount of additional data has been used in the preparation of the map of the isogonic lines, but this data is not, as yet, available for publication.

THE SANITARY VALUE OF THE CHEMICAL ANALYSIS OF POTABLE WATERS.

By Willis G. Tucker, Ph. D.

[Read before the Albany Institute, April 7, 1885.]

For the past six months or more the subject of our city water supply has received an unusual amount of attention from the citizens of Albany. Very naturally questions concerning the various methods of water analysis and their value have come under discussion, and it is possible, that a brief description of those processes which are employed by chemists to-day and a discussion of their respective merits may be of interest at this time. It may be profitable also to inquire what are the questions which a chemical analysis can positively answer and incidentally to consider the probabilities of disease transmission by water used for drinking and the effect of natural oxidation by aeration in purifying those which are polluted by sewage matter.

The general appearance and physical properties of a water will naturally first attract attention when its quality is questioned. An ideally pure water will be clear and colorless, odorless and tasteless, but these qualities, however desirable in themselves, do not necessarily indicate freedom from pollution. Waters which have penetrated through the soil are generally bright and clear from the filtration they have undergone, and may have neither odor nor taste and yet be very dirty waters chemically, while surface waters may show a decided color and even turbidity, may have an earthy, vegetable or peaty odor and taste and yet be quite free from harmful constituents. *Pure* water does not exist in nature, all dissolved or suspended substances being impurities in water as such, though by no means necessarily harmful. The sensible properties of a water, therefore, unless it be so foul that there is no mistaking its pollution, afford little information as to its quality. Water may percolate through the soil for a mile under a mountain and be as clear as crystal and yet carry typhoid fever from a hamlet on one side to dwellers on the other, as in the celebrated and well authenticated case at Lausen, Switzerland.

The suspended matter contained in potable waters, and naturally most abundant in surface waters, usually consists chiefly of clayey matter, easily removed by filtration on a large or small scale or by mere subsidence. In some cases, however, as in the James river water which supplies Richmond, the suspended matter is so finely divided

that its removal is well nigh impossible, but such matter may generally be disregarded as unimportant from a hygienic point of view. The dissolved constituents consist both of gaseous and solid substances. The former may be the atmospheric gases only and aside from the indications which the quantities of nitrogen and oxygen and the ratio between them are thought by some to afford as to the amounts of organic matter which are undergoing oxidation their quantity is of little importance. Sulphuretted hydrogen and other noxious gases may indeed be present as the result of putrefactive changes or peculiar conditions, and the recognition of such constituents may become a matter of importance, not because they are in themselves capable of producing disease in the quantities which may be present in water, but because their existence throws light upon the chemical changes which are taking place.

The dissolved solid constituents of potable waters are both inorganic and organic, the latter either of animal or vegetable origin. Up to twenty years ago the ordinary method of quantitative determination was to evaporate a definite quantity of the water to dryness in a platinum dish, weigh the residue, calculate the percentage of total solids, and then determine the organic or volatile matter by the loss resulting from the ignition of the total solid residue, due correction being made for the loss of carbonic acid. A complete analysis was then usually made of the mineral constituents, but as the precise amounts of these are of little importance and as the method described for determining the organic matter afforded no clue to its nature and was too inexact to be of value even in ascertaining the amount with accuracy, it may be readily seen that the results thus obtained were of little or no sanitary value. In speaking of the exact determination of the mineral constituents as unimportant reference was had to the lime, magnesia, iron and other salts usually occurring in all natural waters save rain water, and not to the chlorine, phosphoric acid, nitrates and nitrites which are important but which formerly received less attention than at present. For manufacturing purposes of course a soft water is generally to be preferred. Hard waters, however, act upon lead less than soft ones, while on the other hand they occasion a waste of soap and are not desirable for culinary purposes, but these are incidental questions, and it cannot be said to be proven that the amount of mineral matter in potable water exercises much influence upon its healthfulness. In most cases a mere determination of the hardness is quite sufficient, a water not too hard being generally preferred, though the total solids are likewise determined when a complete analysis is made.

Let us now briefly consider those inorganic constituents which are generally regarded as important from a hygienic standpoint.

1. *Chlorine.* — This occurs chiefly in combination with sodium. In waters not naturally brackish the determination of its amount is regarded as decidedly important. Chlorides occur in all human excreta and slop waters, and, therefore, in all sewage, and their presence in considerable quantity is a sign of probable contamination. The estimation is generally made volumetrically with a nitrate of silver solution. Over five parts in 100,000 were regarded by the Rivers Pollution Commission of Great Britain as in most cases due to sewage contamination.

2. *Phosphoric acid.*—"Much nonsense" says Wanklyn "has been talked about phosphates." This talk has had to do with the presence of phosphates in sewage and the evidence afforded by them of such contamination. The fact, however, is that in presence of carbonate of lime phosphates can only exist in exceedingly small traces in a clear water, but a qualitative test for their presence is usually made.

3. *Nitrites and nitrates.* — These compounds are believed to result mainly from the oxidation of nitrogeneous organic matter, chiefly animal, and are considered by some chemists as indicating quite accurately the amount of such defilement. In themselves, of course, they are harmless, but if they aid us in determining the amount of pollution their quantity becomes a matter of importance. It is now pretty generally conceded that the conversion of nitrogeneous organic matterin to these forms takes place under the influence of micro-organisms and is a process of fermentation, the rapidity of which depends upon degree of dilution, temperature and other conditions. Recent experiments, as for instance, those of Warrington at the Rothamsted laboratory reported in *Nature*, for October 30, 1884, seem to prove quite conclusively that such is the case, and if so, the old view that nitrification is a mere oxidation must be abandoned and our ideas concerning the value of natural aeration, long considered by many chemists so important, must be greatly modified. Warrington asserts that nitrification will not take place in an acid solution. Some base must be present with which the nitric acid formed may combine, and when this is exhausted the oxidation ceases. If this is true then a study of the amonnt of certain mineral constituents present in a water which may furnish bases to the nitric acid produced, becomes indirectly important in determining the rapidity and completeness with which sewage matter may be oxidized, and a study of this subject, yet practically undeveloped, bids fair to yield valuable results.

At the same time it is to be borne in mind, as Wanklyn and others have pointed out, that certain mineral strata yield nitrates to water containing no organic matter, and that processes of vegetation in rivers

and lakes withdraw them from water. Also that nitrates once formed may be again reduced to ammonia compounds or even to free nitrogen. If so, then an undue importance has been attached to the determination of nitrogen in this form, by Frankland and others, who make use of the term "previous sewage contamination" to denote the amount of sewage which has been discharged into a water and undergone oxidation, estimating the same by determining the total combined inorganic nitrogen present, as ammonia, nitrates and nitrites, and after deducting the amount of nitrogen present in these forms in rain water, calculating how much "average London sewage" would be required to account for it. It will therefore be seen that much difference of opinion exists as to the degree of importance to be attached to the presence of these compounds in water, and that the questions involved are exceedingly intricate and as yet very far from being settled. Various methods are employed in their determination, none of which are perfectly satisfactory.

We may now dismiss from further consideration the inorganic constituents of potable waters, and proceed to describe those methods of analysis developed during late years, which have for their object the determination of the amount and so far as possible the nature of the organic constituents, so much more important than the inorganic, from a sanitary point of view. The following are the most important of these processes:

1. *Permanganate methods.*—In 1849 Forchammer proposed the use of permanganate of potassium for the determination of the oxidizable matter in water. This salt imparts, even in very small quantities, a decided pink color to water, and as it contains a large amount of oxygen which it readily gives up to reducing bodies, thereby losing its characteristic color, its use affords a ready method for the determination of the amount of many such substances in a state of solution. As applied to the determination of organic matter however, the results can have no absolute value, since different kinds of organic matter require for oxidation different amounts of oxygen, and moreover differ in the completeness with which they are oxidized and the length of time required. Much also depends upon the exact method in which the test is applied, and various inorganic compounds which may be present, reduce the permanganate and become a source of error. Nevertheless this test has a certain value, and it was at one time even thought that the amounts of putrescible matter might be estimated by the amount of permanganate decolorized during the first few minutes, since such matter probably first undergoes oxidation. Frankland held this view, as did Angus Smith, but the former has of late entertained a different opinion. W. A. Miller, Kubel, Tidy, Letheby, Schultze and others

have proposed particular methods for the application of this test, that most in use at the present time being Tidy's modification which consists in the addition of a definite amount of permanganate solution to a certain quantity of the water acidified with sulphuric acid. At the end of a certain length of time the amount of permanganate remaining is determined and the amount of oxygen consumed is calculated and reported as "oxygen absorbed." Very generally, two determinations are made on different samples of the water, the permanganate being allowed to act for fifteen minutes in one case and for three or four hours in the other.

Tidy and his adherents attach great importance to the results thus obtained. Frankland admits that they are not without value, and finds that they corresponded in 1418 out of 1686 cases quite closely with those obtained by his own very elaborate method presently to be described. Wanklyn condemns the method as misleading on account of want of delicacy and the fact that albumen is not readily attacked by the standard solution of permanganate, while, as Frankland long ago pointed out, such bodies as starch and cane sugar take up less than the one-hundredth part of the oxygen required for total oxidation. The majority of water analysts probably realize the imperfections of all permanganate methods, but consider their indications as not without a certain value. In this connection it may be remarked that Wanklyn has proposed and patented a method known as the "moist combustion process," in which an alkaline solution of permanganate is distilled with the water and the amount of permanganate consumed determined. It has not been received with much favor.

2. *Wanklyn and Chapman's albumenoid-ammonia process.* — The ammonia method so well known and largely employed at the present time was brought forward by Wanklyn, Chapman and Smith in 1867. The modified process now in general use is described in the fifth edition of Wanklyn and Chapman's *Water Analysis.* No method has ever found such general favor among analysts, a fact, perhaps in part owing to the comparative ease, with which the test is applied, the general nicety of the process and the seeming accuracy — certainly delicacy — of the method. Nevertheless it has been harshly criticised by many and especially by Frankland and his followers.

In this test a definite quantity of water is boiled in a retort, some carbonate of sodium having been added if necessary to render the water alkaline, and the ammonia which existed as such in the water or has resulted from the decomposition of urea and like substances, passes over with the escaping steam which is condensed and the amount determined with Nessler's solution and reported as "free ammonia." When this has all been given off an alkaline solution of permanganate of

potassium is added, and the distillation continued. Certain kinds of organic matter containing nitrogen are thus decomposed, giving off a part or all of their nitrogen as ammonia, and since albumen is one of these, the ammonia so obtained is called "albumenoid-ammonia," and reported as such.

This process was the first to come into general use which claimed to distinguish readily putrescible nitrogeneous matter from those organic substances which are with greater difficulty converted into ammonia, and much importance was naturally attached to the results obtained in distinguishing pollution due to animal matter from that of vegetable origin, but as different amounts of ammonia are yielded by the same weights of different substances, and as the conversion of many such into ammonia is by no means complete, the results can have no absolute significance. On these and other grounds Frankland rejects this method utterly. Tidy, likewise, while admitting that the process might be used to discriminate between a water of excellent quality and one exceedingly bad, holds that when water of intermediate character is under examination, it "utterly and entirely fails." It is to be borne in mind, however, that both Frankland and Tidy are committed to methods of their own, which they advocate not without the exhibition of a partisan spirit, and their conclusions are, therefore, hardly entitled to the same weight as those of less prejudiced, though, perhaps, less distinguished, experts. The rank and file of water analysts have accepted this method as affording very valuable information, and in the elaborate *Preliminary Report on the Results of an investigation made by direction of the National Board of Health, as to the chemical methods in use for the determination of organic matter in potable water*, made by Professor Mallet of the University of Virginia, in 1881, and printed in the report of the National Board of Health for 1882, the author, while he points out the defects of the process, finds "that it is admittedly simple and easily carried out;" that "the value of the results depends more upon watching the *progress* and *rate* of the evolution of the ammonia, than upon determining the total amount;" and that "taking the results by this process as recorded, we find a great deal of similarity between the figures for albumenoid ammonia and those for organic nitrogen (by the combustion process), but with frequent discrepancies of varying extent such as prevent the one being taken as the accurate measure of the other."

3. *Frankland and Armstrong's combustion process.*—This is the third and last of the important processes now in use. It was brought forward by its originators in 1867, and first described in print in the *Journal of the Chemical Society* (London) for March, 1868, and is by far the most elaborate method of any in use. It was employed by the Rivers

Pollution Commission of Great Britain in the examination of a large number of waters. The process consists in the evaporation of a stated quantity of the water which has been freed from all the carbon and nitrogen which existed in it in an inorganic form, excepting in ammonia, by treatment with a saturated solution of sulphurous acid, by which the nitrates and nitrites are reduced with the expulsion of their nitrogen and the carbonates decomposed with liberation of their carbonic acid. Nitrogen in ammonia is fixed and has to be deducted in the final computation. The residue obtained is then submitted to organic analysis, resulting in the conversion of the carbon into carbonic acid and the liberation of the nitrogen as such. The mixture of gases is then subjected to volumetric gas-analysis and the results finally reported as parts of "organic carbon" and "organic nitrogen" in 100,000 of water. The relative proportion of nitrogen to carbon is supposed to throw light upon the nature of the organic matter originally present, since in animal substances the ratio is higher than in vegetable. Frankland finds that the ratio of nitrogen to carbon is for upland surface waters, on an average, 1 to 10; for water from cultivated land, 1 to 6; for shallow wells, 1 to 4; for sewage, 1 to 2. It has been found, however, that the effect of oxidation upon peaty matter is to diminish the proportion of carbon, while during the oxidation of animal matter it is the nitrogen which diminishes most rapidly. Therefore the proportions of nitrogen to carbon in vegetable and animal matter vary in opposite directions during oxidation, a fact which greatly adds to the difficulty of deciding as to the nature of the organic matter present.

This process is, in theory, the most scientific and accurate of any ever proposed, but it is exceedingly difficult, requiring costly and elaborate apparatus and especial skill on the part of the operator. Mallet says, "It is better adapted to regular use in the analysis of many samples of water in a large public laboratory than to occasional use by a private individual in now and then examining a sample of water." For these reasons, chiefly, it has not come into general use and in this country it has been employed by but very few chemists. Objections on the score of difficulty, however, should not be allowed to weigh against the process itself if it is of value, but on this point much difference of opinion exists. As might be supposed, Wanklyn and Tidy condemn it, and while most chemists admit that the principle is a good one, it is pretty generally believed that its indications are by no means as reliable as they are claimed to be by the originators of the process. Mallet, after summing up its errors and the objections to it, says: "The combustion process, in its present form, cannot be considered as 'determining' the carbon and nitrogen of the organic mat-

ter of a water in a sense to justify the claim of 'absolute' value for its results, which have been denied to those of all other methods. It is but a method of approximation involving sundry errors, and in part a balance of errors."

These then are the principal methods and the best at present known for the determination of organic matter in potable water.* It will be seen that no one of them enables us to recognize the real morbific material which water may contain or is able to distinguish with certainty between disease-producing constituents and the less harmful or innocent matter of vegetable origin, or that which has resulted from the conversion of harmful into harmless substances. The English "Society of Public Analysts" have adopted a scheme of analysis which includes both the permanganate and albumenoid-ammonia processes, and this method has been largely followed in this country and adopted by our State Board of Health. I have employed it in quite a large number of cases, and it has frequently happened that waters which had in all probability caused disease, could not be condemned on the evidence furnished by the analysis alone. Mallet would use "all three of the principal processes," since "each gives a certain amount of information which the others do not afford," and adds that "under circumstances admitting only of the use of simpler means of investigation, the albumenoid-ammonia and permanganate processes might be employed together, but in no case should only one of these methods be resorted to, such a course entailing practically the neglect of carbon on the one hand or nitrogen on the other." This opinion is based upon the results of an extended research, and to admit that the determination of carbon and nitrogen — perfectly harmless elements in themselves — affords us our best indications in judging of the purity or impurity of a water is to acknowledge that our best analytical methods are far from satisfactory.

What, then, are the questions which a chemical analysis can answer concerning a water viewed from a hygienic standpoint? It may be answered, first, that all attempts to establish definite standards, so that the points for and against a water can be counted up and a balance struck, have signally failed. For there is no unanimity of opinion as to what degree of importance should be attached to the results obtained, and if there was, such a numerical expression of their relative importance must of necessity be arbitrary and misleading. A committee of the German Public Health Association reported to

* The scope and limits of this paper do not admit of a consideration of certain recently proposed analytical processes like the "actinic method" in which silver salts in solution are reduced by organic matter when exposed to sunlight, nor of indirect methods of analysis like the determination of the gaseous constituents to which reference has been made.

this effect at the Dusseldorf meeting in 1883, and the opinion of this committee accords with that of most sanitarians who have investigated the subject.

Secondly, it may be said that with the various means at present at our command, waters which are very pure, chemically, of medium purity and foul, may be distinguished, but whether these waters are therefore safe to use, doubtful or harmful, must be a matter of opinion, and is not to be decided by the analytical results. You may take a few spoonfuls of the dejection of a typhoid-fever patient and add them to a barrel of distilled water, and a chemical analysis will tell us that the water is pure, and you may add a pound of healthy fæcal matter to an other barrel of distilled water, and an analysis will show that it is defiled, yet the first water may, if drunk, give rise to typhoid fever, and the second to no harmful results at all. The analysis of water is like that of air. It can show us the relative amounts of the main and gross constituents, but the organized and living material which may be present, and if so is probably most instrumental in producing disease, can be neither recognized as such nor measured. In the appendix to the report of the Medical Officer of the Local Government Board of Great Britain for 1881, is a report by Dr. Cory on the chemical examination of certain samples of water purposely polluted with excrements from enteric-fever patients and other matters. Dr. Buchanan sums up the result of the inquiry by saying: "While we must ever be on the watch for the indications that chemistry affords of contaminating matters gaining access to our waters, we must (at any rate until other methods of recognition are discovered) go beyond the laboratory for evidence of any drinking water being free from dangerous organic pollution. Unless the chemist is well acquainted with the origin and liabilities of the water he is examining, he is not justified in speaking of a water as 'safe' or 'wholesome' if it contains any trace of organic matter whatever; hardly, indeed, even if it contains absolutely none of such matter appreciable by his very delicate methods. The chemist can, indeed, tell us of impurity and hazard, but not of purity and safety. For information about these we must go, with what the chemist has been able to teach us, in search of the conditions surrounding water sources and affecting water services."

We are not, therefore, to infer that water analysis is useless because in the present state of our knowledge there are many questions which it cannot satisfactorily answer, for an analysis of a water may reveal to us the presence of compounds which have doubtless resulted from the decomposition of animal matter, as, for instance, in showing us that a well is contaminated by leakage from a cess-pool or privy, or that a

reservoir, pond or river is defiled by sewage matter. Now in the first case the pollution of the well may be harmless, but in the event of specific polluting material entering at any time, as it is quite likely to do at some time, such a well may become a center for spreading disease, and if so its water should not be used at all, and in the other case, if a larger body of water is markedly polluted by sewage, while the certainty of its proving unwholesome or producing specific diseases may not be provable, we shall err on the safe side if we refuse to use such water, the chemical evidence being considered, at least, until we can cut off the access of contaminating matter.

And lastly an analysis may assure us that a given water is of such a degree of purity that the probabilities are that it carries with it no harmful matter, but this kind of evidence is always to be received with caution unless the results of the examination are borne out by other evidence which proves that pollution is not probable. Thus while a chemical analysis alone cannot tell us that a water is absolutely safe or necessarily harmful, it *can* tell us that a water contains those constituents which may reasonably be believed to accompany harmful matter, and if the question be as to the employment of a given water for a city supply, an exhaustive series of analyses made at different points, stages, times and seasons may reveal to us the degree of pollution, points at which the polluting matter enters, rapidity of its destruction by natural processes, and the conditions of the water under varying circumstances, and also indicate to us the methods to be employed for improving its quality and obtaining it at its best estate. Such series of analyses have been made during late years in our own country by various chemists, and with very satisfactory results. But a single analysis, or a few analyses, may give us little information or be entirely misleading.

Previous reference has been made to the investigations of Professor Mallet, and as no more thorough work has probably ever been done in this direction, at home or abroad, and as the conclusions arrived at as the result of an exhaustive study of a multitude of facts confirm the opinions just expressed, some of these conclusions from his report are quoted:

"1. It is not possible to decide absolutely upon the wholesomeness or unwholesomeness of a drinking water by the mere use of any of the processes examined for the estimation of organic matter or its constituents."

"2. I would even go further and say that in judging the sanitary character of a water, not only must such processes be used in conjunction with the investigation of other evidence of a more general sort as to the source and history of the water, but should even be

deemed of secondary importance in weighing the reasons for accepting or rejecting a water not manifestly unfit for drinking on other grounds."

"3. There are no sound grounds on which to establish such general 'standards of purity' as have been proposed, looking to exact amounts of organic carbon or nitrogen, 'albumenoid-ammonia,' oxygen of permanganate consumed, etc., as permissible or not."

"4. Two entirely legitimate directions seem to be open for the useful examination by chemical means of the organic constituents of drinking water, namely: first, the detection of *very gross* pollution, * * * * and secondly, the periodical examination of a water supply, as of a great city, in order that the normal or usual character of the water having been previously ascertained, any suspicious changes which from time to time may occur shall be promptly detected and their cause investigated."

It was proposed only to discuss chemical methods of examination in this paper, and therefore no reference has been made to the microscopical examination of water deposits, or to biological investigations. The former are often of value, and from the latter it was at one time thought, and this is still the opinion of many, that almost every thing might be learned, and that chemical analysis had had its day, and was destined to be entirely replaced by biological investigations. Whether the results obtained so far have justified this view is certainly an open question. In my opinion they have not. That such investigations should be made in connection with chemical analyses is generally conceded, and doubtless when our knowledge has increased very valuable results may be obtained thereby, for the probable significance of some classes of micro-organisms seems to be established; but as Mallet has pointed out, basing his statement upon work done by Professor H. Newell Martin, of the Johns-Hopkins University, Dr. George M. Sternberg, U. S. A., and others, there is the difficulty often presented "either by the sparseness, or more frequently the abundance, of those organisms in fairly estimating their average relation to the mass of water," and "this difficulty is superadded, of course, to the imperfection of our knowledge as to the effects upon human health of some closely allied — even hardly distinguishable — organisms of dangerous and harmless associations, and of perhaps the same organism in different stages of its life history."

Two other subjects proposed for discussion remain to be briefly considered. And first as regards the dissemination of diseases by drinking water, there is so much evidence to support the view that polluted waters are prolific sources of disease, that to deny such a cause as an important factor in the propagation of many zymotic diseases, is, to say the least, illogical. Countless sporadic cases of typhoid fever, for

instance, have been traced to the use of drinking water polluted by the dejections of those suffering with this disease, and many epidemics of typhoid and cholera, have been clearly shown to have had a similar origin. I cannot refrain, in this connection, from referring to the history of the cholera epidemics in Glasgow and Manchester during the present century, taking the facts from the Rivers Pollution Commission Report for 1874. Up to 1859 Glasgow drew its water supply from the Clyde, which was polluted by the drainage of towns higher up the river. After that year a pure supply was obtained from Loch Katrine. The deaths from cholera in 1832 were 2,842; in 1849, 3,772; in 1854, 3,886, and in 1866, 16. Manchester and Salford have a similar history. Up to 1851 they took their water partly from the river Irwell and partly from wells, both sources being much polluted. In 1832 there were 890 deaths from cholera; in 1849, 1,115, and after the introduction of pure water in the epidemic of 1854 but 50 cases, and in 1866, 88 cases. It will be observed that in the general epidemic of 1854, Glasgow, using polluted water from the Clyde, had 3,886 deaths from cholera, while Manchester and Salford, with a purer supply, had but 50 deaths. The death rate per thousand per annum of Manchester previous to the introduction of its present water supply, was 33, while in 1880 it was 24.7. (Usill, *Statistics of the Water Supply of the Principal Cities and Towns of Great Britain and Ireland*, 1881.) In 1832 there were 1,000 deaths from cholera in Exeter, England, but after purer water was supplied from a point two miles higher up the river than before, and above the point at which the sewage of the town entered, when cholera again visited the city, in 1849, there were but 44 cases, and in 1854 hardly a single case occurred. In 1854 the water supplied by the Southwark Company in London, was polluted by sewage, while that of the Lambeth Company was much purer. These companies had pipes in the same streets, and supplied consumers indiscriminately on both sides of streets. The deaths from cholera among those who used the Southwark water were 130 in 10,000, while they were but 37 in 10,000 among those using the better water of the Lambeth Company, while in 1849, when that company took water from a point lower down the river than the Southwark, the death rate was largest among those using their water.

Dr. John Simon, Chief Medical Officer of the Privy Council and of the Local Government Board of Great Britain, testified as follows before the Rivers Pollution Commission: "It is, I think, a matter of absolute demonstration that in the old epidemics, when the south side of London suffered so dreadfully from cholera, the great cause of the immense mortality there was a badness of the water supply then distributed in those districts of London."

In all this nothing has been said about disease germs, for like the chemist's atoms their existence even is not proved, though it seems certain that many diseases are produced by specific poisons, of the nature of which we as yet know little, and that in certain diseases these poisons are contained in the excreta, which may give rise to these same diseases through the use of drinking water to which they have gained access. All filth is not necessarily harmful, a statement which hardly needs proof, but the truth of which is well seen in the case reported by Dr. J. C. McKee, U. S. A., in the *New York Medical Journal* for November 3, 1883, in which water containing large quantities of putrescent animal matter was used for two weeks by a garrison of eighty people, including men, women and children, without producing any deleterious effects, but if some specific kinds of filth *are* poisonous, then the use of a given water which is liable at any time to become specifically polluted, should be abandoned, if possible, in favor of a safer source of supply.

And lastly as regards the natural purification of polluted waters, while the tendency of all organic matter, animal or vegetable, is toward ultimate death and final destruction by oxidation, it is as yet impossible to say how rapidly such a destruction goes on in many cases. The Rivers PollutionCommission mixed urine with water, in the proportion of one part of urine to 3,077 of water, agitated the mixture from time to time and analysed samples. At the end of the eleventh day the improvement in the water was so inconsiderable that other experiments were made in which a stream of impure water was allowed to flow from one vessel to another, and was thus freely exposed to the air, and as a result of these experiments the commissioners concluded that purification by natural oxidation had been greatly overrated, and that "there is no river in the united kingdom long enough to secure the oxidation and destruction of any sewage which may be discharged into it even at its source." They also conclude that "rivers which have received sewage, even if that sewage has been purified before its discharge are not safe sources of potable water." (Rivers Pollution Commissioners' 6th Report, pp. 134–8.) Upon this point Frankland says: "Twelve years ago there was a general impression amongst chemists and others that polluted water quickly regained its original purity by spontaneous oxidation. The opinion had no foundation in quantitative observations; indeed there was not a single experimented fact to prove it. * * * The impression had gained currency from the improved appearance of a polluted river after a flow of a few miles. * * * Two classes of persons strongly interested in its acceptance were chiefly instrumental in the origination and diffusion of this opinion. These were, first, the polluters of

running water, and secondly water companies drawing their supplies from below the sewer outfalls of towns." (*Journal Chemical Society*, May and July, 1880.) Such improvement as does take place in running streams probably depends more upon the part played by fresh-water plants and micro-organisms than upon direct chemical oxidation, and of course no accurate conclusions can be reached as to the effect of these varying and little understood agencies. Mere dilution also doubtless accounts for the apparent disappearance of much noxious matter. Professor Wm. Ripley Nichols, in his *Water Supply*, italicises the following statement: "*The apparent self-purification of running streams is largely due to dilution, and the fact that a river seems to have purified itself at a certain distance below a point where it was certainly polluted, is no guaranty that the water is fit for domestic use.*"

To what extent, therefore, must a polluted water be diluted before it is safe to use, is a question of the greatest interest, but one to which no answer can as yet be given. Nor can we prove that the specific poisons of certain diseases — admitting their existence — may not contain living organisms capable of rapid multiplication, nor can we tell for how long a period or under what conditions these organisms may retain their vitality. In this absence of positive knowledge, but in the light of countless facts which all but prove our suppositions true, we had best err, if err we must, on the safe side, avoiding the use of polluted waters and recognizing the fact that although chemical analysis may detect no impurities in a water, it is not, therefore, necessarily safe to drink.

The views here presented, may seem extreme to those who have long believed on insufficient grounds that from a chemical analysis alone the character of a drinking water may be decided. My endeavor has been to deal with facts, and make no claims for the chemist's ability in this direction which may not be substantiated, and until we have more knowledge than we now possess of the real causes of disease, and until other methods of analytical research shall have been discovered, it is futile to ask the chemist to recognize and measure forms of matter of which he is ignorant, and to state what will be the effect upon the human system of substances the very nature of which is as yet to him unknown.

THE GREEK THEORY OF THE STATE.

By Professor EDWARD NORTH, L. H. D.

[Read before the Albany Institute, October 20, 1885.]

The Greek theory of the state may be studied with new interest, in view of the recent discoveries made at Olympia in western Greece by explorers from Germany. Several characteristics of Hellenic civilization are illustrated by the prytaneum, or town hall of Olympia, where victors were feasted on their return from battle. Previous to this discovery no remains of a Greek council hall had been found, although it was well known that the Athenians had their prytaneum under the northern wall of the Acropolis.

The Greek idea of the state as something sacred, impersonal and supreme, had its visible expression in the prytaneum at Athens, where the laws of Solon were hung up for inspection, and where a perpetual, consecrated fire was kept burning on the city's public altar. This fire represented worship, aspiration, intellectual life, autonomous government. Similar council halls were built wherever the Greek ideas of law and religion prevailed. There was something of political and religious significance in the modest, unpretending exterior of Athenian dwellings. The costly public buildings that crowned and flanked the Acropolis emphasized the theory of the state's supremacy. The bronze image of Athena Promachos, wrought by Phidias from spoils captured at Marathon, announced that at Athens the state was every thing, the individual nothing, except as a loyal integer in the fabric of state sovereignty. This idea gave constant inspiration to the eminent sculptors, painters, architects, orators and poets who grew up to greatness at Athens, or were attracted thither from other cities.

