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The Tech.

VOL. V.

BOSTON, DEC. 30, 1885.

NO. 6.

THE TECH.

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OUR new Annual—for it belongs to the whole Institute, and not to the Junior class alone—has at last made its appearance. The general interest with which its coming was awaited, was shown by the rush—in which Senior, Freshman, and Mechanic-arter alike mingled—for the first copies. All hastened to look it over, and at once pronounced the new venture a success.

In general appearance *Technique* is much the same as the annuals of other colleges, and it is needless to say that the typographical and mechanical work on it are of the best. An excellent heliotype of President Walker serves as a frontispiece, and the cover, title-page, and head and tail pieces are all of tasty and original design. The book, with its information about our athletic records, and so forth, will become a necessary adjunct to the centre-table of the room of every student here, and will fill a long-felt want—a student's catalogue.

Although this is only its first number, there

are but few things to criticise. Improvements might have been made in the way of local "hits," and more care should have been taken in the spelling of the names in the class lists, etc. However, these are matters of minor importance. On the whole, *Technique* is a great success, and its editors are to be congratulated; and also the class which originated the idea, carried it into effect, and, to use the words of its historian, "did the right thing, as usual."

A FAULT with our courses at the Institute, where young men are fitting themselves for civil, mechanical, mining engineering and other scientific professions, is, we think, in the number of studies included in them which are not of direct importance; and, unfortunately, many of these come in the senior year, when it would seem that all time should be spent upon strictly professional work. In a high polytechnic school like the Institute, every man coming there, unless he wishes simply a general scientific education, chooses some particular profession; and, with this object in view, should not his studies all be in line, and all tend to make him proficient in just that profession? It is said that the course would then be too narrow,—and so it would, so far as general education goes; but, since in practice all professions are subdivided, and this is an age of specialists, it would still be general by comparison.

As we understand it, our courses at the Institute are designed to fit a man for some particular scientific profession. Then why attempt to do more? If so, by spreading over more ground, is not the whole weakened? To illustrate our meaning by an example taken at random: To the course in mining a new study—steam engines and boilers—has been added to those of the fourth year. Every one will grant the importance of a knowledge of this subject

by a mining engineer; but is it not taking too much time from still more important subjects? It would be very good if a man could graduate here as an engineer of mines and also be a mechanical engineer. It would be equally good if he could also be a civil engineer, a lawyer, and, possibly, a surgeon. All these things would be useful to him, and good to know; but it is safe to say, that the man would have known more about mining if he had confined himself to that subject alone.

That many of the students here hold this idea, if the Faculty does not, is shown by the large number of special students, who are by no means only those who have fallen behind their regular classes. At all events, we think that, during the fourth and last year here, the time should be left free for strictly professional work, accompanied by outside reading, so that every student can better prepare himself for the profession which he is shortly to pursue.

IT is at about this time of the year that the editors find it difficult to find subjects for editorials. Everything in the college world is quiet, for there is vacation at most colleges during the Holidays. The foot-ball season is over, and the base-ball season not yet begun. All here are grinding hard for the semi-annuals, which are too painfully near, and class-dinners, glee club concerts, and other festivities will not come off until next term. In this state of affairs the editors are often at a loss about what to write. The particular office of the editorial pages of most college papers is to continually grumble about something or other; but it is giving our Faculty no less than its due, to say that at the Institute we have wonderfully few things to complain about.

IF the senior class proposes to continue the idea, inaugurated by '85, of having some final class exercises before graduation, it would seem as though it were high time to take some action on the subject. Such an affair is not for a hasty preparation at the very last moment; at least, such officers as the historian, prophet,

and poet should be selected at once, for they require ample time in which to prepare their themes, especially since, next term, they will also be hard at work on their theses.

This custom is one that must be perpetuated. The class of '85 deserves all credit for having originated it. '86 should improve upon the performance of last year, and '87 can be trusted to make more improvements.

Year by year the thing will increase, until, at last, we shall have a regular class-day. We think that the Seniors should discuss this matter as soon as possible, so that preparations might be begun soon after the semi-annuals.

