Vol. I. No. 2.

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The · W · T · I.

Vol. I. **WORCESTER, OCTOBER, 1885.** **No. 2.**

THE W T I,

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W T I.

THE day is dawning: o'er the gilded hills
The glad sun breaks and drives away the mist,
At first uncertain, glimmering, struggling,
Then rising in its strength and grandeur,
Hurrying towards the West.

This may we hope to do, or to approach it,
And if we do but let a single ray
Upon the cause, to which we pledge ourselves,
We shall be pleased, rewarded,
Nor hope for other pay.

And if, at times, by some unhappy chance,
We fill some page which seems unprofitable to you,
We beg you will, in charity, remember, always,
That, from opposing stand-points, the same object
Presents a different view.

For here the mark at which we truly aim
In the deep undercurrent of our thought and speech,
Is to help upward, stimulate, enrich, ennoble—
Our Institute; its friends, instructors, students,
All and each.

Have patience, elder heads, in judging us
In these our first crude efforts with the pen:
Take not our words for more than we intend them,
Remember we are students:
Not yet philosophers—old men.

* * * * *

So here's a health to W T I.,
Let friends and students pledge us to her weal.
Long may she flourish with increasing vigor
And hold aloft, through storm and wind,
The crimson blended with the steel.

WITH its present issue the W T I enters upon such lease of life as it can earn. It represents an Institution having its origin in a local necessity and indebted to local generosity for its chief support, but one which, fortunate from the first in its president and professors, has been able, without swerving from the special course marked out by its founder, viz; the application of theoretical knowledge to those practical needs which the training of the public school inadequately supplies, to find ways and means to concentrate and dispense an ever-increasing intellectual light.

These men were fair and considerate in all matters pertaining to the city and county; they worked in accord with the board of trustees, avoided the dissensions which isolate so many local institutions from the life about them, and thus secured for a direct aggressive movement upon lines of intellectual and moral progress which they speedily in-

augurated, those silent effectual weapons of reason and public confidence which the present Faculty continue to wield.

The "Tech" has ceased to be a mere local institution. It gathers its students to the full extent of its accommodations, from all parts of the world, and has confessedly no superior in its specialty. As an intellectual centre its effort is to stimulate invention and discovery and to help forward the unnumbered improvements upon which modern life depends. As an industrial organization it recognizes the value of labor, co-operation and industrial partnership.

If the W T I can, in its methods and management voice this, the spirit of the Institute, its work will be well done. It is that spirit of common-sense which Guizot aptly calls "the genius of humanity," and which blazes its way step by step through all difficulties because it knows where it wants to go and expects to get there.

THE school year of '85 and '86 opens for the Worcester Tech with every ray of prosperity focused upon its work. Our Autumn sports have caught the fever as well and at the present writing it is our pleasant duty to comment upon the brilliant outlook in tennis. Before this, the October number, is issued, the outcome of the tournament will probably be known and we shall be able to record the events in what promises to be the first successful undertaking in this line at the Tech. Twice before has the association tried and failed in the attempt, but starting this fall with all the elements necessary to insure success, the probabilities point to another demonstration of the fabled rule of three. The reason for the manifestation of such an unusual degree of energy lies in the fact that, for once, the association has acted as a unit. Not one nor two alone have been interested in the event, but nearly every man has shown his enthusiasm by entering the lists, whether his rank as a player be good, bad, or indifferent.

The association has placed itself on a good financial basis and has thus enabled its committee to purchase new nets and balls and to keep the ground in good condition.

Tennis is a game peculiarly adapted to the needs of the majority of our students both as a means of exercise and of enjoyment, and we confidently predict that success this fall will not only establish the tournament as a regular spring and fall event but also, acting as a direct appeal to the common sense of our men, cause many new names to be added to the association list.

HAD a stranger been present at the first meeting of the Athletic Association, he would perhaps have judged the school feeling at a very low ebb, or, at least, have decided that in athletics the W. T. I. gave a meagre account of itself.

Of the Senior Class nearly every member was present, of '87, not more than one third, while the fifty members of '88 were represented by but five lonely delegates. Appearances, therefore, would have justified the conclusion, but like most critics who judge without an understanding of the real

condition of things, the stranger would have received an impression not warranted by the facts. At a like meeting of Harvard College where but one third or even one tenth of any class were present the number there would have indicated apparently more enthusiasm, while in truth the proportion would have been the same.

What a school lacks in numbers it must and usually does make up in greater individual energy and in unity of action. The Harvard student who absents himself from an athletic meeting either because he takes no interest in the matter, or because his dinner is cooling while he waits, will be told: "If that is the way you feel about it, stay away, we can do without you." But, to the student at the Worcester Tech we say: "Take your dinner cold if you must, but do your duty as a sharer in the reputation of the school for the energy and efficiency of its Athletic Association. Acknowledge your indebtedness to those who have made this reputation, and, by attending the meetings, do your share toward inaugurating and carrying out such measures as shall increase and enhance it. There is the less room for drones in a small hive."

The Faculty say to us in effect, continually: "While so many earnest men are waiting, eager and anxious to profit by the advantages we offer you, we will not tolerate any carelessness nor indifference as to your work." The majority of our students add: "We are united in our work, let us unite also in our exercise and in our play."

Every class in the school has its committees willing to lead in the actual work demanded in athletics; all they ask is that the remainder shall attend the meetings and show by their presence their sympathy and interest. In this matter no man's influence is greater than that of another. Each man counts for one, and for no more, and if one has ever waited in a public meeting for a quorum he will the more readily realize the truth of the text: Verily there is more rejoicing over the entrance of the last man than over all who have entered before.

THERE are two things necessary to the successful management of a college journal, first; the hearty support and generous sympathy of the students; second; the patronage of the business men of the town in the advertising columns.

On both these points we surely have no reason to find fault, for the members of the Institute have lent their assistance not only by their subscriptions, but by their contributions as well, and our advertising columns speak for themselves.

But there is one thing, and it is the only thing which must be done in addition in order to make a paper a permanent success financially, and that is to patronize our advertisers. The business men of Worcester have been greatly interested in the starting of our paper and have generously patronized it, and now it is only right that the students of the Institute should give them their trade. And why not?