With our early training in a different school of politics, and religious faith, it will always be a mystery to us that this idea of the state's supremacy found such a welcome in the sympathies of the common people at Athens. Pericles could have done nothing for art at Athens

without the consent of the tax payers. They were with him, and made cheerful sacrifices on the altar of devotion to the state. Nothing short of a generous, patriotic appreciation of art could have led them to approve such large appropriations for public buildings, which in the time of Pericles alone must have cost upward of ten millions of dollars.

Athenians have been charged with ingratitude in ostracizing eminent citizens of such acknowledged worth that their statues were set up in the prytaneum. Grote, Curtius and Freeman defend these ostracisms as a logical sequence of the theory that the state's integrity and glory are the first and supreme interest. We are told that ostracism was a milder penalty than a bill of attainder; that it was sometimes demanded by cogent political reasons; that if mistakes were made, they could be atoned for afterward.

Religious festivals and public amusements were closely united and subsidized in the Greek system of autonomy. There was no real freedom of conscience, as there ought to have been, in a city crowded with costly temples and images which invited one to worship the likeness of every thing in heaven above, in the earth beneath and waters under the earth. That Socrates should have been condemned to death by a jury of Greek polytheists will always be one of the mysteries of popular inhumanity.

It will be less a mystery to one who recalls the exasperating defiance of Socrates in making his own defense, after refusing the oration skillfully prepared for him by Lysias. Had Socrates been ambitious of a martyr's death, he could not have gained that distinction more surely than by his sneering assault on the dignity of the state as symbolized in one of its cherished institutions.

There was no lack of assailable points in the Greek plan of an autonomous city. Athens had 21,000 free citizens, not counting women and children. Below these were 10,000 foreign residents, mostly engaged in business, with no rights that made them respectable and contented. By the census of 309 B. C. the slaves numbered 400,000; they were a constant menace to the peace and permanence of the state — an uneasy Typhon beneath the roots of society. Many of the slaves were equal to their masters in education and fitness for freedom. Xenophon speaks of slaves and freemen as often so much alike that they could not be readily distinguished in the street. In trying to decide how far the Greek ship of state was sea-worthy, its system of slavery should not be overlooked. The cheapness of slaves gave to the freemen of Athens a general release from the need of manual labor. This helps to ex-

plain the fact, otherwise well nigh unexplainable, that Athens made such large contribution to the highest literature and art from a body of freemen less than half the population of Albany. In its own perilous way, slavery accomplished for Athens what has been more safely gained for modern civilization by the invention of machinery. Leisure and wealth easily gained, bright skies and sunny companionships, helped to quicken the inspiration of poets, orators and philosophers whose thoughts are a living power to-day. The wealth and pride of Athens made it an object of envy to rival states. When the final assaults came, habits of luxury, indolence and extravagance proved a fatal weakness.

Another weakness was in neglecting to strengthen the family. Faithful wives and daughters were banished to the rear apartments of the Greek mansion where they had charge of the household slaves, the children, the weaving and the spinning, the baking and brewing, and the preparing of sumptuous dinners for the lords of the *andronitis*. Greek women were cumbered with needless household drudgeries, while their sons were pedagogued to schools taught by slaves often better educated than their own mistresses.

The decay of heroism and chivalry in Greek character was largely due to this departure from Homer's teachings. Homer's women were exemplary housekeepers, yet they were not excluded from the halls of hospitality. In fact, the words *andronitis* and *gunaikonitis* were never used by Homer. They were the coinage of a later period, and each word does the duty of an epitaph, proclaiming the death of Greek chivalry and the social dethronement of Greek women.

In the shaping and organizing of public opinion, the functions of the modern press and pulpit were anticipated, after a fashion, by the utterances of the agora, the pnyx, the academy, the portico, the symposium and the theater. The Attic jury system was a popular law school; superficial, but better than none. Each year 6,000 jurors were drawn, and 500 were taken for trying an important suit. Inasmuch as the jurors decided all points of law, as well as questions of fact, their power was immense. It would pass for the grand event of a life-time, to have been one of the 500 sworn jurors who gave their pebbles for acqnittal, or against it, after hearing Æschines and Demosthenes in their orations *De Corona*. The theater of the Greeks was another school in which they were literally educated in ethics, social philosophy and political wisdom. As the state gave a generous support to religious rites and festivals, so it supported the theater and dramatic competitions. The theater of Bacchus was large enough to

seat all the freemen of Athens, and none were kept away by religious scruple, social caste, or lack of means. Theater going was a part of the popular religion. The sermonesque character of many of the choral odes harmonizes with the fact that priests occupied seats of the highest honor, alongside senators and foreign embassadors.

The talk of the street was a great power at Athens. The newspaper will not deny that one of its tendencies is to make men unsocial. Neighborly confidences must sometimes submit to a discount when the wide world's photogram can be had for less than a half-dime in the morning paper. At Athens no such pitiless, incessant rivalry eclipsed the brilliant talker. Conversation was carefully cultivated as one of the finest of the fine arts. The Athenian was the Frenchman of antiquity.

When final results are reached the history of the Athenian state becomes a record of degeneracy and disaster. There was a worm at the root of all its outward prosperity. It was a false and fatal theory as the event proved, that permanent strength could be secured to the state by ignoring the claims of the family, the captive and the bondman; that regarded the least mixture of foreign blood as more degrading than any moral taint; that made no provision for lightening the burdens of vice, poverty and misfortune. False and short-sighted was the policy that sought to build up a strong and perpetual government with no asylums or free schools for the needy, with no homes worthy to be classed with the Englishman's castle, with nothing worth the patriot's dying for but the glory of the impersonal state as embodied in splendid architecture, magnificent tragedies and grand religious festivals.

ON THE CORRESPONDENCE OF GOVERNOR D. D. TOMPKINS (1808–1824), LATELY ACQUIRED BY THE STATE, WITH SOME NOTES ON HIS LIFE.

By Henry A. Homes, LL. D.

[Read before the Albany Institute, November 15, 1885.]

While the principal object of my paper this evening is to give you some information regarding the original correspondence in manuscript of Governor Daniel D. Tompkins, into the possession of which the State has just entered by purchase, I shall be continually adverting from necessity to events in his official career in explanation incidentally of their importance and value.

The facts relating to the protracted public life of Governor Tompkins, which will be introduced, will prove, I hope, more interesting to you than if I had been compelled to confine my remarks to a pile of antiquarian manuscripts. And if your thoughts are frequently carried back seventy years — to the war of 1812, it will be associated with so many new and some of them touching facts that you will find yourself listening to something more fresh than a "twice told tale."

The official correspondence of Governor Tompkins was first offered for sale to the State in 1878, by his eldest son Minthorne Tompkins. He was a man of fascinating manners, and popular where he was best known.

The Hon. Erastus Brooks was conspicuous in this first attempt to have them purchased for $5,000, for apparently only 1,700 letters. Mr. Tompkins told me however that he had never dreamed of yielding them for a less sum than $10,000, as he wished to give $1,000 each to several sisters then living. The measure was adopted in the Assembly, but failed in the Senate. Other attempts were made in succeeding years and finally, in 1883, the law was adopted in the legislature, and waited for the Governor's signature. Governor Cleveland vetoed this item iu the bill. But in 1884, the measure again passed both houses; and Governor Cleveland had the magnanimity to disregard his previous

veto, and to approve of the purchase, which had twice been recommended by the Regents of the University, who are trustees of the State Library.

Six months elapsed before the State entered into possession of the papers, the delay being occasioned in part by the fact that the sum offered by the State was not considered as an equivalent for their value. The ensuing six months down to the 4th of July, 1885, were occupied in obtaining a quiet and incontestable title to the papers, since it was deemed proper before completing the payment to procure a release from the nearly forty heirs of the governor who had left no will.

The purchased papers consist of the official copies of 1,800 letters written by him while Governor of the State from 1807, bound in five volumes folio; also of letters written by him while Vice-President of the United States, from 1817 to 1824; also of 2,000 letters *received* by him during the same two periods, of seventeen years in all. Besides these there are 1,000 miscellaneous papers, making 5,000 manuscripts of all classes. Of the letters received by him, besides the originals, there are careful copies which he had made of large numbers of them, and bound iu six folio volumes.

The bound volumes make in all fifteen beautifully and closely written folio ledger volumes of about 450 pages each, or 9,000 pages in all. In addition to these there are 2,000 letters and loose papers in their originals.

And now why was it considered important that these papers should be owned by the State. One prominent and sufficient reason is that the greater portion of them constitute a part of the official, civil and military history of the State while the State did not possess either the originals or the copies. The State for scores of years did not possess the official papers of any of its governors, and if to-day she possesses those of Governor George Clinton she has obtained them by purchase from private parties at an expense of several thousand dollars. It needs no argument to sustain the sentiment that it becomes every civilized State to preserve in its archives the record of what the State has done, not only through its legislators, but through its executive officers.

But a more special and important reason for securing the papers of Governor Tompkins is, that more persons, towns and counties of the State are interested in their contents, than in any papers of the State from the revolutionary war until the present time. They cover the whole period of the aggressions of England which culminated in the war of 1812, and continued to 1815. And the chief permanent theatre

of that war in the United States was on the northern and north-eastern frontier of this State, while the men serving in the defense of the whole country were largely citizens of New York.

And lastly, I think that it is not an exaggeration of sentiment to declare that a more influential reason with a generous minded people would be that, as the early and successful termination of the war of 1812 was owing more to Governor Tompkins' personal exertions than to those of any other individual, the people would rejoice to be able to possess in these papers the choicest memorials of the patriotism and faithfulness of their own governor to the Nation.

I must, now, for the sake of making you acquainted with the character of these letters and documents, give a brief sketch of the official career of Governor Tompkins and of his times.

Daniel D. Tompkins was born in Scarsdale, Westchester county, in 1774. He was descended from a Plymouth pilgrim; graduated at Columbia College; practiced law in New York city; was member of assembly in 1803; was elected to congress in 1805; was appointed judge of the Supreme Court in 1804, when only thirty years old; and was inaugurated governor in January, 1808, when thirty-three years old. He held the office for ten years, until he resigned it in 1817, to become Vice-President of the United States; and during the whole period, he was Chancellor of the Regents of the University. He died in 1825, only fifty-one years old. His first message, as governor, to the legislature, in 1808, commenced with a protest against the British attack on the U. S. Frigate, Chesapeake. Being of the Jeffersonian school in politics, he sustained the embargo laws, and accomplished with zeal the organization of New York's quota of 100,000 men, so as to be ready for the war that was expected. In the next message, viz., in 1808, and in the one following, he reports, the establishment of depots of arms and ammunition on the northern frontier of New York, and that provision had been made for the defense of New York city, by batteries and an arsenal. In his message of January, 1812, notwithstanding a declaration of war impending, he recommended, none the less, to use his own language, that the legislature should devise the means "for the gradual and ultimate extermination from amongst us of *slavery*, that reproach of a free people."

Two years after, in September, 1814, at a special session of the legislature, on account of the urgency of the war, he made such recommendations, that the legislature immediately passed a law, decreeing

the formation of two regiments, of 1,000 men each, of colored men, to serve during the war. And they were, accordingly, organized, and served at Sackett's Harbor, among other places.

And five years afterward, when peace had been declared two years, and after he had been chosen Vice-President of the United States, and twenty-five days before resigning his office of governor, viz., on January 28, 1817, he evinced the high moral tone of his nature, by sending a special message to the legislature, urgently recommending the entire abolition of slavery in the State, and that after 1827, there should not remain a slave within its limits; thus, in his own language, "emancipating from bitter servitude that portion of his fellow-creatures who continue to be held in unjust and cruel bondage, by civilized and independent freemen."

After his resignation, and though he was no longer an officer of the State, the legislature at that session, on March 31st, unanimously and promptly enacted the law which he had requested. There is no doubt that it was done at that time largely in deference to his request and out of love to him. It was the era of good feeling in politics, the days of President Monroe, when Governor Tompkin's chances for the presidency seemed as good as those of Monroe himself. Hammond, the political historian of New York, says of the governor: "He was personally more popular than any man the State has ever produced." page 532.

His message of February 24, 1817, in which he sends in his resignation of his office of governor, expresses in most touching language his consciousness of the degree to which he had the love and confidence of the people, and of what he calls "the paternal solicitude" with which they had all sustained him, officers, legislators and citizens, during the war and amid violent party collisions, national difficulties and distress.

In the clear light of the coming centuries with what pride will every New Yorker point to the volumes containing Governor Tompkins' messages and correspondence on the library shelves, as the memorials of the man who was the leader in accomplishing the abolition of slavery in this State!

Besides this most honorable action he was persistent in favoring popular education, the amelioration of the Criminal Code, and he once, which was a most extraordinary proceeding, prorogued the legislature, lest it should enact a law incorporating a certain banking institution, which law he believed would be obtained through bribery and corruption.

Prominent as is the moral grandeur of the picture, of his effective opposition to *slavery*, it is surpassed, so far as his personal self-denial and patriotism are exhibited, by his steadiness and zeal in sustaining the war against England. It must be remembered, that one branch of the legislature was opposed to war measures, and was indisposed to provide the funds necessary for the prosecution of the war and to aiding the general government with the credit of the State. Governor Tompkins took the responsibility of raising funds for the purposes of the war, frequently on his own personal indorsements. He disbursed during the war more than three millions of dollars, of which one million was for the State and two millions were for the United States, these sums being frequently raised, as I said, on his own responsibility. Rufus King, in a meeting of citizens, including Col. Rutgers, Col. Willett, etc., said to him: "If you ruin yourself in so doing, you will have the gratitude of your fellow citizens; trust to their magnanimity! You must save the State and the city, even if you ruin yourself." Governor Tompkins took the chances, assumed the load placed upon him as his duty and was successful in saving the State, and secured thereby the gratitude of its citizens; but eventually suffered the pecuniary ruin set before him in Rufus King's dilemma.

During the three years of the war, the very catalogue of the offices which he held is appalling. He was Governor, Commander of all the forces of the State, Major-General of the United States, Paymaster, Quarter-master, Commissary and general disbursing agent for both governments.

The surprise should not be that he may have committed many errors,—but rather that he escaped with so few. His correspondence shows the earnestness with which he engaged in the discharge of his multifarious duties.

Governor Tompkins, as early as July 28, 1812, wrote to Henry Dearborn, major-general in command on the northern borders of New York and in Canada: "You may rely upon all the assistance which my talents, influence and authority can furnish, to the active prosecution of the just and necessary war which has been declared by the constituted authority of our beloved country."

At a later period in the summer of 1814, the prospects of the war were more discouraging than at any previous period. All the correspondence from the interior and northern boundary was an appeal for reinforcements, and for funds for the war. When in that same summer the United States government wished the governor of Massa-

chusetts to raise funds for a military expedition to Maine, nothing was done. But Governor Tompkins raised $300,000 again in the emergency and placed it under the orders of General Dearborn who was then commanding in Massachusetts. James Monroe, Secretary of State, and acting as the Secretary of War, wrote to Governor Tompkins in 1814: "It is in the power of your State to make an exertion that will not ouly *save* those armies" (those of Generals Brown and Macomb), but crush the British force employed against them. * * * It is the object of the enemy to overwhelm *us* in this campaign, and I have satisfactory reason to believe that they indulge the presumptuous hope of penetrating from the lakes by Albany to the city of New York. A vigorous and manly exertion is therefore necessary on your part." There *was* an intention to repeat the scheme of the Burgoyne campaign of 1777, in which year was fought what constitutes in this world's history one of its fifteen decisive battles. If we did not have another as decisive a battle it was because we had a most decisive man who by his energies forestalled the occurrence of such a battle. To effect this result, he added "to his ordinary duties of chief magistrate and to all the anxieties growing out of this alarming state of public affairs, the labor and perplexity of calling into service 25,000 militia — the care of raising the large sums of money necessary for the National government, which was almost penniless, the fatigue of personal command blended with questions of rank among the fiery spirits he had awakened into action."

"It seemed however that he grew with the emergency. And it is delightful to witness the ease with which he carried the burden." In less than forty days, without assistance in money from the National government, he brought into the field at various points of danger 50,000 men who were armed and equipped and organized, bore the toil and expense of commanding 20,000 of them in person, and in less than sixty days, the National credit being at its lowest point of depression, when interest could not be provided for, he raised $1,000,000 for the public service" and he writes, "I made myself personally liable for the whole amount." I have not given on these topics my own opinions, but simply quote his own words and give the opinions of historians who have treated of the theme.

He entered upon the vice-presidency with his accounts unsettled and therefore liable to imprisonment. During his eight years in that office, he was in conflict with the financial officers of the State and the nation, on whose ledgers he was made to appear as a defaulter.

And yet if they had paid him his just due they would not have cancelled their obligations to him, as his pecuniary claims on them exceeded any debts he owed either to the State or to the nation. Letters preserved in this collection of manuscripts from President Monroe and Henry Clay prove that after the war and after Governor Tompkins' death, there was still due to him from the United States about $92,000, of which only one-half was ever paid to his family.

With regard to the controversy on his indebtedness to the State proceeding from Comptroller McIntyre and from the legislature, the historian Hammond admits that both political parties wished to pay him what might be due, but differed about the form, and adds: "Both parties admitted that he had not wasted or appropriated to his own use the public moneys." The reason the controversy assumed the shape it ultimately did, and of the adverse action of the two houses, was that both parties thought they could make political capital out of it, and each party thought it could make more than the other.

As late as the year 1847, his death having occurred in 1825, or twenty-two years previously, his family presented his claims at Washington, and were paid by the government nearly $50,000, though it was only a part of what was due to him as generally admitted. To make more intelligible an extract I am about to read regarding Governor Tompkin's embarrassment in money matters, I will mention that in the village now called Tompkinsville, on Staten Island, Governor Tompkins was once the possessor of a large number of acres of land, now covered with houses, and the streets of the village are to this day named after his sons and daughters.

The extracts to which I refer are from two letters addressed to me in 1883 and 1885, regarding the Tompkins' papers by Henry B. Dawson, of Morrisania, an eminent historical writer, who was for many years editor of the *Historical Magazine.* He writes:

"The letter-books and some of the papers of Governor Tompkins were in my possession for some years, and I think I am competent to pass upon the value of those manuscripts, as materials for history. I say without hesitation that there is nothing in the country to be compared with them for importance concerning the war of 1812, and the crowning part which New York with her governor bore in that conflict, can *nowhere else be seen.* The United States were dependent on the personal indorsement of that same governor to the Bank of America for the money which they could not provide anywhere else; and after all, those same United States permitted its paper to go to protest on

that occasion, and the governor's private property was sold by the sheriff, it having been the bank's security for that federal loan. *Mrs.* Tompkins, three days after her confinement, was carried out of her home on her bed, and laid in the street with her infant a few days old, by the sheriff's officers penniless and homeless. The officers and crew of the United States revenue cutter then lying off Staten Island, who had witnessed the barbarism of the law, picked up the bed, the mother, and the babe, and carried them on board the cutter."

"Not until the past few years was the principal sum of that debt paid to the Governor's children. The interest was never paid; and the property which was wrested from him by the sheriff to pay what he had borrowed for the United States, is to-day worth millions. * * * I fear that these papers will be lost to New York, and fifty of General Washington's coats, seals, walking canes and what not, would not repay the world for such a loss." Mr. Dawson here refers perhaps to the sum of $20,000 which was appropriated by this State in 1871 to pay for some memorials of Washington, certainly of great value, but not in any wise so important to the State of New York as these papers of Governor Tompkins. He adds: "I hope you will do entire justice to that noble man; and that you will not permit any thing to prevent you from exposing the villainy which drove him to drink and to an early end." This is all that I will quote from Mr. Dawson's eloquent letters. Although Mr. Dawson uses severe and strong language, he is rarely mistaken in his statements of facts.

I had the same convictions with Mr. Dawson that we cannot expect to obtain materials for the history of this State, of its towns and its families of greater value, from any quarter and at any price than the papers of Governor Tompkins. It is the events in this particular period of the war of 1812 to 1815, and the marshalling of troops by the State in the years preceding which have procured so much honor to our State and to Governor Tompkins. And as we repeat the names of the towns which were the theatre of the war in this State, we see the grounds for the perpetual interest which will always attach to even minute particulars regarding this period. Some of the familiar names recorded on the historical column of New York, are Plattsburgh, Sacketts Harbor, Oswego, Niagara, Buffalo, Chippewa, Craney Island, Beaver Dams, Fort Erie, Ogdensburg, Ontario, Fort Queenstown, St. Regis, Thames river, and many others.

The most exact and critical history of the war of 1812 that has been written is by Charles J. Ingersoll of Philadelphia. In that history,

speaking of the period during the year 1814, when Governor Tompkins' exertions for the defense of New York city had been most earnest and self-sacrificing, Ingersoll writes: "Governor Tompkins was at that period the pivot, on which the success of the war and of the Union turned more than on any other individual. * * * His speech to the legislature, September 27, 1814, was commensurate with the emergency."

And yet I cannot refrain from illustrating to you by an example, the facility with which the most important character in a war may be utterly ignored. With this opinion of Ingersoll's in your minds as to the value of the services of Governor Tompkins in the war of 1812, contrast the history of this war in two volumes, entitled "The Second War with England." It was written in 1853, while Ingersoll's had been published in 1849. The author of this history makes no mention of New York as a State, or of Governor Tompkins in his table of contents, and only once did I find his name casually mentioned in the work, and with no discrimination to his praise even then. The author of this later history was not a citizen of a distant state of the Union, but of the State of New York, one who was honored two years after its publication with the office of Secretary of State, the Hon. Joel T. Headley. No such blunder should have been possible then. It will be of very improbable occurrence now that the State possesses these original records of Governor Tompkins' life.

Bolton, in his voluminous history of Westchester county, speaking of Governor Tompkins, observes that "Whenever the history of that war shall be written for posterity, his name will fill an ample space." You will all agree with Bolton, that evidently, therefore, Mr. Headley's history is not the one which has been written for posterity. And I am sure that you are already felicitating the State and yourselves, that in possessing Governor Tompkins' official correspondence, it has acquired the materials by means of which it can become acquainted, can make known and perpetuate the knowledge of the honorable deeds of one of her first citizens, as acknowledged by a citizen of another State, though they were disregarded by a historian of our own State.

As I aim at and enjoy giving you the opinions of others rather than my own, on this moral hero of New York, I will now give you the voice of history already speaking in 1881, as compared with the silence of Mr. Headley's History of the war. The History of the United States, edited by Wm. C. Bryant, contains this paragraph on Governor Tompkins :

"Tompkins was the war-governor of that period. By his energy, executive ability and personal pecuniary sacrifices, he had done as much, perhaps more, than the administration itself, in conducting the war on the borders of Canada. His qualifications for the chief magistracy were far superior to those of Monroe. But Monroe was a Virginian, devoted to the slave power, while Tompkins was disqualified by Northern birth." V. 4, p. 246.

Ferris Pell, Esq., a New York gentleman, was the author, in 1819, of a volume in which he draws a parallel between the character of Governors Tompkins and DeWitt Clinton, and extols the more highly that of DeWitt Clinton. Still here is his language on one point, which does not have its force abated by any other comparisons which he makes to Governor Tompkins' disadvantage in the same pamphlet. He says: "It is a source of proud and grateful emotion that in that dark and perilous period when our country was assailed by a haughty and gigantic foe without, and convulsed by unprincipled factionists within,—that Governor Tompkins stood the undaunted advocate of the Union, amid the direct conflicts of party spirit;—that he breasted the most appalling obstacles which inexperience, want of preparation and political acrimony could interpose, with steady and unwearied perseverance;—that he devoted all his influence, all his authority, and all his talents to protect his native State and to aid the general government;—assuming responsibilities for the public good, which the law did not sanction, identifying his pecuniary safety with the safety of the State, withering his constitution and wearing his frame—*are truths as undeniable as they are splendid and endearing.*"

In further confirmation of what I have already said, I suppose that an audience, embracing so many who cherish a lively interest in the history of the State, will be prepared to listen to an additional analysis of the contents of these manuscripts, though I am as yet but superficially acquainted with them myself. Still I hope to be able to interest you with what I may communicate. Among the papers received by the State, there are seven original letters from President Jefferson, three from President Madison, twenty-seven from President Monroe, and ten from other presidents.

From generals of our army, there are thirty-seven from General Robert Macomb, seven from General Alexander Macomb, sixty from General Jacob Brown (a man of whom it was said, "no enterprise undertaken by him ever failed").

From General Henry Dearborn, both Secretary of War and Commander on our northern frontier in 1812 and 1813, fifty-six letters; from General William Curtis, Secretary of War, twenty-six letters; from Colonel Jonathan Williams, also Commander at West Point, twenty-two letters; from General John Armstrong, also Secretary of War, twenty-three letters; from General Solomon Van Rensselaer, Adjutant-General of New York, eighteen letters; from Governor DeWitt Clinton, twelve letters.

And from a long list of many others, names with which you are perfectly familiar as the eminent names in our State or National history, from one to eight letters from each of them — such as, Nicholas Fish, General Wadsworth, Robert Swartwout, Dr. S. L. Mitchill, Albert Gallatin, Eli Whitney, General James Wilkinson, Ambrose Spencer, Washington Irving, General Scott, Rufus King and six from T. Addis Emmet, and many others.

One volume contains his correspondence as Major-General of the United States, commanding the third military district of the United States and his general orders in 1814 and 1815. Two volumes of five hundred pages each contain all the general orders and correspondence of the Adjutant-General's department of New York, during the years from 1800 to 1812.

In two folio volumes containing 1,000 beautifully written pages have been copied out all his judicial opinions, all his messages to the assembly, the senate or the legislature and their answers for the whole ten years of his terms of office.

The 2,500 loose manuscripts, the originals of many of the copies in the volumes, have yet to be compared with the copies to discover how far they duplicate or are additional to what are in the bound volumes.

Our curiosity may be excited to know how it comes to pass that so many of these letters exist in *copies* in this purchase, as well as in their *originals*. It was the opinion of Minthorne Tompkins, his son, that the copies had been made to facilitate the governor in using them in defense of his claims. His son thought that many of the copies were in the handwriting of his father, or were original entries made by him when sending off his letters.

I will now read extracts from a few of his unpublished letters, which I do not pretend are more interesting and important than many others. They are such as my eyes chance to have rested upon, and may be supposed fairly to illustrate the character of the State's newly acquired treasures.

The first is a letter from Governor Tompkins and illustrates the operation of the party animosities of the day.

February 29, 1812:

To the Hon. PETER B. PORTER:

The enclosed letter is from Judge Ostrom, who wishes an appointment in the army. He was formerly a decided Federalist and represented Oneida county in the Assembly for several years. But disappointment in 1810 and disgust with the Federal party since, has caused him to avow himself a republican....He is well qualified for a major in the army and I can recommend him cheerfully....

By a list, which it is understood is before the Secretary of War, I learn that the names of Aquila Giles and Solomon Van Rensselaer, Benjamin Walker and William North are presented for the first grades of command....Our republicans will illy brook it, that the command of an army in a contest with Great Britain should be entrusted to such men.

March 2, 1812.

To JOHN BULLUS:

* * * I have been repeatedly desired to mention to you that the republicans in this quarter are desirous that instead of Mr. Walton, some friend to the government should have the transportation of navy articles from Albany to the western waters.

Walton is considered in the light of a British adherent, and is largely engaged in smuggling from Canada. * * * Eli Lusher is the republican transporter.

I have mounted your charger but once, and his spirits were then so high, that it put me in a fine perspiration to ride him about ten miles * * * As soon as the ice leaves the roads I shall pay him off for his winter frolick.

April 3, 1812.

To Gen. PAULDING:

I have received your letter relative to the application of Mr. Davis for the office of deputy commissary general. I have already recommended Col. Lamb. Even if I had not, I should be reluctant to hazard any further recommendations, after such men as William North, P. I. Schuyler, Robert L. Livingston, etc., are honored with the highest military distinctions in this State by a republican administration. I shall avoid even the appearance of responsibility in the appointments to be made....

I have received an order from Washington to station militia at Nia-

gara, Oswego and Black River; but....I am not advised....where they are to get tents and camp equipage, or who is to advance the necessary expenses * * * I shall to-morrow dispatch the necessary orders on my own responsibility as to funds.....

April 4, 1812.

To WILLIAM IRVING, Esq.:

* * * I feel perfectly conscious of the propriety and necessity of the responsible step which I have taken, and therefore shall not be made unhappy by any sacrifice I may sustain by reason of it....Yet ....the approbation of the virtuous and upright will be a cause of great satisfaction to my mind. * * *

The eyes of our friends in every part of the State are directed to New York city, and their universal wish and prayer is that the spirit of discord may be charmed down, or be merged in the importance of the present crisis * * *

This was written in the hope of securing a *republican* representation from New York city.

The next extract is from a letter to Colonel Rutger, dated April 6, and is called "confidential":

"I am penetrated with grateful sensations by the unanimous and flattering manner in which the republicans of New York have been pleased to approve of....my proroguing the legislature. * * * If it be once established that speculation by public officers is a matter in which they are to decide in a legislature * * * capacity is a matter of indifference *with their constitutents* * * * if it be tolerated that combinations of out-door individuals * * * of slender morality can for a stipulated sum pre-engage and contract to carry a measure through the legislature whatever may be its bearings on the public safety....from that time no upright man will endure to breathe the atmosphere of the metropolis."

We will pass now for a moment over five years to make an extract from a letter of January 28, 1817,—addressed to Rev. Dr. J. B. Romeyne.

"At a meeting of the Regents last evening, a conditional charter was granted for a college on Staten Island to be called "Washington College"....The regents generally if not unanimously are in favor of removing Columbia College from the city and are desirous that its sectarian character may be destroyed. * * * The consolidation of the property of Columbia College with the funds of our proposed college will be....more popular and beneficial generally and especially with the Regents...."

September 29, 1814.