THE new Western Alumni Association recently formed at Denver, Col., which we mentioned in our last issue, is an evidence that our *Alma Mater* is growing old. Enough of its children had now located west of the Mississippi to form quite a large Society. The membership list contains nearly forty names, of classes from '70 to '84, most of whom are residents of Colorado.

Such an association cannot fail to be a success, affording, as it will, a chance of meeting classmates and college friends who are too far away to attend the meetings of the M. I. T. Alumni Association in Boston. A registration-book is to be kept at Denver, and all Institute men are requested to register their names, permanent and city addresses, as well as the length of time which they expect to remain in Denver.

THE list of semi-annual examinations has been posted. Regular exercises of the school are to be suspended Wednesday, Jan. 13th, and examinations begin next day and continue until Saturday, Jan. 23d. The exhibition drill of the battalion will take place at the gymnasium, Saturday, Jan. 9th. The next term begins Tuesday, Feb. 2d.

ARTICLES intended for publication in THE TECH *must* be in our mail-box before the Wednesday night preceding publication. All contributions *must* be accompanied by the name of the author.

Double Entendre!

"Sweetest maiden, at thy side
 May I evermore abide?
 Tell me, wilt thou be my bride?"
 Thus I spoke my passion;
 But the maid with jests replied,
 Laughingly my suit denied,
 Even ventured to deride
 In most cruel fashion.

Sternly then I turned to go,
 Striving stoutly not to show
 How that crushing little *No*
 Had distressed me.
 But I paused, for, soft and low,
 Came in trembling accents: "Oh,
 Really, dear, you might, you know,
Might have *pressed* me." L.

The Cruise of the Arethusa.

SECOND PAPER.

THE WEST COAST OF NEWFOUNDLAND.

PORT AU PORT is a small settlement, comprising some dozen or more houses and a lobster-canning establishment. Our time here, eight days, was fully occupied with the collection of fossils from the lower Silurian formations. We left Port au Port June 25th, for Bay of Islands, distant about twenty-five miles. Along the southern portion of the west coast runs a mountain range, trending very nearly north and south. Its altitude varies considerably, the highest peak being about twenty-three hundred feet high. The lower slopes are covered with a dense growth of trees and shrubbery, while the higher portions are bare rock, intersected by deep ravines, cutting through so regularly that, from the sea, the whole has more the appearance of the work of man than of nature.

After a fair run we reached the Bay of Islands. The Bay itself is about twelve miles square. Its entrance is guarded by Tweed, Guernsey, and Green Islands. Guernsey, the largest of the three, is about a mile in circumference and sixteen hundred and fifty feet high, the sea face being almost perpendicular. From its summit it slopes down to the water, on the inner side. The island is a solid mass of rock, devoid of the slightest vegetation, and over its top the mists drive like smoke. Though we were over a mile

distant, it seemed scarcely a stone's throw from the yacht. South Head, opposite Guernsey, is of about the same height. Just east of South Head is Blomidon Mountain, crowned by a rampart of rock — a precipitous wall, fifteen hundred feet in height. From the large snow-field on its crest a stream makes its way, and over the edge of the rock slips a waterfall, which dangles downward like a flexible band of silver, until lost in the dense forests that clothe the base of the mountain. These forests are a characteristic feature of the southern shores of the bay, and the banks of the Humber River, which empties into it.

Blomidon is said to be almost a solid mass of copper ore. It is known that copper ore has been exported for years from the northern coast to the Swansea furnaces, and the Swansea Company is now furnishing the capital for developing the veins. A claim of three square miles, (good for three years) can be obtained for six pounds sterling, but the Government of Newfoundland has a right to two thirds of the claim.

The southern side of the Bay of Islands is lined with ranges of lofty precipices. Frequently among the higher crags, patches of snow could be seen, and we were told that it did not ever entirely leave the ravines, where it remains at no greater altitude than fifteen hundred feet above the sea.