Our list comprises the best firms of the city and why is it not just as well to go to them, even if at the expense of a

little extra trouble to ourselves, and see if they have what we want. If they have not, it is their own fault. We shall know that we have done our duty, and by giving our patron the chance have shown him that his advertisement was good for something, and that the next year it will pay him to advertise again. We feel that everyone who has the best interests of the school and of the paper at heart will not fail to do this, and we would call attention, in this connection, to the classified list of our advertisers which appears in another column.

IT is now time to pay the semi-annual dues. We hope that all who have any interest in the success of our field sports will pay promptly. Do not look upon the assessment as so many students do, as paying expenses for the sake of a few, but rather as a means of furthering the athletic interests of the school, and by so doing help to secure our long desired gymnasium. We notice that those who find the most fault and who always decline to pay assessments are the ones who are the most eager for tickets and for all the privileges of the association.

THE only thing which detracts from the interest of our field days, and one which if continued will destroy all excitement in the contests, is the lack of entries. We hope this year to see the lists all full. No matter if you cannot win, go in and help keep up the excitement, especially in the running matches. It is very dull work sitting and watching one or two men running around the track. Start in even if you have to give out, and be sure no one will think the less of you if you are beaten.

EVER since entering the school we have wondered that a building externally so fine as Boynton Hall, should show so little use of funds in its internal appearance. We were much pleased to hear that work was being done to improve this defect, and looked forward with pleasure to the time when we should see it for ourselves; but although we have to admit that the corridors are much neater than before we are sorry to see how this result was attained.

With a finish in wood, excelled in natural appearance by few buildings, there was the opportunity to make a perfect looking interior in halls and rooms, and to see this lost in a coat of mediocre paint seems to have been a great mistake, and one that will be ere long regretted. Better have let it remain as it was, waiting until increased finances enabled thorough and correct work.

IN accordance with a vote of the faculty, the drawing mark will hereafter count in the student's standing.

This is as it should be, for though many will take advantage of the chance to slight this branch whatever be its connection with their rank, yet there are those who, not being interested in it and not realizing till too late its importance, neglect it because they know it does not affect their average. No really earnest student would of course do less than his best, yet those who boast of how little they accomplish in drawing, and the number is much too great, will now need other means of showing their foolishness.

WE tender our thanks to the members of the alumni and to those students who, under the pressure of their own work, have responded to our call for contributions. The response has been a generous one. If every student will keep the needs of the paper in mind and give to us some contribution, it matters not how small, we shall be able without undue tax upon the editors to worthily represent the undoubted talent, the existence of which, it having never been called into exercise, has not been admitted as a factor to be relied upon in gauging our propable success. Continue to "give us your best," boys.

THE editors of the W T I offer two prizes of five dollars each for the best essay and poem contributed before Dec. 1st, 1886, to its columns. Communications must not exceed one thousand or contain less than five hundred words, and the committee of award will be chosen by the editors from members of the different classes. The "eds" regret that their limited resources will not allow them to offer a higher premium for this purpose, but hope the competition will be lively notwithstanding. Subjects may be grave or comic, and it is desired that the names of competitors be entirely withheld until the result of the competition is announced.

NO correct solution of the prize problem offered in the last number has yet been received. To avoid any misunderstanding, we will say that geometers, when speaking of an angle bisector as a length, mean the distance between the apex and the opposite side measured along the line bisecting the angle.

PARTED.

ONE day on a sun-lit meadow,
Gleaming along the sea,
I slept beneath the alders,
And a vision came to me.
Two ships from a parted mooring,
Drifting off and away,
One to a violet sunset,
The other, where softened lay
The peaks of empurpled mountains,
Waiting the coming day.

Softly the mist closed 'round them;
The night crept slowly down,
Trailing its mighty shadows,
Donning its moon-lit crown;
While clouds, to invisible harbors
Over ærial seas,
Followed the ships, that softly
Anchored to the breeze,
On, at its wilful fancy,
Past lighthouse, cape and shoal,
The unseen helmsman guided,
Speeding to their goal.

When morning came they had parted,
I could not see them more,
And the tide-waves gave no answer
Beating upon the shore.
Nor yet the fleeting winds that sang
In the hollow under the hill,
"The lullaby of its music
Hath a magical cadence still."
When I asked them aught of parted ships
Drifting off and away,
The one to a violet sunset,
The other to coming day.

Parted, two friends in the gloaming,
I cannot see them more,
There comes no word from the mountains
And none from the distant shore.
Where the southern sea waves glisten,
Glisten forevermore,
Yet the waiting is not fearful
For love-lit eyes grow bright,
Watching, serene in shadow,
The coming of the light.
And faith is won by patience,
And courage, stern and high,
Watcheth the compass duty
As the swift years speed by.
And the helmsman will not falter
Toiling early and late,
Till the full-freighted bark he sped,
Beats back the storms of fate.

And so I wait in the offing,
Lovingly wait to see
The ships I lost in the gloaming
One day come back to me.
Back to the land-locked harbor
"Drifting in with the tide,"
Where faith is lost in vision
And Love is satisfied.

AMATEUR PHOTOGRAPHY.

ONE of the most interesting results of the application of Chemistry to the fine arts is the use made of it in photography.

The readers of the W T I have doubtless had their attention called to photography either by the many advertisements of dealers in photographic materials or by friends who are amateurs. But unless of the craft themselves, they can have no intelligent idea of the pleasure, not to say usefulness of the art, even as practised by amateurs.

Without going into the details of manipulation it might be interesting to know what has given such an impetus to amateur photography within the last few years. Heretofore before taking a picture, it was necessary to flow or cover the plate, upon which the negative was to be made, with the solution which would render it sensitive to the light, and allow the image to be impressed upon it. This had to be done immediately before exposing the plates, thus necessitating the use of a dark operating tent, or room, which in landscape photography had to be carried with the operator, making in addition to his camera and tripod a heavy and cumbersome package.

The inconvenience and in some cases the impossibility of this mode of working created a demand for what are known as dry plates. These, briefly, are plates of glass coated with a transparent film of gelatine, over which the sensitive nitrate of silver is flowed. This having dried and hardened, the plates are packed in boxes of a dozen each, with nothing but a card mat between them to keep the surfaces from scratching. They come in sizes from 3¼ x 4¼ to 20 x 24 inches, but the sizes used by amateurs are usually from 4 x 5 to 8 x 10—a larger size necessitating a package heavier than can be easily carried. These plates require no further preparation and can be placed in the plate-holder before starting.