To Secretary of State and War, JAMES MONROE:

* * * For the defense of the city of New York, I have exerted myself to the utmost. Fully 15,000 of the militia of this State, about one thousand sea fencibles organized under State authority are now in service in the third militia district. These with Commodore Decatur's command, the regulars, sea fencibles of the United States, Jersey militia, corps of exempts, and neighboring militia left in reserve, will if well disciplined and commanded be adequate to the defense of N. Y. * * *

Nearly 25,000 of the militia of the State are now in the service of the U. S. It is a herculean task, at a busy season of the year, and without funds in the hands of any of your quarter-masters, and without any authority or control over the district departments, to get out, transport and equip at various and remote points so large a body of troops. * * * Permit me to say that every exertion will be made on my part to comply with the future requisitions of the National government to the full extent of my authority and resources.

[Signed] D. D. TOMPKINS.

On the third of October, 1814, Governor Tompkins writes in this manly style to complain of President Madison that in his message to Congress he had not mentioned the name of General Peter B. Porter. He wrote to Jonathan Fisk, member of Congress thus:—"When I inform you that General Porter raised his own corps at his own expense under desponding circumstances, the Niagara frontier having just before been desolated, and there being when he began no prospect of the assistance of a considerable regular force there; that the legislature had tied my hands so that I could only help him by commissions and general orders; and he had no funds to recruit with—no bounty money or allowance in lieu of clothing, and no pay beyond what regulars received...."

"Besides all this he was odious to the federal party....He surmounted all these obstacles and raised a considerable force; and with those he has distinguished himself in every action that has been fought. * * * He opened the ball at Chippewa, went with Scott to the shore of Lake Ontario, fought bravely at the battle of Bridgewater,—at the attack upon Erie under Gaines, and in the late sortie under Brown. * * * He has been twice wounded himself. Yet,

while all others have been breveted and complimented, General Porter and his little band alone are neglected and are not mentioned by the President in his message....He had done it with respect to Scott and Gaines, which makes his omission of Porter more unjust and cruel.... I see resolutions have been proposed in Congress to compliment Brown, Scott and Gaines....carefully omitting General Porter again. Now with this repetition of cold neglect, I am compelled to suppose that some personal or local prejudice withholds the meed of praise...."

"In noticing the affair at Plattsburgh, the President seems carefully to have avoided the mention of New York....The militia both in retreat and pursuit suffered most....The common militia of N. Y., assembled in haste, has behaved gallantly in the late sortie at Erie. The storming of strong works by militia certainly demands unbounded applause. * * * Now with the exception of Brown, who commanded the army, not a New Yorker is praised or even mentioned; and with respect to Brown, even the honor of mention is greatly impaired by coupling subordinate officers with him. Nor is the patriotism of the volunteers, nor militia of the State mentioned, although at the time....nearly 30,000 of the yeomanry of this State were in the service of the U. S., and without whom two of their armies would probably have been lost; and the metropolis of the State before this time have been in the possession of the enemy."

"Should the complimentary resolutions introduced into Congress exclude Porter and his brave comrades, I am satisfied that our legislature will feel themselves called upon to do him justice by recitals and resolutions, which will give your great men at Washington a Roland for your Oliver.

I am, Dear Sir, etc.,
D. D. TOMPKINS.

This letter was probably not without effect. On October fourteenth, Gen. Porter received from President Madison the commission of Commander-in-chief of the army of the United States.

It surely awakens in your minds a thrill of grateful pleasure to listen to this disinterred record of a manly defense of an honorable and honored citizen by Gov. Tompkins.

NEW YORK, *October* 9, 1816.

To PETER HAGNER, Third Auditor of the Treasury. [Regarding his accounts.]

....It is almost impossible for any one....to realize the embarrassments at the commencement of the late war, incident to the supply and equipment of undisciplined militia.

The quartermaster-generals would not recognize any militia officers, and therefore did not make any advances to them to bear the expenses of the corps ordered into the service.... Most of the frontier troops (in) the first campaign were militia of this State. I was, therefore, placed in the dilemma of providing for their expenses, or permitting them to return home .... disgusted with the war and the government."

To show the difficulty of having vouchers for all his expenses he writes in the same letter ...

"The Buffalo militia....arrived at their destination.... There was not a camp kettle within 400 miles of the post. There was no alternative to prevent disbandment or starvation but to purchase from the families of the thinly populated frontier, their pots and kettles.... For those expenditures, I conceive, there ought to be much liberality as to the form of the vouchers." * * * I have never had from the government any compensation, nor do I ask any. But as there was a balance of $40,000 due me upon the settlement of my first account ....the early receipt of whatever balance may remain due would be highly acceptable at this time."

The next extracts will continue to illustrate his pecuniary embarrassments from the neglect of government in settling his accounts, for notwithstanding the many and flattering testimonials he received of the confidence and love of the people, his last years were embittered by his being the victim of the poverty brought upon him, either by partisan jealousy or the neglect to pay their debts by those whose rights he had protected. In reference to this, he was tempted to say, in his letter to Comptroller McIntyre, of this State, in 1819:

"By what act of my life, either public or private, have I forfeited the right to the same equity and justice which would be freely dispensed to any other citizen? Of thanks, Sir, I have had enough; of the confidence, affection, and support of the people, the army, the navy, and militia, more than I merited; of factions' opposition, calumny, detraction and abuse, an unexampled portion; — but of remuneration, indemnity, equity or justice, nothing."

And again, in another document, his language is still more definitely that of a man of a broken heart.

"I have not only been defeated in my expectations of the performance of the public faith, but have been traduced and calumniated for years throughout this community as a villain and swindler, merely because I could not perform the engagements I had made, owing to the

non-performance of the pledges of the government to me. * * * *They* have had no cares to encounter, no prison to brave, no family to weep over, no sorrows to afflict them. But to me, for the toilsome days, sleepless nights, anxious cares, domestic bereavements, impaired constitution, debilitated body, unjust abuse and censure, and accumulated pecuniary embarrassments, nothing is yielded;—for which treatment, permit me to say, sir, the whole treasury of the country can never atone."

This unquestionably burning and strong language will however awaken sentiments of which no one of us need to be ashamed.

When the day comes, which assuredly will come, that the full life of Governor Tompkins shall be written out for the world, these volumes of his correspondence from which I have quoted will be found to be such an embodiment of all the civil and official acts with which he was associated, as to be of the greatest assistance to the historian.

The State is still waiting for a suitable life of George Clinton, who was governor during nearly twenty years, twice as many years as was Governor Tompkins. In the possession, as the State is, of their correspondence, the ability to create a memorial for both of them is assured. And the diffusion among the people of a knowledge of their faithful patriotism by means of their biographies is almost equally certain in consequence.

When the life of the governor comes to be written by the light afforded by these as yet unprinted manuscripts, his name and works will be set forth in the history of the country and of the State of New York in copious and strong language and on an ample and emblazoned page.

During the month of August I called upon the venerable daughter of Governor Tompkins residing on Staten Island, Mrs. Maria Westervelt, a lady with her mind at its utmost vigor for her age, which is eighty-two years. I wished to learn from her if in church or cemetery, at Tompkinsville, there was a tablet or memorial stone set up for the governor. She informed me that there was none; that the remains of her father had been deposited in St. Mark's church New York, in the family tomb of the *Minthornes,* by the side of those of his wife who was a daughter of Alderman Mangle Minthorne.

If up to the present time neither State or national gratitude has set up a memorial of Governor Tompkins in stone or bronze, *we* have reason to rejoice as citizens of New York, that with the small sum of five thousand dollars (although if it had been necessary, ten times that

sum might not unworthily have been bestowed upon the family of one whose father had been so ungratefully treated) with this small sum, the State has secured in these manuscripts and letters from his own hand, the materials for a monument more likely to perpetuate a grateful remembrance of his devoted and denying patriotism to the State and nation than would be the erection of a lofty pile of monumental marble.

THE "DREAMERS" OF THE COLUMBIA RIVER VALLEY, IN WASHINGTON TERRITORY.

By Major J. W. Mac Murray, U. S. A.

[Read before the Albany Institute, January 19, 1886.]

All of the aboriginal people of this country have theologies based on natural phenomena surrounding them, and all are believers in spirits, potent for good or evil.

The writer was sent by General N. A. Miles, of the army, then commanding the Military "Department of the Columbia," on a tour of inspection among some affiliated bands of Indians living along the Columbia river, with a view to ascertaining their grievances, their advance toward permanent homes, and to assist them in locating land under the Indian Homestead laws of the United States. White settlers were moving into the country very rapidly, owing to the recent completion of the Northern Pacific railroad, the route of which road lay through the Yakima valley, the richest, and most populous of the Indians' lands. In fact, the road was located through Indian fields and orchards, with little respect for individuals' rights. This caused many complaints, and the subject of land division was as eagerly discussed by them as by the disciples of Mr. George. In fact these Indians had quite similar views on the subject. Another class of subjects which caused friction in the Indian's mind, and was even threatening war, was the interference by the Indian officials, at the Simcoe, or "Yakima Agency," with the domestic life of these people.

Many of the Yakimas, who are a congeries of tribes or people nearly allied in language, and quite so in customs and habits (and in religious fancies, as a rule), are quite civilized, and are professed Christians. Many live in neat looking frame houses, have large fields, orchards and gardens, cattle and horses, pigs, goats and sheep. The majority however, do not live in civilized houses; but keep to the old Indian style of architecture, a large frame-work of posts and poles, covered with a rush matting, which they are skilled in making, although they often have fields, and barns, and excellent orchards.

There are several churches, all I believe Methodist, and several of the natives are ordained ministers of that denomination.

But the great mass of the Indians, are "Dreamers," so called from the "dreams" or trances, through which their prophet, Smoholla, is inspired, or "Drummers" as often called from the ear paralyzing orchestra of seven bass drums, which are a part of all their daily or more frequent services.

Polygamy has always been practiced by them, and the new religion justifies it.

The Indian agent, under his instructions from the Interior Department, at Washington, interfered in all these matters, and sent the Indian police, an armed body of Indian warriors, to arrest and confine those most active in dreamer or polygamous practices, or who left the reservation to take up lands under the Indian Homestead laws. The situation was alike annoying to whites and Indians, but mostly to the latter, as they were the weaker, and the singular anomaly was presented of the United States Indian agent on the one hand applying for troops to drive the Indians from their homestead settlements to the reservation, a hundred miles away, and on the other the Indians telegraphing to the military authorities to send troops to protect them from the Indian police.

General Miles sent me to look over the situation in all its aspects, and instructed me to exercise the utmost patience with the Indians humoring their desire to explain their view, which I afterward found extended to the discussion of the philosophy of the universe, from the creation to futurity; and they were anxious to impress General Miles, through me, with the purity of their intentions, and the theological authority for their opinions. A number had, as I have intimated, taken homesteads. There were many more who would be glad to do so, fearing they might be late in the race with the incoming whites, but who dreaded the vengeance of their "mother, the earth, from whence all things come, and where all must go."

I was invited to visit every village of Indians, and on my arrival found all the people, from the oldest to the youngest, assembled, and solemnly performing their religious service; the shrill voices of the women making a weird chanting, while the drums beat in unison.

Occasional silences were broken, by men's voices orating, by ringing of hand bells followed by the drums, and again the weird chanting. At Celilo, Tune water, Umatilla, Yakima Gap and other places, I had seen some disciple of this faith lead his home people in their peculiar

services which were not always identical in form ; but I saw its greatest development at the fountain head, Priest Rapids, on the main Columbia river, the home of Smoholla, the "Prophet" and High Priest of the Dreamer theology. I found that he was the brake and the wheel of progress of his people, as to retain his influence he advised them to resist any of the advances of civilization, as improper for a true Indian, and the violation of the faith of their ancestors.

General Miles, having the peace and permanent benefit of Indians and whites at heart, desired me to hear all objections to the civilizing influences which were extended to Smoholla's people, by laws of the United States, and to win over the leading men to his views, if practicable. So I listened for several days to all that was said to me through any interpreter in whom the Indians had confidence.

In reply, I presented some of General Miles' views, which have since become the recognized policy of President Cleveland, in reference to allotment of land in severalty to Indians.

The Dreamer notion or superstition, seemed to form the principal bar, to any progress in the matter, and I was glad to hear from its prophet or leading priests as full an exposition of its origin, foundation and characteristics as possible. This I had at Smoholla's village, and salmon fishing at the foot, or lower falls, of Priests Rapids.

I rode fifty miles in a spring wagon, known as a Dougherty, as far as the country was practicable for wheeled vehicles, and was then met by a party of Indians, with a band of saddle and pack ponies, upon which my party and camp necessities were transported over a mountain abont three thousand feet high, my escort dexterously guiding me in such course that the crest of the range was attained at a point where in an instant the whole panorama of the "great bend of the Columbia river" was presented to the eye. I was impressed by the grandeur of the scene, but was not, as was, I think, intended, ready to be equally impressed by the greatness of Smoholla's power as a prophet and high priest.

The scene embraced an area of several thousand square miles, to the further mountain chains or high hills which bounded the horizon in every direction. Through the basin the silver stream of the great river flowed, being broken and glittering at several points, where ledges of rocks tore the current into angry foaming rapids.

Near the lower one, with the help of a field glass, I discerned a number of houses stretched along the margin of the river, and from several poles flags fluttered in the wind. They were distant about

five miles, but the route to them was so devious and so precipitous, over broken basalt, that quite two hours elapsed before we reached the plain, and were met by a procession headed by Smoholla in person, all attired in gorgeous array and mounted on their best chargers. We wended our way through sage brush and sand dunes to the village street, not a soul being visible; but from the mat-roofed and walled salmon houses there came forth the most indescribable sound of bell-ringing, drum-beating, and cat-surpassing screeches. I noticed that the street was neatly swept and well sprinkled, an unusual thing in any Indian village. This, Smoholla said, was in my honor, and to show that his people had cleanly tastes. Our procession passed on beyond the village to a new canvass tent which had a brush shade to keep off the sun, and was lined and carpeted with new and very pretty matting. This, Smoholla said, had been prepared especially for me and was to be my house as long as I should stay with him. To cap the climax, he had constructed a bench for me, having sent to Ainsworth on the Northern Pacific railroad, more than ninety miles distant for the nails.

Fresh salmon, caught in a peculiar trap among the rocks and broiled on a plank, were regularly furnished my party, and with hard-tack and coffee of our own supplying, we got enough to eat and drink. Our own blankets furnished sleeping conveniences. The river was within two yards of our tent door, and was an ample lavatory.

At daybreak the next morning the sound of drums was again heard, and for days it continued. I do not remember that there was any intermission, except for a few minutes at a time.

I was invited to be present, and took great interest in the ceremonies, which I shall endeavor to describe.

There was a small open space to the north of the larger house, which was Smohalla's residence and the village assembly-room as well. The space was inclosed by a light fence, made of boards which had drifted down the river from far to the north,— British Columbia, possibly. The fence was whitewashed, because military posts often have whitewashed fences. In the center space was a flagstaff bearing a rectangular flag, suggesting a target. In the center was a round, red patch; the field was yellow, representing grass (which is of a yellow hue in that region), and a green border indicated the boundary of the world (the hills being moist and green near their tops); at the top of the flag was a small extension of blue color, with a white star in the center.

Smohalla explained:

"This is my flag and it represents the world. God told me to look after my people — all are my people. There are four ways in the world — north and south and east and west. I have been all those ways. This is the center, I live here; the red spot is my heart; everybody can see it. The yellow grass grows everywhere around this place. The green mountains are far away all around the world! There is only water beyond, salt water. The blue (referring to the blue cloth strip) is the sky, and the star is the north star. That star never changes; it is always in the same place. I keep my heart on that star; I never change."

There are frequent services, a sort of processional around the outside of the fence, the prophet, and a small boy with a bell, entering the inclosure, where, after hoisting the flag, he pronounces a sort of lecture or sermon. Captains or class leaders give instructions to the people, who are arranged in the order of their stature, the men and women in different classes marching in single file to the sound of drums. There seems to be a regular system of signals, at command of the prophet, by the boy with the bell, upon which the people chant loud or low, quick or slow, or remain silent. These out-door services occurred several times each day.

Smohalla invited me to participate in what he considered a grand ceremonial service within the larger house. Singing and drumming had been going on for some time when I arrived; the air was resonant with the voices of some hundreds of Indians, male and female, and the banging of drums. The room was about seventy-five feet long by twenty-five feet wide, and was somber in color and light. Smoke curled from a fire on the floor at the back end of the room, and the ceiling of the rear part was hung with hundreds of salmon, split and drying in the smoke. Some smoke pervaded the atmosphere generally. The scene was a strange one. On either side of the room was a row of twelve women, erect, arms crossed, hands extended, with tips of fingers at the shoulders. They kept time to the drums and their own voices, by balancing on the balls of their feet, tapping with their heels on the floor, while they chanted with varying pitch and time.

Those on the right hand were dressed in garments of a red color with an attempt at uniformity. Those on the left wore costumes of white buckskin, with red and blue trimmings. All wore such finery as silver plates, the size of blacking-box lids, or such other form of glittering ornaments as they possessed. A canvass covered the floor,

and on it knelt, in lines of seven, the men and boys. Each seven had similar colored shirts as a rule, and the largest were in front, the mass decending to the distant rear.

Children and ancient hags, filled in any spare space. In front on a mattress knelt Smohalla his left hand covering his heart, and at his right was the boy bell-ringer, in similar posture. Smohalla wore a white garment, which he was pleased to call a priest's gown, but it was simply a shirt.

I with my two assistants, were seated on a mattress about ten feet in front of the prophet; which fortunately placed us near the door, and incidentally near fresh air.

There were two other witnesses, two Indians from distant villages, who sat at one side, with Smohalla's son looking on.

In person, Smohalla is peculiar. Short, thick-set, bald-headed and almost hunch-backed, he is not prepossessing at first sight; but he has an almost Websterian head, with a deep brow, over bright intelligent eyes.

He is a finished orator; his manner mostly of the bland, insinuating, persuasive style, but when aroused, he is full of fire, and seems to handle invectives, effectively. The whole of his audience to a man (or woman) seemed spell-bound under his magic manner, and it never lost interest to me, though in a language comprehended by few white men and translated to me at second or third hand.

His immediate followers are his abject slaves; in villages quite distant the people believe in his inspiration; and this inventor of a new faith (or rather remodeller of several old ones) has upturned the religious convictions of tribes of Indians quite remote, and even of such intelligence as the Nez Perces. Much of this influence is due to knowledge gained from white men, but mainly to his native intelligence and qualities as an orator and natural leader of men.

When a boy, he lived at the Cœur d'Alene Indian mission, where he was familiar with the Catholic service, and learned a little French. He was engaged in several wars, and was growing in influence and popularity, unusual for an Indian of his "social class," when chief Moses attacked and nearly killed him.

Indeed he was left for dead, but managed to crawl away and commenced a long journey which carried him among many tribes, to many cities, even into Mexico, whence he worked his way north through Utah and Idaho. At the end of several years, owing to the removal of Moses to a distance, he returned to his own people, announcing

that he had been dead and in heaven, and had now returned by God's command to guide his people. He admitted to me that he had been in Utah and had seen Mormon priests in trances, getting commands direct from heaven.

This plausible, tongued orator blended what he could remember of the forms of military parade, the Catholic mass and processionals, with many of the Mormon practices such as revelations and tithings, and since then, his influence has been assured. It was fully believed that he had been resurrected.

The fact that he had prophesied eclipses to his people, by the aid of a medical almanac, and the explanation of some land surveyors was proof of celestial authority also.

At this meeting or service I was asked to explain the Indian Homestead law, and how white men divided land. This I did, illustrating with a checker board, saying, that the black squares in all the surrounding country belonged to the railroad, and that the white squares, except the school sections, were available for homesteads by either white, or black or red-men. That the vertical lines were run toward the north star, and that cross lines were run from the direction of sunrise to that of the sunset, and thus divided the land into square pieces, so that each man could find his own, and thereby prevent all disputes. I urged them to apply for land, to settle upon it, and so avoid trouble with the white settlers who were seeking homes for their families.

Smohalla replied saying he knew all this, and much more, and he did not like this new law; it was against nature. I will tell you about it. Once the world was all water, and God lived alone; he was lonesome, he had no place to put his foot; so he scratched the sand up from the bottom, and made the land and he made rocks, and he made trees, and he made a man, and the man was winged and could go anywhere. The man was lonesome, and God made a woman. They ate fish from the water, and God made the deer and other animals, and he sent the man to hunt, and told the woman to cook the meat and to dress the skins. Many more men and women grew up, and they lived on the banks of the great river whose waters were full of salmon. The mountains contained much game, and there were buffalo on the plains. There were so many people that the stronger ones sometimes oppressed the weak and drove them from the best fisheries, which they claimed as their own They fought, and nearly all were killed, and their bones are to be seen in the sand hills yet. God was very

angry at this, and he took away their wings and commanded that the lands and fisheries should be common to all who lived upon them. That they were never to be marked off or divided, but that the people should enjoy the fruits that God planted in the land and the animals that lived upon it, and the fishes in the water. God said he was the father, and the earth was the mother of mankind; that nature was the law; that the animals and fish and plants obeyed nature, and that man only was sinful. This is the old law.

I know all kinds of men. *First there were my people* (the Indians) God made them first. Then he made a *Frenchman* (referring to the Canadian Voyageurs of the Hudson Bay Company), and then he made a *priest* (priests were with these expeditions of the Hudson Bay Company). A long time after that came "*Boston man*" (Americans came in 1796 into the river in the ship Columbia from Boston). And then "*King George men*" (English soldiers). Bye and bye came "black man" (negroes), and last he made a *Chinaman* with a tail. He is of no account, and he has to work all the time.

All these are new people; only the Indians are of the old stock. After awhile, when God is ready, he will drive away all the people except the people who have obeyed his laws.

Those who cut up the lands or sign papers for lands will be defrauded of their rights, and will be punished by God's anger.

Moses was bad. God did not love him. He sold his people's houses and the graves of their dead. It is a bad word that comes from Washington. It is not a good law that would take my people away from me to make them sin against the laws of God. You ask me to plough the ground! Shall I take a knife and tear my mother's bosom? Then when I die she will not take me to her bosom to rest.

You ask me to dig for stone! Shall I dig under her skin for her bones? Then when I die I can not enter her body to be born again.

You ask me to cut grass and make hay and sell it, and be rich like white men, but how dare I cut off my mother's hair?

It is a bad law and my people can not obey it. I want my people to stay with me here. All the dead men will come to life again; their spirits will come to their bodies again. We must wait here, in the homes of our fathers, and be ready to meet them in the bosom of our mother.

THE EXPEDITION OF THE "ALERT" TO HUDSON'S STRAIT AND BAY IN 1885.

By JAMES MACNAUGHTON, A. M., M. Am. Soc. C. E., etc.

[Read before the Albany Institute, April 6, 1886.]

In order that the objects, the scope, and the causes which led to the expedition of the "Alert" to Hudson's Bay, may be fully understood, a brief consideration of a few historical facts appears to be essential.

Hudson's Bay was discovered by Henry Hudson in 1610. He sailed through the Strait which bears his name in June, or July, of that year, in search of a north-west passage to the Pacific Ocean.

Arrived in the Bay, he found himself in a *cul-de-sac*, and could go no further westward with his ship. He resolved to remain there during the winter and to resume explorations the following spring.

His provisions ran short, however, and he was compelled to return to England. It is said that he incautiously declared to his men that, in their destitute condition, he would be obliged to leave some of the crew behind. The latter, with an independence and alacrity which no doubt astonished the bluff old navigator, hustled him, his son, and several of their number who remained loyal to their brave captain, into an open boat and abandoned them to their fate, which to this day is unknown. The remainder of the crew, totally ignorant of the science of navigation, managed to sail the ship as far as Cape Wolstenholme, or somewhere in that neighborhood. Here they went ashore for water and game, but were tendered a warm reception by a band of Eskimos, who butchered nearly half of the crew. The survivors escaped to the ship, and managed to blunder along till they reached England.

As we who live on the shores of Hudson's River are naturally interested in everything pertaining to the fate of Henry Hudson, I may say that it is not of necessity to be inferred that he and his men, who were abandoned in the Bay, starved to death. It is quite reasonable to suppose that they reached the shore of the Bay in safety and made friends with some of the native tribes. The region abounded in game, and we may be sure that the tact, ability, and courage of the leader proved equal to the task of preventing a massacre of the little party by the natives.

Very likely the crafty old sailor managed to persuade the Indians or Eskimos, with whom his lot was cast, that he was a great "medicine-man." With his knowledge of astronomy and the natural sciences, it would have been easy for him to impose upon these credulous and confiding people, who would, on account of his acquirements and seemingly supernatural powers, have looked upon him as a being of divine and sacred origin. Quite likely he settled down to a life of ease and luxury,—from an Eskimo point of view,—married a select assortment of chiefs' daughters, and became the father of numerous chubby, long-haired children. Possibly, he became a great hunter and a renowned chief. Certain it is that, if his life was spared, his fearless and active master-mind must have made him a prominent man among those savage peoples.

Whether his fate was like the one I have outlined or not, I was accustomed to amuse myself last summer by speculating on the possibility, when I met any of the natives on the shores of the Bay, of their being descendants of Hudson; whether I should not address them as Mr. and Mrs. Hudson, the Misses Hudson, etc. It was awe inspiring to one brought up to regard with respect the blue blood of bi-centennial Albany, to think that these not altogether attractive-looking people were the descendants of the man who discovered the river which made Albany possible, and who was famous before the first Knickerbocker of this city baked his marbles or fried his indigestible oley-koeks. It was something of a shock, however, to see the possible Mr. and Mrs. Hudson devouring, with great relish, a hearty meal of raw bear's meat, more indigestible, one would think, than either the marbles or the oley-koeks; or to see the potential Hudson children with their mouths full of feathers, which indicated that their animal economy was in process of absorbing the flesh of the birds which those feathers had formerly adorned.

Little more was heard of Hudson's Bay, after Hudson's last voyage, until 1662, when Desgroseillers is said to have sailed into it.

Couture and Duquet took possession the following year in the name of the King of France; in 1668, Radisson, a Frenchman, and Gillam, an Englishman, from New England, built a trading fort, and, lastly, in 1670, came the first establishment of the Hudson's Bay Company. From that date until the treaty of Utrecht, in 1713, the Bay became the theater of sanguinary conflicts; many a hero there won fame for deeds renowned in story; the navies of England and France made it the field of many a fight, and the forts on its shores were time and again taken and retaken; so that Iberville, writing to the King, said,

"*Sire, je suis las de conquérir la Baie.*" The law of the survival of the fittest was illustrated there as elsewhere in nature. The great English company founded by Prince Rupert, the Duke of Albemarle, the Earl of Craven, and others, emerged from these conflicts, triumphant and victorious.

From 1670 to 1870, the Hudson's Bay Company, originally incorporated under a grant from Charles II., held almost sovereign powers in the region of Hudson's Bay, and for many years, of the region lying between the Bay and the Pacific Ocean. Immense fortunes had been made for its stockholders in that time. This corporation has had the most remarkable history of any on record. Like other corporations, it has had no soul. Possessing in its own territory the power of life and death over its subjects, it has ruled with a rod of iron. It was ever ready, with the inborn pugnacity of an English company, to take up arms against all intruders. The poor traders, whom it could drive out by brute force, were unceremoniously kicked about, maltreated and robbed by the Indian allies of the company and, undoubtedly, at the company's instigation. Competitors, who were too powerful to be bullied, were absorbed into this giant concern. The policy of the company was always to keep the public in the dark as to this region. It spread the most absurd reports as to the awful dangers of navigation in that region; of fearful sufferings from cold, from tempests, from wild beasts, of the savage cruelty and diabolical propensities of the wilder natives. It represented Hudson's Strait to be the gateway to an inland sea of wretchedness, misery, desolation and poverty, and that all who were bold enough to attempt an entrance should leave hope behind. Yet all this time the company was paying large dividends on copiously watered stock.

This great company opposed any attempt to improve the condition of the miserable natives, the Indians and Eskimos. Would-be missionaries were fired out of the country with such vim that they did not care to return.

"A Christianized Indian is a lazy Indian, and we will not have them. Teach them to pray, to sing hymns, to go to church, and you ruin them for hunters and trappers." This was the theory of the Hudson's Bay Company."

The great aim and sole purpose of the Hudson's Bay Company have been to make money for its stockholders. Its affairs have been managed by men of shrewd business tact and acumen. Never was a company more faithfully served by its officers and employés. Every officer,

every factor, every clerk, is either an actual, or a prospective, stockholder. The hardships endured, the risks to life and health encountered, the pluck and devotion displayed by the young men employed by this company, make a record the most remarkable in the history of corporations. The inducements were great and promotion for merit was assured.

In pleasing contrast to the greedy, grasping, and ofttimes unprincipled actions of this great company, stands the fact that they have always kept, strictly, agreements made with their men and have never, I believe, broken a pledge made to the natives. Furthermore, they have never permitted intoxicating liquors to be given in trade to the natives. Their rule over these poor people, although stern and uncompromising, has been uniform and characterized by good faith.

In 1870, the Canadian Government acquired by purchase most of the territory and jurisdiction of the Hudson's Bay Company, the latter reserving only a certain amount of land. So that now this Hudson's Bay region is open to all Canada for settlement, trade, or commerce, and the reign of the giant monopoly is at an end.

As long ago as 1812, attention was called to the importance of the Hudson's Bay route — so-called — as a line for commerce between the Pacific Ocean and Europe, and between the north-western provinces of Canada and England.

In 1848, Colonel M. H. Synge (then Lieutenant) of the British army, published a small work on Canada, in which he suggested that this might become in the future a route for commerce of great importance. In 1864, Prof. Hind favored it in a paper which he read before the Statistical Society of Canada.

In 1878, Dr. Robert Bell, F. R. S., Assistant Director of the Geological Survey of Canada, wrote an account of this route for the Minister of the Interior Department of the Canadian Government. In 1881, the same gentleman presented a paper to the Royal Geographical Society, in which he discussed in a masterly manner the commercial importance of Hudson's Bay.

