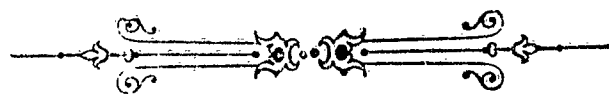
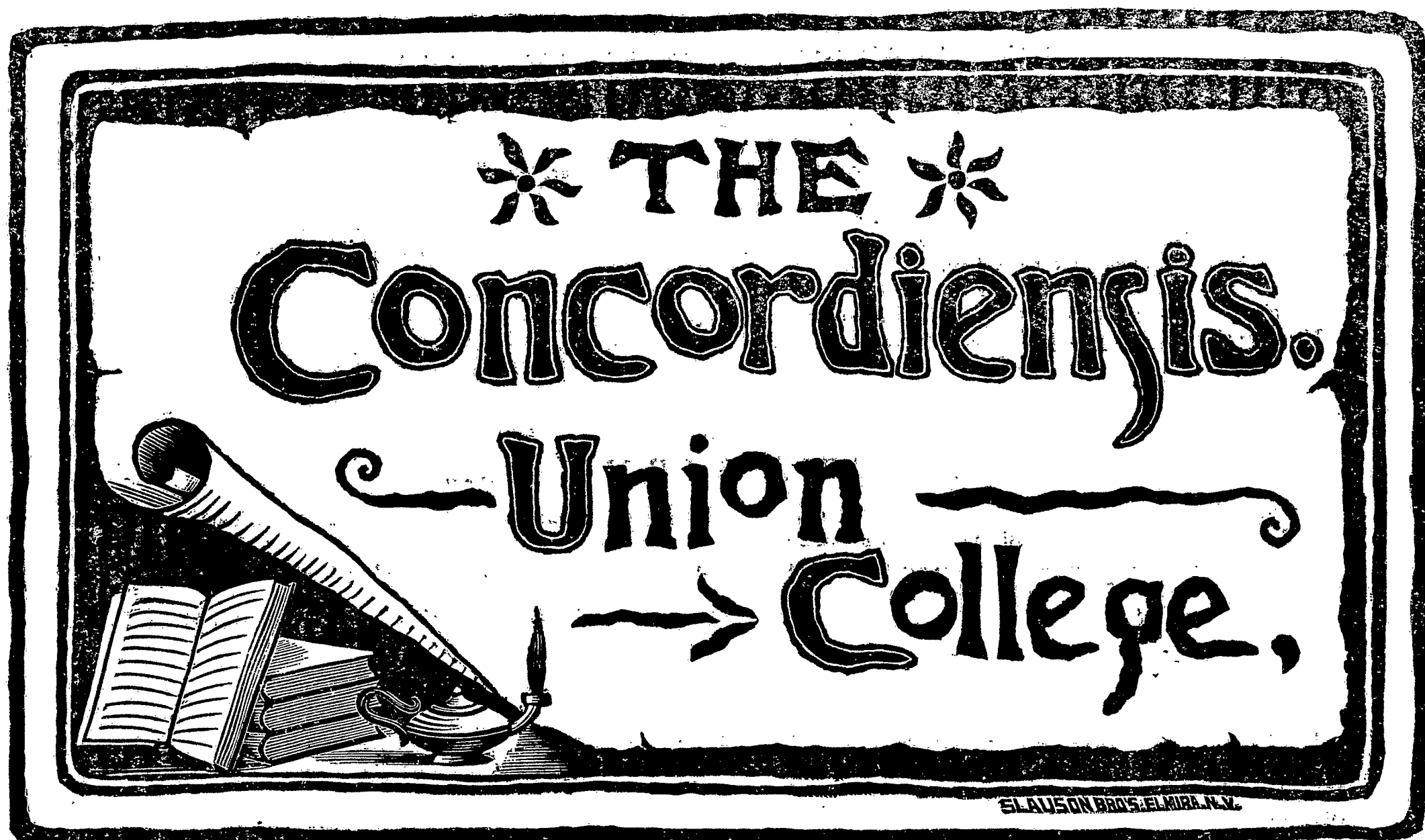


Volume XII.



Number 2.

NOVEMBER, 1888.



SCHENECTADY, N. Y.



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THE CONCORDIENSIS.

VOL. XII.

UNION COLLEGE, NOVEMBER, 1888.

No. 2.

LITERARY.

Idealism Versus Realism.

This may rightly be called an age of realism, or if you please, of excessive realism, for realism is of two kinds, which, for want of better terms, we will designate as positive and negative.

Negative Realism is optimistic, it is the idealism of literature; it deals with the veriest villain, the noblest hero, and the most devout saint. It believes in virtue, and has its Desdemona, in friendship and has it Horatio. Truth, honour, bravery, patriotism and love are not to it vain words, symbols of abstract ideas, which exist nowhere but in the imagination. Man, created in the image of his Maker, has not yet descended so low as to assume the character of his Destroyer. This is the realism of Shakespeare, who by the side of cruel, tyrannical and murderous Macbeth, portrays the noble-hearted Macduff; of Shakespeare who atones for the faithless and unnatural daughters, Goneril and Regan, by the true, filial love of Cordelia. It is the realism of Shakespeare who surveys with incomparable genius the whole human race; who penetrates as never man has done before, the innermost secrets of the human soul, and who then in a paroxysm of admiration and wonder, is compelled to exclaim, "What a piece of work is man! How noble in reason! How infinite in faculty! In form and moving how express and admirable! In action how like an angel! In apprehension how like a God! The beauty of the world, the paragon of animals!" This too is the realism of Scott, Eliot, Dickens, Thackeray, the realism of poetry, the realism of all fiction that tends to lift a man above himself, the fiction that portrays to a man's mind, virtue purer than his own, yea, and guilt deeper than his own. It sees the true as well as the false,

and above it all, above and beyond the weaknesses and the mistakes of our frail humanity, it beholds the Author of all, omnipotent perfection. This I have defined as negative realism, because it does not so much picture man as he is, as what he might and can be. I believe it to be the true *idealism* of literature, as compared with the abnormal and unnatural character painting of the so-called light novel of the day, and the dregs of filthiness and vice served us by the modern French school. It is especially this latter class of fiction which I have included under the head of positive or excessive *realism*, the evil influence of which can scarcely be estimated. It searches the dens of immorality and vice, it throngs divorce courts and brothels, it revels in anarchy and crime, in short whatever is base, degrading, and animal it paints, and holds the product before the eyes of the rising generation, exclaiming, *Behold humanity!* The world in which you are living is treacherous, immoral, steeped in crime and sin. You must adopt its methods, and assume its garb if you would be happy, if you would exist. Yes, this is the realism that would make misanthropes and pessimists of us all, the realism that would deny to man the possibility of spiritual development, that would keep us forever upon the level of the brutes, nay, it would go still farther than this, it would deny the providence of God and the personality of man. Between these two great schools there are a thousand and one minor ones, prolific of ephemeral productions, which deal with abnormal growth, some of them good in themselves, but which do no harm as they only receive their just reward, the attention of a passing moment. Yet after all, is it not true, that this world is, for the most part, one of ideals? What is it that holds society together, that keeps this toiling, seething mass which we call

humanity, within proper bounds? What is it, I ask, that urges the laborer to his daily task, that prompts him to toil on and on until his hair is white, and his form is bent 'neath the weight of accumulated years? What that inspires the student and the philosopher to delve after truth; what, but that goal, that mirage which we call an *Ideal*? That fleeting shadow of an ideal which we can never grasp, but which recedes as we approach, until at the latter end of our journey, we either see it shining afar off, brighter than ever, in the spirit world, or quenched by the death damp of the tomb. Youth builds its air castles, and the child is father to the man, frequently, very frequently, our ideals are wrecked on the shores of stern reality, sometimes overcome with disappointment we drop out of the race, and suffer ourselves to sink into the sloughs of vice and crime. More frequently we aim for another goal, again to be disappointed, again to press on. Has not character too its ideals, as well as human activity? The devout Buddhist quenches the fountains of true happiness, afflicts himself, mutilates himself—for what? Following the teachings of Gotama, he sees in the far off future what is to him the ideal of every soul, utter annihilation. The Christian sees the perfect man in Jesus. He beholds his infinite patience while toiling up the slope of Calvary amid the revilings of his enemies. He beholds him, climbing that rugged height 'neath the weight of the cross, which was to be the instrument of his death. No wonder the world loves to linger upon that scene, that expression of love, or devotion unbounded and infinite. In the life and character of the founder of the Christian religion the most pronounced atheists recognize the perfection of human character. It is to our everlasting disgrace to cry, "this is too high, I cannot attain unto it," it is our high prerogative at least to attempt the task. What then is, or should be, the true function of fiction, to saturate us with the filth of the world, and then leave us to find our own means of escape, or that higher, nobler duty, to lead us to the formation of pure and true ideals, to warn us from the bad, and to point us toward the good, to prepare us little by little for that great awakening, when we shall find the realization of our ideals in the realities of God.