At the very entrance of the river we began to see houses and clearings. Clusters of houses and hamlets appeared here and there, and buildings in process of construction showed more enterprise and activity than will be found elsewhere on that coast.

Petipas and Birchey Coves mark the end of navigation on the Humber. The former was the first settlement made on the river. The place is simply an aggregation of houses, and, as yet, does not boast a street. The prettiest spot in Petipas is the old saw-mill, which stands at the river's edge, just at the foot of a most picturesque ravine, resounding with the splashing of a trout-brook overhung with white birch. Near this spot stands the Roman Catholic Church; and not far from the church is the



AT BIRCHEY COVE.

mansion of Mr. Carter, who rules Petipas and regulates its trade. As there is no recognized law for the government of the smaller settlements, the question is practically one of "might makes right." Mr. Carter showed us "our police force," as he is pleased to call a short bit of rope which he uses to enforce his orders to refractory sailors and half-breeds. Opposite Petipas is Birchey Cove, the prettier place of the two. Here there is an Episcopal chapel and the residence of the rector, Mr. Curling, an English gentleman of large fortune. He has a yacht, in which he sails up and down the coasts of Newfoundland and Labrador, visiting the various settlements and holding services.

At one time the herring fisheries along the Humber were extensive, and were a source of considerable profit; but some years ago the fish left suddenly for parts unknown, and that industry came to an end. But now a considerable business in lumber is carried on, and it will probably not be long before the Humber will again be the scene of active operations. Communi-

cation between Bay of Islands and the outside world is carried on in summer-time by means of a steamer making a trip from St. Johns every fortnight. In the winter, which lasts about seven months, the mail is very irregular. An Indian comes every six weeks from Hall's Bay, takes the mail on a dog-sledge and carries it to Codroy, in the channel, where it is received on board the steamer. Bay of Islands is also connected with St. Johns by telegraph. The one night we remained at anchor in the river was superb. The water was as smooth as a mill-pond, and the full moon threw a most perfect reflection of the hills upon the quiet surface of the river; while far away in the north the northern lights sparkled, and threw their rays heavenward until indistinguishably mingled with the yellow moonlight. We had gone into the Bay of Islands to await the arrival of the mail steamer; so next day our disgust can better be imagined than described when the postmaster informed us that there was nothing for us—not even a postal-card. We made sail as soon as possible, and

started for Bonne Bay. We passed rapidly out of the river and bay into the gulf. It was not long, however, before the breeze died out and left us. The coast is high, and cut up by deep ravines, adding greatly to the aspect presented from the sea. It was one o'clock at night before we came to anchor at the entrance of Bonne Bay. Next morning, after breakfast, we made sail, and ran up to the settlement. The bay makes inland a distance of about two miles, and then divides into two parts, known as the east and south arms. The village is situated upon the south arm. Our first inquiry was for the postmaster, to find if, by any chance, our mail had been left here instead of at Bay of Islands. We found that he had one letter for us, but that was all. The settlement is small, and does not seem to have as much enterprise as was manifested along the Humber. Noticing ladders placed against all the huts and houses, we asked the meaning, and were informed that they were for use in case of fire.

In order to be nearer our work, we anchored in a small cove at one end of the east arm.

Bonne Bay, taken all in all, presents the finest and most varied scenery of any place on the west coast. The east arm is about three miles long, and averages about a mile in width. In our imagination we will now cross the entrance of the east arm, and take a trip along its shores. The land dividing the arms of the bay measures at its highest point about four hundred feet, and gradually slopes down to the head of the east arm, where a stream empties its waters into the bay. On the further side of the brook the land rises abruptly again, and instead of bare cliffs of rock, the hills are quite heavily wooded to their summits, and here and there some mountain brook tumbles over its rocky bed, winding in and out among the white birches. Passing further along we lose our forests, and come to hills about eleven hundred feet high, their higher slopes perfectly bare, and covered with rock broken into fine pieces, owing to the severe action of the weather during the fall and spring months. For the rest of the way around the arm the land is lower,

and covered with a thick growth of stunted trees, and the rocks are no longer fossiliferous limestone, as we pass by an abrupt transition to the non-fossiliferous rocks of another period.