By these and other means public attention in Canada has been called to the great importance of this Hudson's Bay route — if practicable — not only as affording a quick and cheap outlet for the products of north-western Canada, but also as a short and economical route between Japan and England.

If we assume that the navigation of Hudson's Strait and Bay is possible for a long enough time each year for the purposes of commerce, the immense importance of this line becomes manifest on reflection.

The so-called Hudson's Bay route consists of a railway connecting Port Simpson, on the Pacific, with Ft. Churchill, on the west coast of Hudson's Bay, and a line of ocean steamers plying between the latter port and Liverpool. The distance from Port Simpson, in British Columbia, to Ft. Churchill by the proposed railroad is 1,450 statute miles, and the distance by water from Ft. Churchill to Liverpool is 2,960 nautical miles. In other words, with a haul of only 1,450 miles by rail, freight from the Pacific can be delivered by this route nearer to Liverpool than is either Montreal or New York. Let me say, in passing, that there is little doubt as to the practicability of building and operating the proposed railway.

If we take Yokohama, a central point in Japan, and Liverpool, the great commercial center of Europe, it will be an easy matter to find the shortest distance between the two on some of the existing routes, and this proposed one.

LINE NO. 1, VIA CENTRAL AND UNION PACIFIC RAILWAYS.

	Statute miles.
Yokohama to San Francisco	5,140
San Francisco to New York	3,390
New York to Liverpool	3,496
Total railway and navigation	12,026

LINE NO. 2, VIA CANADIAN PACIFIC RAILWAY.

	Statute miles.
Yokohama to Port Moody	5,030
Port Moody to Montreal	2,885
Montreal to Liverpool	3,450
Total railway and navigation	11,365

LINE NO. 3, VIA HUDSON'S BAY ROUTE.

	Statute miles.
Yokohama to Port Simpson, B. C	4,444
Port Simpson to Churchill	1,450
Churchill to Liverpool	3,404
Total railway and navigation	9,298

Difference in favor of No. 2 over No. 1	661 statute miles.
Difference in favor of No. 3 over No. 1	2,728 statute miles.
Difference in favor of No. 3 over No. 2	2,067 statute miles.

Compare particularly the saving in *railway distance* by the Hudson's Bay line. The saving as compared with Union and Central Pacific Railways is 1,940 miles; as compared with the Canadian Pacific Railway, is 1,435 miles.

There is still another advantage which the Hudson's Bay route possesses over the other two. The highest point of the railway, on that line, would be only about 2,350 feet above sea level, nearly 1,000 feet lower than the highest point on the Canadian Pacific Railway, and 5,800 feet — more than a mile — lower than the highest point on the Union Pacific Railway.

Assuming, as I have said, that this line is a practicable one, it would prove of incalculable benefit to Manitoba and the north-western provinces of Canada. These districts are now almost shut out from the markets of the world on account of the long railway haul, which is now an essential function in the marketing of their products. Their wheat, their cattle, their lumber, must now be transported over the Canadian Pacific Railway, which has no competitor in that region. So bitter and intense is the feeling in many places in these districts, on account of the seclusion, that threats are frequently made by prominent men, of organizing a movement of secession from the Canadian confederation and of joining the United States. In fact the confederation has been of very little benefit to any of the provinces except Ontario and Quebec. Manitoba, the north-western territories and the maritime provinces have derived very little advantage from the union, and the Government has been obliged, in various ways, to yield to the demands of these provinces in order to keep the peace.

The expeditions of 1884 and 1885, which the Canadian Government sent out to Hudson's Bay, were organized principally at the urgent entreaty, I might say almost imperative demands, of the north-western provinces.

A select committee of the House of Commons was appointed at the session of Parliament, in 1884, to inquire into the navigation of Hudson's Bay. They had full power to send for persons and papers, and they made an exhaustive study of the problem. They were so convinced of the importance and practicability of the project, that they submitted a report to the House, in April of that year, in which they recommended that a surveying and exploring expedition be sent to Hudson's Strait and Bay; that stations be established at important places in the Strait where meteorological and magnetic observations should be made, various physical phenomena studied, such as the currents, temperature of waters, the tides, the movements and nature of

the ice masses, hydrographical bearings, etc.; that notes be taken as to the dates of forming and breaking up of ice in various rivers on the shores of the Bay; that collections of minerals and rocks be made, in order to throw light upon the geology of the country; and that notes be taken of the value and importance of the various fisheries and of the fur trade.

In brief, the object of these expeditions was primarily to ascertain the practicability, or otherwise, of the Hudson's Bay route, and to learn, in addition, as much as possible about the resources and products of that vast territory, which had long been a *terra incognita* to the general public. It was decided that the observing stations should be continued for three years at least.

In the summer of 1884 an expedition was, therefore, sent to Hudson's Strait and Bay and seven observing stations were established.

After the houses at the various posts had been built, and the men had been assigned to their positions, the ship which had taken them out returned to Halifax, with the remainder of the expedition, in October of that year.

The expedition of 1885, of which I was a member, started in the latter part of May, the plan being that the vessel which carried the party should be off the entrance to Hudson's Strait soon after June 1, so as to be able to take advantage of the earliest opportunity of running into Hudson's Bay whenever the ice should open up sufficiently to permit of our entrance.

I hope I have not wearied you by too much preliminary matter, but it seemed to me essential, in order that you might grasp the importance of the mission on which our expedition had been sent, that these preliminary data be presented to you.

You will thus see that this expedition was not a utopian one to hunt for the North Pole — as some people seem to imagine — and was not an arctic expedition *per se*, although at times our experiences partook of an arctic flavor.

The various members of the expedition were ordered to report to Lieut. A. R. Gordon, R. N., at Halifax, on May 25, 1885.

The expedition was under the immediate command of Lieut. Gordon, who is now the Assistant Director of the Meteorological Bureau of Canada. Most of the cabin passengers on the ship were officers of the same branch. In addition to these were Dr. Robert Bell, F. R. S., Assistant Director of the Geological Survey of Canada, and myself, who was also an appointee of that department. Our party in the wardroom of the ship was composed of ten individuals. We had, in addi-

tion, forty-two men, comprising the petty officers, crew and station men. The ship in which we passed five long months was H. B. M. s. s. "Alert," which had been given to the United States by the British Government, to aid in the relief expedition which rescued Lieut. Greely and his unfortunate party. After its return from that expedition, the American Government gave it back to the British, with grateful expressions of thanks for the international courtesy. The "Alert" is also famous for having penetrated the furthest northward of any vessel in history, when she was under the command of Sir George Nares, in 1876, on the arctic expedition of which he was commander.

Our table-ware in the ward-room was a substantial reminder of the good feeling and comity existing between Great Britain and the United States. The china displayed the naval crown of the British Empire, while the silver and glass bore the monogram of the United States navy.

They seemed to be mute memorials of a family quarrel which was a thing of the past and of bitterness forgotten, pledges that the two great English-speaking nations of the world were willing to work shoulder to shoulder in the cause of civilization, of science, of progress and of humanity.

At 11 A. M. on Wednesday, May 27, the hawsers were cast off and the "Alert" left the wharf at Halifax on her northern cruise.

The day was bright and pleasant. The entire ward-room contingent passed most of the afternoon on or near the ship's bridge, with the laudable purpose of getting acquainted with one another. Captain Gordon and Dr. Bell I had met before; of the others, Mr. Beaton was the only representative of the press on board, Mr. Barry was the first officer, while Messrs. Payn, Woodworth, Tyrrel, Mackenzie and Shaw were officers of the Meteorological Department. These five latter gentlemen were sent out to relieve others of the same service who, as already explained, had been left at various points in Hudson's Strait a year previous, and who will remain for a year in that region. Each one is to have charge of a station with only two men — generally laboring men — as companions. They are separated many miles, and in that long time will see no human beings save Eskimos. Their duties are to make the regular meteorological and other observations.

The printed instructions given them by Captain Gordon, soon after they came on board, read as follows :

Instructions to Officers in Charge of Stations in Hudson's Bay and Straits.

"As the primary object of the whole expedition is to ascertain for what period of the year the Straits are navigable, all attention is to be paid to the formation, breaking up, and movements of the ice.

"Each station is supplied with a sun dial and time piece, and the clock is to be tested each day when there is sunshine about noon. A table of corrections is supplied for the reduction of apparent time to local mean time, to this the difference of time will be applied to 75th meridian, all entries being made in the time of this meridian, and observations will be taken regularly at the following times throughout the year, viz.: 3h. 8m., 7h. 8m., 11h. 8m., A. M. and P. M.

"Each morning the sums and means of the observations taken on the previous day will be taken out and checked over, they will then be entered in the abstract books supplied for the purpose.

"After each observation during daylight, the observer on duty will take the telescope and carefully examine the Straits, writing down *at the time* all that he sees, stating direction and (when possible) velocity of tide, movement of ice, if any, also describe the condition of the ice, whether much broken up, solid field, etc., etc.

"*Tidal observations.*—Each day the time and height of high and low water is to be carefully observed, and during the open season the character of the tide will be carefully noted for two days before and three days after the full and change of the moon. For this purpose a post marked off in feet and fractions of a foot is to be placed in the water, at low water in some sheltered spot, if any such be available, and the height of the water noted every half hour during the rise and fall of one tide on each of these days — the height to be noted most carefully every five minutes during the hour of high water, and the same at low water — the five minute observations will also be taken for one hour during the most rapid portion of the rise. Special observations of barometric pressure are to be taken in connection with these tidal observations.

"To check the zero mark for the tidal observation post, select a spot on shore from which the horizon line will be projected on the tidal post, and record the reading of this line when seen projected on the post by the observer, whose eye is to be placed at a measured height above the datum point selected on shore.

"All remarks in regard to the movements of birds, fish, etc., and also as to the growth of grasses, will be carefully entered.

"As it is impossible to give to the officers in charge of stations detailed instructions which would be of service in every contingency which might arise, the officers are required to observe and enforce the following rules:

"(*a.*) Every possible precaution is to be taken against fire, and as it is anticipated that the temperature can be maintained considerably

above the freezing point inside the houses, two buckets full of water are always to be kept ready for instant use.

"(*b.*) As the successful carrying out of the observations will, in a great measure, depend on the health of the party, the need of exercise is strongly insisted on during the winter months, and also that each member of the party shall partake freely of the lime juice supplied.

"(*c.*) Each party is supplied with a boat, but unless some emergency required it, it must be a rule that neither afloat nor ashore must any of the party leave the station for a greater distance than they can be sure of being able to return the same day.

"(*d.*) As soon as possible after the houses are completed and the stores all in place, the party will set to work collecting sods, grass or any other non-conducting material, and before the winter sets in the whole house is to be covered with this, boards overlaid and snow packed over all; the assistance of the Eskimos should, if possible, be obtained, and the whole house arched over with snow.

"ANDREW R. GORDON,
"*Lieutenant R. N., Commanding Expedition.*"
"OTTAWA, *5th July*, 1884."

After leaving Halifax harbor, we stood out to the south-eastward and then altered course to east by north, thence we passed between Cape Breton Island and Newfoundland into the Gulf of St. Lawrence. Our first stopping place was Blanc Sablon, in Labrador, where we laid in an additional supply of coal. From Blanc Sablon, we passed up through the Strait of Belle Isle into the waters of the broad Atlantic.

Almost immediately after passing Belle Isle, we met the ice pack which was coming down the coast. The entire Labrador coast from that point to Hudson's Strait, and away north, was lined with a pack varying in width from thirty-five to one hundred miles. We were obliged to shape our course to the eastward and then to skirt along the edge of the ice pack.

In the early morning of June 13, we spoke the whaling-barque, "Maude of Dundee," Scotland, Captain Watson in command. He came on board the "Alert," and stated that he had arrived abreast of the entrance of Hudson's Strait about April 1. At that date there were over one hundred and twenty miles of ice between him and the shore. From that date, until the day of our meeting, the "Maude" had been cruising off the edge of the pack between Lady Franklin Island and latitude fifty-nine degrees north. Captain Watson was unable at any time to get nearer than thirty-five miles to Resolution Island—at the entrance to Hudson's Strait.

This would indicate that the stream of Davis' Strait ice had been flowing, without interruption, through the months of April, May and

the first half of June, across the entrance to Hudson's Strait. This, of course, would have proved an impenetrable barrier, during that time, to any ship desiring to run into Hudson's Bay, even if the ice in the Strait itself had been loose enough to work through.

Most of this ice, which closed the door to Hudson's Bay, was of the heavy arctic variety and had come many miles from the northward. Some of it was over forty feet in thickness of solid blue ice, not field ice which had been thickened by the piling of pan upon pan, but a solid sheet of ice which had frozen just as we saw it. How long this ice had been in process of formation it is difficult to judge. The depth to which water will freeze has, so far as I know, never been determined, but it is certain that ice, being a very poor conductor of heat, when once a certain thickness of it has formed, the rate of thickening will be very slow.

Lieut. Ray, of the United States Signal Service, gives as a result of his observations at Point Barrow, in the Arctic, that the greatest thickness of ice formed in one season was six feet two inches.

Early on the morning of June 16 we made the land, Cape Best on Resolution Island, distant about ten miles off the starboard bow, but the ice having run together the engines were stopped. We were in the midst of heavy field ice tightly jammed. With the exception of Resolution Island, which is a bleak, barren and desolate looking island with rocky and bold shores, nothing was to be seen except ice all around us. As the event proved we were destined to remain in this icy trap for three long, monotonous weeks, drifting about helplessly with the ice pack, without volition on our part;

> "In thrilling regions of thick-ribbed ice
> To be imprisoned in the viewless winds,
> And blown with restless violence about
> The pendent world."

During the three long weeks in which we were beset in the ice, time hung heavily on our hands, although we all had some daily duties to perform. Occasionally we would get a shot at a murre or a gull, or if the ice opened up a little, a shot at a seal. After living for some time on salt meat, a delicacy like curried gull, or seal pie, or broiled seal flipper was highly appreciated. For amusement and exercise we were obliged to content ourselves with pitching rope quoits on deck, walking over the ice, or when a particularly large ice pan was near the ship, by a game of "rounders." Those who, like myself, belonged to the great order of land lubbers would make vain attempts to imitate the sailors

in climbing about the rigging and to impress the crew with the idea that we were old hands at it.

But in spite of the occasional tedium of our monotonous life there was much to interest one who had never been in arctic regions before. At times one would be impressed with the supernatural tinge which the surroundings would give. Every thing seemed odd and the world upside down and chaos come again, where nothing was to be seen but ice — ice everywhere except where the black rocks of Resolution Island broke the surface. On the evening of June 21, the longest day of the year, I remained a long time on deck. It was bright, clear and cold, the thermometer at eight P. M. registering thirty-one degrees. In that region the variation of the magnetic needle is very great, being greatly west of true north. Sunset occurred about ten P. M. on that evening. It was difficult almost to convince myself, knowing the time of night, that I was not dreaming. And, strangest of all, the sun was setting about north by compass. It was a weird, eerie, impressive scene. It almost seemed that the sun had strayed so far from its course that it would wander off into some infinitude of space and never return. Soon after it disappeared behind the ice, as if conquered by obstinate frigidity, the still arctic twilight shed its pale light about. Clouds, like a funeral pall, hung over the grave of the extinct sun. Solemn, mysterious, gigantic icebergs moved slowly along, carried onward by hidden currents which were powerless on the surface. This ghostly procession passed in review while our little ship lay motionless in icy fetters. Resolution Island, black, forbidding, looked like the evil genius of this strange scene. Later on the moon rose and filtered pale, flickering rays through the clouds which, mixed with the peculiar arctic glow, made the most singular and supernatural light I have ever seen.

Long after midnight — or what would have been midnight in this latitude — I went below and turned in to my berth, which was just below the water line. Until I fell asleep, I could hear the ice grating along the ship's side, with an ominous sound. Then would come a loud rap, as if some ghostly and restless denizen of these weird regions resented sleep on the part of mortals. Again, as we were caught in a tight ice nip, the old ship's timbers would groan as if in mortal agony. We seemed beset on all sides by unseen enemies. Away from the ship's deck, not a living creature was to be seen. It seemed

> "A universe of death; which God by curse
> Created evil, for evil only good,
> Where all life dies, death lives and nature breeds,

Perverse, all monstrous, all prodigious things,
Abominable, inutterable, and worse
Than fables yet have feigned, or fear conceived,
Gorgons, and Hydras and Chimeras dire."

In the sharp contest with the ice, which was without doubt unusually heavy last season, our ship was very badly damaged. Her iron stem-plate was wrenched completely off, the chafing plates on her bows were partially pulled out and the timbers underneath somewhat damaged. Under these conditions, and as there was little prospect of getting into Hudson's Strait for some time, Captain Gordon wisely decided to put about and to run down to St. Johns, Newfoundland, and repair the ship.

This was accordingly done, and we did not return to the entrance to Hudson's Strait until August 3. On the morning of this day, we were off Cape Chudleigh, after having steamed through heavy ice all the night before. On this morning we were still in the ice, although there was open water near the land. Before reaching it, however, the tide changed, and the tidal current of six knots per hour ran the ice together against the ship, and carried ice, ship, and everything floating out to sea.

In the afternoon, a heavy fog shut down, and at ten P. M. the engines were stopped and we lay to for the night.

On the following day, at about three P. M., after another struggle with the ice and tidal currents, we rounded Cape Chudleigh and dropped anchor in the harbor of Port Burwell, where one of the stations was established the previous year. We were obliged to walk ashore, about an eighth of a mile, over the ice, as the latter had run closely together soon after we had dropped anchor.

Mr. Burwell, the officer in charge of the station, and his two men were found to be quite well. They reported that they had had no sickness during the year, and that they had not suffered unduly from the cold, although the thermometer had indicated during the winter a temperature at times 40° below zero.

On some winter days the wind blew with fearful violence. One day the anemometer registered a speed of eighty-four miles per hour, when the instrument was blown down. Subsequently, the wind appeared to increase in velocity. It slightly raised the frame house several times. The inmates feared it would be blown over altogether and they put out the fire in the stove for fear of disaster. One of the station-men and an Eskimo started out of doors for some purpose, when the wind suddenly caught them, threw them off their feet, and hurled

them into a snow-drift twenty feet distant. In order to return, they were obliged to crawl on their hands and knees. The station-houses, of which the one at Port Burwell is a type, are frame dwellings, strongly built, having two thicknesses of boarding and the interstices filled with felt and moss. The inner part of the roof is lined with felt, and the same material is placed under the floor, while heavy canvas is used in lieu of carpets. Outside the house stone walls are built, and the space between the walls and the house filled in so as to prevent, as far as possible, the wind from getting underneath the house and so overturning it.

The house is divided into three rooms, one the general sitting-room, kitchen and eating-room, one bedroom for the officer in charge and one for his two men. A large cooking stove, in which hard coal is burned, heats the building. Even with the low temperatures of winter, the men had little difficulty in keeping the temperature in-doors up to 65° and 70° Fahr.

At these stations a plentiful supply of provisions, sufficient to last two years, had been left. It consisted of salt beef, salt pork, canned meats, evaporated fruits and vegetables, biscuits, flour, oatmeal, tea, coffee, sugar, condiments, etc., and plenty of lime juice; a considerable supply of tobacco was furnished, also a good and well-selected supply of medicines, which included two bottles of brandy, which was all the liquor permitted to be taken ashore.

At all of the stations, where the instructions as regards care of health, including those relating to diet, exercise and cheerful occupations, were followed, the health of the men was excellent. One man died of scurvy, but the result was clearly his own fault. He refused to drink lime juice, would not vary his diet nor take sufficient exercise and, consequently, died of a disease which is considered preventable.

On Wednesday, August 5, we left Port Burwell, *en route* for Ashe's Inlet, on the north side of Hudson's Strait. We did not get entirely clear from the ice until August 11. About five A. M., on the following day, we arrived opposite Ashe's Inlet, and found the ice tightly jammed along the shore, making a belt about ten miles wide. We attempted to steam through it and all went well until about noon, when one blade of the propeller was broken off and we lay to in order to fit on another. Fortunately, we had two spare fans for this purpose.

The following day opened dull, foggy, and disagreeable. About two P. M. the fog lifted and the ice began to run abroad. We found that

the ship had been carried about thirty miles to the westward of Ashe's Inlet, and we were obliged to retrace our course.

About five P. M., of this day, the ice having closed in again, some Eskimos were seen walking over the frozen surface to the ship. The party consisted of four men and one woman, the latter carrying a baby in the hood of her dress. They were all hoisted on board by ropes, the poor creatures seeming to have perfect confidence in our good intentions. They had small bundles of skins and curiosities for trade and, soon after they came on board, bartering began. They had rather a pitiful supply of seal skins, walrus ivory and a few seal skin boots. The prices for these articles were a plug of black strap tobacco, or some powder, or some percussion caps.

The Eskimo woman, in spite of the burden on her back, seemed quite able to keep up with the men in coming over the ice. Her infant, apparently about a year and a half old, was entirely nude, and was thrust into the seal-skin hood on its mother's back. The poor little wretch was blubbering away with cold and fright. Its head only could be seen peeping over the mother's shoulder. It was a most grotesque little face. It indicated a paternity not Eskimo, its hair being of a light color. One could imagine that that portion of its organism derived from its white father was crying out against such heroic treatment as it was then undergoing, while that portion derived from its mother was trying to conquer such effeminacy.

The struggle of races was going on in the little body, and expressing itself in the disturbed and wailing face. While its plump little body was covered, by nature, with a good layer of blubber to keep out the cold, its face was covered with another kind of blubber as a protest against the frigidity of the air.

The mother and the men seemed happy, cheerful and, like children, were fully impressed with the novelty of every thing on board the ship.

At night they were all sent up to the forecastle to sleep. The baby was a great source of amusement to the sailors. One of them wrapped the little thing up in a warm flannel shirt before it went to sleep for the night.

One's heart goes out in pity to these poor people, whose lives are passed in such inhospitable regions in a constant struggle against all the adverse forces of nature. Yet they seem happy and contented. Fortunately, their heroic method of bringing up the children weeds out, in early infancy, all the weakly ones.

As they have no farinaceous food, the mothers nurse their children until the latter are five, and sometimes six, years old. The men, women

and children are all inordinately fond of tobacco, and it is no unusual thing to see a child, after partaking of nourishment at its mother's breast, reach up and take the pipe from her mouth, and smoke it with all the apparent satisfaction of a true devotee of the soothing weed.

After spending several days in trying to get through the ice into Ashe's Inlet we abandoned the attempt, and steamed across the Strait to Stupart's Bay, where we came to anchor on the morning of August 22.

The Bay is a very picturesque one, with bold, mountainous shores, and several islands scattered about. A number of Eskimo tents were to be seen along the beach, while the station-house, sheds and magnetic observatory were at the head of the Bay.

Soon after coming to anchor, an Eskimo came out in his kayak and made signs that he wished to see the Captain, and handed him a package from Mr. Stupart, the officer who had been left in charge. This contained a letter giving the astounding intelligence, that Mr. Stupart and his three men had abandoned their station several days before our arrival, and had set out on a perilous journey of over 300 miles, in an open boat, for Ft. Chimo, at the foot of Ungava Bay. The letter stated that the winter had been a very severe one, and that many of the natives had starved. Thirteen of them died of starvation almost at the door of the station building. Mr. Stupart had given them more provisions than he could afford, and a like fate seemed to be in store for his little party. Our ship should have arrived a month earlier than it did under ordinary circumstances.

Mr. Stupart feared that she had gone to the bottom. He, therefore, decided that his only course was to attempt to reach Fort Chimo, one of the Hudson Bay Company's trading posts, whence he could go on one of their vessels either to England or to Newfoundland. I am happy to be able to state that Mr. Stupart and his party reached their respective homes in safety.

Soon after coming to anchor in Stupart's Bay a most singular looking object was seen approaching the ship. It proved to be an oomiak, or women's boat — a large open boat made of seal-skin — and was filled with women and children. I counted thirty-eight people in this frail craft. Each individual was in a state of tremendous and audible excitement, yelling, gesticulating, and pushing for a good point of view, while two divided their attention between paddling and adding to the general pandemonium. It looked like Bedlam let loose, or a floating lunatic asylum which had lost its keeper.

As they neared the ship, their excitement increased and we could

distinguish their yells "Chimo! chimo! tobaccamick! matchamick!" which meant "Welcome! give us tobacco! give us matches!" thus showing that their welcome was not altogether disinterested.

When they came alongside the ship, I threw a few plugs of tobacco into the yelling crowd. In their frantic struggles to get the tobacco, they nearly upset the old tub of a boat.

At this point, the first officer of the ship, fearing that this wild crowd would invade our floating home, jumped upon the bulwarks, with a huge stick of wood in his hand. With a number of forcible and violent Anglo-Saxon expressions, which a sailor always knows how to use, accompanied by menacing gestures with the billet of wood, he persuaded these lovely women to move away from the ship. It is the only instance I have seen, where a sailor was ungallant to the fair sex.

We saw at various times, during our cruise, considerable numbers of the Eskimos. They interested me greatly, as being types of the human race still pursuing a barbarous and nomadic life, and totally unimproved by civilization or Christianity.

The Eskimos are the most northerly of the American native tribes, residing chiefly above latitude 60° N. The name "Eskimo" was applied to them by the Algonquins, a family of North American Indians, and means literally, "eaters of raw meat." The term is well applied, for I have never known them to cook their meat, except for the very old people who had lost their teeth. They appear to show great kindness and deference to the aged and are, in this respect, a pleasing contrast to our wild Indian tribes.

Most ethnologists class the Eskimos with the Mongolians. Their physical characteristics give strong support to this theory. Their ingenuity, their intelligence, far superior to that of most wild tribes, their skill and cunning with their hands, all furnish reasonable grounds for this theory.

I have here a little carving made from a walrus tusk by one of these savages, his only implements being a file and an old nail. It represents an Eskimo in a kayak, or skin boat for hunting, with paddle, harpoon, gaff, etc., complete. It is a perfect miniature of what it represents. The proportions are exact, there is not a line out of drawing, and it shows a great degree of intelligence and of the art instinct, remarkable in a savage who has lived in such an unfavorable environment. It would indicate to me, quite as much as physical appearance, that the origin of this people was Mongolian.

We have all seen the ivory carvings of the Chinese, and I leave you to judge if you cannot trace a resemblance between the work of

this rude barbarian and that of their more cultured and enlightened relatives of the Orient.

I have also a model of their kayak, made of seal-skin, the same material which they use in their large boats. Except for its size, it is exactly what they would use in going out hunting for seals or walrus. You will observe that there is not a particle of metal in it. Its components are seal-skin, wood and sinews probably of the cariboo.

The Eskimos are very reticent about their religious beliefs. They seem to believe in a future existence, after death. Formerly, in burying the dead, if the deceased had been a hunter, their custom was to bury with the body, a gun, knife and other implements of the chase, for use in the happy hunting grounds. Now they do not do so. When asked why, they said, it is no longer necessary, that the Great Spirit has restocked the hunting grounds of the spirit world with game, and that the latter is now so plentiful and so devoid of pugnacity, that all which is needed to kill it is a club. The truth probably is, that guns are more valuable now than formerly and they do not wish to waste them.

In this respect they modify their religious views to suit circumstances with as much ingenuity as some of their more enlightened fellow-beings of civilized countries. A sliding-scale in religion is sometimes as convenient as it is in trade.

I spoke of their burying the dead. Of course in that region, where what little soil there is, is permanently frozen a little below the surface, they cannot dig graves. The dead are laid out on the rocks, and boulders and stones piled around and over them.

The Eskimos are rather well versed in astronomy. They have grouped the stars into constellations and have named the latter after objects with which they are familiar. They know the peculiarities of the pole-star and call it Nicky-chew-ē-too, "the star which does not move." The Pleiades they call Secky-ē-cha, "the breast-bone of the reindeer." The Dipper, or Ursa Major, they call Took-took-dew, "the reindeer."

The limits of this paper will not permit me to say more about these people. With their manner of living, their ordinary habits and physical characteristics, you are probably already familiar, from what you have read in books on arctic travel.

From Stupart's Bay, we went to the westward to Nottingham and Digges Islands, and relieved the men in charge of those stations.

In addition to the difficulties arising from the ice in the Strait, the total lack of light-houses and reliable charts, there are other obstacles to navigation, chief of which is the unreliability of the ordinary mag-

netic compass. At the western end of the Strait it becomes so sluggish as to be almost useless. The Sir Wm. Thomson card was used by Captain Gordon, and was found to work admirably when properly compensated.

The reason of the difficulty with the compass is, that from the proximity to the magnetic pole, the horizonal directive force of the earth's magnetism, which alone directly affects the compass needle, is very small compared with the whole magnetic force; consequently, the effects of induced magnetism in the iron of the ship on the compass needle becomes very large in comparison with the direct action above mentioned; the result being, that in an imperfectly compensated compass, the error due to local attraction is very greatly increased.

The means of correcting this error in the Sir Wm. Thomson binnacle are perfect and easily mastered, and the system is such that the compass can, after the first voyage or two, be perfectly compensated by using certain proportions of soft iron bars and magnets, as correctors, the proportion having to be determined by actual observation and experiment on the voyage. Of course, in that region no opportunity should be lost of taking azimuth observations, both stellar and solar.

Our last stopping-place, previous to crossing Hudson's Bay, was at the Digges Islands at the extreme western end of Hudson's Strait. Here we remained several days for the purpose of taking on ballast, testing the chronometers and making a survey of the islands, which had never before been surveyed.

The general appearance of the landscape of these islands is similar to most of the country around Hudson's Strait, presenting bold, rocky shores utterly devoid of vegetation, except moss, lichens, stunted willow-bushes, small plants and grass in the lower valleys. This whole region is desolate-looking in the extreme. I was often amazed to see the amount of animal life in existence there, and wondered how it all managed to find sustenance.

The rocks of Digges Islands are mainly Laurentian gneiss. The bare hills of which they are composed are divided into several detached groups by straight, transverse valleys, cutting well down toward the sea-level, thus giving the appearance of separate islands, when viewed from a distance. The greatest length of the islands lies about east and west (true). As this is also the commonest direction of the strike of the gneiss, most of which is red, and also of the glacial striæ, the islands have become divided by longitudinal valleys, some of which, too, were traced in nearly straight courses for several miles.