Although the uses to which photography can be put are many, more numerous in fact than the amateur will find desirable to practice, yet there remains ample field for his amusement in this art. The microscopist, in the course of his studies, meeting an animal or growth which from its rarity or for other reasons he wishes to draw or reproduce, can, by a very simple device, attach his microscope to a camera and have a photograph of the slide taken. In mechanical and civil engineering, or in architecture, photographs of work in course of construction are often appended to periodical reports and show better in some respects than figures the progress of the work. But it is chiefly from an artistic stand-point that we would advocate the still further practice of this interesting branch of the fine arts. It has been held by some, the majority of whom may usually be found to be ignorant of the subject, that photography is "merely mechanical" and "requires no artistic cultivation." This, as any one at

all acquainted with the subject knows is untrue, a fact forcibly illustrated by the comparison of a photograph taken by an amateur, with one by a professional. Allowing that each has been equally successful in the mechanical process of developing which, however, is rarely the case, the amateur will be found deficient in arranging his groups and single figures in easy, natural postures, while he will have entirely neglected the important matter of expression. Another error by which the beginner can be identified is in allowing the light to be reflected with equal brilliancy on both sides of a face, giving a flat appearance with no contrast. Thus in countless ways are his pictures filled with imperfections that force themselves upon the attention of all. Who has not noticed a really beautiful scene spoiled by intruders, whose presence could by a little forethought have been avoided? Of a truth can it be said: "Eyes have they but they see not."

That beautiful villa stands out richly in the picture, with its delicate outlines clearly shown; the neat lawn sloping away to the water's edge, the running vines and trellis giving life and beauty to the scene. But why did our amateur select Monday morning for taking his picture? In horrible contrast with the sloping lawn and trellis on the left is the sight of waving shirts and taut drawn clothes-lines on the right.

Such a mistake—occurs but seldom as the experience of the amateur increases. No such errors entrap him then. A good light, a capital pose, how instinctively are they recognized. In an instant the camera is brought to bear, deftly is it focused, and in a moment the shutter catches the scene. No commonplace interlopers mar its beauty. All is perfect, tasteful, good. Day by day disgust for his earlier pictures increases while he wishes they might all be gathered and forever lost in one grand cremation.

He has changed now. Call him no longer a green amateur photographer—rather let it be "art critic." His photographic apprenticeship has aroused abilities that he never knew he possessed. Art galleries that had lost their charm are visited with renewed interest. Treasures of art, before passed carelessly by, now arrest his attention; all that is beautiful about him is thoroughly appreciated. With judgment strengthened and perceptions sharpened, he enters avenues of pleasure that were closed to him in the past.

For this, then, if for no other reasons, would we exalt the practice of the so called "mechanical art" of photography.

A COLORADO DUG-OUT.

IT was my lot, the year before entering the Technical School, to pass several months with a prospecting party in Colorado. The camp was not in the mountains, but in the midst of a fine grazing country, and the head man of the company had noticed the peculiar "wall-rocks" of the "leads" while engaged in the cattle business.

These "leads" can be traced for some miles on the prairie but are most distinctly marked in the cliffs of a cañon which extends for miles through this section. These cañons are peculiar. One may ride over the prairie and, noticing only

a line of cedars, be surprised to see just before him the rocky sides of a great break in the earth several hundred feet wide and from fifty to one hundred feet deep. The bottom will be found well grassed and shows signs of water running in wet weather.

I went there in July and lived in a tent, almost the same as in the open air. As the cold nights of autumn came on, we felt the need of warmer quarters. A more secure sleeping place seemed desirable on account of polecats, catamounts, and perhaps a stray mountain lion. One night our dog encountered a polecat under my bed, so I resolved to have a dug-out at once. I selected a piece of ground six and one-half by eight feet and dug the side walls straight down through the hard, clayey soil six feet deep. I smoothed the floor nicely and wet it and the walls with water to harden them still more. Four pine logs were placed at the edges above ground. Upon these the rafters were closely placed. All the crevices were securely plastered with mud and the whole roof covered with earth eighteen inches thick. I built a railing around it to keep the horses and cattle from walking over. A single sky-light about twelve by eighteen inches, closed by a home-made wire netting and wooden shutter, afforded light and ventilation. My bedstead was lowered into the dug-out before the roof was put on and just fitted. To tell the truth, the width of the room was calculated from the length of the bedstead. Over the foot of the bed was a curtained space for clothing. In one corner was my trunk and above a book-shelf with my dozen or more books. Close by the head of the bed was a small stand for my lamp and just beyond this the fireplace was located. The fireplace was simply an excavation in the wall arched above and hardened by water and fire. The chimney was a hole in the ground dug down to it, surmounted by a low stone work and capped at first with an empty syrup keg, but which took fire and burned early in the season.

Eastern people might consider such a place rough and uncomfortable, but I found it cosey and pleasant. True, the bed had no white spread. Only a pair of thick woolen blankets and a warm buffalo robe upon a hard matress. The pillow was a grain sack filled with oat straw.

In this dug-out I spent my quiet evenings for months. A bright fire of pitch pine branches, a good book, and best of all a feeling of comfort, and of health and strength. Then to bed with the stars shining in through the opening in the roof and a sound sleep from which to awake long before sunrise in the morning and begin the day's work with the great, silent, flaming comet in the sky shining with startling brightness in that clear atmosphere.

THE PRESERVATION OF TIMBER.

THE last census gave many unpleasant revelations concerning the proximate extinction of many of the forests, which have hitherto been so bountifully productive. These revelations make it apparent that the time cannot be far distant when our people will have to stop the waste of timber which has been going on, and resort for many purposes to the artificial preservation of wood from decay.

Although iron and steel are being more and more extensively employed, yet the amount of wood which is used in our mechanical structures at the present time, and which will without doubt continue to be so used for a long time, is surprisingly great.

Consider, for example, the enormous draught made upon our forests to supply the ties requisite for one hundred and twenty-two thousand miles of railway in this country, allotting to each mile twenty-eight hundred ties. The average life of a tie is not far from six years, and, at twenty cents a tie, the value of those laid yearly foot up $11,386,666. It will be readily seen, therefore, that any process or processes, practical and economical, which applied would prolong the life of a tie ten or a dozen years, would affect a saving of millions of dollars.

In the Thesis, of which this is an abstract, the writer made use of the following classification of conditions, to which timber is ordinarily subjected: Timber in dry situations, timber in fresh water, timber in salt water, timber in damp situations, timber alternately wet and dry.