From our place of anchorage we look across a narrow neck to the land on the farther side of the bay; back of this land rise two hills, one above the other. Close down to the water's edge lies the settlement, surrounded by heavy woods; next is a hill of red sandstone, upon whose slopes no vegetation is to be seen; and, lastly, the third and highest hill, its slopes for the most part covered by large snow-fields, extending down the sides until the view of them is cut off by the hill nearer us. B.

Althausen.—A Romance.

(TRANSLATED FROM THE GERMAN.)

CHAPTER II.

ARNOLD soon found that the village lay much nearer than he had been led to suspect from the sound of the bell; and that which he had mistaken, in the distance, for thick alder-bushes, his companion pointed out as a row of fruit-trees, behind which were broad fields, the low church-tower, and the houses blackened by smoke of the old hamlet. They now entered upon a well-laid street with a row of trees on each side. Over the village there hung, however, the peculiar mist which Arnold had before noticed, and which obscured the bright sunlight, turning it to a sort of uncanny yellow. But Arnold gave to all this hardly a glance, for Gertrud, tripping along by his side, seized his hand as they neared the first house, and holding it in her own, turned with him into the next street. A very strange sensation darted through the young fellow at the clasp of this warm hand, and his glance almost involuntarily sought that of the fair young creature at his side. But Gertrud did not look at him; with eyes discreetly bent upon the ground, she conducted the guest toward her father's house, and soon Arnold's attention was turned to the rather curious behavior of the villagers, who, perfectly silent, passed them without any greet-

ing. This astonished him much; for in all the neighboring villages it was considered almost a sin not to salute a stranger with a "Good-day," or something of the sort. But here they greeted neither him nor the maid by his side, but simply passed by, or perhaps stood and looked after them. The old houses looked very grim and weird with their gables and straw-thatched roofs; the window-panes were round, and fastened in with lead, and showed upon their surfaces that shimmering of all colors sometimes seen in old houses. Here and there a shutter was opened as they went by, and friendly girlish faces or old matronly ones peeped out at them.

The appearance of the people was totally different from that of the neighboring villages, and besides, a nearly unbroken stillness reigned, which was almost painful, until finally Arnold said to his companion, "Do you keep Sunday so strictly here that when people meet each other they do not exchange greetings? You don't even hear a dog bark or a cock crow, and one would think the whole place was dead."

"It is dinner-time now, you know," said Gertrud, quietly, "when people are not given to talking much; to-night it will be merry enough. But here is my father's house, and he will, I am sure, give you a welcome; they are waiting for us."

"Waiting for us! You mean for you and your Heinrich? Ah, Gertrud! if you would only take me in his place to-day, I would remain with you until you yourself send me away." He had uttered the last words almost unconsciously — pressing lightly the little hand he still held in his own — when Gertrud of a sudden stopped, and looking at him earnestly, said, "Do you mean that — truly?"

"A thousand times yes!" cried the young artist, carried away by the young girl's extreme beauty.

Gertrud said nothing more, and they entered the tall house before which they had been standing, where already the Mayor had appeared in the doorway. From a side window was thrust out the head of an elderly woman, who cried out, "Why, Gertrud, how long you have staid

out to-day, and what a fine gentleman is with you! It is not Heinrich, either. Ah! I always said he would not come again."

"It is all right, mother," said the Mayor, holding out his hand toward the stranger. "You are welcome to Althausen, sir, however you chanced to meet my daughter." He left the young man no chance for apologies, but conducted him into a broad, low room with a wooden floor sprinkled with clean white sand, where a table was spread with snowy linen, and plates and spoons upon it. In the recesses of the windows stood several rosy-cheeked children. But little time was given him for observation before a door at one side was pushed forward, and a stout serving-maid appeared bearing a platter of steaming dumplings, which she placed on the table. Thereupon all gathered about the table, but no one sat down, and the children looked almost affrightedly at their father, who, leaning with one arm upon his chair, his hand clenched, was murmuring something which sounded more like a defiance than a prayer.