It was learned by a survey which we made that there are two of these

islands. On the morning of August 26, a party of us left the ship at 6:30 A. M. in the steam launch to make a track survey of these islands. Dr. Bell was in command. In addition were Messrs. Laperriére—the officer in charge at Digges—Tyrrell, myself, the engineer of the launch and one of the sailors.

It was a cold, blustering day. The sea was running high, so much so that when we got into the tide rips, we shipped large quantities of water. Before we had been out an hour, one of our party, not myself I am happy to say, became very sea-sick and "subsequent proceedings interested him no more."

After we had been out about three hours, and the work was becoming monotonous, the sailor in the bow of the launch called out that there were a couple of polar bears in the water between us and the shore. Let me say here that these animals live in the water more than they do on shore, and have been seen a hundred miles from land, swimming about in apparent unconcern. On account of their amphibious habits they have received the name, *Ursus Maritimus*.

On this day I had the only rifle on board the launch and merely a few cartridges, as I had not expected to see any game. As soon as our party caught sight of the bears, the launch was headed for them. As we approached, we saw they were a large female bear and a young cub. When within range, I fired several shots, but the launch was pitching about to such an extent in the rough water that it was impossible to shoot with any accuracy and I did not hit either of them. The little cub was very much alarmed at the firing and poked its nose inquiringly in its mother's face to know what it all meant. The old dame, however, had more serious business on hand than answering questions, and roughly shoved her child away with her paws. When within about fifty feet of the pair, and just as I was in the act of firing, the old bear made a sudden dive, disappeared, and then came up under the counter of the launch, and caught the gunwale with her jaws and one paw, within about two feet of where Mr. Laperriére was sitting. The rapidity with which he vacated his seat was astonishing. Had we not been going at considerable speed, five knots, the bear would undoubtedly have got into the boat, but, as it was, she could not retain her hold and dropped astern.

By the time we had recovered from our astonishment at the plucky act of Mrs. Bruin, and had turned the launch about, she and her cub were near a rocky promontory which jutted out from the shore, and were soon on the rocks, whence they disappeared over the hill.

After they had disappeared, we ran into a little bay to get fresh

water for the boiler. As we were coming out and rounding a high rocky cape, we saw again two polar bears swimming. At first I thought them the same pair which we had first seen, but soon made out that they were two full-grown animals. As my ammunition was pretty well exhausted, I did not fire until I got within easy range. I fired two shots, wounding one of the beasts. They immediately made for the shore, ran up through a little ravine where they were out of sight, and then appeared on a ledge above. I fired two more shots and wounded both animals. They then started to climb up the cape, but, finding it too steep, fell back and turned down into the ravine or gully, where we could not see them.

The launch was run ashore and the sailor, a bold, courageous man, from Newfoundland, known as "Con" Griffen, and myself got out. Griffen's only weapons were a boat-hook and an axe. We climbed up the rocks, so as to get a good point of attack above the bears. For some time we could not see them, but heard them growling with pain and rage. I must confess that I resembled at that moment Bob Acres, in "The Rivals," and could feel the courage gradually oozing out from my finger ends. But it was worse to go back and be laughed at for showing the white feather, so I kept on. We approached within about fifty feet of the bears before they were visible. As soon as they caught sight of us they began to growl and roar worse than ever. I immediately fired two shots from my Remington rifle, which is a single-fire breech-loader. Both took effect in the body of one animal. In order to get a better aim, the bears being a little below the ledge where we were, and among the rocks, Griffen and I went nearer. I fired at the other bear, which was very slightly hurt, and hit him in the body, but it only enraged him the more. He immediately gave a most terrific roar of pain and sprang at us; fortunately, he was obliged to come up hill. By the time I had extracted the old shell and had reloaded my rifle, he was within ten feet of me. I fired as carefully as I could; the ball struck him in the lower jaw and then entered his head. He fell back into the gully, turned tail, crawled down to the water's edge and plunged into the sea, where he died soon after. By this time my last cartridge had been fired. "Con" Griffen all this time had stood just at my right, with axe uplifted, ready to take a hand in the fight whenever necessary.

As we did not wish to go back without some trophy, we decided to attack the remaining bear, which was very badly wounded, with the axe and the boat-hook. In this way we killed it. The party from the launch soon after came ashore, and all turned to and helped skin

the bear. We then proceeded with our survey of the Digges Islands, and returned to the ship about six P. M.

The places which we visited at various times on our cruise constitute a sportsman's paradise. Of large animals there are, besides the bears, cariboo, or reindeer, in great numbers, and walrus and seals by the hundreds. Of birds there are the beautiful ptarmigan, various species of ducks, murres, sea-pigeons, geese, swans, and curlews; of fishes, according to locality, cod, sea-trout, speckled trout, salmon, grayling and white-fish.

From Digges Islands we sailed across Hudson's Bay to Ft. Churchill, one of the large posts of the Hudson's Bay Company. Near this post are the well-preserved ruins of old Fort Prince of Wales, which was captured by the famous French Admiral, Lapérouse, in the last century, its guns spiked and its walls partly destroyed.

From Fort Churchill we returned over the same route, revisited the various stations, and thence proceeded to Halifax, where we landed on a bright, sunny Sabbath morning, the 18th of October.

I will now give some of the results of our work. Of course I can give you only a few general facts as pertaining to the main objects of our cruise. An almost indefinite number of papers might be written as to the geology, zoölogy, entomology, botany, meteorology and all the other ologies of that region. Of these I will not attempt to speak.

"Hudson's Bay, situated between 51° and 63° of north latitude, is a vast sheet of salt water, measuring 1,300 miles in length with an average of about 600 miles in width. It is more properly a sea, having an area of over 500,000 square miles, or considerably more than one-half the area of the Mediterranean. It has aptly been called the Mediterranean of this continent.

"It drains an expanse of country spreading out more than 2,000 miles from east to west and 1,500 from north to south, or an area of 3,000,000 square miles."* It lies entirely south of the Arctic Circle, and its southern extremity is about the latitude of London. Its waters are never frozen, except near the shores; it is navigable the entire year. In the summer months its waters are warmer than those of Lake Superior, the temperature of the water sometimes rising as high as 59° Fahr., and people bathe in it with comfort. Hudson's Strait, which is the gateway to this vast sheet of water, is about 500 miles in length, with an average width of 100 miles. The narrowest part is about the center, and at the outlet into the Atlantic, where the breadth is only about 45 miles. The depth of water in the Strait, so far as

* Popular Science Monthly, June, 1885.

it has been sounded, varies from 100 to 340 fathoms. In the Bay there is an almost uniform depth of 70 fathoms.

* "It will be seen by an inspection of the chart, that Fox's Channel, in respect to width, general direction, etc., is a continuation of Hudson's Strait, and that the outlet of Hudson's Bay joins this great channel at right angles. It is much deeper than Hudson's Bay, the comparative shallowness and the uniformity of the bottom of which are remarkable features. If the sea in these latitudes were only about one hundred fathoms lower than it is at the present time, James' and Hudson's Bays would become dry land, while the Strait would remain as a long bay, but with a slightly diminished breadth. The bottom of the Bay would have become a plain, more level in proportion to its extent than any other on the continent. The numerous rivers which now flow into it would traverse this plain, converging toward the north-east and falling into the Strait near Cape Wolstenholme, after having, perhaps, formed one immense river, flowing northward down the center of the Bay, or probably nearer the east-main side.

During the "great ice age" the basin of Hudson's Bay may have formed a sort of glacial reservoir, receiving streams of ice from the east, north and north-west, and giving forth the accumulated result as broad glaciers, mainly toward the south and south-west. The direction of the glaciation, on both sides of Hudson's Strait, was eastward. That an extensive glacier passed down the Strait may be inferred from the smoothed and striated character of the rocks of the lower levels, the outline of the glaciated surfaces pointing to an eastward movement, the composition of the drift, and also from the fact that the long depression of Fox's Channel and the Strait runs from the north-westward toward the south-east, and that this great channel or submerged valley deepens as it goes, terminating in the Atlantic Ocean. Glaciers are said to exist on the shores of Fox's Channel and they may send down the flat-topped icebergs which float eastward through the lower part of Hudson's Strait into the Atlantic. During the drift period, the glacier of the bed of Hudson's Strait was probably joined by a contribution from the ice which appears to have occupied the site of Hudson's Bay, and by another also from the southward, coming down the valley of the Koksok River, and its continuation in the bottom of Ungava Bay. The united glacier still moved eastward round Cape Chudleigh into the Atlantic.

Throughout the drift period, the top of the coast range of the Labrador stood above the ice and was not glaciated, especially the high

* Report of Dr. Robert Bell, F.R.S., 1884.

northern part. Further south on this coast, the range is lower and there may also have been more ice in this direction. Here the valleys and the hills, up to the height of one thousand feet, at any rate, have been planed by glacial action, the course followed by the ice on the eastern slope having been down the valleys and fjords directly into the sea. In the southern part of the Labrador peninsula, the general course of the ancient glaciation appears to have been southward, varying to the eastward or westward with the courses of the rivers and valleys, and coming to the north shore of the Gulf of St. Lawrence, in a general way, at right angles to the coast line. On the island of Newfoundland, the glaciation appears to have been from the center toward the sea on all sides."

In the vast region, included in the water-shed of Hudson's Bay and Hudson's Strait, there are boundless stores of wealth awaiting the magic wand of enterprise, pluck and capital.

In the country south and south-west of the Bay are untrodden forests, which will one day be an important factor in the lumber supply of the world. The varieties of wood found there are white and red pine, cedar, spruce, tamarack and the Banksian pine; and I am informed that the trees grow to a good size.

In many places on the shores of Hudson's Bay and Strait, valuable economic minerals are found in good deposits. These co mprise gold silver, lead, copper, several kinds of iron ore, including the valuable manganiferous variety, asbestos, pyrites, and a great variety of coarser mineral products and ornamental stones.

The value and importance of these mineral deposits can only be determined by further search, but they are undoubtedly great.

The waters of the Bay and Strait and the inflowing streams abound in marine mammalia and fishes. Between the extremes of the scale, the huge whale and the tiny capelin, myriads of seals, white porpoises, walrus, cod, salmon, sea-trout, speckled trout, white-fish, grayling and other fishes swim undisturbed by the fisherman or hunter. Occasionally that rare creature, the narwhal, the unicorn of the sea, is found.

In the north-western part of the Bay, the whale-fishery is carried on to a limited extent by the enterprising whalers from New Bedford and New London. It has been officially stated that the returns from this source during the years 1863, 1864, 1865, and 1866, were about $1,000,000 worth of whale-oil and whale-bone, and this was the product of only four or five comparatively small whaling barques and schooners.

The white porpoise, though not very large, yields the best of oil, yielding on an average a barrel of oil to each one. At one of the

Hudson's Bay Company's posts they caught in one year as many as 2,800 porpoises, by a very inexpensive method.

The walrus are now valuable for oil, ivory and the hides. A full grown walrus represents a monetary value of over $150. I have seen seventy or eighty of these huge beasts swimming about in close proximity, and must confess that I looked with some regret at about $12,000 floating away.

Of the value of the cod, salmon and trout fisheries it is not necessary to say much. They will in the future prove to be of great value. The opportunities which this region under discussion affords to the fur-trader have been proved by the history of the Hudson's Bay Company, which in the past has been chiefly a fur-trading corporation.

The valuable black fox is frequently captured, whose skin is worth from $100 to $300 in the London market. The silver, the grey, the red and the white foxes are very numerous; hundreds of polar-bear skins, musk-ox robes, carcajou pelts, reindeer skins, wolf-skins, hides of the square-flipper and hood seals, and other articles of barter are obtained annually from the Eskimos and Indians, for prices varying from a $3 gun, or a little ammunition, to a flew plugs of black strap tobacco, worth about three cents a plug.

Having glanced hastily at some of the resources of that region, we come now to the question of the practicability of the Hudson's Bay route. This is a question which I cannot with propriety discuss here, as the complete reports of the officers of our expedition have not yet been given to the public.

I will make only a few remarks and give some facts which have already been published.

The only troublesome part of this route for navigation is in Hudson's Strait and the entrance to it from the Atlantic. There is little doubt that from three to four months can be relied upon for navigation each year for properly-constructed steamers. For the rest of the year, as a rule, the door to Hudson's Bay is locked with a key of ice. Whether that length of time is sufficient for purposes of commerce or not, I do not pretend to say. Some good judges say it is.

From the time of Hudson's first trip into the Bay up to 1882, seven hundred and thirty round voyages had been made. The Hudson's Bay Company formerly insured their ships at as low a rate as would have obtained if they had cleared for Quebec or Montreal. Now, I am informed, they do not insure them at all, as their losses have been few and far between. No vessel, I believe, has ever been lost in Hudson's Strait. Bear in mind that all these voyages were made in sailing

vessels. The "Alert" was the second and last steamer to plow the waters of Hudson's Bay.

To what extent artificial aids might improve that navigation is now a problem. Undoubtedly correct charts of that region, light-houses, buoys, telegraph stations, to signal ships where open water might be found, etc., would improve it very greatly.

To illustrate how carefully we should form an opinion in the matter, I would state that in 1716, Captain Vautrou wrote, that of all known countries, the navigation of the Gulf of St. Lawrence was the most difficult and the most treacherous. Of three expeditions fitted out by England to seize upon New France, and sailing through the Gulf of St. Lawrence, only two were able to cast anchor in the harbor of Quebec. Only one voyage each year was made, and it was alleged that the St. Lawrence River was frozen solid in winter. What a contrast between the navigation then and now. Much of the change has been wrought through artificial aids to navigation, including, of course, improved motive power.

Yet, in the very year that Captain Vautrou condemned the Gulf of St. Lawrence as the navigator's *bête noire*, the Hudson's Bay Company's sailing vessels were threading their devious way in and out of Hudson's Bay.

What seems chimerical and utopian to-day, is a common occurrence to-morrow. The man who proposes any new and strange project, if successful, is regarded by the world as a genius, otherwise, a fool.

The wise men of England were demonstrating the utter impossibility of running a train of cars by steam power, on the very day that George Stephenson hauled a very substantial and material train on his tramway by means of his little locomotive.

Wise men proved conclusively that a ship could not be propelled by steam across the Atlantic, while the first ocean steamer was ploughing her way across.

It seems to me that we should form an opinion with great care and deliberation as to the practicability of this Hudson's Bay route. It is still an open question. Many able and impartial men advocate it; many others oppose it as being utterly impracticable. Others, again, render their verdict in the convenient and old-fashioned Scotch style, "Not proven."

GOLD, SILVER AND THE COINAGE OF THE SILVER DOLLAR.

By Chauncey P. Williams.

[Read before the Albany Institute, May 18, 1886.]

From the early ages of mankind, before written history or authentic legend give us any insight into the habits and customs of our ancestors, it is evident that gold and silver were used as money. Employed by common consent as the means of the exchange of objects of desire, these metals thus became the objects of universal desire and value. It is probable even that the coinage of gold and silver preceded the use of letters, as the earliest coins are destitute of letters, while the earliest writings known invariably allude to money.*

Gold and silver have been known and used as money by every people above the level of barbarism since the dawn of civilization. There would seem to be something natural, therefore, in their use as money. In every civilized country they have been used together — that is, *concurrently*, as money. While useful and important for a great variety of other service, their chief use and value has been and is as money.

The relative value of gold and silver to each other during the world's history has greatly varied.† The Code of Manou prescribed it at 2 1-2 to 1. The early Egyptians held the two metals at 3 or 4 to 1. Between the fifth and sixth centuries, B. C., the current relative value

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*Del Mar., History of Money, p. 15.

†Some writers hold that silver and even iron, at some ages, and in some countries, have been held in higher estimation than gold. It is said there are, in the museum, at Copenhagen, samples of implements or weapons made of gold and edged with iron, which seems to substantiate this opinion.

for the world, excepting India, was 6 or 8 to 1.* From the period of Xenophon, in Greece, 350 B. C., and for about 500 years of the Roman dominance of the civilized world, the general rate of about 10 to 1 prevailed. The rates were, at times, and in some countries, considerably varied, by both higher and lower relative values. On Cæsar's return from his conquest of Gaul, B. C. 51, the amount of captured treasure, in gold, brought by him to Rome, reduced the ratio to 7 1-2 to 1.† In the time of Theodosius the Younger, 412 A. D., the rate had risen to 18 to 1.‡ These variations, however, appear to have been comparatively temporary; the general progress being to a gradual widening of the relative value. From the ninth to the middle of the sixteenth century, the prevailing rates were about 11 and 12 to 1.§ After the opening of the mines of Potosi, about 1545, the preponderance of silver became so great as still further to widen the difference by gradual appreciation to 14 and 15 to 1, which rates were held up to about the close of the last century. In 1791, Hamilton, after careful study of the subject, recommended congress to establish our coinage at the rates of 15 to 1 in the coinage of the United States, which was done; and these rates remained our legal valuation of the two metals, until 1834.

In 1803, France established her mint ratio at 15.5 to 1, with free coinage, which rates became those of most of the States of Europe; and they became the basis of the international compact called the Latin Union, formed in 1865. France had kept her mints open to the coinage of both metals for seventy years, at these rates, very greatly to the benefit of the world's commerce, no doubt, in the steadiness of value which was thereby given to both the money metals as measures of value. By the formation of the Latin Union it was sought to perpetuate the benefits of the free coinage of both metals.

England had, in 1816, established for herself the single gold standard, using silver only as a subsidiary coinage. England's great colony, India, had (as she always had) an exclusively silver standard. London became the chief mart of the world, where silver was sold and bought *at a price.* That price, however, fluctuated within extremely narrow limits, owing to the fact that the free coinage of France offered to all holders her mint terms of 15.5 to 1, for either metal.

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* Faucher. Remarks on the Production of the Precious Metals. London, 1853. p. 11.

† Lord Liverpool. Letter to the King. London, 1880. p. 285.

‡ Faucher, p. 12.

§ Faucher, p. 13. See, also, Vaughan, Coins and Coinage.

The fall of Sedan, in 1870, and the capitulation of Paris to the German army cost France two of her richest provinces, and a thousand million dollars gold values, as ransom. Germany, with full coffers, resolved to reform her monetary system and to adopt the single gold standard in place of her previous standard of silver. This led her in 1876 to throw upon the market immense amounts of silver, the old stock in circulation, which the government had redeemed with the purpose of clearing up the silver coinage. France, moved no doubt by resentment quite human under the circumstances, closed her mint to the coinage of silver; which action was followed by all the States of the Latin Union. The mints of the United States were already closed against the free coinage of silver, by the Coinage Act of February 12, 1873. There was therefore no bi-metallic nation with mints open to the coinage of silver, from which Germany could procure gold in exchange for it. No other resource was open but the London market. The only customer of the London market was that great absorbent of all surplus silver for ages,—the Orient. But the supply exceeded the demand, and the price declined in consequence. From about 60d per ounce of pure silver as its usual value, the price, in 1874, ran down to 57¼d; in 1875, to 55½d; and in 1876, to 46¾d—thus in four years showing a loss of more than one-fifth of its usual value.

The commercial world was agitated by the threatened revolution. Europe was alarmed. Germany slackened, and finally suspended her silver sales. Brother Jonathan, with his eye to the "*main chance,*" looked about to see if the situation could not be in some manner turned to his advantage.

Two parties in the country were especially concerned in the issue. The Greenback party had been and were active and noisy in the claim that the national bonds could justly *be paid* in bits of printed paper declaring that they were each $100 or $1,000 more or less, and that it was the height of impudence and injustice on the part of the public creditor to demand any thing better. The large interest in the country connected with silver mining felt severely the decline in silver, affecting seriously their revenues. The Greenback party was able to see the clear indications of defeat casting its shadow upon their hopes, in the general progress of the country in preparation for the resumption of specie payments. The silver mining interests were easily led to conclude that if the "Dollar of the Fathers" could be minted without limit, it would aid much their silver enterprises and afford them a sure market at a stable price. What more natural than that these two

forces should join in advocacy of the dollar coinage! Here, under the semblance of patriotism, the grudge and envy of the one, and the cupidity of the other, were each promised gratification. Hence, the crusade of 1876 to 1878, for the restoration of the "Dollar of the Fathers."

A little digression will here be pardoned, to pay our respects to the Dollar of the Fathers. The United States silver dollar was authorized by the act of April, 1792, establishing the mint. It contained the same *quantity* of pure silver as the dollar now coined under the act of 1878.* But when we are truthfully told that prior to the recoinage act of February 28, 1878, during eighty-six years, the total coinage of such dollar amounted only to $8,045,838; —a sum insufficient, if the whole eighty-six years' product is put together, to pay off a single ten million U. S. bond call — that over $3,567,000 of this sum was coined during the suspension of specie payment, and only three or four years prior to 1873, to answer the call of owners of silver to ship the dollars to China, and that since 1834, our rates of coinage have been such as to offer a premium of 3 1-3 per cent for the export of these dollars to the mints of the Latin Union; our veneration for the "Dollar of the Fathers," is somewhat abated. The fact seems to be that the dollar went into the melting pot for silver-plate, or into cabinets of coins, or was exported about as fast as coined. And it may truthfully be said never to have been a part of the circulation of the country.†

The statement was made in 1877 or '78, during the discussions upon the restoration of the dollar, that intelligent merchants of fifty years of age could be found, who had spent their whole lives in business, and handling money every day, who had never seen an American Silver Dollar, and did not know the coin. I have no doubt of the truth of the statement, from my own knowledge and experience of business during the time.

So much for the Dollar of our Fathers! We will now consider the Dollar of the Sons!

The coinage act of 1853, depreciating the weight, and limiting the legal-tender power of the fractional silver coinage, practically established the gold standard. This act left the silver dollar standing in the statutes precisely as it had done. While it so existed in the statutes

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*371¼ grains Troy.

† "The coin did not pass into circulation, but was chiefly used as a convenient portion of silver in the laboratory of the metallurgist, or was hoarded as an object of curiosity." J. J. Knox, Report of Comptroller of the Currency, 1875, p. liv.

as the legal potency of a dollar, it was wholly dormant. Prof. Laughlin, in his recent history of bi-metalism,* gives the reason as follows:

"At no time after the act of 1853, until the Civil War, was the silver dollar of 412 1-2 grains, equal to less than 103 or 104 cents of our gold coins, and it was, consequently, never seen in circulation. The country had willingly acquiesced in the practical adoption of the gold standard, and so well did the situation satisfy all demands that the question of gold and silver dropped out of the public mind."

It may be well for us to bear in mind that prior to 1853, the total coinage of the dollar during the sixty years of operation of the mint up to that date, had been only two and a half millions of the coins.†

All merchants and bankers, whose recollection goes back to that period, will remember that, from 1862 to 1879, during greenback times, any dealings in specie, in any manner, was in terms of gold, Gold was the subject of purchase and sale in Wall street, and the "Gold room" and "Gold market" and "Gold premium" and price were subjects of daily paragraphs in the public journals, and of daily and hourly quotations by telegraphic wire throughout the country. Nobody would have thought of delivering *silver dollars*, or of having them accepted in filling a sale of such coin.

In view of this history, Congress, by the act of 1873, reorganizing the mint, and bringing into one act the several statutes on coinage, after long and careful deliberation, decided to drop out the silver dollar from the future coinage of the mint, But, recognizing the fact that a full-weight silver dollar was needed in the China and East India trade, the act authorized the *Trade Dollar of* 420 *grains*; the legal-tender potency of this coin was limited to five dollars.‡

Meanwhile the silver mining interest of the west was gaining large influence and wealth. The Comstock lode was being developed; its actual production of silver was large, and its promise for the future still larger.§ The producers, finding the coinage of the standard dollar closed against them, and the London silver market depreciating, employed the mint in coining the Trade dollar. About thirty-six millions were coined between 1873 and 1877, as had been generally

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* History of Bi-Metallism in the United States, by J. Lawrence Laughlin, Ph. D. 8 V. p. 257. New York, 1886, p. 86.

† Exactly $2,506,890. See U. S. Mint Reports, for 1886, p. 113.

‡ Laws of U. S., vol. 17, p. 424. Act 12th of February, 1873, § 15.

§ The Comstock lode, in 1877, produced $37,062,252 of the precious metals. Our Country. By Rev. Josiah Strong, p. 25. In 1878, the product was $47,076,863 United States Mint Report, 1879, p. 17. About one-third of these amounts was gold, and two-thirds, silver.

supposed, for shipment to China. But, about 1876 or '77, the appreciating value of the greenback note, as the period for resumption approached, was found to give the silver miners a little better price for their silver in exchanging the Trade dollar for them at par, than they could get in the London market. Consequently, as specie resumption arrived, the country was found to be flooded with the Trade dollar. The special China dollar had either never gone there, or had evidently returned.

The Secretary of the Treasury, as he was authorized by law* to do, finding this illegitimate and fraudulent use being made of the Trade dollar, restricted and later ordered the discontinuance of its coinage.†

Finding the outlet for silver closed to them except through the London market, which was showing constantly receding figures for it, owing to the pressure of the mass of German silver‡ offering and known to be coming, there was a sudden awakening to the enormity of the demonetization of the standard silver dollar — the "Dollar of the Fathers"!

All remember the pious horror with which the advocates of silver waked up to the fact that the coinage of the dollar had been legally discontinued! — how freely and persistently the charge of surreptitious and fraudulent passage of the act was made! Yet, so far is it from the truth that any facts exist to justify this charge — the facts all prove the contrary. Seldom in the history of our country has an act of Congress been adopted with so much deliberation, and evident aim to give full scope to every objection which might be brought against the measure.

The bill was drawn in 1869, by Mr. Knox, then deputy comptroller of the currency. It was sent with a report accompanying it, stating and explaining its provisions, and especially calling attention to the fact that it proposed the discontinuance of the dollar coin, to the officers of the Treasury and each of the mints, and also to a large number of gentlemen whose studies and occupations were supposed to render them peculiarly fitted to advise upon such subjects, asking their criticisms. Some thirty replies were received.

The reports of the Secretary of the Treasury for 1870, 1871 and

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* By Act of 22d of July, 1876, § 2.

† Laughlin, p. 209.

‡ It seems foolish and weak to claim that the fact of the United States having closed the coinage of the silver dollar should have exerted any influence whatever upon the world's markets for silver. The entire sum coined from the foundation of the government, if it could all have been gathered in one mass, would amount to hardly an appreciable fraction of the world's stock.

1872 — three years, called the special attention of Congress to the bill. It was reported favorably in both the Senate and the House in the Forty-first Congress, and was fully debated in both houses. It passed the Senate by a vote of 36 to 14.

Not becoming a law in the Forty-first Congress it was introduced into the Forty-second. Mr. W. D. Kelley, of Pennsylvania, was chairman of the House committee on coinage of both the Forty-first and Forty-second Congress. In introducing the bill to the Forty-second Congress, he said it had "secured as careful attention as I have ever known a committee to bestow on any measure."

The bill was thus fully debated in both Houses of both Congresses,— on several occasions occupying two days together. It was printed for the use of Congress no less than eleven times and twice further in reports of the comptroller of the currency. The fact of its dropping the coinage of the silver dollar was frequently alluded to in debate, but no member of Congress expressed dissent.* It passed in the House of Representatives with but thirteen negative votes on the 27th of May, 1872. It was not passed in the Senate until the 17th of January, 1873, and then with some amendment not concurred in by the House which led to a committee of conference, and its final passage was delayed until the 12th of February, 1873 — nearly nine months after its second passage in the House, and after having been before Congress for three years.†

Notwithstanding the complete and overwhelming refutation which the facts give to the charge of surreptitious and secret passage of this act, the charge is still repeated and is widely believed. So intelligent and able a writer as Judge Robert W. Hughes, of the United States District Court of Virginia, in a recent work on the silver question says:

'When passed, the act was not read except by its title, and it is notorious that this transcendent change in the money system of the country, affecting its most vital interests, was carried through Congress without the knowledge or observation of the country." ‡

It has become the custom of the advocates of the continued coinage

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* The bill was frequently considered by the Finance Committee of the Senate and the Coinage Committee of the House, during five different sessions of Congress. It was repeatedly read in full in both Houses. The debates upon it in the Senate occupied sixty-six columns of the Congressional Globe, and those in the House seventy-eight columns. H. V. Poor, Resumption and the Silver Question, p. 121. See also Upton's Money in Politics, p. 207, etc.

† For full history of the origin and the action of Congress upon the bill which became the Coinage Act of the 12th of February, 1873, see report of the Comptroller of the Currency for 1876, pp. 53–55, and pp. 160–165.

‡ The American Dollar. By Robt. W. Hughes, Richmond, Va., p. 74.

of the silver dollar to claim for silver that its value has not fallen, but that gold has risen, as the reason of the largely widened difference in value of the two metals. Judge Hughes, in his pamphlet before referred to, takes the lead in what he presents as proof of this assumption. He produces a list of some seventy staple articles of commerce with their prices in 1870 and in 1884,* and shows a depreciation in the latter year as compared with the former of twenty-six per cent. The judge assumes from this showing that his proposition is proved, and says: "This table shows a fall compared with gold of twenty-six per cent.† Thus it is plain that silver and general prices have remained on the same level; gold having risen."

"Who will pretend that there has been any such real destruction of values as these tables indicate? It is obvious that the fall in prices denoted by them is in the main but relative, and is absolute to but a partial extent. It is the standard that has been increased. It is gold that has undergone a change of value and has risen by eighteen or twenty per cent. By what means and for what purpose this increase in its value and the resultant tax imposed upon all mankind who owe debts, own property, or live by wages has been effected, is a subject for the indignant reflections of the reader."‡

I have quoted the judge, because I observe he makes an argument which is followed by many members of Congress in their speeches and by many writers on the question.§

If Judge Hughes had studied his subject closer, probably he might not have made up his judgment with but half the testimony before him.