II.

A Summer's Trip.

Mr. Editor:

You ask for a description of our summer's tour. The request is too broad. Our bare itinerary, covering the chief points of interests in ten different countries, would quite fill the space at my disposal. But the stock sights really constitute a small part of the enjoyments of such a trip. The ridiculous, peculiar, vexatious, experiences, the impressions received, the glimpses of custom and character, these are the things which make one feel that it pays to travel and of which one must needs write to his friends: "Wait till I reach home and I'll tell you all about it." However, we will compress and cull and give you the result.

Our party consisted of four Union men, of the classes of '82, '86, '88 and '89. Seven is a perfect number; so is four; if you go abroad, go with three others. Cook and Tourgie, it is true, say forty, but they are prejudiced; in their hearts they say four. Four means one stateroom, one cab, one compartment in a railway carriage, two rooms at a hotel, two couples for a ramble.

Again, if you go abroad, leave your trunks on shipboard. It's discouraging to pay three florins for your ticket and four for your trunk; it's vexatious to see that ogre of a custom house officer poke and probe and tear and pull, turning your baggage topsy-turvy and back again looking for things you wouldn't have if you could and couldn't if you would. Yes, leave your trunks behind you; it will save money, time and patience, the last two of which are worth more than cigars, diamonds and silks. Wear stout shoes, a suit that will not easily soil, a flannel shirt and a soft hat. Carry a light overcoat and an umbrella. The few extras can be easily packed into a small satchel. A black suit is not necessary. One can appear at table d'hôte in flannel without bringing disgrace upon the stars and stripes. Foreigners always say: "They're English, you know."

Sunday July 22nd, we steam up the Schelde past forts and along ramparts which, it is estimated, would enable Antwerp to withstand a year's siege against an army two hundred thousand strong. At noon, our wee, ideal ship-board world disintegrates. A small army of

porters, cabmen, hotel clerks and commissionaires talking German, Dutch, French and English, charge the docks and demand unconditional surrender. Those with trunks capitulate. We who have none escape and in an hour are seated comfortably in our rooms listening to, perhaps, the sweetest chimes in Europe. What an altogether delightful experience is this landing in the Old World! All that is novel, beautiful, instructive, is yours. History, sculpture, painting and poetry offer you their treasures. We feel as Lot must have when shown the whole land and told to take his choice. Or as one who sits down to a banquet so laden with good things that he must ask himself not what dainties shall I choose? but rather, what must I omit? The cathedral is nearly opposite the hotel. It isn't a very fine one. We wouldn't look at it toward the close of our journey, but it will do to start with. Besides it contains two real treasures, "Ruben's Elevation of the Cross," and the "Descent from the Cross." It is perhaps unfortunate for one who desires to understand the great painter to begin with these masterpieces. A historical study of his productions would be much more interesting. To pass from this beautiful expression of a beautiful thought, "The Descent from the Cross," to the colossal, contorted, sensual nuditities with which the artist has seen fit to cover his canvasses now scattered through European galleries, can but be disappointing. We would not depreciate the genius of Rubens; it was of the first order. But we do maintain that he made a great mistake in placing fat Mrs. Rubens in a thousand of his paintings, as a type of feminine beauty.

Antwerp is unique. Houses are out of the perpendicular, horses pass on the wrong side. We say wrong side. The question is, which is the right side. In many European countries, carriages pass to the left. Is John Bull or Uncle Sam right? John ought to know; he's been driving longer. But then right here, the principle of personal liberty asserts itself. Uncle Sam may turn to the right if he so desires. Travel brings one to the realization of the fact that right and wrong, normal and abnormal are relative terms. In America salted butter is normal; in Belgium butter is always eaten with-

out salt. Here the country folk eat with their knives, the city folk with their forks; in many parts of Germany the city folk eat with their knives, the country folk with their forks.

Brussels is but twenty-eight miles from Antwerp and yet this short distance carries one from the seventeenth to the nineteenth century. The city is decidedly modern. It has miles of beautiful streets, acres of museums and galleries and the finest public building in Europe—the Palace of Justice. This Oriental palace—for the architecture seems Assyrian—covers more ground than St. Peter's at Rome. It is massive, beautiful, grand. The great Salle des Pas Perdus is so symmetrical, so imposing, that one instinctively exclaims, "What a place to study architecture!" And what did this magnificent pile, over whose construction harmony and taste presided, cost these Belgians? Ten millions of dollars! We think of Albany and sigh.

From Brussels to Waterloo! Is the battlefield worth visiting? No and yes. There is little to see. A great pyramid of earth two hundred feet high and a half-mile in circumference, surmounted by an enormous British lion (Mark Twain says lions never choose such places in which to pose,) the ruined chateau of Hougomont, the farm buildings of La Haye Sainte, a small museum of relics and a host of dirty ragamuffins who run behind your carriage with outstretched hand crying "Une petite merci! Une petite merci!" If these are all you find Waterloo scarce repays a visit. There are finer lions in menageries, finer chateaus on the Rhine and more persistent and consistent beggars in Italy. But if history has any meaning for you, if you can go back in thought to the 18th of June, 1815; if you can, with Lord Saltoun and Colonel Mac-Donnell, defend Hougomont against fire, sword and bullet; if you can dash into the flames with Sergt. Graham to rescue a wounded brother; if you can charge down the slope by La Haye Sainte with Picton and Uxbridge; if with Victor Hugo, you can see Milband's cuirassiers, "gigantic men on colossal horses" mount the plateau of Mount Saint Jean only to find a grave in the sunken road of Ohain, "riders and horses rolling in together pell-mell grinding each other, making common flesh in this dreadful gulf"

until the ditch is full of the living and the dead and the rest march over and pass on; if you can see Blucher come and hear Napoleon's despairing: "Tout est perdee! Sauve qui pent!" there is no place better worth visiting than Waterloo. We were told that more Americans visit the place than Englishmen, and as they ordinarily bring their pockets full of money, perhaps that accounts for the large number of beggars there. Why is it that mendicants, lackeys and knaves have been allowed to appropriate the world's best battle-fields, cathedrals, mountains and waterfalls? They weren't at Waterloo the 18th of June, 1815, that is certain.