A careful study of the above conditions, gave the effects produced in timber and also certain of the causes of these effects. For the determination of the remaining causes, the germ theory of decomposition, as advanced by Pasteur and Tyndall, furnished a ready means. This theory, in brief, is that the phenomena of organic decomposition are caused by the presence and action of living germs. Examine a crack or wound in the trunk of a living fir-tree. It will be found that, by a natural process, a resinous substance exudes, which closes the wound against the agents of destruction. The bodies of mammoths preserved in ice through countless ages; the trees of primeval forests, excluded from the air, beneath thick deposits of peat; the fragments of wooden piles, which have endured undecayed for centuries, when driven deeply below the surface of water; all confirm the belief of Pasteur and Tyndall and prove that the exclusion of germs prevents putrefaction. The writer made no attempt to draw the dividing line between the decomposing action of germs and the action of oxidation. It was sufficient to submit that all influences which either destroy or exclude germs, will prevent decay only so long as these influences endure; but that permanent effects must not be expected from agents which are not themselves permanent and abiding.

The Germ theory then becomes a salutary test in choosing antiseptics for the treatment of timber. Such treatment is of little value unless its effects will endure for long periods. Reliance must not be placed upon those germicides, however potent, which will readily volatilize or dissolve in water. The substances, to be employed, should by preference be antiseptics in a double sense; they should be both germicides and germ excluders. From all research and experience, it would appear that the best antiseptics for timber are to be found among oils and bitumens, preference being given to those that contain germicides. Of all processes, looking toward the preservation of timber, the one, called Creosoting, has unquestiona-

bly given the best results and it has practically forced all its rivals into obscurity by a species of "survival of the fittest." As the name of the process implies, creosote is the preserving agent and is obtained by distilling coal tar. But first let us see what the term "creosote" implies. This is important, seeing that it does *not* imply any compound of fixed chemical composition. It is in fact a composite liquid, made up of a variety of chemical bodies in differing proportions; the quality depending first, upon the kind of coal from which the tar is obtained, second upon the details of the distillation and treatment. Broadly speaking, it is that portion of the distillate which comes over when the temperature is three hundred degrees Fahrenheit. It may be taken that about one-third the bulk of coal tar consists of creosote, or as it is commonly called "dead oil." It contains, first germicides in the shape of carbolic and cresylic acids, second germ excluders in the shape of certain bituminous bodies which solidify within the pores of the wood.

The method of treatment which is generally considered to be the most thorough, practical and rational is, that which involves first the subjection of the timber in close vessels, to the action of high pressure steam, for a sufficient length of time to enable the steam to penetrate all the cells of the wood and to vaporize the liquids contained therein, these being afterwards removed by a vacuum pump. After this preparatory treatment, the creosote is forced into the cells of the wood under powerful pressure, the quantity of this substance being regulated according to the use for which the timber is destined. If simply to be used for bridges or other elevated structures, the quantity of creosote required is less than for ties; if for piles exposed to the attacks of the Liredo, the largest amount which can be forced into the wood becomes necessary. A railroad tie, skilfully and conscientiously treated with creosote, will endure, undecayed, until it is actually destroyed by the mechanical action of the rail, a period varying from twelve to twenty-four years.

In many localities, the cost of timber is still so low as to preclude any treatment of this kind, but there are many others in which its cost has already increased beyond that point where creosoting may be profitably employed. The area of such localities is continually increasing, hence, no prophet is required to foresee that in the near future the adoption of some preservative process for timber will become imperative.

W. O. E.

A MEMORY EXERCISE.

OF all the faculties of the mind none are so useful, so potent, and so much neglected as the memory. It is probably due to the recognition of this truth that the course in English is made to include a large number of memory exercises. The results have been highly satisfactory and reflect credit upon both students and Professors. But this must certainly depend upon whether the exercise is written at four P. M. or three A. M., for only the supposition that the writer was in bed with his boots on could possibly account for the following poetic but hardly truthful rendering of the beautiful story of Donatello's statue

of St. George, given as a memory exercise to the senior class recently, and which was subsequently unearthed from the Professor's waste basket.

"The statue was standing in the artist's studio, finished at last. It was the statue of a dog and the masterpiece of Donttellwho. All Florence talked about it. Everyone went into raptures over it. The poets wrote doggerel about it and the question which, each day, was on everybody's lips, instead of being ; "Have you seen the W T I?" or ; "What sized hat do you wear this morning?" was: "Have you seen the dorg?" It was indeed a masterpiece, and well had the artist represented an animal tired out by the chase, his tongue lolling from his mouth, his head and tail drooping, showing in every way evidences of extreme fatigue. Even Lorenzo de Jones, the mayor of Florence, came along and said: "Pretty doggy!"

But there was one youth in Florence who was "up on dogs," and for his criticism did Donttellwho anxiously wait. He came. Long did he gaze at the masterpiece. Finally he ventured the remark, "Something wanting!"

"Oh! tell me what is needed?" Donttellwho cried. "It is perhaps a collar or a horse blanket. Oh! illustrious youth tell me wherefore this thusness?" But even before he could yell pickpocket and thus detain him, the noble youth had gone aboard a horse car on the Appius Joe Billius, and had hied away to Rome.

Years passed away. It's a kind of way years have. The boy had developed into the great man, Mike Angelo. He was a marble worker. He dealt with the pure stuff, and, after painting many towns red,— carmining many municipalities, so to speak—he again came back to his native heath. As he approaches the city, he sees the broad and massive tower of the Worcestius Technologicus Instituticus gleaming in the distance, and even while contemplating it and musing on the uncertainty of life among the Technologites, he receives a summons to the bedside of Donttellwho. Death comes to every man sooner or later, even though he be a constant user of Lydia Pinkham's Vegetable Compound, Sarpisostical Blood Purifier, or Indian Hair Restorer, and Donttellwho, though bald, was no exception. Mike hastened to his bedside. "I've got 'em again," moaned the dying sculptor. "Why this is madness," said Micky. "This is thrice within a month." "Yes, I know it," replied "Donty," "and it is the last." I have had 'em once too many times. (Take away yonder boa constrictor from before mine eyes.) But Mike, I could not die without seeing you again and asking you one question. Will you swear to answer me?" "I am a Quaker so I will affirm, me most illustrious liege," replied Mike, "so go ahead." "Then tell me," said Donty, raising himself on his elbow, "tell me what is the matter with my dorg. There is the drooping head, the lolling tongue, everything indicative of fatigue; everything seemingly perfect, tell me what is yet lacking in him, what does he need to make him perfection? Tell me I pray you?"