That the general prices of commodities and service — of all things purchasable with money, are to be taken as the criterion of its value — of its purchasing power — is admitted. But such prices must be taken with due allowance for adventitious ccicumstances and condi-

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* Ib., pp. 50, 51.

† Ib., pp. 51, 52.

‡ Mulhall, in his price level of the world's commerce from 1860 to 1883, makes the total commerce for 1873, £1,285,000,000; for 1883, £1,883,000,000. For the United States, 1873, £207,000,000; 1883, £328,000,000. Price level for 1873, for the United States, 100, for the world, 103; for 1883, for the United States, 91, for the world 81. That is, between 1873 and 1883 he shows a general decline of the world of twenty-two per cent; of the United States of nine per cent. Mulhall, History of Prices, pp. 155, 156.

§ Judge Hughes is followed in this line of argument by Mr. Beck in the Senate and by Mr Reagan, Mr. Symmes, Mr. Warner and others in the House. Mr. Warner puts the depreciation of average commodities as high as fifty per cent, which is clearly excessive. Others quote somewhat of English authority to the general average depreciation of about twenty to twenty-five per cent decline.

tions affecting them at the times of comparison. To illustrate — a comparison of the market price of a given quantity of planed and matched floor boards, or of neatly wrought mouldings to-day, with the prices of the same articles before the invention of the Woodworth planing machine, would give us no just conception of the relative value or purchasing power of the money in which prices are stated at the two different periods.

So in the case of the cost of pins. The market prices at periods before and after the invention of the ingenious machine, by the use of which one man performed the labor theretofore performed by sixty men in making an equal quantity of pins, or of the price of hooks and eyes before and after the introduction of that other machine, invented in Massachusetts about 1815, by the employment of which the wholesale price was reduced from $1.50 to fifteen cents per gross in a few years. In neither of these cases would the market prices of the product at the two periods stated give us any true criterion of the value of the money in which the prices are stated at those periods.

The prices of steel and the products of steel at periods before and after the discovery of Sir Henry Bessemer, might furnish us with another illustration, and so we might go through the whole list of the products of industry, into the production of which invention of improved processes or of machinery have entered to aid the efficiency of human labor.

It would be manifest in the cases stated that actually cheapened cost of production would much more rationally account for reduced prices, than to attribute the change to the enhancement of the value of the money in which the prices are expressed.

Another thought will occur to us, namely, that concurrently, and very likely as the direct result of these cheapened cost and prices of the products stated, the wages of labor engaged in their production might not decline, but very materially advance. And this also we find to accord with the observed facts.

Judge Hughes and the members of Congress who follow in his wake, although they refer in eloquent terms to those who live by the wages of labor, do not anywhere, that I have been able to find, quote the wages of labor, either as a component part of their tables of prices, or separately, in the maintenance of their claims, that it is gold which has risen and not silver which has fallen, that has produced the gap between the two.

The wages of labor are regarded by all the standard writers upon Political Economy as a more reliable criterion of values than gold and

silver or the prices of commodities.* By this criterion it will be shown that during the past twelve or fifteen years, during which silver has been receding in market-value, gold has just about held the even tenor of its way, in purchasing power.

There are difficulties in comparing prices for single years, and for periods not far distant from each other. Adventitious and accidental circumstances may affect prices, though having no relation to the currency in which they are expressed. The only reliable test would be to take the average of a considerable number of years and at periods considerably apart.

I propose to show, first, that notwithstanding the general decline in the prices of commodities, the wages of labor have considerably advanced in the past thirty years, and held their own during the past fifteen years; and second, that the decline in commodities is accounted for by other causes, so as to leave no room to attribute it to the appreciating value of the money with which their value is measured.

First, as to the wages of labor.

The most complete statistics of labor for our own country, available to us, are those of the Massachusetts Bureau of Statistics of Labor. I quote from the Report of Hon. Carroll D. Wright, Chief of the Bureau, August, 1885:

"Wages in Massachusetts are 28.36 per cent higher than they were in 1860." Wright's Report, 1885, p. 144.

"Wages in Great Britain are 9.64 per cent higher than they were in 1872." Ib.

In Mr. Wright's table of comparative wages for employees in all industries, in Massachusetts, from 1860 to 1883, in twenty-five industries, comprising all for which he gives the wages for both 1860 and 1883, the wages paid in 1883 average 11.8 per cent over those paid in 1860. In the same table the wages for the common laborer for 1860 are not given; nor are they given for 1873. But for 1874 they are given at $8.07 as the weekly average, and for 1883 at $13.37 as the

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*Adam Smith says: 'Labor * * * is the only universal, as well as the only accurate measure of value, or the only standard by which we can compare the values of different commodities, at all times and at all places." Wealth of Nations, London, 1796, 3 vols. Vol. 1, p. 54.

"The wages of a day-laborer are the best criterion of value." Thomas Took, as quoted by Mulhall. History of Prices, p. 190.

"But there is only one thing from whence we may certainly track out the prices, and which carries with it a constant resultance of the prices of all things which are necessary for man's life, and that is the price of laborers and servants' wages, especially those of the meaner sort." Vaughan, Coins and Coinage, p. 107. Written about 1630.

weekly average; showing an advance of 65.6 per cent. See Report, pp. 132, 133.

In the same table, Mr. Wright gives us comparative average prices of wages in all industries in Massachusetts in 1872 with those paid in 1833, which shows a decline of 14.8 per cent in the average for 1883. Now, in 1872, gold was at an average premium of 12.5 per cent for the year, showing prices were that much inflated from irredeemable currency. Allowing for which, the average for 1872 shows but 2.3 per cent ahead. But 1872 was a year of exceptionally high prices, aside from gold premium, which was, doubtless, reflected in wages.

If we take 1874, as wages are stated in Mr. Wright's tables, for a further comparison with 1883 (1873 not being given in these tables), the difference in the average wages for that year, over 1883, shows 2.95 per cent highest for 1874. But as the premium on gold averaged 11 per cent for 1874, allowing for that inflation, we show 8.05 per cent for 1883 over 1874, and a resultant total advance from 1872–1874 to 1883, of over six per cent in wages.

Of course, if we go further back, to 1830 or 1850, we show much wider difference and larger advance, but I have chosen to confine myself as near as possible to the years Judge Hughes selects for his supposed demonstration, and to show its fallacy.

Mr. Wright says:

"In the ninety industries in Massachusetts and Great Britain, supplying statistics of average weekly wages, for the period between the years 1860 and 1883, the wages of at least 1,250,000 employees are represented." Report, p. 127.

In concluding his report he says:

"As a rule, wages show an upward tendency from the earliest recorded period (meaning between 1752 and the present) to the present time, the progress being broken at certain intervals, as relates to certain industries, by fluctuations, temporary only, and, therefore, not materially affecting the onward current." Report, p. 463.

To similar effect is the testimony of Mulhall, the distinguished London statistician, as to labor in Europe. He says:

"The workingman, in Europe, can now buy 140 pounds of bread with the same labor as seventy-seven pounds, in the decade ending 1850." History of Prices,* p. 95.

This shows a gain to the laborer of 83 per cent, and is, doubtless, divided between advanced wages, and cheaper bread.

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* History of Prices, since the year 1850, by Michael G. Mulhall. London, 1885

The advance in wages of labor, has been 50 per cent in Europe and 43 per cent in the United States since 1850. See Ib. pp. 125, 128.

"Agricultural wages have risen 90 per cent, while those of artisans and mechanics only 50 per cent since 1850." Mulhall's Prices, p. 129.

But this is sufficient on the wages of labor. Let us now consider other causes producing decline in prices of commodities.

"Whenever, without additional fatigue to the laborer, means are devised to double the quantity of work he can perform, the ratio of his daily gains is not reduced, although his product is sold at a lower price." J. B. Say, Political Economy. Gregg & Elliot, Philadelphia, 1837, p. 303.

"The tendency of all scientific discoveries and improvements is to cheapness." Newmarch, as quoted by Mulhall, p. 135.

"The industrial power of nations, between hand, horse and steam is now 802 foot-tons per inhabitant, against 527 in 1850; and, consequently, five men perform as much work as eight could thirty years ago. This involves a saving of 40 per cent in labor since 1850, which necessitates a fall of 13 per cent in price of commodities, unless counteracted by other causes.

"Steam and machinery powerfully aid each other in economizing labor and in reducing prices to a lower level." Mulhall's Prices, p. 57.

Railways have reduced land carriage, in Europe, to one-sixth the previous charges, thus saving fifty shillings per ton. The saving is equal to a reduction of 9 per cent in value or price (cost) of commodities in general.

Railway freight charges in Great Britain are 17 per cent over the average of the Continent, and more than double those of the United States.

"The goods traffic of the world sums up four million tons daily, carried 100 miles, against four hundred thousand tons in 1850. An increase ten times.

"Telegraphs have exercised a lesser, but an unquestionable effect, toward the fall in prices, in enabling merchants to work with less capital; to keep smaller stocks of commodities and to turn over their money oftener." Mulhall's History of Prices, pp. 50, 51.

Although the ratio of rural population has declined in both Europe and America, the area under tillage has risen 50 per cent since 1850, in consequence of machinery displacing hand labor, and the weight of crops in proportion. A farm laborer in the United States raises as much grain as four able-bodied French or Germans, or six Russians or Spaniards. Mulhall's Prices, pp. 79 and 85.

American labor is much more productive than that of any other country for these reasons: First, because the ratio of able-bodied men among the operatives is larger. Second, because machinery is brought to greater perfection and more universally used than in Europe. Third, because "protective" duties give an artificial value to those products intended for home consumption. Ib., pp. 127, 128.

At Newburyport, in hosiery weaving, by the use of the power stocking-loom, the capacity of the female operative was increased ten times (about 1830). Wright's Report, p. 177.

In 1833, a weaver fifteen years of age, with a young assistant, could perform nine times as much work in a given time as could be performed by a man in 1803. Merrimac prints, which in 1825 averaged 25.07 cents per yard at the factory, declined to 16.36 cents by 1830.* The cotton cloth made at Waltham, a staple article, sold as follows in the years succeeding the introduction of the power-loom, viz.:

In	1816	at	30	cents.
"	1819	"	21	"
"	1826	"	13	"
"	1829	"	8 1-2	"
"	1843	"	6 1-2	"

Wright's Reports, p. 177.

From 1850 to 1880 there was an increase of 75 per cent in the value of the product per operative in the cotton manufacture of the New England States. The increase in pounds of product, since 1831, per operative, was 145 per cent.

There was in the same industries, from 1831 to 1880, an average increase in the wages of employees of 97 per cent, and in same time a decrease in the hours of daily labor of 12 per cent. Also, in same time, a decline in prices of heavy sheetings, of 11.8 per cent, and in printed calicoes of 58.8 per cent. Wright's Report, pp. 186–188.

Here was, concurrently during the same period, an advance of 97 per cent in wages of employees, a shortening of their hours of labor, 12 per cent; and an average decline of price of goods produced, of 35 per cent.

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* Merrimac prints sold later as follows, viz.:

In	1847	at	11	cents.
"	1850	"	10	"
"	1871	"	11 1-2	"
"	1879	"	6	"
"	1880	"	7	"
"	1886	"	5 1 4	"

H. B. Claflin & Co , Letter. March, 1886.

Steam power in Europe and the United States, is increasing 20,000 horse-power weekly, and hence further economy of labor and another fall in prices.

In 1880, 5,000,000 sewing machines were at work, doing the work of 60,000,000 sewing women with the needle.

There were also 3,100 Boston boot-making machines turning out yearly 150,000,000 pairs of boots and shoes.* Mulhall's Prices, pp. 5, 67.

Sea-going freights since 1861, have declined thirty-three and one-third per cent — equal to reduction of five per cent in the cost of all merchandise. The general price level of 1884 being fifteen per cent lower than the said twenty years, we find that one-third the so-called depression in trade is simply an economy in freight. Ib., p. 41.

"Steel is now produced at one-third the cost of twenty years ago." Ib.,— p. 70.

Pig iron, by a saving of thirty-three per cent in coal since 1857, is reduced eleven per cent in cost of production.

Copper ores are worked at a saving of fourteen per cent.

Petroleum which now stands for seven per cent of the total value of mining products of the world, has fallen eighty per cent in prices in twenty years. Mulhall, p. 77.

An economy of thirty-three per cent in the whole range of hardware merchandise has powerfully contributed to the present lower price-level among nations, which is erroneously called trade depression. Ib., p. 136.

But I forbear further evidence to show that declining prices of commodities alone cannot be relied upon to prove that the money medium in which they are valued is appreciating. It is manifest to the reflecting mind that every invention by which human labor is relieved and aided — every machine which enables one man to do the work of two or more in a given industry — every improved process or manipulation in manufacture — every new means of harnessing nature's forces in aid of productive industry, tends to cheapening the cost of production, and that cheapened cost must be reflected in the prices of commodities. With the world's advance in invention, in the application of steam and electricity to the work of production, and the circulation of intelligence in the last twenty-five, or even the last fifteen

* The machine enabling one man to make 300 pairs of boots daily. Mulhall, Dictionary of Statistics, art. Boots, p. 55.

years, a large reduction in the general price-level of commerce must be expected.*

I think it demonstrated therefore that the verdict upon the claim of our friends, the advocates of continued coinage of the dollar, that the wide and widening difference in the commercial value of silver and gold bullion is not in the depreciation of silver, but in the appreciation of gold, must be entered as *not proven*. Facts seem clearly to prove the opposite. See Appendix.

Although the proof fails to show appreciation of the money measure of values as claimed for the past twelve or fifteen years, nothing in history is clearer than that the converse is true, if we go back for any considerably long term in the past, since the middle ages. All writers of repute upon political economy, admit the very large depreciation in the value of the precious metals as measured by their purchasing power in commodities or service in the past five or six hundred years.

The following facts as to prices in the olden time taken from authentic sources will abundantly establish this.

"In 1253 A.. D., wheat sold at 2*s* 6*d* per quarter" ($3\frac{3}{4}d$ per bushel). "In 1272 a laborer got $1\frac{1}{2}d$ per day; a harvest man 2*d*. In 1256, brewers sold three gallons of beer for one penny. In 1241 the king paid 18*s* 4*d* for thirty-seven sheep" (not quite 6*d* each).

In 1300, wheat and barley brought 3*s* 4*d*, and oats 1*s* 8*d* per quarter" (wheat 5*d*, and oats $2\frac{1}{2}d$ per bushel). "A cow 6*s;* a fat sheep 1*s;* a hen $1\frac{1}{2}d$, and a pair of shoes 4*d*. Labor from $1\frac{1}{2}$ to 2*d* per day."

In 1314, Parliament fixed the price of a fat ox at 16*s;* a cow at 12*s;* a fat hog 3*s* 4*d;* a sheep 1*s* 2*d;* a couple of chickens 1*d;* a goose $2\frac{1}{2}d$, and eggs $\frac{1}{2}d$ per dozen. Arable land in Kent let from 3*d* to 6*d* per acre; pasture at 1*d;* and meadow at 4*d* to 10*d*."

"In the middle of the fourteenth century, wine was 4*d* per gallon; wool was 2*s* per stone (or about $1\frac{7}{10}d$ per pound); Kendall cloth 3*s* 4*d* to 5*s* per piece; wheat from 4*s* to 6*s* per quarter. In 1500, oats were 2*s* per quarter, and wheat 6*s* (oats 3*d*, and wheat 9*d* per bushel); ale 2*d* per gallon; labor $2\frac{1}{2}d$ to $3\frac{1}{2}d$ per day."

"In the reign of Elizabeth, 1558–1603, a house in a country town let for 4*s* or 6*s* per annum; and the purchase was £5 to £6; wheat was 1*s* a bushel; malt and oats 7*d;* an ox 26*s*, and a fat sheep 2*s* 10*d;* claret $2\frac{1}{2}d$, and red port 3*d* a quart. Labor 4*d* to 6*d* a day."

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* As Mulhall says: "It would be monstrous if prices remained the same in spite of cheapened transport, improved machinery, and all the efforts of scientific progress."

The above prices are taken from an old work entitled "A Million of Facts," by Sir Richard Phillips, published in 1835. It will be observed by noting the dates of those quotations in connection with the prices, that with the progress of time, there is an evident appreciation of prices of both commodities and labor. This appreciation is, in part, real, showing the lessening value of the money metals; and in part, only, apparent, owing to the lessening of weight of the coin, as will be explained further on.

Historic records of the continent of Europe are less clear than those of England, as to comparative prices, owing to the uncertainty of weights and measures, and the frequent changes in weight of the coins which continue to bear the same names. Mr. Jacob, in his "Inquiry into the Production and Consumption of the Precious Metals," published about 1831, has given us some facts from which I extract the following.

By an ordinance of Charlemagne, at Frankfort, in 794, at a time of threatened famine, it was decreed that the maximum price which might be charged for a weight, equivalent to thirty-six pounds of wheaten bread, shall be one denier — the equivalent of three pence sterling, or six cents U. S. currency of present time. It is also stated that the king himself sold the produce of his own lands at one-third less price, or at the rate of four cents for thirty-six pounds of bread. The maximum price is equal to six pounds wheat bread for one cent. The king's price is equal to nine pounds for a cent. Jacob, vol. 1, pp. 318, 319.

In the year 1237, each of three chaplains, who did daily duty in the church of the Templars, received a yearly salary equal to £8 sterling, or of $40 of our present currency.

In Alsace, at the end of the tenth century, wheat bore the price of seven pfennigs per scheffel, which is about equal to the English bushel of sixty pounds. About the middle of the thirteenth century, the scheffel of wheat sold for twenty-four pfennigs. Jacob describes the pfennig as of value somewhat less than a farthing sterling of his time; or less than half a cent.

In the construction of the Strasbourg cathedral, about the eleventh or twelfth century, it is recorded that the masons employed were paid one and a half to two pfennigs daily.

At the building of the great bridge of Dresden. in the thirteenth century, the laborers were paid two pfennigs; or less than one cent daily as wages.

In the year 1363, a statute of Edward III, of England, provided that no man shall give to a parish priest more than ten pounds a year, or else his board and lodging and four pounds a year.

By this it seems that the yearly board and lodging of a parish priest was counted at six pounds. At that date the pound sterling contained about twice and one-third the weight of silver it now contains, which would make the salary of the parish priest equal £23, or $116 of present currency; and his annual board about $70.

Bishop Fleetwood, speaking of the year 1439, claims that a clergyman could maintain himself respectably for ten pounds a year. This sum, as the coinage stood at that date, is equal to a little less than $100, gold value of to-day. If rendered into the equivalent of silver bullion, it is only $75.

In 1470, English cruisers seized seven Spanish ships loaded with merchandise for Flanders. Their owners demanded redress of the king, and presented a sworn statement of the burden and value of the ships, including their stores and provisions. The list makes the average tonnage of the seven ships something over ninety-five tons each, and their value £114 each, which would be equivalent to £175 of the present currency of Great Britain, or $875 each ship. We may feel reasonably assured that, under the circumstances, the owners did not intend to undervalue the ships.*

The English statutes, in early times, fixed the price of labor and of staple commodities. "In 1352 it was provided that in hay-making none should pay above one penny a day, and that for threshing of one quarter of wheat or rye, none should pay above 2*d* a day; and for threshing of a quarter of oats, barley, peas and beans, about 1 1-2*d;* that a master-carpenter shall have four pence, another carpenter 2*d* a day; a master-freemason but 4*d*, a tyler 3*d;* but either of their servants a penny half-penny. All this in summer-time, for in winter, wages lessened, and without meat or drink, or any other courtesie; and in the country, where wheat was wont to be given, they shall take for the bushel ten pence, or wheat, at the will of the giver."

"In the twelfth year of Richard II (1389), these rates did still continue, but there was further added, likewise, a yearly rate for servants' wages; and there was allowed by the year, for a Bailiff of Husbandry, 13*s* 4*d*, with a livery. A master-hind was rated at 10*s;* a shepherd at 10*s;* an ox-heard at 6*s* 8*d;* a cow-heard at 6*s;* a driver of the plough at 7*s*, at the most; and all these but the bailiff, without clothning or other courtesie."

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* Jacob on the Precious Metals, vol. 1, chap 12.

"In the sixth year of Henry VI (1428), the price of things growing higher by reason of the raising of moneys, it was provided by statute that the justice of the peace might rate as well the hire of day-laborers as the wages of servants as they should find fit in sessions, notwithstanding the former statute of 25 Edward (1352), and 12 of Richard II (1389), notwithstanding the money had been raised not above the sixth part, which I attribute to the great want of servants and laborers, the kingdom being then exceedingly exhausted by the long continuance of the wars in France.

"In the 11th of Henry VII (1496), there was a new statute for the rating of servants' wages and the hire of day-laborers. By this statute the meat and drink of the day-laborer is valued at 2*d*.

"A statute of 17th of King James (1620), rates the threshing a quarter of wheat at 18*d*; barley 10*d*; beans and peas 9*d*; the hire of a man a day for hay making 10*d*; a woman 8*d*; master carpenters and tylers 20*d* a day; the second sort of the said workmen 16*d* a day; and laborers of the best sort at 12*d* a day; of the second sort 10*d* a day; a bailiff £3 3*s* 8*d* a year, with living; carters £5; the best sort of plough-men, carters or shepherds are rated at £3; the second sort of hinds and all servants in husbandry at £2 6*s* 8*d*; a dairy woman 6*s*. By the said rate in Middlesex the best women servants are rated at 40*s* a year; the second sort at 33*s*, and 4*d*. In Essex the best women are rated at 33*s* 4*d*; the second sort at £1 6*s* 8*d*. See Vaughan's Coins and Coinage, pp. 107–119.

The author adds: "And if any man shall object, that the present rates will not generally through the whole kingdom hold thus high, though they are thus rated in the parts near adjoining London, it may be answered, that by the old statutes it was provided that in no place any higher rates than those should be given, but they might give less where less in former times had been used to be given."

"But on the other side it may be much more probably objected, that the rates are now greater than they are here set down, because it is not so strictly observed as it should be; whereas when the old statutes were first made, it is probable that the rates were with the largest, and were more strictly observed than they now are." Vaughan, p. 119.

It should be borne in mind that this author wrote his treatise about 1625 or 1630. The statute of King James from which he quotes was the latest statute of the kind then adopted — only some five or ten years previously. He quotes it, and compares it with those of 1352,

1389, 1428 and 1496, to show that the successive "raising of the moneys," from the time — about 1300 A. D., when the "pound sterling" meant the *Tower pound weight of standard silver;* down to his own day, when the Troy pound — a weight three-quarters of an ounce heavier than the Tower pound — was by statute of Queen Elizabeth in 1591, coined into 62*s* — making the coinage of silver under that statute just about one-third the weight of the coins which passed under the same designation prior to 1300.

He thinks that general prices up to his times have advanced about six times. He thinks about half of that advance has been by debasement of the coin to one-third the weight of pure silver it formerly contained, and that the value of silver and gold have been depreciated about one-half by the excessive quantities of these metals "come into the kingdom of Spain out of the West and East Indies, within this hundred years or thereabouts,* and thence dispersed into other parts of the world, whereby it has come to pass that the value of gold and silver is become more vile and cheap, and generally all things valued by them are rated higher, at double and almost treble as much gold and silver as they were rated in the twenty-fifth year of Edward III (1352), as one scale pressed down doth necessarily make the other rise higher." Vaughan, p. 103, 104.

It would not be difficult also to show, did time permit, that during the last two and a half centuries since the close of this recital on prices, the same tendency has been steadily exhibiting itself of a gradual but sure, and in the main, steady decline of the value of both gold and silver as measured by the general prices of commodities and service. Since the last statute Vaughan quotes, that of King James I, 1620, there has been no change in the English coinage — a pound or shilling then, expressing precisely the weight of pure metal which they do now. Would not the prices for wages and service prescribed by this statute seem very inadequate compensation for similar service at the present day? Say thirty-two to forty cents per day for skilled mechanics, and twenty cents to twenty-four cents per day for the best common laborers.

The conclusion, therefore, seems irresistible, that with the progress of time and freer intercourse of commerce among the nations of the earth, a gradual, slow, but in the main, steady depreciation of the value

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* That is. the 100 years ending about 1625 or 1630, which means the 100 years or thereabouts since the American continent had been opened to European commerce.

of the precious metals has been going on during all modern time. Political economists, whose opinions gain the most general acceptance, estimate that depreciation during the past five or six centuries as equal to from five-sixths to seven-eighths of the value of these metals about the thirteenth and fourteenth centuries of our era. That is, that their present value or purchasing power, is only from one-eighth to one-sixth what it was five or six hundred years ago.

Gold *and* silver, during all historic time, have performed concurrent and harmonious service as money; varying, as we have seen, in relative value at different times and in different countries; but, on the whole, with about equal acceptance for each, at such relative values. Judging from their use by mankind in all ages, as well as from what we observe in our own time, there would seem a natural adaptedness of the two to serve the wants of mankind *co-ordinately* in the exchanges of commerce. Different nations, at different times, have exhibited a leaning of preference, now for silver and then for gold, as their chief medium of exchange and measure of values. But, as has been before stated, a pretty steady tendency from the earliest historic times to the present is manifested, toward a gradual widening of the difference in value between the two metals.*

During the past ten or fifteen years a great change has been reached in the relations of value of the two metals. Germany having resolved in 1871, to change her monetary standard from silver to gold — establishing a gold monometallic, in place of a silver monometallic currency, as has been before stated, placed a large part of her stock of silver coin on the London market, depressing its current value more than 20 per cent. The result of this action was much beyond the sacrifice of a few millions on the sale of 160 millions value of merchandise. It was the disposal of a commodity under conditions which aimed a fatal blow at its fitness for the chief use which had before given it its value. It was even more than this. It was the elimination, so far as one influential nation could accomplish it, of one of two joint and equal factors in the measure of values of the world's commerce. Its effects are felt to the remotest and most obscure corners of the earth,

*This gradual widening of the commercial ratio of value between the two metals may, and probably does indicate a growing preference for gold over silver M. Faucher, writing more than thirty years ago, says "When we seek to examine minutely the various monetary changes which have occurred, and to lay hold upon some principle to guide our inquiry, we quickly recognize the fact that the difference in value between gold and silver increases in proportion to the development of civilization and industry. Remarks on Precious Metals, London, 1853, p. 9.

like a taint in the circulation, or a shock to the nervous system in the animal subject.

The result of this action of Germany has awakened the commercial world anew to the study of money and its agency and influence in its affairs. Germany was unconscious, or but half-conscious, of the tremendous tendency of her act. She saw, or thought she saw, in other commercial nations what she herself felt — an appreciation of gold, as more stable and more desirable than silver as the medium of commerce; and having before made the mistake of adopting the sole silver standard, now makes the opposite and equal mistake of adopting the sole gold standard. Her precipitate action was prompted, no doubt, by the suspicion that the difficulties of accomplishing the desired change would be largely aggravated should others take the initiative of discarding silver in favor of gold. England and the United States already had the single gold standard in practical operation; for, as before shown, the legal use of silver with us had been in theory only, while gold was practically our standard, and had been so for forty years.

No doubt the theory of the doctrinaires is true, that a measure of value cannot be constructed out of two commodities, each of which varies in value in relation to the other. No doubt, it is true, that in such case, the real measure for the time being will be the cheaper of the two media, where both are left to unobstructed action, and either are equally freely accepted.

The French school of finance accepts this conclusion as to gold and silver, and boldly bases its coinage upon the equal acceptability of both metals at the fixed relative value by weight of fifteen and one-half of silver to one of gold. The mint is opened to unlimited coinage of both metals to all comers. It freely offers in practical effect and theory, the exchange of all the coin of one metal in the country for an equal value of the other, at this fixed ratio. All the world may come and satisfy its wants of either metal in exchange for the other so far as the stock of either lasts. This is the theory of French monetary policy. The coinage compact of the Latin Union is based upon this theory. It is quite probable that Germany, in originating her late monetary policy, hoped to avail herself of this means of supplying herself with gold in exchange for her silver. If she had formed the policy of adopting the *bi-metallic system*, and purposed to discard sufficient of the silver for that purpose only, doubtless it would have been welcomed, as that action would have placed Germany in entire harmony with the system of France and most other European nations. But with the

purpose of the total change to gold alone, it was a menace to that system which she could hardly expect its aid in carrying into effect. The result is what we have seen — the mints of all nations of the western world — Europe and America — indeed of the whole world, except those solely on the silver standard, are closed to silver, for free coinage.

Some of the European writers upon finance have exhibited an ardor in support of the French system of coinage amounting almost to infatuation. M. Garnier, some forty years since, constructed a historical theory, in which he maintains that silver and gold have, during all time, maintained about the ratio of fifteen, or fifteen and one-half to one, and that the French valuation has consequently a law of nature in its support. Most of the French economists adhere with great tenacity to the exact French ratio of fifteen and one-half to one, and exhibit apprehension that the financial universe would be unbalanced, and chaos imminent by a change to any other ratio. At the two late international conferences — 1878 and 1881 — the representatives of France clung to the idea that silver could be rehabilitated as international money, only upon the basis of fifteen and one-half to one. I understand her most trusted financiers still adhere to that view, notwithstanding the commercial ratio of value has widened to over twenty to one.

Meantime a crisis is reached in the world's medium of exchange and measure of value. Commerce and industry hesitate in the doubt as to the future. While the problem is unsolved as to the continued healthful circulation of an equal half of the life-blood of commerce, trade must move feebly, and enterprise halt. The world's traffic must have stability to prosper, and instability in any thing else can be easier endured than in money. Instability in that spreads uncertainty and apprehension into every transaction throughout the intercourse of mankind.

I am profoundly impressed by the study of this subject, that the principle involved in the French bi-metallic policy offers the true solution of the difficulty. Unless the world is prepared to face the risk of the ultimate subsidence of silver from the commerce of the nations, with all which that involves, it seems indispensable that a convention of the commercial nations should agree upon establishing free coinage of both metals at a uniform ratio of value. England has so far declined to enter such an agreement; but England is learning by present experience, what her pride thus far hesitates to acknowledge,

that it was French bi-metallism which made her policy of gold mono-metallism possible, from 1816 *to* 1876.