From Brussels two routes are open to tourists, one northward through Holland, the other direct to Rhineland. No one who can spare a few days should fail to choose the former. A ride from the Hague to Scheveningen on the imperial of the horse cars, a swim in the surf and a concert in the Kursaal will alone amply repay one's trouble. One can see more in less time and for less money in Holland than in any other country. In square miles it is not great. You could place the entire kingdom in New York state north of the Mohawk river and not trespass on British territory. But in moral worth it is great. The principle that through struggle comes development is nowhere better illustrated than here. The thought "God made the sea, we made the shore," has given the Dutchman a back-bone. He's fought for fatherland and loves it, loves its dikes, its windmills, its institutions. This long continued battle with wind and wave has made him strong and energetic. And now having won the victory, he settles down contented, earnest, thrifty and religious to enjoy the hard-won fruits. Especially is this noticeable in Holland art. Broad contentment smiles at you from every gallery wall, contentment which on festive days is transformed into rollicking boisterousness. One sometimes doubts as one looks at a painting representing a kermis or dance that the artist has been true to life. A day in Rotterdam at the time of the great harvest kermis will remove all questionings. The city packed with merry-makers! Wild, reckless frivolity! Thousands of men, women and children in groups of ten, with locked arms swinging through the

streets the livelong night, singing, shouting, dancing. Collisions on all sides! Pranks innumerable. A group of masqueraders swings into a restaurant, turns things upside down and swings out again. Two groups of twenty meet in the street. Neither yields and a skirmish is the result. Each person clings tightly to his neighbor's arm and the groups finally separate and pass to new collisions and pranks. Bacchus rules supreme. In such scenes painters like Frank Hals and Jan Steen have found their character, and they have exaggerated in no degree. Indeed the characteristic of the Netherland school of art is fidelity in depicting things as they are. To test this, examine one of Ruysdael's paintings and then climb a steeple and study the landscape. There are no wide vistas, no sharp outlines—the atmosphere is too humid—but there is a soft, subdued, yet rich light which makes the scene very pleasing. There are red tile roofs, green meadows, thousands of Holstein cattle, giant windmills and great water highways fringed with long lines of willows. We seem to have seen it all before, for the dikes and windmills were in our school geographies and we have often read of them, but it is different now. The windmills are alive and their arms are longer than we thought and the light and shadow on the scene are quite other than any we have known. Altogether Holland is delightful and unique and as such the painter has grasped it.

It is said that Bismarck intends to grasp it too. His eye has long been squinting toward the Zinderzee. Germany, it is reported, refuses to recognize Wilhelmina's right to the throne unless Holland consents to enter the German Confederation. We need have no fear. Wilhelmina will wear the crown after King William's death. Dutchmen have fought too long for their rights to yield any portion of them to Deutschmen.

Mr. Editor, I have exhausted my space. I started for Naples and have reached Amsterdam, reached it without writing of a tithe of the things we saw. We will stop in Amsterdam.

A. S. WRIGHT.

—There are thirty-seven Japanese students at the University of Michigan.

Our Experience.

"I say, Quill, lets go camping for a few days!"

It was a beautiful, warm afternoon at the beginning of August. I was sitting on the broad piazza of one of the lesser known hotels among the Adirondacks. My feet were stretched out on the railing; my chair was tipped back; my novel had fallen on my knees, and I was dreamily watching the white clouds glide caressingly over the distant blue mountain peaks. I twisted slowly around in my chair as far as I could without interfering with the comfort of my position, and glanced up at the Enthusiast, who had accompanied his exclamation with a rather too vigorous slap on my shoulder.

"Go where?"

"Let's go back into the woods for four or five days," he repeated. "Dick, here, says he will take us in. He says he can find us some first-rate fishing, and there isn't a doubt of our getting a deer."

I took one foot from the railing, and turned with an inquiring glance toward the guide, who was sitting tipped back against the wall of the house, indifferently smoking his pipe. He neither noticed my glance, nor seemed inclined to speak, so I was forced to ask—

"Where can we go, Dick?"

Dick drew his pipe from his lips, and viewed it critically. "The best place I know of is Moose lake. A party of us were in there Fourth of July, and we brought out about forty pounds of trout apiece, besides having all we wanted while we were there."

"We can start Tuesday and stay a week," the Enthusiast urged. "I should like tremendously to shoot a deer, and it's getting monotonous at this old hotel, with nothing to do but row on the lake. Do you know, Dick, this morning Quill enticed me into going rowing in the sun for a little exercise, and I was nearly roasted. If you catch me taking a little exercise with him again—I'll eat my hat, that's all."

"One would think you very tender!" Then without noticing his indignation farther—"Do you really think we could get some venison, Dick?"

"Haven't got a doubt of it," answered Dick laconically, rapping out his pipe. "We saw

half a dozen beauties last time we were there."

I lifted the other leg from its comfortable perch, picked up my book from where it had fallen and faced round.

"It took the thought of venison to stir Quill up," cried the Enthusiast, noticing my increased interest. "Will you go, old fellow?"

"Why, yes," said I, hesitatingly. "I think so, if you want to."

"Shall we start Tuesday, then, Dick?" and the Enthusiast turned to the woodsman.

"Why not start to-morrow?" I broke in; for when I have made up my mind, I dislike delay.

"We can't very well go to-morrow," Dick laughed at our ardor. "The bread and other things will have to be got ready. Besides, it's against the law to shoot deer before Wednesday." * * * *

"The idea of a fellow who doesn't care to hunt or fish, going camping!" exclaimed Miss Black when I told her that evening. "Well, I think the Enthusiast will have his revenge for being parboiled."

And so it was settled.

Of course it began raining Monday night, and Tuesday dawned wet and cloudy. The prospect for our tramp was not inviting. In despair we appealed to a native weather prophet. "Wall, it 'pears to me to have sot in for a rainy spell," was our only consolation.

But in spite of prophecy, the sun broke through the clouds as the morning advanced, and at one o'clock we stood on the piazza ready to start.

I was last to appear. I drew a deep breath as I closed the door of my room. I was eager enough to go, but the comforts and conventionalities of life are very dear to me.

"You don't mean you are going to carry that book!" exclaimed the Enthusiast as I stepped out the door.

"You can't wear that broad brimmed straw hat in the woods, Quill," was Dick's dispassionate criticism. "You'll knock down all the trees."

The straw hat was surrendered, and I replaced it with a small felt; but as to the volume I was inexorable. I neither liked to hunt nor fish, and I thought to spend many pleasant hours reading under the trees. Vain hope!

We shouldered our packs and were off. I will say nothing of what we carried, lest some deluded creature should follow our example. Oh, my dear friend, unless you take many more of the necessities of life than we did, never, never go camping!

We were to cross a small lake four miles broad, and begin our tramp from the opposite side. When we reached the water, we found the strong breeze which had sprung up as the weather cleared had made it very rough, and long before we had rowed across we were wet to the skin. More unfortunate still, a tremendous wave dashed over our bread, completely saturating it! But we had made up our minds "to rough it."

"Well, I'll be hanged!" and Dick stopped short as he was dragging the boat up on the sand. "I've left our frying pan on that big rock on the other side. I forgot all about it. Pshaw!"

"Oh, it's no matter. We can get on somehow without it. Don't go back!" we protested, as we saw him begin to put the boat back into the water.

"Perhaps I hadn't better, after all; it will loose so much time," Dick retorted slowly. "It's all my blessed carelessness," he muttered. We began our tramp in single file, Dick first, with his pack on his back and repeater over his shoulder; then the Enthusiast, also heavily laden, carrying his shot gun, and I brought up the rear entirely unarmed and defenseless, loaded with our much abused bread. For the first mile we pushed right through the woods, climbing fallen logs and pressing aside the underbrush; then we took an open wood road for several miles and finally turned to follow a blazed trail. The afternoon was delightful. Thanks to our bath on the lake, it mattered nothing how wet the bushes were, and we admired without drawback the raindrops glistening on every leaf. The squirrels and birds were reveling in the warm sun after the rain, and every tree seemed alive with their happy clatter. Through the dark green of the foliage we could catch glimpses of the deep blue of the sky, intensified here and there by the pure white of a passing cloud. Once we skirted, for half a mile, the shores of a wild little lake, over whose shores a black hawk was hovering in search of food.

Beneath our feet the damp moss was a soft carpet, and its elastic spring seemed trying to aid us to the next step. Around and through all was the souging of the wind among the tree tops. My mind was full of it all. But alas, this work-a-day world! Dick had led us around a sharp turn, and I was sprawling over the first log of a corduroy road. Ugh! I moaned.

"What are you doing down there?" laughed the Enthusiast over his shoulder.

"Do you suppose I tried to get down here?" I shouted angrily; but he was already disappearing among the trees. I straightened my pack and hastened on.

We had scrambled over wet logs an interminable time, when Dick stopped, threw down his pack basket, and began to fill his pipe.

"Want a drink of water?" said he, briefly, when we had followed his example.