Gertrud went up to him softly, and, laying her hand on his shoulder, looked at him beseechingly for a moment in silence. "Let us then to dinner," said the man harshly, "since nothing can help us;" and, after serving the dinner, he sat in silence during the rest of the meal. The man's whole manner appeared most uncanny to Arnold, and among the repressed tone of the others, he did not feel very comfortable. The Mayor did not, however, mean to spoil the midday meal by disagreeable associations; and, rapping on the table until it shook, he signified his desire for wine and glasses to be brought. The wine was old and costly, and the enlivening effects soon appeared to change the former restraint into cheerfulness, if not jollity. The noble fluid streamed like liquid fire through Arnold's veins; never had he tasted anything similar to it. Gertrud, also, and the old frau drank thereof; the latter of whom seated herself by the spinning-wheel in the corner, and sang softly a little song of the homely life of Althausen. The Mayor was, however, changed most of all. In proportion as he had been pre-

viously silent and earnest, he now became noisy and uproarious. Without knowing exactly how it all happened, the Mayor had seized a violin, and was playing a lively dance; and Arnold, the beautiful Gertrud in his arms, was whirling about the room so madly that he threw over the spinning-wheel, ran up against the old lady, and then fell into a chair exhausted, amid the weird laughter of the others. But all at once everyone in the room became hushed; and when Arnold followed the glance of the Mayor, who had laid down his violin, he saw the cause of the sudden change — for, in the street outside, a corpse was being borne along. Six men, clad in white garments, bore it upon their shoulders; while behind them, alone, walked an old man, leading a little, fair-haired girl. The old man walked with difficulty; but the little one, who could not yet have counted more than four years, skipped along with no suspicion of what lay upon the shoulders of the men in front. She laughed and nodded about her in childish good spirits.

Only so long as the funeral procession was in sight did the stillness continue, however; then Gertrud, stepping forward to the young painter, said: "Let us take a short rest, now; you have caroused sufficiently, for the heavy wine rises with great influence to your brain. Come, take your hat, and let us take a little walk together. When we come back it will be time to go to the tavern, where there is to be a dance this evening."

"A dance! That is good," said Arnold, delightedly. "I have come here at just the right time, have I not? and you will give me the first dance, Gertrud?"

"Most assuredly, if you wish it."

Arnold took his hat and portfolio, and was starting off, when the Mayor said, "What wilt thou do with the little book, my friend?"

"He is an artist, father," said Gertrud, "he has already taken my picture, and you must see it." Arnold opened his portfolio and handed him the sketch.

The peasant observed it attentively for awhile. "And you mean to take this home with you?"

he said finally, "and perhaps put it in a frame and hang it upon the wall?"

"And why should I not?"

"May he, father?" asked Gertrud.

"If he does not remain with us," chuckled the Mayor, "I have no objections. One thing is wanting, however, on the back."

"What?"

"The funeral procession of a moment ago. Draw that also upon the sketch, and you may take the picture with you."

"But what has the funeral to do with Gertrud?"

"There is room enough for both," said the Mayor, obstinately. "That must go on, or else I will not suffer you to take away my child's picture so entirely alone with you. In such sober companionship, however, no one could find anything improper."

Arnold wondered at this strange guard of honor for the pretty maid; but reflecting that he could easily erase the obnoxious surroundings later, he complied with the request, and with skilled hand he quickly sketched in the mournful sight.

The family crowded about him and watched with amazement one figure after another rise from the paper. "Have I done it well?" said Arnold, finally, holding the sketch at arms-length before him.

"Capitally," cried the Mayor. "I would never have imagined you could do it so quickly. Now you may keep it; and now go out with the child and look about the village. You may not have a chance to see it again very soon. But be back again by five o'clock, for to-night we celebrate a festival, and you must be present at it."