Her present experience with her Indian exchanges and in her dealings with other countries having a silver currency, is fast educating her to the conclusion that she cannot isolate herself from the common interests of the world, without herself being the sufferer.

Meanwhile our own persistence in the coinage of the dollar under the act of February, 1878, is the fatal obstacle to any settlement of the question. It delays the inevitable crisis which would enforce a decision of the nations whether silver shall or shall not be sustained as a medium of international exchanges. It holds open the hope to the nations of Europe which have decided on a sole gold policy, that by our capacity for blundering and wrong views of the subject, if not from settled policy and design, we may yet find ourselves forced upon the single silver basis, and thus afford them the means of escape from the sacrifices involved in their policy, It is action directly contrary to the earnest advice of every intelligent friend of bi-metallism in Europe.* If any international ratio is reached it is highiy probable all our mass of silver coinage will have to be recoined. For, if the European ratio of fifteen and one-half is retained, we must recoin; or our stock will slide off to European mints under the stimulus of the three and one-third per cent premium which their ratio establishes for our silver coined at sixteen to one. If any other ratio is established, of course recoinage will be indispensable.

And as to the ratio in case of international agreement: Notwithstanding the almost superstitious attachment of the continental European mind to the fifteen and one-half ratio, it would seem probable some higher ratio must be established in case of any international agreement of any sort. Of course in that case our total coinage must be reminted. In any view we can take of our continuation of the coinage, unless it be solely in the interest of the silver miner, it appears to be an economic and financial blunder.

Up to 1878, all the coinage acts of the United States exhibit great solicitude to conform the relations of our gold and silver coins to the prevailing commercial values of the two metals as bullion. This was

* M. Henri Cernuschi closes a pamphlet entitled, "The great metallic powers," published last autumn, thus — "So long as the bi-metallic treaty proposed in 1881, by the United States and France, is not accepted by England or Germany, not one silver five franc piece should be coined in France, not one silver dollar should be coined in the United States. In no form, under no pretext, should silver currency be increased either in France or in the United States.

the burden of Hamilton's Report in 1791, which Congress adopted in the organization of the mint, and it controlled the coinage legislation of 1834, 1853, and 1873. In the Act of the 28th of February, 1878, we take a new departure, defying the laws of nature and of commerce, in the attempt to set up a *political standard of value*. It is an experiment in a line in which all past human experience affords small hope of success.

The following summary may aid us in fixing in our minds the important points I have aimed to establish:

Summary.

1. Although a great variety of materials has been in the history of the world temporarily used as money, gold and silver are the only materials which have at all times and by all peoples been so used. They would seem therefore to be the natural materials for money.

2. While gold and silver have during all history been used concurrently as money, there seems to have been from the earliest times a gradual widening difference of value between the two metals, exhibiting a depreciation of silver as measured by gold; such relative value beginning in the rude ages by about an even valuation of each metal by weight, and now reaching a preference for gold of more than twenty to one, in silver.

3. With the progress of civilization, the office of money *as a measure of value* has become of much greater importance than its more manifest office, as a medium of exchange. For both uses *stability* is important; for the former it is *indispensable*.

4. There seems to be exhibited by the silent and mainly unconscious *consensus* of judgment of the most advanced commercial nations, an appreciation of gold over silver, as the *more stable* measure of value.

5. But, as a large part of the world must use silver as money, the importance that it shall be retained as *international money* is manifest. Its volume is too great to be used merely as subsidiary currency.

6. As the immense mass of debt of the world has been for the most part created when gold and silver were equally money, there would seem to be justice in the claim that neither should be eliminated from the common money of the world, for the payment of these debts.

7. It is also claimed, and with much force of reason, that the oscillatory measure of value created by the free exchange among the nations of gold for silver, or silver for gold, at a fixed ratio of value, creates a measure of the general values of commerce more stable than either gold

alone, or silver alone, can be. The theory is that the base is broader —a larger volume of value in the materials of money as the measure of value; and that not unfrequently, conditions which tend to depress the commercial value of one of the metals elevates the other, and *vice versa.*

8. The theory of the monometallists is that half the world may use gold and the other half will prefer silver as the money of commerce. But if this condition is realized, the world goes back to barter in international commerce. It is a relapse toward barbarism. This condition of barter is already illustrated in the relations of the Indian exchanges with England.

9. While facts fail to prove the claim of the extreme advocates of the continued coinage of the silver dollar in our country, that the wide and widening difference in the value of gold and silver arises from an appreciation of gold, and not from the depreciation of silver; yet there is great reason to fear that the elimination of silver from the world's money, would cause great derangement of all the values of commerce; retard greatly the productive industries of mankind; and, for a period, longer or shorter, turn backward the dial of civilization.

10. Facts of history seem to sustain the opinion that the purchasing power, or actual value of the money metals — gold and silver — have been through the past five or six centuries, slowly but steadily depreciating in value, and that this depreciation is still going on. The cause of such depreciation seems to be more the extension of credit; national debts, and the use of bills of exchange; banks, bank-checks, and bank-notes, and clearing houses, than the increase in quantity of the precious metals as instruments of exchange. This depreciating tendency has been much more rapid during the past two centuries, since the invention of national debts, than previously. All inventions to economize the use of coin in settling the exchanges of commerce tend to depreciation of the value of gold and silver. The measure of this depreciation is estimated at five-sixths to seven-eighths of their value six centuries ago.*

11. Desirable as the retention of silver as an equal factor with gold in the world's money is, we seem to have reached a point at which a concurrence of the chief commercial nations as to a common ratio of value with gold, at which it will be maintained by each, is an indispensable condition to that result.

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*Faucher says: "Money in the time of Charlemagne, A. D. 768 to 814, possessed a power eleven times greater than at present." Remarks on Precious Metals, p. 8.

12. Our persistence in the coinage of the silver dollar at a ratio not in accord with Europe, and against the earnest advice of her most experienced bi-metallists, tends to delay and to defeat this most desirable consummation.

13. We were told, in 1878, in the debates upon the coinage bill, that its passage would promptly restore silver to its former value with gold. The commercial value of the silver bullion contained in the silver dollar was then ninety-two cents. After eight years persistence in the coinage, it is now but seventy-six cents, and it is still falling.

Conclusion.

With the attempt at some research, and the application of earnest thought to this subject, I count myself still but a learner. It is too broad a question to be disposed of by dogmatic assertion. It becomes us to hold our opinions with modesty, and subject to modification from further light — as the French say, "to hold the attitude of expectancy." But upon two points it appears to me we are justified in taking a stand. *First* — that what God and nature have joined together as money metals in the transactions of mankind through all history, it must be eminently unsafe, and probably seriously detrimental for man to put asunder; and *second* — that this government, whose stable foundations rest alone in righteousness and justice, cannot afford to persist in the purchase of seventy-six cents' worth of any metal, and after fixing its impress upon it, force it upon its creditors for a dollar.

APPENDIX.

A.

Mulhall attributes the depreciation in silver not to over production, but to the decline in its use for plate and ornament — electro plate having largely superseded it. As proof he cites the official returns of Great Britain, which show an annual average of 1,091,000 ounces stamped for plate in the thirty years 1821 to 50. and only 790,000 ounces in the decade ending 1880. Page 11.

The world's stock of gold and silver in 1850 and in 1885, in tons, and in pounds sterling, was as follows, viz.:

	Tons, gold.	Silver.
1850	4, 550	148, 000
1885	10, 760	201, 000

	Gold.	Silver.
1850	£630, 000, 000	£1, 350, 000, 000
1885	1, 504, 000, 000	1, 550, 000, 000

The present commercial value of silver bullion would reduce the world's stock to a less sum in value than it stood at in 1850, more than neutralizing the entire production of thirty-five years.

B.

From 1850 to 1885, the world's stock of gold increased 138 per cent, while the stock of silver increased but thirty-five per cent.

The stock of uncoined gold increased eighty per cent, while the stock of uncoined silver actually decreased about one per cent, or $50,000,000.

In 1850 the world's stock of silver was thirty-two times that of gold by weight; in 1885 it is but nineteen times only.

The stock of coined gold increased 259 per cent, while that of coined silver increased only sixty-eight per cent. Mulhall Prices, pp. 11, 12.

Since 1860 India and China have absorbed more than the total product of the silver mines of the world. Ib., pp. 15, 17.

All these seem settled facts, and yet it is silver which has fallen in value.

MINUTE ADOPTED IN COMMEMORATION OF THE TWO HUNDREDTH ANNIVERSARY OF THE PUBLICATION OF NEWTON'S PRINCIPIA.

By Verplanck Colvin.

[The following paper was transmitted to the Institute May 18th, 1886, by Verplanck Colvin, President of the Department of Physical Science and the Arts, who was requested by vote of the Institute, at a previous meeting, to prepare a suitable record. The paper was read at a meeting of the executive committee May 8th, and was adopted as the report.]

In accordance with the instructions of the Institute, I have prepared the following minute relative to the two hundredth anniversary of the announcement of "The Mathematical Principles of Natural Philosophy," by Sir Isaac Newton.

Minute.

On the 8th of May, 1686, Sir Isaac Newton transmitted to the world that grand volume known as the Principia; the foundation upon which have been built those marvelous discoveries of physical science that render the two centuries, terminating to-night, illustrious in the history of man's intellectual and material progress.

It is proper that we record our appreciation of the benefits then conferred upon mankind; with an expression of the reasons which induce us to make this minute.

We do not celebrate the man who lived two centuries ago; whose frail body so many generations since crumbled into dust; but the living, everlasting soul, and pure and noble intellect, that sought truth for truth's sake and handed it down to posterity in the collection of principles which have brought so many grand phenomena for the first time within the limits of the human understanding.

We do not celebrate the Principia alone. Considering all the works of the great master, we find in them everywhere an intelligence of method and system, most admirable; so that we select the date which is affixed to the preface of his famous volume as the period which marks the first general dissemination of those methods of investigation that yielded so much in the hands of their discoverer, and still remain, but slightly modified, the most valuable implements of mathematical analysis.

When Sir Isaac Newton wrote upon the title page of his great work the simple inscription: "The mathematical principles of natural philosophy," he marked the period of the renaissance of science, and every proposition that he solved in his investigations is an example of the method or methods which have done so much to systematize or rationalize knowledge.

We do not think of Newton as one of infallible mind, for his philosophy contains well known errors. Yet his errors are not at all surprising when we consider the vast field of investigation he designed to cover, and the meagre information then obtainable by instrumental means, of the obscure and difficult problems which he proposed for solution.

Though Newton's theory of light be defective, yet his investigations form a substantial portion of the data on which the wave theory depends, and his bold thoughts upon "fits of reflection and refraction of light"—professedly provisional—may be said to almost indicate the form of the luminous waves, as we now understand them. Had he lived longer, and continued to be endowed with those extraordinary faculties which were the wonder of his age, he would, probably, have anticipated many of the greatest of modern discoveries. His methods of investigation were so broad, so general and so easy of application to varying phenomena that in his familiar grasp, with due time and study, nature's laws became revealed as though from a slowly opening scroll; the only difficulty being the transcription and translation.

Of his method it may be said that he dared to be original. He dared to change his theories when new facts taught him that the old deductions were erroneous. Rejecting his own theory of gravitation at one time, as unproved — for lack of precision in the results of computation — and returning to the same theory when new and better data afforded proof of its rigorous accuracy, was but a phase of his carefulness of method. The stupid might term this carefulness hesitancy, and the change of belief inconsistency; but his hesitancy was the honesty of doubt, and his change of mind was a change in his convictions.

Of his singular modesty we have a notable example in the conclusion to his preface to the "Principia" in which he says:

"I heartily beg that what I have here done may be read with can-
"dour, and that the defects in a subject so difficult be not so much
"reprehended as kindly supplied, and investigated by new endeavors
"of my readers."

This final sentence of the introduction to a work which contains the principles of the infinitesimal calculus, the true theory of the universal gravitation of matter, and the application of that theory to the practical work of astronomy is modest almost to humility; yet, in the presence of his great discoveries, this noble modesty has a thrilling grandeur, for we must believe that such great gifts came only from Omnipotence, and that he who delivered them to us in written characters was so intellectually illuminated as to see the vastness and wonders of the undiscovered, and that he bowed in worship of the majesty which he had been permitted to approach.

There is a noble encouragement to the student, when the great discoverer urges his reader to kindly supply his deficiencies. He had faith that to others would be given the same power of investigation, if they would but try; that they would have the same courage, the same fearlessness in the pursuit of truth, the same readiness of arrangement of facts in the form of novel ideas which men call useful inventions.

It is not essential to the purposes of this minute that a list of the works of Sir Isaac Newton be made. Such statistics may be found in every account of his life, and the titles of the papers give an imperfect idea of his work and methods. We should rather desire to integrate, mentally, those separate fields of study, so as to obtain a clear conception of their sum and substance, and thus learn the precise nature and value of the methods we admire. By such study we may ascertain how best to fulfil our duties as scientific investigators and advance to greater heights by an expansion and amplification of his methods.

The words written in 1686 urge others to follow in the paths that he discovered; that the "defects be not so much reprehended as kindly supplied," and demand that the problems of the future "be investigated by new endeavors."

We earnestly desire to recall public attention to these words of Sir Isaac Newton; to the principles which he enunciated and the system and method characterizing his work. We believe that by a revival of interest in the Newtonian methods of philosophical inquiry, the intellectual growth of the world will be facilitated and placed upon a more substantial basis.

So vast is now the extent of what may be termed heterogeneous information, so multitudinous are the interesting phenomena discovered since the publication of Newton's great work that, for lack of arrangement and systematizing, we are unable to utilize many of these wonderful additions to knowledge in that ultimate order of natural

relationship which would render them easy to remember; or even in such sequence that their symmetry or lack of symmetry would enable us to recognize how much precise and connected knowledge modern discoveries represent.

If new discoveries in any department of natural philosophy fail to arrange themselves in symmetrical order with earlier discoveries, or with the natural laws which have been found to have a general application to similar phenomena, then we may either doubt the precision of one or the other observation or of the laws which have been assumed to correctly govern such phenomena or — what is even more important — we may be taught to search for some as yet unknown element of the system, necessary to that natural symmetry of form or motion or combination of elements found every where in nature. The greatness of the Newtonian method is in this underlying principle, applicable to every field of investigation. From the binomial theorem to the calculus of fluent quantities we find the same thought everywhere evident in Newton's work; that the universe is a harmony in every way symmetrical, and that all lack of symmetry among known and established facts is an evidence of a lack of true knowledge and a proof of the existence of other unknown and important facts.

Thus the attempt at mathematical arrangement, the assembling and rigorous classification of facts will be found only to demonstrate laws when all the essential facts have been discovered.

Conversely we may reason that when the number of what are termed mysterious phenomena, which may be revealed to man, are multiplied or appear to increase to an astonishing extent, they remain mysterious and incomprehensible because there has been no proper or sufficient collection or arrangement of these facts, no true systematizing, sufficiently comprehensive or logical in a mathematical sense.

When it is considered that science has no nationality; that, during these two centuries, valuable discoveries have been made in every portion of the civilized world, so that every language possesses its separate literature of scientific papers, it becomes evident that while the amount of this literature is enormous, the waste of human effort in the rediscovery of facts already elsewhere known, and the delays caused by the lack of a general, systematic method of study, are great hindrances to progress. It is to be believed that beside the by-paths of science are hidden in many an unpretentious paper the germ of even greater discoveries than those which have so astonished and delighted the present generation. But these papers and the facts which they describe

are so innumerable that human memory and human understanding would seem to require enlargement to retain and digest all this varied information.

If it be true that all this world-wide literature of science teems with valuable discoveries; new powers placed within our grasp, requiring, however, systematic study and arrangement; then we shall be better able to systematize when every valuable portion of this world-wide literature has been made accessible to every toiler in this field of work.

If we cannot hope for an immediate unity of language, we can, at least, insist upon the adoption of simple methods of arrangement of ideas and words, so that future publications shall be perfectly logical, clear and unmistakable, while at the same time full and complete in every detail necessary to an understanding of the facts described.

There are no occult sciences; and obscure, defective and careless descriptions of physical phenomena are inexcusable violations of those elementary rules of human communication that are essential to method and system.

The language of science should be formed, as far as may be, from the simplest and purest words commonly in use among educated people; words which possess no ambiguity; old words of established meaning and unquestioned value.

Such a simplification of science and of learning is believed to be the first problem of the age.

It is believed that the result desired may be attained by the extension of the methods of investigation devised by Newton. His was a broad philosophy. He seemed instinctively to seek for traces of correlation in all similar phenomena. He was a systematizer, but not satisfied with any superficial appearance of harmonious arrangement, he tried and tested, measured and weighed, fitted and adjusted his problems within numerical and geometrical limits, and classified them and learned their properties from their proved relationships.

The application of mathematical system to every branch of human inquiry is essential to the completeness, perfection and symmetry of knowledge. Without such perfection and symmetry, knowledge is chaotic, without sequence or connection, toilsome to the memory and useless to the man.

Prof. Huxley, now the President of that Royal Society to which Newton transmitted his great work, recently said in his annual address:

"Those who have toiled for science are in a fair way of being overwhelmed by the realization of their wishes" * * * "We are in the case of Tarpeia * * * crushed under the weight of the reward

bestowed" * * * "It has become impossible to keep pace with the whole of any important branch of science" * * * "He who attempts to do so will have his mental faculties crushed beneath the multitude of voluminous monographs" * * * "It looks as if the growth of science tended to overwhelm its votaries; as if the man of science of the future were condemned to diminish into a narrower and narrower specialist as time goes on." He adds "I am happy to say that I do not think any such catastrophe a necessary consequence of the growth of science; but, I do think it a tendency to be feared, and an evil to be most carefully provided against" * * * "The only defense against this tendency to the degeneration of scientific workers lies in the organization and extension of scientific education in such a manner as to secure breadth of culture without superficiality, and, on the other hand, depth and precision of knowledge without narrrowness."

Your committee agree most heartily with these thoughtful views of the President of the Royal Society; but we think that the remedy he seeks is to be found in a return to simple, logical, connected processes of thought, of which we believe the methods of Sir Isaac Newton afford a most notable example.

If the methods of Newton are to be judged by their fruit they are indeed golden. They are as broad as the universe, as deep as the abyss, and reach up unto the stars of heaven.

The track of the comet through space, the pathways of the planets and the courses of their satellites were by him shown to be dependent upon the one simple principle of gravitation; one general law for atom and for universe.

He simplified, systematized and formulated. Upon his formulation of laws depend — directly or indirectly — a thousand of the practical methods of the present time. The navigator of distant seas finds the inequalities of the moon's motion explained; the artillerist traces the true path of his projectiles with knowledge of the laws that Newton found; the modern geometrician and mechanic rectify curves and find the areas of surfaces within complex lines by equations based on his analysis; the motion of the tides, the flow of rivers, the mighty rush of loaded trains down the steep gradients of iron tracks, are all primarily controlled by the same law that governs the fall of a pebble from the hand (however much they may be masked by the inertia of other enclosing or surrounding matter) and are all reducible to system by some form or modification of the calculus that he devised.

A multitude of workers have helped to rear the structure whose foundation stones he laid. Thousands who went before him brought the material to his hands. Descartes' geometry was his school book, Euclid was his delight, and no valued work of ancient mathematical science escaped him. He was the contemporary of Halley, Huygens, Flamsteed, Wallis, De l'Hopital and Leibnitz. If he was greater than his contemporaries in the boldness of his inventive genius, it originated in his desire to speedily arrive at useful results. Thus he brought the studies of the past into shape available for human purposes, and by new devices made difficult problems easy to the understanding; and we, of the present age, should seek to devise some equally general and simple methods to bring more into unity and crystalline form the vast accumulations of knowledge collected during these two momentous centuries.

Whether we may best be able to gather all these observations into proper form by means of a permanent international commission; a world's university, organized into classes and sub-classes for the collection and arrangement of scientific data by specialists in every department of science, and by publication of the revised data in one language—preferably English — is not now for discussion. The assembling of the facts, the literature of science, both ancient and modern, in one language, is but one step toward the end in view; an important step immediately in the direction of that method and system which we seek, but it must be reinforced by the work of capable scientists, men bold in thought, simple in mind and language, and able in original investigation.

In whatever manner this great work shall be accomplished let us not lose sight of what should be the only object of science and education; the study of the will of the Creator; the search for his rules in order that we may obey: the sum and essence of all philosophy and inquiry.

EVIDENCE OF THE FRENCH DISCOVERIES IN NEW YORK PREVIOUS TO THE COLONIZATION BY THE DUTCH.

By GEORGE R. HOWELL, M. A.

[Read before the Albany Institute, June 15, 1886.]

The old story of Columbus and the egg has been re-enacted in our day and generation. It was easy to make the egg stand on its end after he had shown the company how to do it. So, although the evidence of prior visits and even occupation, by the French for trading purposes, was abundant in the old writers, and even in a work so late as the Colonial History of New York, still the old tradition, started by the Dutch and repeated by the English, has been reiterated in our day, that Henry Hudson was the first European to navigate the river that bears his name. Columbus discovered America in the sense that there was no certain knowledge of its existence among the civilized nations of the world until his return from his celebrated voyage in 1492. It was then only that the tidings of a new continent, or at least new large islands unknown before, lay on the other side of the Atlantic. But we have now the records of a Danish, a Welsh, an Irish, and even a much more ancient discovery by the Phœnicians. And right here I bring to your attention still another claim that may be new to many of this audience. In 1785 two small volumes were published in Paris, entitled "Mémoires chronologiques pour servir à l'histoire de Dieppe, et à celle de la navigation française." This work says that a citizen of Dieppe, a young and enterprising sea captain, and a man of high talents, had been instructed by Descaliers, the best mathematician, astronomer and chart-maker of the time. His name was Cousin. Translating from vol. 1, p. 93:

"Cousin sailed from the port of Dieppe in the beginning of the year 1488. This captain was the first in the world, who from the instructions of Descaliers knew how to take an altitude in the middle of the ocean, so that he did not coast along the shores as did his predecessors. After leaving the British channel he launched out into the ocean, and found himself at the end of two months near an unknown land, where he discovered the mouth

of a large river, which he named Maragnon, and which has since been called the Amazon. Cousin, by taking an altitude on shore, ascertained that to reach the coast of Adra in Africa, he needed to sail to the south-east; by this means he was first to discover the southern point of Africa. He gave the name of the Needles to a range of hills or a reef which he noticed there. This young captain, having made a note of these places and their position, returned to the coasts of Congo and Adra where he made exchange of his merchandise and arrived at Dieppe during the year 1489.

"The ship-owners of this town agreed for their own interest to keep secret the discoveries of their men; they concealed also the fact of Cousin's discovery of the southern terminus of Africa; they thought that by this means they could be the only ones to reach the East Indies by sea, and draw therefrom a large commercial profit. Besides, the French Government was then entirely occupied with intestine wars. * * * The people of Dieppe did not inform the government of these discoveries, of the importance of which they had no conception. * * * They resolved, therefore, to profit by it alone to the exclusion of every other nation."

On page 99 of the same volume, the author says: "The inhabitants of Dieppe were carrying on their commerce in the East Indies, when they learned the discoveries which the Spanish had made in America. Their emulation thereat was piqued, and they fitted out two vessels to learn if that part of the world was prolonged to the north. They intrusted the command of these, to two of their most skillful captains, Thomas Aubert and John (or Giovanni) Verazzano. These two ships departed from Dieppe at the beginning of 1508 and discovered the same year the river St. Lawrence, to which they gave this name, because it was on that Saint's day that they began to explore; which they did for about eighty leagues, finding the natives peaceable, with whom they made the most profitable barter for furs. It is without foundation that the inhabitants of St. Malo attribute to Jacques Cartier the discovery of Canada. The fact is the latter having learned of the voyage of Aubert and Verazzano and of the trade in furs made by the people of Dieppe in that country, fitted out several vessels and there made an establishment which proved unsuccessful."

We may add in confirmation of this narrative of French discovery, that on the map of the German cartographer, John Ruysch, in 1508, the only portions of the western continent given, are the West India Islands and the northern coast of South America.

It was as late as 1534 when Cartier made his first visit to the mouth of the St. Lawrence.

Until the reign of Francis I, who was crowned in 1515, the shipping of France, both mercantile and naval, was quite insignificant. For a hundred years France was too much embroiled in wars, foreign and domestic, to engage in schemes of colonization. As the Memoirs just quoted say, the founding of colonies involves the necessity of troops to protect and money to maintain colonies, neither of which

was at the disposal of the king for this purpose. Spain was all on fire with the news of fabulous lands in the west, with their treasures of gold and silver; and to crown all, tidings of a wonderful fountain that imparted perpetual youth drifted across the ocean to the cabarets of Spain, filled with spare-featured graybeards who would gladly welcome a rejuvenation. The cities of Italy, along the Mediterranean, had caught the spark of enthusiasm, and Genoa and Florence sent its winged messengers across the no longer trackless ocean. The mariners' compass and the science of Descaliers had opened a high-way. Portugal joined in the quest of land and treasure, but like Spain confined its explorations to the south. England, until the reign of Henry VIII, had no marine to spare for explorations; but in 1497 and 1498, the Cabots explored along the coasts of New Foundland and Nova Scotia, and set up the arms of the British king. There was, then, a large stretch of territory from Nova Scotia to Florida unknown, unvisited, and unclaimed, except by the preposterous claim of Spain, at times advanced, to all the western world, on the ground of the discovery of the West India Islands and South America by Columbus. France had her opportunity and improved it. Francis I, in 1524, sent out John Verazzano, before mentioned, on a voyage of discovery, and here is his account of the result. He first made land on the coast of what is now North Carolina, sailed south, exploring for harbors and a short cut to the Indies, then turned northward and skirted along the whole coast, in his course entering Chesapeake bay, and so on till he arrived at Sandy Hook. While off the coast of Maryland or Virginia, he says: "Having our abode three days in this country, riding on the coast for want of harbors, we concluded to depart from thence, trending along the shore between the north and east, sailing only in the day-time, and riding at anchor by night. In the space of 100 leagues sailing, we found a very pleasant place, situated amongst certain little steep hills; from amidst the which hills there ran down into the sea a great stream of water, which within the mouth was very deep, and from the sea to the mouth of the same, with the tide, which we found to rise eight feet, any great vessel laden may pass up." This was, of course, the mouth of the Hudson, called by all the early navigators, "The Great River." He says they passed up the river about half a league and found the country well-peopled, and the inhabitants received the visitors with great shouts of admiration. This was the extent of his explorations of New York harbor. Again: "We weighed anchor and sailed toward the east, for so the coast trended, and so always for fifty leagues; being in the sight thereof, we discovered ar

island, in the form of a triangle distant from the mainland three leagues, about the bigness of the island of Rhodes. It was full of hills covered with trees, well peopled; for we saw fires all along the coast. We gave the name of it of your majesty's mother (Claudia); not staying there by reason of the weather being contrary." It would seem from this account that Verazzano sailed along the entire coast of Long Island (as it is nearly fifty leagues in length), supposing it to be the main land; and the island to which he gave the name of Claudia was afterward called Block Island from its subsequent Dutch discoverer, Adrian Block. The astonishment of the Indians at the sight of Hudson's ship, the Half Moon, eighty-five years after, and of himself in scarlet robes, showed that this visit had been forgotten. But then the witnesses of the first European visit were long dead, and the archives of the Indians made no revelations of these matters.

There are those who have asserted doubts of the authenticity of this letter. But there is no more reason to challenge the genuineness of this, than of any other document of human history. The letter is given in Hakluyt's voyages as any other historical document, entitled to the same belief. Hakluyt, as an Englishman, was interested to suppress, but he was too honest to do so, the evidence of the French discovery of New England; De Laet, the Dutch historian of the same period, published in 1640 in a history of the world, this letter of Verazzano, notwithstanding it was adverse to the title of his own nation to New Netherlands. These facts are also given in the relations of the Jesuits and of Voyageurs, and particularly by those of Champlain, pp. 9 and 10, and of L'Escarbot, pp. 3 and 29.

Now, after these remarkable discoveries what would naturally happen? Would the French say to the English on the north: "Here is a splendid land we have discovered, rich in harbors, rivers and natural products; move down and occupy." Or to the Spaniards on the south: "Move up and enjoy." Not very likely. They would naturally do just what they did do. They would claim it as their own. Now, let me direct your attention to a map called the Carte Figurative, in the New York State Library. This map, Mr. Brodhead, the historian, says, was presented to the States General by the Directors of the West India Company in 1614. This map contains a remarkable memorandum written in the Dutch language, and, as Brodhead says, probably by one of Hudson's companions on his first voyage of discovery up the river in 1609. The translation of this memorandum is: "But as far as one can understand from what the Mohawks say and show, the French come with sloops as high up as to their country to trade with

them." This inscription is put on the map near the present site of Albany. Those who reject the claims of the French to the first discovery of the river, say that these words refer to the French passing up the river St. Lawrence, which river *as on the map* lies as near the memorandum as the Hudson does. But when we remember the memorandum was written on board the Half Moon on the Hudson and probably near Albany, with the St. Lawrence actually two hundred miles away, the irresistible conclusion comes that it was up the Hudson that the French came to trade with the Mohawks. The men of the Half Moon also found a fort on the island east of the lower portion of the city, and a dilapidated chateau within it, and accordingly named it Castle Island. Some have said that the Dutch built this fort, forgetting that Hudson did not stay here long enough to build a fort, and that the fort was found there. The Dutch and English historians afterward attempted to conceal the real facts by suggesting that the Spaniards had erected it. But there is no evidence whatever of a Spanish occupation. But as if to mock the claims of Hudson as a discoverer, one year after the discovery of our noble river by Verazzano, Estevan Gomez, as narrated by Peter Martyr, also ascended the same river and has left on record a full account of his voyage. (Hudson's sailing directions, p. 37). Traces of French traders all along the Hudson up to Cohoes are still found in the local names of French origin.