"Augustus Cæsar!" screamed I. "What have you stopped in this nest of mosquitoes for? They're eating us alive."

"They are rather thick, ain't they?" he agreed, handing me a cup of deliciously cool water. "Wall, the road is a trifle swampy the next two mile, and I thought we'd rest a minute before we tried it."

The Enthusiast and I sat on a log and fought mosquitoes for the next ten minutes. Dick seemed perfectly oblivious to them. We both agreed afterward there was no greater wonder than a native mountaineer's indifference to mosquitoes.

For an hour we waded knee deep in water through swamp grass and alders. But no one complained. Dick was indifferent to every thing; the Enthusiast was buoyed up by his own innate ardor; and I was trying to school myself into the proper frame of mind to call this pleasure. At last we reached firm ground again, and the walking became once more tolerable. At half-past six we reached Jessup's river. We were to spend the night here, and complete our journey to Moose lake in the morning. Our camp was a small log hut about fifteen feet square and five feet high, built for winter deer hunting. One side of the structure was formed by a huge boulder, against whose base the camp fire was built; a hole in the roof being the only

chimney. The house had a very stable appearance, but the withered moss stuffed between the timbers, and the dry hemlock brush on the floor suggested innumerable unwelcome insects.

"Dick, suppose you and I go and catch some trout for supper. You would rather stay here and rest, wouldn't you, Quill?"

"By all means; twelve miles are quite sufficient for me in one afternoon."

So Dick built a fire in our shanty to drive the gnats out, and he and the Enthusiast left me to my thoughts. After I had rested some time a brilliant idea seized me. I would cut some wood for the night's fuel. I found a number of large stumps about three feet high, where the trees had been cut for the shanty, and had just succeeded, after great exertion, in chopping down three of them when the fishermen returned.

"Won't those old fellows give us a capital blaze to-night?" were my first words after I had inspected their basket of fish.

"Splendid!" exclaimed the Enthusiast.

But there was no sign of approval from Dick, and I repeated my question.

"I guess we can use 'em if we split 'em up," and he looked doubtfully up from the fish he was cleaning; "Balsam's so full of water it won't burn much."

Dick was incapable of satire, or I might have felt hurt.

Just then the Enthusiast came out of the shanty waving aloft a very rusty frying pan, some previous camper had left behind him.

"Luck favors the righteous," he shouted, and went down to scour it with sand from the river bottom.

Only one thing interfered with the enjoyment of our wild supper that night. The coffee was splendid; the trout were delicious; but our bread from its soaking in the bottom of the boat was strongly flavored with some fisherman's waste bait!

"By the way, Quill, how did you like Miss Sullivan? You were introduced to her last evening, weren't you?"

For over an hour we had been stretched before Dick's blazing fire, lazily talking over our day's experience, the condition of the trout

streams and our hopes of capturing a deer tomorrow.

"Why, I thought she was pleasant enough," I said, quietly rolling a fresh cigarette.

"She is a mighty fine girl; you know I met her at Commencement ball. She is a splendid dancer, now, I can tell you," the Enthusiast broke out, sitting up in his excitement.

"Oh, I have no doubt of it. But isn't she a good deal of an Anglomaniac?"

"Pshaw! She's no more an Anglomaniac than I am! I do wish you would learn to appreciate a nice girl when you meet one, Quill!"

"Be good enough to hand me a light from the fire since you are up, will you?" I yawned.

"You'll die of ennui some day if you don't look out." He handed me a burning twig, then turned to Dick in desperation:

"You have seen her, haven't you, Dick? Don't you think she is a pretty handsome young lady?"

Dick gave a deep meditative puff on his pipe. "What, that slim girl I seen walkin' down the road in front of the hotel this morning? They'd better throw a blanket onto her, or she won't cast a shadder!"

"I'm going out to chop some more firewood," the Enthusiast exclaimed, leaping up impatiently from the ground.

"Look out, don't wake up the neighbors," chuckled Dick, over the vexation he had caused.

After we had heard him chopping some time, the Enthusiast came to the door and called:

"Come out, Quill, and see what a beautiful night it is."

It was indeed beautiful. The wind had gone down with the sun, and not a sound could be heard except the soft rippling of the river in the distance. The stars shone calmly in the sky; a silvery moon was just breaking over the black wall of forest which seemed to encircle us like an impenetrable barrier, and impressed upon us the lonely thought that fifteen miles of its dark gloominess separated us from every human being. We stood silent for some minutes, our hands on each others shoulders; then the Enthusiast slowly repeated:

"It is a beauteous evening, calm and free,
The holy place is quiet as a nun,
Breathless with adoration."

I did not thoroughly enjoy my first night's camping. Dick rolled himself up with his arm for a pillow, and was soon fast asleep. The Enthusiast, with his head on a fish basket, followed suit. But for a long time I lay awake. The spiders, warmed up by the fire, crept up my sleeves and bit me, and a colony of mice came out of some crevice to investigate the intruders. Once I saw one of these little rascals sitting on Dick's coat collar, and heard that individual murmur persuasively, "Set still, darn ye, or I'll kill ye."

Moose lake is a wild, rocky little basin of the glacial formation. From every side the thickly wooded mountains slope precipitously to the water, which lies calm and placid in their embrace. Its beauty is so primeval and untamed, one might almost imagine his the first eyes that ever looked upon it, while the surrounding walls of rock impress one with a grateful sense of protection and security; one feels separated from the world, its cares and temptations. We took possession of our lean-to camp on its shores at noon the following day. A lean-to is a most primitive habitation. Across the tops of two forked posts, four or five feet high, a pole is laid. From this pole a light frame-work or branches, sloping gradually to the ground, is constructed and covered with hemlock bark. The campfire is placed at the open end, and you recline with your head close up under the bark roof at the rear, and your feet stretched toward the blaze.

As soon as we had thrown off our packs and taken a moment's rest, Dick led us to the best fishing ground. We had a most delightful afternoon. A light film of cloud obscured the sun, and our sport was the finest. Even my Enthusiasm arose at the prompt way my hook was taken, and the fine catches I soon had in my basket. It was nearly dark before we came back to have our trout cooked for dinner. Just as we finished and were enjoying our first smoke, a cracking of the underbrush startled us, and Frank appeared with two more tourists. He threw off his pack with the terse "How are ye?" so characteristic of the North woods guide; but the professor was more demonstrative.

"Ye gods! That last half mile was the worst

walking it has ever been my ill fortune to find! I am completely used up."

"Have you walked from the hotel to-day?" I inquired feelingly, making room for him on the hemlock boughs.

"That is precisely what we have done, and a precious hard tramp it is too."

The artist came up next. "Frank, do, for pity's sake, get us something to eat! I'm half starved!"

And it was not till after Frank had fed them that conversation thrived at all. Then we became more social, and found the professor a delightful story teller. We pulled out the cards and played seven-up by the firelight, with a pack basket for a card table, and the evening passed pleasantly till nearly ten o'clock, when the Enthusiast and Dick prepared to float for deer. Floating for deer is the most fascinating form of hunting—at least, so the Enthusiast maintains. From the trunk of a birch tree, Dick cut a ring of bark about a foot wide. This he nailed to the edge of a semi-circular board he hewed out with the axe, and then put within the apparatus, which looked much like a large flour scoop, two or three candles, and fastened it to a pole in the prow of his row-boat, so that the rays of light were cast ahead on the water. Behind this rude lantern the Enthusiast took his seat, his loaded shot-gun on his knees, while Dick sat in the stern and paddled noiselessly out into the darkness. The mysterious light on the water dazzles the deer, who has come to feed on the lily pads, and he stands perfectly still, a splendid shot, if the hunter does not catch the "buck fever."

The rest of us crept into the lean-to and went to sleep. At nearly midnight the hunters returned disappointed; they had not even seen a deer. Unfortunately, the shanty was only built for three men, and they were forced to follow Frank's example and sleep under the open sky. It was well enough till early morning; then it began raining and they sought protection where they could. An odd spectacle met me when I awoke about six o'clock. The Enthusiast was sitting against one of the posts of the camp fast asleep, his head fallen over on his breast. Dick had pulled his hat over his face and was slum-

bering contentedly quite out in the rain. Frank was sleeping soundly, his head and shoulders covered with a huge piece of bark, and on one of his great boots, reached out toward the smouldering fire, sat a little squirrel chipping gaily.