And the glad golden sunlight streaming in through the skylight lit up the noble face of Mike Angelo as he leaned over the old man, placed his hand under his

pillow, raised him in bed, and whispered in his ear the two words, "His pants." It is needless to say that the old man immediately expired, while Micky going out and gazing at the statue placed in the adjoining fields to scare crows, is said to have been so moved by the resemblance to real life that he involuntarily cried, "Hi there! sic'em."

Scientific Notes.

Instruments for measuring time have been constructed so that $\frac{1}{500000}$ of a second can be easily and accurately read.

According to W. Schinkewitsch a new genus of fleas, the *Vermipsylla Alakurt*, has been discovered. Heaven deliver us.

Cornell has a tangent galvanometer capable of accurately measuring currents of a strength varying from $\frac{1}{1000}$ to 250 amperes.

P. G. Taik's excellent works on Heat and Light are now joined by a third entitled "The Properties of Matter." The series is to be completed by works on Dynamics, Sound and Electricity.

A. S. Packard, in the *American Naturalist*, states that the larva of a certain ant is eaten by the Otomite Indians of Mexico, and that a caterpillar, about two inches long and feeding upon the century plant, is eaten either cooked or raw.

Two English scientists have recently undertaken to trace the connection between cyclonic and magnetic storms at the Kew observatory. "Out of thirty storms, in twenty-three cases there was a distinct magnetic disturbance for the most part preceding the storm by somewhat more than a day."

In a recent meeting of the Society of Psychical Research, Prof. Balfour F. Stewart says: "To my mind the evidence already adduced is such as to render highly probable the occasional presence among us of something we may call thought transference or more generally *telepathy;* but it is surely our duty as a society to continue to accumulate evidence until the existence of such a power cannot be controverted."

A celebrated naturalist gives his opinion that fish air bladders are a degenerated organ having been used by primordial fish as lungs in their frequent excursions upon land; but as the struggle for existence increased on land those fishes of a land wandering turn of mind were killed off thus leaving fewer progeny till gradually that organ degenerated to its present state. His views are further strengthened by the fact that in the young this bladder is connected with the esophagus by two rudimentary ducts.

Messrs. Defries of England have recently introduced a lamp of a superior order. Its chief claims to our good will, are freedom from danger of explosion, absence of the disagreeable odor emitted in burning, and uniformity of illumination, i. e. the flame does not diminish in power on burning some time. Two sizes are made, the largest having a maximum illuminating power of 61.3 candles, the smaller of 42.4. Sir Frederick Able is quoted as saying: "The lamp has all the features which exhaust-

ive scientific enquiry have proved necessary for the perfectly safe use of mineral oils."

One of the latest departures in photography is the composite photograph. A photograph of this kind is formed by combining several of a type into one and thus getting the average of all. It is done in the following manner: The photographs of different sizes are reduced to a common size. They are then mounted upon a block, one on top of another in such a manner that the prominent parts nearly coincide. After this the different photographs are successively exposed to the camera for equal times, and since the change of the sensitive plate upon exposure is purely chemical, the order of exposure is entirely independent and every feature in the composite is the sum of all the corresponding features in the different photographs. Those lines that are common to most are thus brought out more strongly while any line peculiar to one will be neutralized. The result is highly interesting. By taking a composite of some fifty of a class, one will thus get a picture which resembles more truly the typical one than any single one selected for that purpose.

The following, written by Prof. Fowler of London, was read by Pres. Gillman at a dinner given to Sir William Thompson. Sir William Thompson, it will be remembered, delivered a course of 20 lectures on the Dynamics of a Particle at Baltimore last fall. Prof. Kimball of this school attended. The 21 coefficients, spoken of below, were the 21 physicists in attendance, of whom Prof. Kimball was one.

The Lament of the twenty-one Coefficients in Parting from each other and from their much esteemed Molecule.

An aeolotropic molecule was looking at the view,
Surrounded by his coefficients twenty-one or two.
And wondering whether he could make a sky of azure blue,
With platitatic *a b c* and thlipsinomic Q.

They look like sand upon the shore with waves upon the sea,
But the waves were all too willful and determined to be free,
And in spite of *n*'s regidity they never could agree,
In becoming quite subservient to the thlipsinomic P.

The *web* like coefficients and a loaded molecule
With a noble wiggler at their head worked hard as Haughton's mule,
But the waves all laughed and said a wiggler thinking he could rule
A wave was nothing but a side long normal fool.

So the coefficients sighed and gave a last tangential skew,
And *a* shook hands with *b* and *c* and S and T and U.
And with a tear they parted but they said they would be true
To their much beloved wiggler and to the thlipsinomic Q.

Signed (g. f.) a cross coefficient now annulled.

In Sweden a divorce may be obtained by a wife from her husband if she can prove he is an inebriate or that he has been convicted twice of drunkenness. A clergyman finding either a wife or husband in his parish an inebriate may have them separated for a year or longer if necessary and if this is not sufficient the king will decree a divorce upon application. Also if a man becomes drunk in a public house and then goes out the landlord is responsible for all damages done by him.

Amateur photographers will hear with pleasure that a tricycle has now been devised so that it affords means for supporting a camera or when the latter is not in use, room to store it and other apparatus required.

The following contract work is now being built in the shop :—

One passenger elevator for the People's Bank. This has a $500 mahogany car and the whole work is to be of the very best construction and will cost about $2500.

Another passenger elevator of about the same capacity for Pratt's new building on Main Street. Although each of the elevators required the drilling of some forty feet of solid rock the contracts were awarded Mr. Higgins in preference to all other builders.

Also one hydraulic lift 14½ in. plunger for the Penn. Lead Co., Pittsburg, ordered by F. C. Blake '76.

Another hydraulic lift for the Union Match Co., Wilmington, Del.

Seventy-five patent Adjustable Drawing Tables for a Philadelphia institution.

Two patent hydraulic valves for the State House, Boston. These are 6 in. in diameter, the largest ever made in the shop.

The above orders with an unusual amount of special machinery already ordered will insure plenty of business and a wide variety of practice in the shop for some time.

Total number of students practicing in the shop is seventy-seven. The number is increasing from year to year as the accommodations are enlarged.