But the French did not colonize here. I have already stated that they were too much occupied with wars to engage in founding colonies. But they never for one minute abandoned their claims to the territory which they had discovered. In February, 1685, M. de Callières presents these claims of the French in a letter published in the Colonial History of New York (vol. 9, p. 265) — claims based on the discoveries before mentioned of Verazzano and Cartier. In 1686 the Marquis René de Denonville substantiates the same claims on the basis of French discoveries. (Colonial History of New York, vol. 9, p. 303.) In 1699 another memoir to the same effect was written and is given in vol. 9, of the New York Colonial History, p. 701.

The memoir of M. Bobé of March, 1723, is so interesting and to the point, that I hope to be pardoned for quoting it in full. He says: "The Bretons and Normans frequented the seas of North America for fish as early as 1504. Francis I, stimulated by the example of the Spaniards, sent Jean Verazan, in the year 1524, to make discoveries on the northwest coast of the new world. Verazan discovered seven hundred leagues of coast, from the 30th to the 50th degree of north lati-

tude, going from time to time on shore to reconnoitre the country and the inhabitants, by whom he was invariably well received. To the entire of this tract of country, which had never before been frequented nor discovered by any other European nation, he gave the name of New France, a name which it has always retained from 1524 up to the present time. (See Herera, decade 3, book 6; Hakluyt, vol. 3, p. 295; Purchas, vol. 4, p. 1063.)

"The wars that Francis I, and Henry II, had to wage against Charles V, were the cause that the French did not form any establishment in New France. Notwithstanding the great disorders which prevailed in France on account of the religious wars, Charles IX resolved to form settlements in the south part of New France. He sent thither Ribaut in 1562, who called that part of New France, Carolina, and built a fort there which he named Charlesfort, in honor of King Charles IX. Laudonniere went thither after Ribaut, and Gourges succeeded Laudonniere. The French were disturbed there by the Spaniards, but finally Charles V ceded that country to France, and from that time the Spaniards have not contested with France any portions of New France discovered by Verazan.

"France, then, was at that time in quiet possession of all the coasts and countries from the 32d up to the 50th degree, and for better security thereof had a fort at the southern extremity of New France, in the province she had called Carolina, and *Frenchmen frequented the northern extremity, where they fished and traded with the Indians.* But this quiet and peaceable possession was disturbed by the English, who, in the year 1585, established a post in the part of New France, which they called Virginia, about the 36th degree. They did not stop at this, as they resolved to seize the whole of New France. They began in 1613 to attack the French there on all sides; to capture their ships, which were employed in the fisheries and in the Indian trade; to take the posts and forts they had erected on the coast of Norembega, or of the Etechemies at Port Royal, in Acadia, at Gaspé and at Quebec. These hostilities continued until the English, apprehending the resentment of Louis XIII, bound themselves by a treaty, in 1632, to restore to France all the places occupied by the English in New France, Acadia, and Canada, with the ships and the property of the French. Here it becomes important to pay attention to this word *restore;* nothing is restored but what is unjustly possessed, or what has been unjustly taken, for people do not restore what is their property; but give it or cede it. * * * In execution of said treaty, they restored to France, Canada, Acadia and a part of what they occupied in New

France; but they continued to retain a great portion thereof, contrary to the obligation imposed on them to restore all they occupied. Not content with retaining a great portion of New France, that is to say, the entire coast, from the country by them called Virginia to the country called also by them New England, having given new names to all that coast in order to erase the recollection that the whole of the countries from the 32d to the 50th degree was called New France from the year 1524, they have since 1632 always enlarged their usurpations, and made encroachments on the coasts and territories of New France. (New York Colonial History, vol. 9, p. 913.)

There is one more witness I wish to summon on this question. It is Johann De Laet, the famous Dutch historian. Whatever he may admit as a Hollander should not certainly be questioned by an American. The History of the New World was issued by him in 1640. He says: "We have now treated of that part of North America of which the French have been the first discoverers and even some time the possessors, having introduced colonists there; and which the English have attempted to usurp after having since called it Nova Scotia and New England." (N. Y. Col. Hist., v. 9, p. 914.)

Sufficient has been said to show an uninterrupted claim of France, based on the right by discovery, to the territory from Florida to Nova Scotia, until the claims were extinguished by the superior title of a cosmopolitan people sprung from the dominant nationalities of all Europe, a title they had matured by possession, by conquest, by purchase, one or all, and by turning the wilderness into towns, cultivated fields and gardens.

Now let us see what is the testimony of the maps of North America made previous to the voyage of Hudson in 1609. Opposite page 305 of Weise's Discoveries of America to 1525, you will find a copy of a map by André Thevet, published in his "Cosmographie Universelle," in the year 1575, thirty-four years before Hudson made his first voyage up the North river. Here is a fairly correct picture of the river up to the inflow of the Mohawk. Turn again to page 360 of the same work and you will find a map still older, published by Gerard Mercator in 1569. Here also is the Hudson with the Mohawk as its affluent, correctly inserted. As maps are not made by chance or by guess, a fairly correct picture of a country shows it has been visited.

I have given Dutch, Spanish and French testimony by verbal statements and by maps. I now call your attention to a map of North and South America made by the Viscount de Maiollo in Genoa, in 1527.

nearly twenty-five years before Henry Hudson was born. He has indicated by the national ensigns the portions of America in possession of the several nationalities of Europe. Over the tract of country from what is now Georgia to New Brunswick is spread out in large letters the name of the possessor Francesca, the Italian form of the name of France. The Hudson river is not there, for the French had not yet made public their discoveries. This map, by the way, was photographed a few years ago at the request of Dr. Homes of the State Library, Mr. Weise of Troy having learned of its existence in the Ambrosian Library in Milan, and expressed to Dr. Homes a wish for a copy to illustrate his work on early discoveries in America, then in process of preparation. This map of itself, being a contemporary witness, ought to be sufficient to settle the question of French possession.

One other point of interest is the location of Norumbega which has not unfrequently attracted the attention of scholars. In the two maps before alluded to, by Thevet and Mercator of 1575 and 1569, the name of Norumbega is printed across the Hudson river, showing that this river ran through the territory of Norumbega as it now runs through the State of New York.

WHAT MADE THE INSTITUTE POSSIBLE.

By LEONARD KIP, President.

[Read before the Albany Institute, October 5, 1886.]

It was a cherished project of our late president, Dr. Murray, to inaugurate and bring to completion a series of papers relating to the history of Albany. In a careful and elaborate article presented by him a few weeks before his retirement from among us, he developed his idea with much minuteness and research; and it is safe to say, that if his plan could have been fully carried out, it would have resulted in the publication of a volume which would have been of great value to the city of Albany, and also, in its preparation would have added largely to the reputation of our association. Perhaps one of Dr. Murray's most lively regrets at being obliged, through ill-health, to retire from his office, may have come from having lost the opportunity of personally superintending to its proper result, a work in which he had shown himself so warmly interested.

During the few months in which I have occupied Dr. Murray's place as his successor, I have endeavored fully to carry out his conception, and, as far as possible, in the way he had projected it. But it was found on inquiry, that though the Institute surely does not lack the requisite ability, there were not many members who could devote the necessary time to the production of papers requiring, in most cases, a great deal of close research. Added to this, moreover, I discovered that the somewhat exhaustive nature of the city's bi-centenary had fatigued the minds of many with the contemplation of our history and antiquities, predisposing them to turn for relief to other topics, which might afford rest and variety. Yet still, among those whom I have approached upon the subject, I have found a few members who have been willing to select from Dr. Murray's comprehensive programme subjects adapted to their professional or scientific studies; and who, in due time will give us the benefit of their research in papers which doubtless will not only gratify our sense of taste and fitness, but will stand upon our transactions as valuable additions to our local history.

In now offering, as it seems becoming that I should, a few remarks of my own, as an introduction to this short series of papers, I design not to enter into any scheme of elaborate research or critical examination, but merely to throw into connected form a few ideas that I have long entertained respecting the value and purposes of the Institute; treating the matter, as is necessary, upon something of a historical plane, and apart from that, attempting to deduce from it some thoughts which may tend to awaken us to a fair conception of our real importance. In an association of the character of the Albany Institute, whose course is so uniform and monotonous as sometimes to grow almost sluggish, it is very easy at times to sink into an apathetic state, whereby we may become habituated to take up the tone of outside critics, and seemingly learn to depreciate the excellence that really belongs to us. If we would be comprehended aright by others, we must resolve to comprehend ourselves; and I question whether at this moment there may not be many of our members who are inclined to yield to the seductive languor which leads to the contemplation of mere continued dull existence rather than of occasional results, and in this spirit give tacit assent to those outside utterances which speak only in our depreciation and discredit.

This tendency to belittle may, perhaps, be realized, as well as in any other way by noting the expression with which the heading to this paper would be received, if given out as a question. What made the Institute possible? What is the meaning of such a question?—would, perhaps, be responded. And what is there about the Institute which should make its existence impossible under any circumstances or among any people? In the eyes of many, it is merely a collection of some twenty or thirty quiet gentlemen of more or less scientific taste or culture, as the case may be, who amuse themselves by meeting together at stated periods, and reading papers — over which many yawn, but of which all politely approve at the end; — which papers are then published and at once relegated to obscure places upon high shelves in public libraries, from whence they are never again lifted. Why should not the Institute easily exist in perpetuity, if it should be the taste of its members to continue so to meet? And why cannot similar associations be formed any and everywhere, as long as in this or that village or city, twenty or thirty complacent gentlemen can be found, to call themselves a scientific society? But to the more comprehensive and far-reaching mind there must be something different from this. There must be the basis of three or four hundred members, who, if seldom

attending our meetings and even then sitting in silence, have some sympathy with our organization, and interest in its work. There must be the smaller number who always attend when they can, and show a reasonable enthusiasm for our purposes; at times even adding contributions of their own. And there must be the still less number who have made themselves distinguished in their several scientific careers, and are able to put their knowledge and discoveries into a shape for others to listen to or study; and who, through their fame, are able to throw around the Association the lustre of honored names encouraging emulation, and stilling the voices of those who would more often be our detractors, were it not that by means of these shining lights they see that there must be some high purpose animating us to usefulness, and manifesting itself as a reality. To call these classes together and harmonize them for our purposes is not the matter of a few days or weeks. The fallacy of such an idea is shown in the fate of associations which are here and there formed in imitation of our own, and in places where the ground has not been carefully prepared and matured. They start out with glowing aspirations — soon lose heart as they find no sympathy from outside extended to them — then degenerate into mere debating societies — and finally die out altogether, without leaving any thing of value behind to mark that they have ever lived at all. It is far different, I maintain, with the Albany Institute. It has started with the groundwork of systematic education, and it bears the superstructure of popular approbation. It has run its course, so far, upon the plane of concentrated talent and research. It has lived, because with its high purposes, it has been able to gather to itself the brightest and most able intellects of each generation. Through these means it has won a high place among kindred associations of our own land, as well as gained the approbation and fellowship of foreign societies. And by these influences, it was able to take its inception nearly a century ago, when bodies of that character were almost unknown among us, and science seemed still too crude and uncertain to need careful investigation and registry. There is, therefore, something very pertinent in looking back along our past career, and tracing out the causes which have not only made our existence possible, but have signalized it as one of usefulness and honor.

The seeds must have taken root, it seems to me, not one or two centuries ago, but at the very settlement of Albany. Our good city was not begun by chance, or through any heedless, unguided emigration of base material. It did not originate as towns have grown up in the

western prairies — a log hut here and there, a few patches of land lightly skimmed over with ordinary crops, a gradual increase of resources through three or four generations, not by any means at the best approximating to that degree of wealth which might invite a higher mental culture; and at the end of fifty years or so, a railroad, a city hall and a common school, as the sole evidences of progress. Albany was settled by men who brought brain and energy and a determined purpose with them. In many cases they were the cadets of well-established families of the old world, and came hither animated by unfading knowledge and recollection of the more prosperous social state they had left behind them, and resolved, with their earliest success here, to lay broad the foundation of a similar life. The many stately residences that sprang up even within the ensuing century, and some of which still remain, show how amply this resolve was often fulfilled. And it was a determination not as difficult to carry out as to some it might seem; for these men belonged to a people that in a generation had made of themselves the most wonderful and distinguished nation of the century. It had wrested its soil from the ocean; it had beaten back from its land the trained armies of the Spanish Empire; it had swept the English channel with its fleets, a broom at the peak of the admiral's ship, and humbled the pride of Britain; it had made itself unrivaled in at least one school of art, and had built up a powerful literature distinctively its own in original force and tone of thought; it had originated, perhaps, the common school system, and made its universities celebrated among the seats of learning throughout all Europe.

Added to this, of course came the zeal for discovery and colonization; at that time a necessary element in all nations that had the right to hold themselves in any consideration. Holland, as well as England and Spain, felt that it must take steps toward founding foreign empire; and upon the first upward navigation of the Hudson river, the country was pronounced a good and pleasant one, and worthy of permanent occupation. When Fort Orange was erected, it was not intended as a transient post, to be abandoned as soon as the profits of the fur trade might slacken; almost at once the attractiveness of the location led to Beverwyck growing up about the fort, and it became fully realized that here might be one of the seats of future dominion. To determine upon remaining was to begin improvement, and among the earliest improvements were the church and school. Under the partial military government of that day these were the true educators of the people, and as instruments for that purpose they were not allowed

to become inefficient. There is little record of the schoolmasters of that time; but more about the clergy, whose influence dominated over all. They were not mere strolling preachers of low degree, sent out to the new colonists as superfluous refuse, but were men of brain and learning. The Dutch dominies had been educated in their home universities, and brought scholastic qualifications with them; the clergy of the English church were graduates of Oxford and Cambridge; the Jesuit missionaries of whose occasional presence the colonists were not intolerant, carried with them into their exile the training of their own learned seminaries. Those were days when the cities of Europe, with few exceptions, leaned lovingly toward the acquisition of universities; and some of them held their rank among other cities as much through the number of students within their walls as through the wealth of the traders in their guilds. Beverwyck might never hope to found a university; that, certainly, would be asking too much. But would it be extravagant to dream that in the course of time, the scope of its schools might widen, and something broader and higher than mere elementary education be established, teaching the more profound sciences? Here, therefore, in the minds of cultivated men, might perhaps be found the earlier germs of the longing for that more thorough knowledge which would make associations like the Institute possible.

As time ran on, and the Dongan charter came, abundantly providing freedom for universal education, Albany began to mingle more freely with the outside world; not by any means letting itself remain shut up in narrow-minded seclusion, but gathering information eagerly from every possible source. It began, too, to become an important point for interchange. The French and Indian war brought officers of the British army, with ready knowledge of the doings at Whitehall; and now and then a captive French officer came in with traditions of the glories of the Bourbon Court. The Revolution broke out, and the scales turned. It was now the English who were captured; but all the same the city was becoming almost cosmopolitan, at times, in the possession of that intercourse from outside which fosters new ideas, and turns the routine education of the day into an enlightened aspiration for something higher. Then, in turn the Revolution passed into history; and Albany—already proud of its varied and unstained past, took its place as the capital of the state and prepared itself for newer and higher possibilities from the hand of destiny. There were politics at that time, as now; but there were also statesmen and states-

manship, as some day there may be again. And it could scarcely fail to happen that the city which ruled the greatest and wealthiest of all the states, should naturally stand powerful with the central government—occasionally, even, controlling that, as well.

And so, as a new phase in the city's career, began its more distinctively political history, continuing down to the present time with little variation, except as changing customs of life and conditions of government have compelled it. It is a career replete with the memory of distinguished men among us, each of whom has directly or indirectly exerted some influence upon the city's history. I speak not altogether of governors and senators, some of them have here gained their promotion to still higher office. I speak also of those who have naturally been drawn into the life of this place, through the varied and often tremendous interests here clustering. There were great statesmen and orators among us, who were not in the gubernatorial chair or in the senate; but who all the same, have left their impress upon their generation. And there were distinguished lawyers and jurists, who were not only eminent in their own practice, but in many respects gave a new character to the law of the civilized world, codifying and rearranging abstruse principles, and sweeping away with a free hand technicalities and absurdities that had come down from feudal times unchanged; until the great body of law began to become practicable and flexible and even more humane, bringing into existence new theories of jurisprudence that are slowly but surely being adopted elsewhere. A state standing pre-eminently above all other states must of course have its public libraries and museums, requiring the services of distinguished scholars as librarians and curators; and this would naturally lead to much scientific exploration and enterprise of its own. The great work of our State Natural History is only one exemplification of this result; and we must congratulate ourselves that so many of those eminent men who were engaged in that undertaking are still among us to continue their labor. And a state in which was gained the first extended experience in steam-navigation, railways, canals and telegraphing must not withhold its encouragement to invention of every description and degree. In fact, quiet and settled down into apparent apathy and indifference as Albany now seems, there are few cities which in the space of three centuries have held such a varied population or seen so many startling changes. The early Dutch settler—the Indian—the trapper and the Jesuit missionary first come before us in picturesque group-

ing; then the titled officers from the Courts of France and England. It has had the savage war-whoop ringing at its very gates, and the cannon shots of invading hosts almost near enough to be heard from its hill tops. It has been the objective point of attack in two wars, though never reached; and these attacks were not mere unimportant affairs of outposts, but were portions of the great plans of strategy which accompanied the conduct of wars that changed the whole fate of the world, and that with different results, might have done much to set back the course of civilization. In one, the success of Montcalm against Wolfe might have so constrained the operations of the allied forces against Frederick as to have altered the destiny of all Europe; in the other, thirteen colonies hung breathless on the issue, since upon it mainly depended, more certainly than at that time they realized, the question of their final independence. There has scarcely been a generation in the history of Albany, in fact, during some period of which the eyes of all nations have not been turned upon us, awaiting the development of schemes or undertakings fraught with importance to civilization. And here have been settled matters of national and international policy that have made our statesmen distinguished, and for centuries will be topics for discussion in political treatises.

This varied career, I claim, must have formed a large part of the condition which made the Albany Institute possible. I do not mean that every detail of it was necessary for the attainment of the result, and without which it could never have been reached. Nor do I claim that associations of similar purpose and equal value could not struggle through less favoring circumstances; even, it may be, through an age of dull uniformity, and yet reach influence and distinction at the last. But I do maintain that there has been much in our past history, not only of value in rendering the Institute a welcome element in the scientific world, but even in making its early creation a necessity. Where so much interesting history has been wrought out, there must be historians who would wish their labors properly acknowledged. Where there are statesmen, it is fit that their works should have due preservation in some permanent form. And more especially where there are men among us distinguished with world-wide scientific reputations, it is eminently needful that their observations should be suitably recorded. These classes, not always in any one city sufficiently numerous to maintain themselves alone, naturally felt that in a closer connection they would more readily attain their

due position and be able to assert their authority; while in another aspect, it would be of individual and personal value to have some medium for mutual acquaintance and discussion. Hence the motive which must have originally drawn these classes of men together into one association; and by their united talent maintained it at a time when other cities, which had little change or history, were still groping blindly with the problems of the lower education, unsuspicious of any higher plane of thought than might be made to extend beyond their own limits for the enlightenment of the world.

How the Institute has fulfilled its trust, it seems to me, calls for no doubting answer. Those who regard us, as I have suggested, merely in the light of some twenty or thirty quiet gentlemen, meeting to discuss abstruse themes of no especial importance, and afterward accept each others congratulations, look upon only one side of the picture. For the other and more truthful side, I would point to the nine or ten volumes of our Transactions, as affording every necessary justification for our existence. These volumes do not profess to contain all the papers which are read before us. There is much that comes to us with the intention merely to entertain, and without any anticipation of reaching the immortality of print. But there are occasionally papers of much scientific and historical interest, as well as exhibiting great research; and these we carefully preserve, not for the ornamentation of our shelves, but for the possible instruction of posterity. And it is in this feature, more especially, that the merit of our institution most abundantly shows itself; in the proper record of what may be called new science. We occupy an indefinite territory, which is supposed to be bounded by the circuits of other societies, of a similar condition and purpose of existence. Whatever is novel and important in our range of topics we are expected to gather up and place in permanence. If new developments in the structure of the earth are made, our geologist describes them, and in their proper terms. If wonders appear in the heavens, our astronomer makes his note of them. In natural history, botany and the kindred sciences, we have our learned members ready and able to record their unquestioned observations. These are the papers which we publish, and which, when gathered into volumes, we exchange with other societies; collecting thereby, as far as practicable, a knowledge of the physical progress of the world. If there were a sufficient number of such societies in existence to cover in their jurisdiction the whole surface of the earth, our means of knowledge would really be

complete ; as it is, we can only wait in hope until our method shall obtain its proper development. Our volumes thus prepared and circulated may, for a while, stand idle upon dusty shelves ; but perhaps only for a while. The connection of the sciences is often apparently arbitrary and without reason, and their influence upon each other is not always capable of being definitely forecast. The trifling item garnered up in one generation may become essential in the next, as the link necessary to establish an important principle ; and the trival paper of to-day may, in a century hence, be seen to have been of more value than could possibly have been anticipated by the most sanguine scientist. And who can tell what might not now be the addition to our sum of knowledge if the same system of annotation and exchange had prevailed throughout the scope of past history ? What if in old records we could discover a scientific minute of the blazing star that was superstitiously said to have forewarned Cæsar of his assassination ? What if we could obtain a fuller account than that which the younger Pliny gave of the destruction of Pompeii ? What if we could have a rational exposition of many of the great phenomena that are mentioned in history, and which live in credulous minds as portents of change and disaster ? We are now doing what could not then be done, the conditions of former society having been so incomplete and uncertain. In future centuries our efforts may be looked upon with thankfulness, just as we would now regard a similar labor in the past, had it been practicable.

And now, what encouragement can we have for believing that the Albany Institute will remain true to its past record ? And what have we to induce a belief that it may even gain in credit and usefulness ? In my opinion, there is much to be looked forward to, as giving promise of our continuance in success. There have been times when our meetings were lightly attended, and our interest in ourselves seemed almost to have died away ; but we must believe that these were merely the usual oscillations toward weakness which every institution must at certain periods experience. I do not say that even at this moment we are doing full justice to our purposes, or to our anticipations of a prosperous future. But I believe that any present apathy is only for a time ; and I base my assertion upon the fact that the influences which created and have so far sustained us — an aggregation of talent devoted to different departments of art and science, and imperatively demanding some proper medium for ude development — are destined to continue and probably increase in volume. I think that the char-

acter which our city has gained as an educational centre is becoming more and more widely recognized, and that the future will lead to improved results in that direction. Albany has so far sought to become a great manufacturing and commercial emporium. This, in a new and growing country, has always been the praiseworthy ambition of every central point; and it is only after centuries of effort that some of them begin to recognize the potent logic that geography or climate is against them, and must, in the end, compel a surrender of the struggle, and a willingness to take upon themselves other aims and aspirations. Among ourselves we now hear low mutterings of disquiet, as here and there some branch of our industry seems to wither, and our population does not gain as had been expected; and we look forebodingly to the future, as though it had nothing but disaster in store for us. We speak of the chances against us, and perhaps, unjustly to ourselves, of our own lack of energy. No energy, however, can avail against location removed from newer marts of trade and commerce. We may hold our own, or even slightly increase; but it is probable that no amount of enterprise could now develop us into one of the great centres of wealth and influence. All the fortunes of all our citizens poured out for the establishment of new avenues of communication could not now force upon us the vigorous development of many a western metropolis. But, neither, perhaps, could the western metropolis, with all its wealth, gain in one generation our advantages as a centre of education and culture, and our genial association with what has been so improving and influential in the past. It might lavish its millions for a university, and in time the great gothic buildings grandly encompass spacious quadrangles, and the roll of the faculty show highly honored names; but there, in one respect, the hoped-for success might come to an end. Its citizens might point with pride to what has been done; but at the same time they might too often look upon their work as upon their parks, their gardens, their great hotels, their opera house, and their enormous depots; something which no city should be without, and which must be so grandly completed as most magnificently to vie with rival cities. Even in the midst of their civic exultation they might be cherishing a secret pity for the hundreds of students within the marble walls, who in the public estimation have so unwisely shut themselves deliberately out from a career of commerce and its resulting wealth. It would, perhaps, take many generations for such a great city to grow into that loving sympathy with its University, which now yields veneration to Harvard, Yale, Columbia and Princeton.

This, therefore, is the one respect in which Albany has an advantage; the possession of this groundwork of regard and sentiment, the production of centuries, and upon which so vast a fabric of education and scientific culture can be built up. It is too early, perhaps, to forecast the future with any exactness; and after all, the superstructure may prove of slow growth, and amount to but little in the end. But there is nothing more certain than that with half the toil and expenditure which Albany must put forth to enter into a precarious rivalry with other cities, more suitably located for compelling commerce, it could adapt itself easily to new conditions, which in the end would surely prosper to its infinite honor and satisfaction. It need not part with any thing which it already has; but it might obtain in addition a more complete development in another direction, doubling its influence and attractiveness. Even if it should chance to lose something of its present commercial success, it might in the end feel amply recompensed in the exchange for other advantages. It may be that Oxford and Cambridge once deplored the extinction of chain-armor or leather-doublet industries, and dolefully predicted approaching ruin; but if so, I think that Oxford and Cambridge could not afterward have regretted their change to different conditions. Albany has now its capitol, which must some day be finished, and with all its faults will rank as one of the great buildings of the world, a study for artists. It has its two kindred libraries; both made up not so much with reference to their number of volumes as to such thoroughness in certain departments as must make them advantageous to students. It has its State museum, which in its new quarters must become an object of pride, and at once magnificently begin to expand, leaving its hitherto contracted space to be forgotten, except as an ugly dream. It has its astronomical observatory, which has already recorded its triumphs. It has its law and medical colleges, to which some day may be added the only remaining factor needed to complete its university. And it is the cathedral city of two powerful dioceses, which, with becoming enterprise, are signalizing their existence with beautiful and imposing edifices. All these advantages must necessarily lead to further accumulations in the same direction, scarcely now to be foreseen or realized. What, then, will be the progress of the Institute? It must naturally increase and develope, in common with all other associations around it. In company with the ever growing body of political, scientific, literary and ecclesiastical talent that will more and more surely be attracted hitherward, it must certainly gather into its membership new and valuable mate-

rial, adding to the ability and interest of its papers, and causing its influence year by year to expand. And with possible endowment lifting it above the charity of other institutions, and in its own building and with its scientific collection beside it, it may then be able to realize more clearly than now, not only its value and prosperity, but also its comparative freedom from all successful rivalry; inasmuch as its existence here has been begun and fostered by conservative elements, which are the creation not of a day but of three active centuries, and annot elsewhere easily be duplicated.

CATALOGUE OF MEMBERS

OF THE

ALBANY INSTITUTE.

HONORARY MEMBERS.

1864.	Solomon Alofsen*	Jersey City, N. J.
1865.	Sir J. Bernard Burke	Dublin, Ire.
1870.	Abram B. Weaver	Deerfield, N. Y.
1872.	Paul B. Du Chaillu	New York.
1872.	John Tyndall	London, England.
1873.	Alexander S. Johnson, LL. D.*	Utica, N. Y.
1873.	Thomas Davidson*	Brighton, Eng.
1880.	Alfonse Goovaerts	Antwerp, Belgium.

CORRESPONDING MEMBERS.

Elected since 1876. (*For lists of corresponding members previous to this date see Transactions, vols. VI and IX.*)

1879.	Dr. Charles Barrois	Lille, France.
1879.	Prof. Edward R. French	Aurora, N. Y.
1880.	Elisha Harris, M. D*	Albany, N. Y.
1881.	R. Halsted Ward, M. D	Troy, N. Y.
1881.	William E. Griffis, D. D	Boston, Mass.
1882.	Theodore F. Dwight	Washington, D. C.
1882.	Harry Macdona, LL. B	New York.
1882.	G. Richmond	Canajoharie, N. Y.
1883.	Prof. Lewis Boss	Albany, N. Y.
1883.	Charles Hawley, D. D*	Auburn, N. Y.
1883.	S. O. Vanderpoel, Jr., M. D	New York.
1884.	Prof. W. S. Chaplin	Schenectady, N. Y.
1884.	S. Lowell Elliot	New York.
1884.	Geo. T. Stevens, M. D.	New York.
1885.	Antonio de Gregorio	Palermo, Sicily.
1885.	W. J. McGee	Washington, D. C.
1885.	Prof. Edward North, L. H. D	Clinton, N. Y.
1885.	Miss Eleanor A. Ormerod	Isleworth, Eng.
1886.	Geo. S. Batcheller.	Saratoga, N. Y.
1886.	Edward Danforth.	Elmira, N. Y.
1886.	Thomas H. Fearey	Albany, N. Y.

* Deceased.

ACTING RESIDENT MEMBERS.

MAY 1, 1887.

For alphabetical list of Resident Members from the organization of the Institute to January 1, 1879, *see transactions, vol. IX*, 334–340.

Richard L. Annesley,
57 North Pearl.

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Frank Chamberlain,
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Norton Chase,
25 North Pearl.

Andrew J. Church,
325 Washington Ave.

Verplanck Colvin,
Adirondack Survey Office,
Capitol.

Paul F. Cooper,
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Erastus Corning,
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Charles M. Culver, M. D.,
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William Dey Ermand,
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Rt. Rev. Wm. C. Doane, D. D.,
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George Doelker,
67 Clinton Ave.

Andrew S. Draper,
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19 Washington Ave.

Edward P. Durant,
475 Broadway.

James W. Eaton, Jr.,
151 Lancaster.

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25 North Pearl.

Wm. H. Hale, Ph. D.,
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State Hall.

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James B. Hendrick,
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Leonard G. Hun,
25 North Pearl.

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Peter Kinnear,
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Leonard Kip,
20 Elk.

George W. Kirchwey,
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Rev. Frederick M. Newman,
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105 State.

Howard S. Paine, M. D.,
105 State.

Amasa J. Parker, Jr.,
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Nathan B. Perry,
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Lemon Thomson,
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Emanuel B. Toedt,
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Frederick Townsend,
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Luther H. Tucker,
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Garret A. Van Allen,
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Albert Vander Veer, M. D., Ph.D.,
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Andrew Vanderzee,
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Normal School.

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