The rain lasted with persistent determination all day long. It drenched our provisions; it drenched our clothing; and finally penetrated so deeply as seriously to dampen our spirits. There was some attempt at fishing, but it was too rainy for that. The trout wouldn't bite. We tried to play cards, but the soaked pasteboard put an end to that. Our bark roof proved little better than no covering at all. We passed a dreary day enough, bemoaning our hard luck and wishing ourselves back at the hotel and civilization. A rainy night followed and was more than I could endure. While we were eating breakfast, I burst out:

"What do you fellows think of going back to-day? I, for one, am tired of staying here in the rain."

"Oh, we don't want to do that, do we?" objected the professor. "It will clear up to-day, won't it, Dick?"

Dick looked at the sky reflectively. "It 'pears as if it might to'ards noon. We could go on to Beaver pond. May be our chance of getting a deer would be better there. Something has got to be done, our grub is getting so low."

"How far off is that?" I enquired anxiously, for we were all stiff from the damp by this time.

"About five mile," Frank explained; "but the trouble is, the lean-to there only holds two."

"That's of no consequence; what do we care for a roof now? We're beyond all such trifles," laughed the artist.

So a little before noon we started for Beaver pond. A more dismal journey is not easily imagined. The actual rain had for the moment stopped, but the clouds were still heavy and threatening. The ground was slippery and difficult. More than half our way was through swamp and alders. The others, who were more or less veteran campers, took it all as a matter of course; but I trudged along in silence. I dared not speak for fear of imparting some of my despondency to them. Inwardly I was vowing that should it please an all merciful

Providence to return me to civilized life before I was entirely dissolved, I would never venture from it again. Once the Enthusiast turned upon me with a curious smile:

"Well, Quill, are you enjoying yourself? That expression of yours is worthy of a funeral."

"We must take the bitter with the sweet, I suppose," was the retort given with greatest nonchalance.

A sadly bedraggled party we were when at last, after three hours plodding, we came upon Beaver pond. As its name declares, years ago some industrious beaver had dammed up the small stream which now flows in sluggish current, winding and twisting through what was once the bottom of a lake. In the idle water grow innumerable lillies, tempting food for the deer. Our sportsmen immediately essayed to fish, but with poor success. The stream was too high. Before long we had all gathered around the fire watching Dick and Frank make ready our supper.

"Tell you what, boys, only two loaves left; it'll go hard with us if we don't get a deer to-night," remarked Dick, as he opened our bag of wet bread.

As soon as it was dark, the Enthusiast and guide once more departed to float for deer. The artist retired into the lean-to to clean his gun, and the professor and I stretched ourselves before the fire, and with stoical indifference for all material circumstances, plunged into an animated discussion of 'Robert Elsmere.' The hours passed and we heard no gun-shot. Finally the Professor crept into the shanty and rolled himself in his blanket for the night. I looked a moment at the two men crowded close together under their forlorn roof, gave an envious sigh at Frank snoring under the shelter of a decayed log, then drew my rubber coat a little tighter around me, and went to sleep where I lay.

The first great drops of a heavy shower disturbed me, and I had barely succeeded in squeezing myself into the shanty between the legs of the two sleepers, when the Enthusiast and Dick came up from the water carrying their canoe.

"Well, old man," I inquired, anxiously, "you haven't shot a deer?"

"No, confound it! I'm the most unlucky fel-

low above ground. Here I walk twenty-five miles to kill a deer, and then never get a shot at one. We could even hear 'em wading around among the lily pads too. We should have had one in an hour, but this rain must come up and drive 'em all away. That's what I call beastly hard luck—don't you, Dick?"

"'Tis rather hard, that's so," assented Dick, bending over the remnants of the fire in search of a light for his pipe. "T'must be the harvest storm they said was comin'."

Nothing ever disturbed Dick's equilibrium. He accepted success or failure with the same degree of insensibility. Perhaps—heaven forbid! he had seen so many pleasure hunters in our misery, he had become hardened to it.

He and Frank tipped the boat over, propped it on some sticks, and with the Enthusiast crowded under it for shelter. We had not slept more than two hours when another tremendous shower came down upon us. Sleep was out of the question. I sat up, my hands clasped around my knees. The others were already up and out in the rain, except the professor. One great piece of bark in the roof protected him completely from the down-pour, and he was sleeping in happy oblivion. It was more than human nature could endure.

"Let's roast him out!" cried the Enthusiast. "We can't allow such comfort as that," and he began to rekindle the smothered fire.

Soon a huge blaze was glowing and crackling before the lean-to, and we stood watching its effect on the innocent sleeper. Slowly he began to draw away his legs and move uneasily in his slumber. Then came a most unprofessional howl, and he leaped out into the wet.

"Good heavens! What are you doing any way? My feet are nearly burned off."

A savage shout of triumph was the only reply we gave him.

The shower gradually became a steady rain, and we slept as best we could till morning. An ominous silence pervaded our breakfast. We all knew we were eating the last of our provisions, and twenty-five miles of hard, heavy tramping lay between us and our next meal. Dick was the first to mention it. As we were drink-

ing our last cup of coffee, he announced with his usual brevity:

"I guess you fellows 'll be pretty hungry before you get any thing more to eat." Then after a moment's consideration, "We'd better start as soon as we can get our traps packed."

But it was nearly ten o'clock before we could gather courage enough to set out. What a tramp that was! The rain continued steadily without intermission. All day long we tore on over the soaked, slippery ground, through swamps and streams, making only the briefest halts to rest. We thought it would never end. The last mile seemed ten. We could scarcely drag one foot after the other. A more miserable day I never passed. We reached the lake shore a little before six in the evening. As Dick began to row us across, I broke out:

"Next time you get the camping fever, my friend, we'll lock you up till you get over it; you may depend on that."

For some moments he was silent; then his face lighted up. "I don't know; I have had a mighty fine time. I have enjoyed it all immensely; I'm going again next year. *You* may depend on *that*."

Enthusiasm that could endure such a wetting as this without flinching aroused me. "There is a kind of excitement about it that animates you and braces you up."

The last agony came when Dick tried to get us out of the boat. A cold wind was blowing over the water and had stiffened us all, heated with walking, as rigid as logs. * * * *

When I came down stairs next morning, I found Miss Black on the piazza. She held out her hand laughing, "I presume you have had a perfectly magnificent time. I have been asking Dick what luck you had. He said, lots of weather and experience." She glanced an instant at my woful face and continued, cruelly: "There's not much doubt that the Enthusiast has been fully revenged."

I looked down at her sorrowfully,

"A sadder and a wiser man,
He rose the morrow morn."

And so it ended.

A Rebuff.

A rustic seat,
 A cool retreat,
 Down where a brooklet flows.
 A maiden fair,
 With pensive air,
 Quite often to it goes.
 I spy her there
 And, in despair,
 Thinking my fate quite sealed,
 I venture on
 Where she has gone,
 To boldness she may yield.
 Presume to kiss
 The dainty miss?
 At least it is no harm.
 A haughty glance
 Checks my advance,
 And I remember that I have
 an appointment with a gen-
 tleman at the hotel for this
 very moment.

—*The Dartmouth.***A New Periodical.**

Sometime ago we received a communication from Mr. Samuel Abbott, president of the New England Intercollegiate Press Association, and chairman of the editorial board of the "Collegian." A part of this communication we print below, and would commend it to the careful attention of our student readers.

In the first convention of the New England Intercollegiate Press Association, held February 22, 1887, the feasibility of an established magazine, to be recognized as the official organ of the body, was extensively discussed. The idea as a project was finally abandoned.

After the lapse of a year or more the principle has come to activity again, but in a modified aspect. The ground work is now under way, upon which a periodical will take its place to be known as the "Collegian"; not the mere representative of N. E. I. P. A., but of the American undergraduate.