The total number receiving practice this year will be about one hundred and ten.

The 15 in. Hendey Shaper now being constructed from the drawings made by the class last term proves to be one of the finest pieces of machinery ever turned out of this shop.

A variety of new and excellent machines will immediately follow the construction of the shaper.

Personals.

Pierpont, '86, passed the summer in Germany.

'84. Mr. C. B. Albree is employed on Harper's Weekly.

Aldrich, '85, and Webber, '85, have been in town for the past week.

Southgate, '85, is with Prentice Bros., Worcester.

Woods & Greene of '85, are with the Deane Steam Pump Co. of Holyoke, Mass.

Mr. Sanderson, '85, is with the Thompson-Houston Electric Light Co., Lynn, Mass.

'87 regrets the loss of Sewall who did not return to occupy his position at the head of his class.

It is understood that McAuther, '86, expects to return in Feb. and graduate with '87. '86 mourns her loss.

Prof. Kimball has been engaged to deliver the lecture in Physics at Mt. Holyoke Seminary this winter.

Brooks, '84, is assistant engineer in the Washburn Flour Mills, Minneapolis, Minn., the largest flour mills in America.

Emory, '85, who was one of the first six in his class, is at the Inst. for another year as a "special," taking chemistry with Dr. Kinnicut.

Mr. Stone, '84, who was Dr. Kinnicut's assistant in the laboratory last year, has accepted a position as chemist in the Alkaline works, Wyoming.

Prof. Alden was elected a member of the American Association for the Ad-

vancement of Science, at a meeting in session at Ann Arbor, Mich., early in September.

'85. E. W. Ela is connected with an Electric Lighting Co., in Hartford, Conn., and is now engaged in putting in a circuit of over one hundred incandescent lamps in Whitcomb's envelope factory.

'84. Willard Fuller was married Sept. 2, in this city, to Miss A. C. Souther. Mr. Fuller is chemist of the Union Rolling Mill in Cleveland, O., to which city the happy couple carry the best wishes of many friends.

Mr. Ralph Woodward, '85, enjoyed last summer a two weeks yachting trip, visiting Bar Harbour and other ports on the Maine coast. The remainder of the season was passed in making the tennis rackets which have justly become so popular among our tennis players.

Fred E. Butterfield died in Clinton, Sept 3. He was a graduate of the Class of '77, and when last heard from was Superintendent of the Gould's Manufacturing Company, Seneca Falls, N. Y. The funeral was held at Indian Orchard, and was attended by many of his classmates, some of whom came a long way to testify to their regard for the friend whose happy disposition and active energy had added so much to make their school life memorable.

News was received here, Aug. 17, of the death of Chas. H. Foster of this city, while on his way to Lima, Peru. Mr. Foster entered the school from Westboro; his mother, a widow, afterward moving to this city. He graduated in 1882, and after graduation was employed as draughtsman at the Cleveland machine works. Quite recently he was engaged by the Thomson-Houston International Electric Lighting Company to go to Lima to put in an electric light plant there. He sailed on the 20th of July, and could hardly more than have arrived there when he died. The news of his death came to his firm by cable, without particulars. He is said by those who knew him to be a capable, upright and promising young man, and his death is a matter of profound sorrow to a circle of near friends, while its melancholy circumstances will increase and extend the regrets of all.

Communications.

"IS IT ADVANCEMENT?"

"Of course you make yourselves familiar with other processes of manufacture beside those in your own particular line." This remark was addressed to the writer in the course of a conversation relating to the Institute by a business man whom he met last summer. What could I answer? "No, we are not permitted to enter the shop or to use any tool of the wood-room. It is positively forbiden."

How the force of this rule dawned upon me as I beheld the face of my hearer, then his words, "Is that for the promotion of industrial science? I would give more for an observing than for a knowing man." There is force in this estimate of the rule in question, coming as it did from a man who has paved his own way to success, and the writer asks the same question. Is this exclusion for the advancement of industrial science?

How many times have we heard practical men say that a good civil engineer ought to be acquainted with machinery, or be a machinist; but how few can tell how the speed of a lathe is increased by the use of the back gears? And would not the liberty of seeing machines at work tend toward the increase of our knowledge in this direction? Would it not be for advancement if he learned how a tape could be mended so that he could do it himself?

We certainly fail to see the inconven-

ience resulting to anybody! Again, while passing through the shop recently we saw a twist drill in course of construction upon one of the machines, and are told it is the universal Milling Machine spoken of in the catalogue, and this is our first acquaintance with the monster. We are investigating the motions of the machine when we are told that the shop is no place for us. But has not the process of making a twist drill been unfolded to us in that moment?

The experience of a former student occurs to us in this connection. He was an ingenious fellow and one who stood high in his classes. How was his inventive mind cultivated? Was it by the W. M. S.? Oh, No! It was by a collection of tools brought from home and stored in his commodious trunk, and many were the inventions and electrical appliances which had their origin in this room used as a workshop. But all of us are not permitted to use our study rooms as workshops.

We are told of a "civil" who wished to plane one edge of his ruler; of another who wished to make a telephone box; but both were refused the privilege although they had had access to and used wood-working machinery all their lives. Again, a Senior "civil" wished to make a box for his batteries; the wood-room was empty; but the rule was there. "No work can be done now by civil or mechanic," and therefore plans for galvanometers and resistance boxes float away into oblivion. Must we house our transit from the gaze of the "mechanic?" Would the use of a tape for a few moments be refused us? We hate to believe it. And again, why should we be infused by one professor and refused by the next?

It is in order to state objections to all rules, and to ask a reply to any objection respectfully urged. Would not a permit to employ our leisure hours in personal work put us more nearly on a level with sister institutions in this respect, and help us toward advancement in Industrial Science? A CIVIL.

We welcome to our columns any communication, intended, as is the above, to express in an independent manly fashion a dissent from the methods of the Faculty in matters of importance to the interests of the school, believing, that in the effort to remove misapprehension and thus to cement cordial relations between us, we shall be met, as in this case, with a patient consideration of the subject in question from our own point of view and with a disposition to concede to us, as students, all that the resources of the Institute will allow by way of preparation for any work incidental to our training.