The "Collegian" will resemble "Lippincott's" in size and general "makeup," and its contents will be much as follows:

One Special Paper.....	10 or 12 pages.
Two Prize Stories, each.....	10 pages.
Two Prize Essays, each.....	10 pages.
Two Prize Poems, each.....	1 page.
Editorial Columns.....	6 pages.
Rostrum.....	6 pages.
Preparatory School Department	15 pages.
Letters, Berlin, Oxford, etc....	10 pages.
Eclectic and Chronological Dept	15 pages.

Athletic.....	10 pages.
Book Review.....	10 pages.

To give a few words in explanation; the "Rostrum" is to consist of the compilation of the best articles upon a given topic, editorial or otherwise, appearing during a month's time in the pages of our college press. These several best views will be reprinted in this department of the "Collegian," with a few appended considerations of the "Sanctum."

The foreign correspondence has for its chief merit the opening up of constantly occurring new ideas and incentives to the American undergraduate having in prospect a term of study abroad.

The Eclectic and Chronological pages keep willing space for all truly meritorious productions coming to the surface in "monthly," "bi-weekly," "weekly" and "daily," besides maintaining a constant record of event.

The Athletic and Book Review departments explain themselves as to scale of Prizes:

For the best Essay, any subject, 6,000 words limit,	\$50.00
For the best Story, any plot whatever, 6,000 words limit,	50.00
For the best Poem, 40 lines limit,	15.00
For the second best Essay, 6,000 words limit,	25.00
For the second best Story, 6,000 words limit,	25.00
For the second best Poem, 40 lines limit,	10.00
For the best Editorial under "Rostrum,"	25.00

The subscription price is fixed at \$3.00 per annum, and twelve numbers will be printed, the first appearing in December, '88, as the January number—provided a subscription list sufficient to guarantee publication be obtained prior to December 1; if not, then delay must ensue, but the "Collegian" is a mere question of time, and is a fact of the near future. Articles and contributions for this number will be due on or before November 1, 1888, at the address given below. Contributors must sign full name, class and college.

"THE COLLEGIAN,"

Wakefield, Mass.

Clippings.

—Trinity Seniors will plant a tree instead of ivy on their class day.

William and Mary College, Virginia, has been opened as a State Normal School.

—Dartmouth has the credit of publishing the first college publication, Yale second and Union third.

—Harvard men deny the statements made in the article in the *North American Review*, titled "The Fast Set at Harvard."

—The wisdom in selecting Dr. Webster as president of Union College can be found in the increased number in the Freshmen class. The incoming class is sixty per cent larger than last year's, and it is possible that it will be still further increased before the end of the term.—*Hobart Herald.*

THE CONCORDIENSIS.

PUBLISHED MONTHLY BY
STUDENTS OF UNION COLLEGE.

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Subscriptions taken at Robison's news room, 263 State street, where receipts can be obtained. Extra copies can be obtained at above news room or on application to Business Manager. Subscribers not receiving papers promptly, will kindly notify Business Manager.

All remittances should be made and sent to THE CONCORDIENSIS, Schenectady, N. Y.

Entered at the Post Office, Schenectady, N. Y., as second-class matter.

CHAS. BURROWS, PRINTER AND BOOKBINDER, SCHENECTADY, N. Y.

EDITORIAL.

THE article in the October CONCORDIENSIS by Prof. Jas. R. Houks, of Elmira, entitled "Lecturers and Professors," attracted general attention, and received much deserved praise.

WITH this number of the CONCORDIENSIS, we take pleasure in introducing to our readers a new feature of the magazine. That which has contributed as much as any thing else to Union's fame and greatness in the past, is its engineering department. The prestige of this department has been largely due to its competent instructors and the thoroughness of its course, the results of which have been shown by the eminence obtained by its alumni. As influential as is this department, it has never as yet issued a periodical—a project, which indeed at this date, would be unadvisable. As a means out of the difficulty, however, the Gillespie Engineering Club has chosen a representative for the CONCORDIENSIS board, who will have charge of the

last four pages of each number of the paper, under the head of the Engineering Department. We trust that this departure will meet with the general approval of our readers, and while the essays and papers which will appear from time to time, will be of especial interest to the engineers, they will still contain a fund of information for our readers at large.

* * *

SCARCELY a week passes but one hears numerous complaints from the students rooming on the hill in regard to the bathing facilities afforded by the college. From an impartial view of the case, we think that these complaints are entirely reasonable. The baths are antiquated, and even then are by no means in good condition. The rooms are cold, the water is not regulated; there is no alternative between a bath in water at boiling point, or a few degrees above freezing. Yet these difficulties are slight when compared to the fact that frequently one can scarcely breathe because of the coal gas in the rooms. In short, a bath in the college bathrooms during the fall and winter terms is taken at the risk of health and life. With all kindness, we would call the attention of the authorities to this matter, with the hope that the difficulty will receive prompt attention, and will be speedily remedied.

* * *

REGULARLY for the past few years, just as regularly as the chapel bell has rung out announcing the beginning of another college year, have attempts been made to revive the literary societies. The efforts this year have been so slight as to be scarcely perceptible, and there is fear that these famous old institutions, so many times resuscitated, only to fall back again in a short time into a state of "inocuous desuetude," there is fear that these old institutions have at last become defunct. An exhortation from this paper to revive them once again would indeed be hackneyed—nevertheless, we would call the attention of the students to the lamentable figure that Union is presenting—without, as she is, any literary society, so-called. Both the Philomathean and Adelpic societies rival in age, fame and usefulness, Alma Mater herself; and it reflects ill upon the character of the stu-

dents that they are permitted to die out. Without doubt, it would be impossible to support both societies so as to make them either of interest or benefit to their members, but why not unite them under the name of the Philo-Adelphic society? We offer this as a suggestion; at all events, let a live debating society be a thing of the near future.

COLLEGE NEWS.

Foot-Ball.

The foot-ball season thus far with Union has been barren of victories, although at the same time reflecting credit on the team. The first game was played with Ridgefields, on their grounds. An Eleven composed of unpracticed, ill-conditioned men went down to Albany and were defeated 28-6. This caused a realization of the poor condition of the team, and brought about earnest and systematic practice; the effect of which was seen in the return game with Ridgefield on our own grounds. In this game, Ridgefield was successful by a score of but 18-6, and were outplayed wholly by Union's rush-line, winning the game only by the brilliant playing of Hodge, the present quarterback on Princeton. The touch-down in each of the games with Ridgefield was made by Culver, who also kicked the goal from both touch-downs.

The foot-ball interest was now concentrated in the approaching game with Cornell, which was played at Ithaca on November 3rd. Before this, Cornell had been defeated by Williams by only 20-0; and when it was remembered that Williams had scored against Harvard, very little hope was entertained by Union of defeating Cornell.

THE GAME.

According to a very impartial report in the *Cornell Sun*, it was "a pretty one to watch, being characterized by hard rushing, determined tackling, with lots of passing and running." It was umpired by Waite, and refereed by a Cornell man. The only point in which Union claims an error is in the refereeing. The *Cornell Sun* acknowledges that the referee permitted an illegal "dribble" by Cornell, which increased their score by six points. The Cor-

nell team was hearty in its praise of Union's Eleven, admitting that every point was gained by the hardest of work. In scientific team work, Union undoubtedly outplayed Cornell; but the great weight of Cornell's team was almost irresistible to our lighter men. The difference in passing was noticeable; Cornell not daring to pass more than seven feet; while Union's quarter, Clute, often passed the ball a distance of thirty-five feet. According to the referee's score, Cornell scored 16 in the first half and Union 4; while in the second half, Cornell scored 10 and Union nothing. This makes the official score 26-4, although it has been widely published as 30-4. The touch-down for Union was made by Clute, by a double pass from Culver to Clute.

After this, Cornell's referee did his College a good turn in taking the ball from Union several times before they had made four downs, or after having gained five yards. Were it not for this, Union could probably have increased its score, and kept down that of Cornell. In the second half of the game, Van Voast and Briggs were injured, and Bennett and Comstock substituted. Union's men are hearty in their commendation of the gentlemanly manner in which they were treated by Cornellians.

The team as played consisted of DePuy, full; Culver and Snow, halves; Clute, quarter; and Kaughren, Van Voast, Coons, Stewart, Briggs, McQueen and Rathbone, rushers; Bennett, Comstock and Ferguson, substitutes.

NOTES.

—Our challenge to R. P. I. has not yet been accepted.

—Clute and DePuy played on Ridgefield against Rutger's, November 5th.

—Union is anxious for a New York State Inter-Collegiate League.

—The following extract from the "*Cornell Sun*" of November 9th, will peculiarly interest Union men: "The managers of the Williams and Union Elevens were surprised when they heard how little Cornell had subscribed for foot-ball. Both of these colleges have \$800 for the support of the Eleven. Cornell ought easily to furnish as much as this."*

Locals.

- Where is the College Glee Club?
- A general college bolt was given for election day.
- The Freshmen have adopted scarlet and black for class colors.
- The Gillespie club hold their regular meetings each Friday afternoon at 2:30 o'clock.
- The Junior engineers will not take up mechanics with Professor Brown until next term.
- The Seniors have taken up Logic in connection with Psychology under Professor Hoffman.
- Thanksgiving vacation continued from Wednesday, Nov. 28th, through the following Monday.
- South college is being resingled, and a new fence back of the college woods is in process of construction.
- Under the leadership of Prof. A. S. Wright, the college Y. M. C. A. meetings have become very interesting and instructive of late, and are quite generally attended.
- The sixty-first annual convention of the Delta Phi Fraternity was held at the New York club house, 5 East Twenty-seventh street, on November 22d, 23rd and 24th.
- Mr. Stoller has assigned the following subjects for Senior essays, due Dec. 15th:
1. Educational Value of the Study of Zoology.
 2. A Comparison of the Structure of the Limbs of Vertebrate Animals.
- Professor Perkins attended the recent International Health Convention, which was held at Milwaukee. The President took charge of the Senior Geology and Junior Chemistry classes during the Professor's absence.
- The committee composed of Waite, '89, Nolan, '89, Carroll, '90, Little, '91, and Smith, '92, which was appointed to discuss the advisability of holding a college fair or minstrel show for the benefit of next season's ball nine, decided that neither were expedient, and that the money should be raised by subscriptions among the students.

—Owing to the refusal of the college authorities to sanction the use of any part of the buildings for the Junior assemblies, '90 has been forced to resort to the Arcade Hall. Their hop there on Thursday evening, Nov. 22d, was a very enjoyable affair, and was a success. May more follow. The committee is made up of Pickford, Carroll, Mosher and Harder.

Personals.

- ✓'54. A. A. Yates has been re-elected member of the New York State Assembly,
- ✓'55. General P. S. Post has been re-elected member of Congress from Illinois.
- ✓'56. Horace M. Hale, formerly Superintendent of Public Instruction for the state of Colorado, was recently elected president of the University of Colorado.
- ✓'62. James J. Burns has been re-elected member of the New York State Assembly from Westchester County.
- ✓'69. Prof. E. B. Fancher has a flourishing private school at Yonkers, N. Y. (He writes a friend that over sixteen per cent of his students are sons of his college classmates.)
- '78. Dr. Charles M. Culver is in Europe.
- '80. J. V. L. Pruyn is active and useful in Albany politics.
- ✓'82. Dr. Matthew Beattie of New York was married last September to Miss Sallie C. Voorhees of South Branch, N. J.
- ✓'84. Leo is superintendent of the Cohoes public schools.
- '87. Smith is in the wholesale grocery business in Rochester.
- ✓'88. Williams is in the Blue Line freight office in Rochester.
- '89. W. T. Peirson is in business for the present in Schenectady.
- '89. The engagement of Nelson W. Wait to Miss Annette Jackson, of this city, is announced.
- Cornell has a chapter of the Q. T. V. Fraternity.

ENGINEERING DEPARTMENT.

Friction.

The importance of a correct knowledge of the laws of friction can hardly be exaggerated, yet, notwithstanding the fact that the methods and results of engineers may be worthless on account of their ignorance of the true laws, we find on this essential matter the greatest diversity of opinion. No two series of experiments, no two authors agree.

To bring order out of this chaos would be a herculean task. The majority must be wrong, or at least only in part correct, while probably no one man is right in all his conclusions.

The object of this paper will be to give the laws as found by some of the most reliable series of experiments. To criticise and check the results of one man by those of others, and to try and find some laws which we may hold as true, at least approximately and between certain limits.

Probably the first experiments were by Amontons in 1699. He concluded that friction was not affected by any increase of surface, but varied with the pressure, and also with the velocity. Lambert doubted these results, and Enter, the great mathematician, using an inclined plane, found that the co-efficient of friction equalled $\tan. L$ and did not vary with the velocity, Brosset distinguished rolling from sliding friction, but probably erred in respect to the ratio between friction and time, pressure, etc.

In 1779, Coulomb made his experiments, which were very extensive and among the first of real importance. He agreed with Amontons in his law of pressure, but thought that under extremely heavy loads he found some deviation from it. The following are Coulomb's laws:

1. That friction is proportional to the pressure and varies with the kind of material.
2. That friction diminishes as the surfaces in contact are worn smooth, until a minimum is reached.
3. That between woods, the friction is less when the grains cross each other than when they run in the same direction.

Friction is greater between surfaces of the same kind, than between those of different kinds.

This law was undoubtedly refuted by Morin's experiments.

5. Friction diminishes as the smoothness of surface is increased.

Vince, in 1875, experimenting in a small but apparently accurate way, found that friction was not proportional to the pressure alone, but also varied with the extent of surface in contact.

Rennie, in 1829, agreed for the most part with Coulomb, finding the law of pressure in respect to hard surfaces, to be the same; but that with fibrous materials, friction was increased by surface and time, and diminished by pressure and velocity. After Rennie comes Morin. His experiments in most respects had a wide range. Probably on this account his laws have obtained their almost universal credence. They are the following:

1. Friction between two surfaces varies directly as the pressure, no matter what the intensity of such pressure may be.
2. Friction is wholly independent of the extent of the surfaces in contact.
3. Where lubricants are used, a distinction must be made between surfaces simply lubricated, and surfaces when a stratum of lubricant is interposed between the surfaces, although the law of the independence of extent of surface holds good in each.
4. Friction is always independent of the velocity with which a body moves. Morin did not find that if the surface were perfectly clean and free from lubricants, they became more smooth, and that friction became less after a period of attrition—thus differing from Coulomb. Morin also does not agree with Coulomb that friction is greater between dissimilar than between like substances.

Let us now turn for a moment to the consideration of rolling friction, after which in connection with a summary of the results of recent investigations, we will try to find in what points, if any, Morin's laws are open to criticism.

The motion of a roller or wheel on a surface is always attended by resistance. Coulomb made some experiments with wooden rollers on a wooden plane, from which he deduced two laws. First, that the resistance is proportional to the weight of the roller. Second, that the

resistance is inversely proportional to the diameter. Some time afterward, Prof. Reynolds found that a roller, in passing over a plane, caused a temporary indentation and lateral expansion, so that the roller in reality passed over a greater extent of surface than would correspond to the distance between any two points. By experiments he found that a roller 18 inches in circumference, in making two revolutions, lacked three-fourths of an inch of passing over a distance of a yard—the surface upon which the roller revolved being made of india rubber; if iron or some hard surface had been used as a plane, the discrepancy would, of course, not have been as great. Reynolds explained this in the following manner, namely: That the extension of the surface or surfaces at the point of contact, caused the one surface to slide over the other, and that this sliding was accomplished against friction. From further experiments, this was found to be true. He also found that friction not only opposes the sliding of one surface over another, but also prevents it to a considerable extent, thus modifying the deformation that would otherwise take place. The friction accompanying this deformation is called rolling friction, and should be distinguished from sliding friction. Rolling friction follows laws of its own, differing from some, though not all of the laws which govern sliding friction. As its discussion would prolong this paper to unreasonable length, suffice it to say that in many cases, where the pressure is not too great, rolling is being substituted for sliding friction, as offering much less resistance to the turning of axles, &c.