The argument on the other side of the question may be stated as follows: The Washburn Machine Shop was founded by a large hearted unselfish man who had paved his own way to success. He thought the endowment sufficient to enable the shop to receive from eight to twenty students. For seventeen years it has received more than five times the largest number and this year the total number accommodated will exceed one hundred and ten. Nevertheless, the endowment has never been increased. The capacity of the shop in its equipment and working force is taxed to the utmost, five days in the week, by the regular students in Mechanics and it would be impossible to extend the advantages of the shop to students in other departments, by any regular provision, with its present facilities.

Of course there are hours and days when an outsider can see how he could slip in and use machines and tools to his personal advantage, but such permission experience has shown, would not advance the interests of the larger number, and some, doubtless, would be gratified to their own hurt.

Most of the students of the Institute have all they can do well in their own specialty, and it is the regular round of duty which gives value to a training, a fact appreciated later in life of which instructors must often avail themselves against the present wishes of their pupils.

Again, rules enforced to confine the use of the shop to special students who elect this department are not only necessary for the "Advancement of Science" but also for the organization and preservation of the shop itself. It requires "eternal vigilance" to keep a machine shop up to the standard and practice of the times, and nothing will go downward faster than a shop used as common property by those who may drop in to "observe," question and do the personal work of an amateur. If our students were permitted to follow such a course it would *not* tend to put us on a level with sister institutions except such as are, in their methods and management, much inferior to our own already.

No one thing has more largely contributed to the repeated failures which have marked the introduction of the element of practice as a part of intellectual training than the laxity which seems so desirable to our correspondent.

All rules, rightly enforced, are "means of advancement" which make the school shop a real shop. It is not a museum, or even a laboratory, but a manufactory, real in its organization, system method, mechanical tools and processes. It differs from ordinary manufactories in one particular only, its object. The one manufactures to make money, the other to make students acquainted with approved methods and practice and expert in them.

MR. EDITOR:—

The present Middle class is the first to which the study of French in place of German during its present year, has not been optional. This is in accordance with a plan the first move of which was the requirement of French at entrance examinations, and which first went into effect at the entrance of this same class.

I have heard opinions from undergraduates, against this plan, but do not think with them.

Conversing not long since with a graduate, I found grounds for my belief in the change. The man in question took the German course through both years, and since his graduation has been at one of the chief manufacturing establishments in New York City, where as elsewhere out of New England he was brought in contact with many more Germans than French.

Having charge, in part, of the hiring of help, he was continually applied to for work by newly-arrived Germans who could speak no English, and it was in conversing with them in order to ascertain their ability, that his knowledge of German was tested.

As a matter of fact it was over-tested, and he often was at a loss to make himself understood or to himself understand.

Hence the point he wished to make and which seems right to me to try and emphasize, is that rather than give time to French, more if possible, should be given to German, and especially to conversation.

Fluency comes only after long practice, but a good beginning could be made, if in addition to the reading which is well enough in its way and helps in a general education, a course in conversation should be supplemented, as thorough as possible and confined to practical topics.

This savors of the hard-pan "practical" so hated by many and oftentimes so justly, yet ours is a school combining theory and practice, and it seems to me the practice in this direction is overlooked.

Let me hear from some one who has thought about it. MIDDLER.

We are sorry that space forbids us to publish the following interesting contributions:

The Tech's secret; or, last in his class.

On the right path; or, searching for H.

Out on the fly; or, the unexcused mark.

Tightening the brake, or, biting the dust.

The lawn tennis racket; or, the buzz planer's revenge.

Told in the twilight; or, reminiscences of a Falculty meeting.

From pillar to post; or, the wandering goat.

The woman in white; or, shadows of evening.

Called back; or, no whistling in the halls.

Sick unto death; or, the Prof.'s excuse book.

Sent to Chicago; or, the Tech's last game.

Twelve nights in a bar room; or, from Tech to Tech.

The china dog; or, Belgium and the police force.

What the moon saw; or, a night on the Jo Bill road.

The cruise of the morning star; or, from lamp-post to sidewalk.

From jest to earnest; or, tutoring in the summer.

The heart bowed down; or, left at the election.

For her dear sake; or, ice cream and oysters.

Near to nature's heart; or, seeing Nelly home.

All's well that ends well; or, from chisel to glue-pot.

Measure for measure; or, the examination reports.

OUR DUDE.

A BIG white hat, with a hole in the side,
A checkered cravat so carefully tied,
A giddy shirt-front, cuffs and collar to match;
The collar so notched, oft his "apple" does catch;
A suit whose color is, at least, not subdued:
This, in the summer, is the "Technical Dude."

He seldom recites; can his voice be so weak?
Or why of his lessons, does he dislike to speak?
Yet meet him outside and he with a smile
Yells at you "Hello" so you'd hear him a mile.
"How are you?" comes next,—his voice weakens not;
If you ask him a question, without waiting comes "What?"

This thing is the reason the small boy rude
Sings "O, I'm a dude, I'm a dude, a dude."
This makes the dude swear as nothing else will,
And he wishes some one else would the "kid's" blood spill;
But he smothers his wrath up under his hat,
And meeting a friend proceeds to a chat.

If on telling his wrongs he is told he *is* tough
He thinks its "too bad" and "awfully rough."
Never mind, dear boy, he is having his day,
He'll shortly get wilted; they'll lay him away.
And the dude of the future, beside whom he's crude,
Will read on his tombstone if his learning is good:—

"Poor Technical Dude,
Here he lies,
No one laughs
And no one cries;
Where he's gone
And how he fares,
No one knows
And no one cares."

Technicalities.

Back again.

Put back the tennis balls.

Fall Field-Sports will be held Saturday, Oct. 3.

Have you paid your tuition (?) for the paper?

It is rumored that the orchestra will furnish the music for field-day.

There is but one designer in the school, Mr. Krichner of the Middle class.

The Middle class have adopted wine and lavender as the class colors.

The Middle class are to take mineralogy the first half this year in order to help them in Qualitative work.

A bar in the river and a bar on shore have the same name because water is scarce in both places.

A new spring emery-grinder with 18-inch wheels has been placed in position in the shop.

The '85 class tree is dead but we understand that our patron saint, John Hurley, says: "He will set 'em up agin."

During vacation the laboratory has had its share of improvements. A new water bath and ventilator having been put in.

During the summer the woodwork of the corridors and recitation rooms received a coat of paint, and is much improved thereby.

It is reported that the grapes in the neighborhood of the shop belong to the Faculty. They have our sympathy over the failure of the crop.

It has been decided that the Senior Class, Mechanics, are to construct a Hendee Shaper, the castings of which are already in the shop.