Of late, the laws of Morin having failed, at least, apparently, the subject of the laws of friction has again been taken up, and competent engineers have performed several series of experiments in order to find whether the laws of Morin would hold good when subjected to the test of modern science. Among the most important of these are the experiments of Mr. Goodman of England. With the most modern appliances, and every facility for range and accuracy, he obtained the following results with dry surfaces:

1. The friction between dry surfaces under moderate loads and low velocities, varies di-

rectly as the normal pressure between them.

2. The normal pressure remaining unchanged, the friction is independent of the extent of surface in contact.

3. Friction is always greater on the reversal of the direction of sliding.

4. Friction sensibly diminishes with a rise in temperature, with well lubricated surfaces.

5. The co-efficient of friction, with the surfaces efficiently lubricated, is from one-sixth to one-tenth of that for dry or scantily lubricated surfaces.

6. The co-efficient of friction for moderate pressures and speeds varies approximately, inversely as the normal pressure. The frictional resistance varies inversely as the area in contact, the normal pressure remaining constant.

7. At very low journal speeds, the co-efficient of friction is abnormally high; but as the speed of sliding increases from about 10 to 100 feet per minute, the friction diminishes, and again rises when that speed is exceeded, varying approximately as the square root of the speed.

8. The co-efficient of friction varies approximately, inversely as the temperature within certain limits, namely, just before abrasion takes place.

As to these four rules concerning friction between well lubricated surfaces, we have no well established data with which to compare them. They may be, and probably are correct for the circumstances under which the experiments were made.

But let us compare the results obtained by the different men whom we have had under consideration. We will first take up the laws of friction with dry surfaces, as found by Goodman. In respect to his first law, we find that Euler and Morin agree that the friction varies directly with the pressure. Goodman and Coulomb qualify this so as to exclude heavy pressures. Vince found that it was also proportional to the extent of surface in contact. And Amontons and Hirn, that it was proportional to the velocity. While Bochet claims that the co-efficient of friction decreases as the velocity increases.

As to the second law, Goodman, Morin, and Coulomb obtained the same results, while Vince is almost the only one opposed to it.

The third law is probably true, while the fourth has not been noticed much except in late years.

The subject of velocity has been treated along with pressure under the head of the first law.

Now the question naturally arises as to what authority we are going to accept. The different results of Morin, Coulomb, Amontons and others were probably correct for the particular cases under consideration. First, let us see if the friction would be constant at all velocities with constant pressure. This will be true if the extra force required at high velocities in breaking off the little projections between the surfaces be exactly equal to the gain due to the loss of resistance caused by the projections of the surfaces not having time to slip into one another, because at a low rate of speed the surfaces would come close together, and considerable force would be required to pull the one surface out of the innumerable little ruts or crevices into which it has fallen. The loss and gain above mentioned may be equal, but if so, it would be a co-incidence that is not likely to take place.

The second law, with all its weight of authority, is open to criticism. Vince alone disagrees, but there are many practical examples which help to maintain him in his position.

R. A. Wilder, who was chief engineer of the Mine Hill and Schuylkill Haven R. R., a heavy coal road, stated that upon his road, a grade of 92 feet per mile laid with narrow rails, was immediately succeeded by a 130 ft. slope, with rails of full width; and that it was found that an engine could draw more up the slope of 130 ft. than up that of 90 ft. This is further magnified by the fact that friction disregarded, the steeper an inclined plane is, the more work is done in drawing a load up it. Again, it is pretty generally conceded that new brakes do not have as great an effect of retardation as those worn to fit the wheels. Such practical examples contradict the law, but seem to me to be worth all the fine tests that can be made. And even taking into consideration the number of experts who have decided for the second law, we are obliged to say that on account of the lack of tests for heavy pressures, they have failed to become rules that can be applied universally.

But these are not supposed to be rules. They are laws, and if they fail at any point, or in their application to any particular case, they cease to become such. So, perhaps, we may say of Mr. Goodman's laws, that they are rules with exceptions, no doubt, yet true for most cases, and sufficiently reliable to be followed for want of better ones.

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Necrology.

'37. Robert R. Raymond, a well known teacher, died in New York City, about two weeks ago. He was one of the strongest friends of the late Rev. Henry Ward Beecher.

'79. George Stuart Gregory, a prominent lawyer and political speaker, died in Albany, N. Y., recently.

Exchanges.

Outing for December is a seasonable and welcome number. The articles on the athletic organizations of the country are excellently handled, while the illustrations merit high praise.

Drake's Magazine is very neatly arranged, and contains some interesting articles. It certainly deserves good patronage.

The athletic news in the *Pennsylvanian* is exceptionally good.

The *University News*, is excellently conducted.

The *Lafayette* is attractive to the eye, as well as to the mind. It is one of the best of our exchanges.

The appearance of the *Polytechnic*, of Troy, is much improved by its new cover. All of its departments are creditable, and the alumni notes especially worthy of mention.

The *Nassau Literary Magazine* is the best college publication that comes to our sanctum. Its appearance is very good indeed, and its articles are well worth reading.

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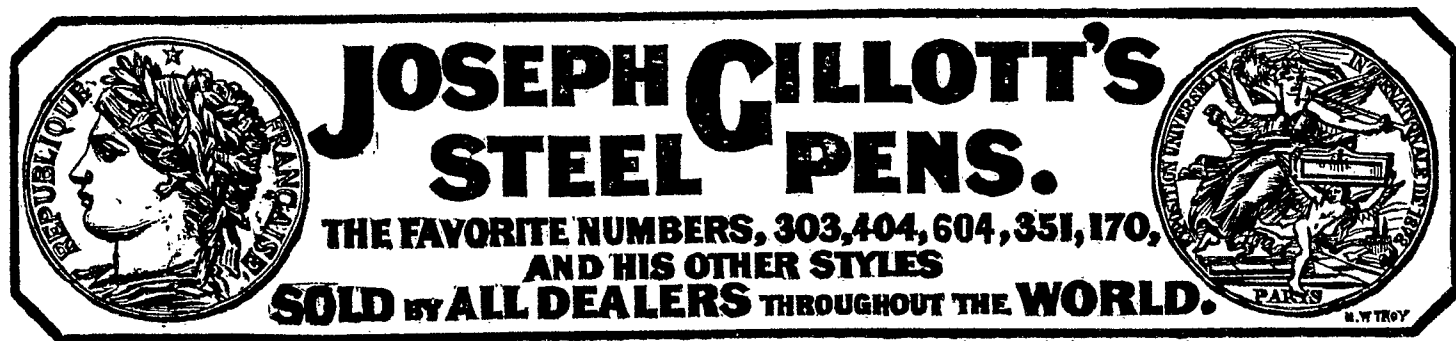
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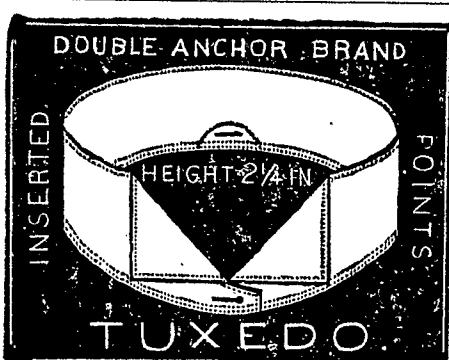
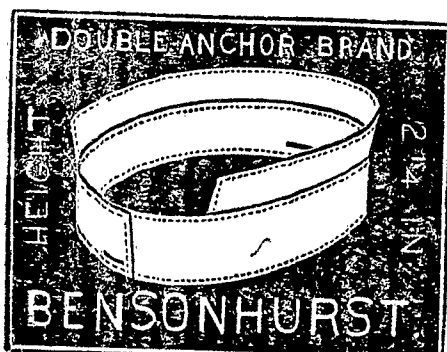
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