One of the Middle chemists was seen carrying a bunch of bananas into the laboratory one afternoon. Probably they were to be analyzed.

Prayer meetings in the Institute office have been resumed. They are held under direction of the Society for the Promotion of Religious Interest. All students are invited.

The summer school in wood-working at the W. M. Shop continued four weeks, and was attended by sixty boys. They were divided into two classes, whose hours of practice alternated in the usual way.

Twenty-six new members joined the '88 Apprentice class, making a Junior class of fifty men. The other classes contain,—Senior thirty-five, and Middle thirty-six, making a membership for the school of one hundred and twenty-one students.

The Boston Tech. admits each year two hundred and fifty or more students, and the average number of graduates during its thirteen years is 21.4. As a comparison, our own school has, during the fifteen years of its existence, graduated an average number of 21.7.

A handsome set of chairs from P. Derby & Co. of Gardner, has been placed in the office of the Institute, and the recitation rooms are to be furnished with, in all, two hundred chairs from Heywood Brothers of Gardner. These last are at the shop, being fitted with a leaf attachment.

The melancholy days have come,
The saddest of the year;
When seniors all, both great and small,
Take up the festive gear-
Ing with Professor Little.

Scene.—Recitation room, W. T. I.

Time.—Election of class officers by '8—.

Pres. "Nominations are now in order."

Student. "I nominate Mr. Modest."

Mr. M.—(popping up.) "I nominate Mr. Q——, I myself must decline."

Pres.—"Mr. Modest declines."

Mr. M.—(again rising.) "I —er, I don't say positively I won't accept the office, but I don't wish it. If —er, if the class *want* me, why —er, of course 'll —er *have to*."

Senior class officers: Pres., A. A. Gordon; V.-Pres., A. B. Fairbanks; Sec. and Treas., A. T. Rogers.

Middle class officers: Pres., W. N. Weston; V.-Pres, J. O. Phelan; Sec. and Treas., H. H. Allen.

Junior class officers: Pres, Lee Russell; V.-Fres., C. L. Griffin; Sec. and Treas., F. W. Spiers.

Following are the officers of the A. A., elected Sept. 11, for the fall of '85: Pres., A. A. Gordon, '86; V.-Pres., W. N. Weston, '87; Sec, W. W. Bird, '87; Treas., C. W. Chadwick, '88.

TENNIS.

It is very encouraging to those interested in tennis to notice the way in which the tournament is being conducted this year. We feel that the game is fast becoming one of the firm institutions of the school.

The interest in the tournament has been much increased by the gift of a valuable cup, which Mr. Landsing, '87, has presented to the Tennis Association. It is to be held by the Association as a permanent possession to be competed for at each tournament. The cup, and platter which goes with it, are of pure beaten silver of Turkish design and both are of fine workmanship; this gift of Mr. Landsing is highly appreciated and will undoubtedly give the cause of tennis a great impetus in the school.

BICYCLES.

Columbia bicycles seem to be the most popular among Tech riders, seven of this variety being owned by them. The Victor has two riders and the Rudge two.

It is said that a certain '86 man is ambitious to join the Bicycle Club, and has selected for his thesis subject: The Sapidity of West Street Dust, as obtained by Precipitation from a Bicycle without a Brake.

The Worcester Technical Institute Bicycle Club was organized Sept. 14, with a membership of 12, which includes every active wheelman in the school. The officers are as follows: President, Wm. H. Morehouse; Vice-President, C. W. Chadwick; Secretary and Treasurer, John C. Knight; Captain, Fred. W. Speirs; Lieutenant, Walter N. Weston. Club runs are held nearly every Saturday afternoon. Club races will be run under rules of the League of American Wheelmen. This organization, to which several of our riders belong, has a membership of over 7000, and is the highest authority on bicycle matters in the United States. "SPOKES."

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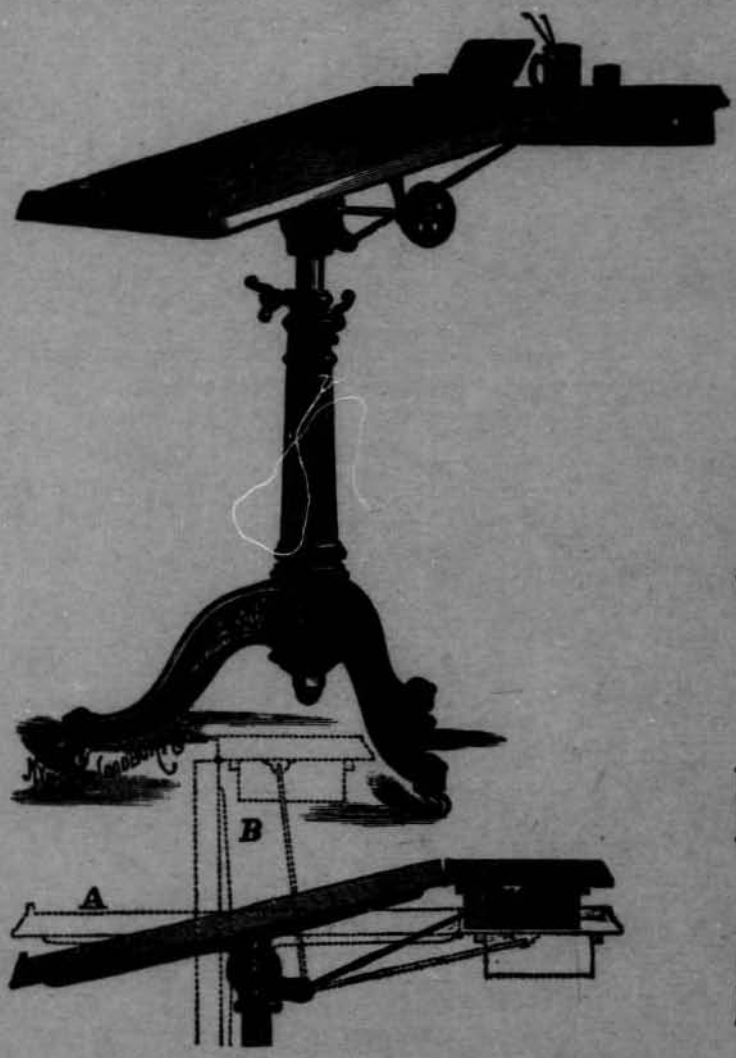

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