Arnold was glad to get out into the fresh air again, for the combination of the close room and the wine he had drunk had given him a curious sensation in his brain.

The streets now were no longer as still as before; children played about; the old folks sat about in their doorways; and the entire place, with its curious, ancient buildings, would have assumed quite a friendly aspect if only the sun

had been able to penetrate through the dense, brownish vapor which like a cloud lay upon the hamlet.

"Is there a marsh or lake in the vicinity?" he questioned of his companion; "this smoke does not lie over any of the other villages, and it cannot come from the chimneys."

"It is the 'earth-mist,'" said Gertrud, calmly; "but have you never heard about Althausen?"

"Never."

"That is strange; and the village is already so old — *so* old!"

"The houses have that appearance, at least, and the people act so queerly, and their speech sounds so very different from that of the neighboring places! But do you always have this earth-mist here?"

"Yes, always."

They walked on for some distance after this in silence until the limits of the village had been passed, nodding here and there to a young girl. Arnold noticed that they all looked at him almost as if with pity in their eyes, until he became quite uncomfortable, but he did not like to ask Gertrud about it. This spot was as deathly still as the village had lately seemed lively. The gardens looked as though no foot had trod there for many and many a year; the paths were overgrown with grass, and the fruit-trees bore no fruit among their branches. They met now several people who were coming out of the inclosure, and Arnold recognized them instantly as the pall-bearers in the funeral procession of a short time before.

With one accord he and Gertrud turned their steps toward the churchyard, and as they walked, Arnold sought to entertain his companion by relating to her tales of the various places he had seen, and how the outside world appeared. She had never seen a railroad, in fact never heard of such a thing, and listened in astonishment to his statements. Of the telegraph she was quite as ignorant as of the various discoveries of the century, and the young artist found it difficult to believe that there yet lived in Germany people so utterly removed from any connection with the outer world.

During this conversation the churchyard had been reached, and here a fresh surprise awaited the young stranger in the very antique pattern of the gravestones and the queer inscriptions of the monuments.

"There is an old, old stone;" said he, bending down, and with trouble deciphering the scrolls, which read: "Anna Maria Berthold, geborene Stieglitz, geboren am 1sten Debr. 1188 — gestorben den 2ten December 1224."

"That is my mother," said Gertrud, solemnly, and a few big tears fell from her eyes.

"Your mother, my dear child?" said Arnold, perplexed; "your great, great grandmother, it must have been."

"No," said Gertrude, "my *own* mother; my father has since married again, and she whom you saw at home was my step-mother."

"But does it not say there on the stone, 'Died, 1224'?"

"Of what consequence to me is the year?" said Gertrud, sadly. "I only know that it is so dreadful to be thus separated from my mother; and yet," she added with decision, "it is perhaps better, much better, that she should be permitted to go to heaven *before* all this."

Arnold, shaking his head, bent again over the old stone to examine more closely whether the first 2 in the date might not have been an 8, for the old-fashioned way of writing made this not improbable. But the other 2 resembled the first to a hair, and, besides, it was not time to write 1884 for a long while yet. Perhaps the stone-mason had made a mistake. He left the stone on which the girl was kneeling in order to examine some of the other monuments; but all, without exception, bore the date of many hundred years back, even so far back as 900 n. Chr. G., yet the dead were still buried here, as the last newly-made grave showed.

From the low churchyard wall there was to be obtained a striking view of the old village, and Arnold quickly embraced the opportunity to make a sketch of the place. But over all this place, as well, lay the remarkable mist, while afar off he could see the sun shining bright and clear upon the mountain-sides. At this moment

the old cracked bell sounded in the village, and Gertrud, rising quickly and brushing the tears from her eyes, turned to the young man, and, with a friendly glance, bade him follow her. Arnold was quickly at her side.

"Now we must be no longer sad," said she, smilingly, "for the church-bell has struck, and presently we will go to the dance. You probably think that the Althausen folks are all sober, long-faced Jacks, but this evening will prove the contrary to you."

"But there is the church-door," said Arnold, "and I see no one coming out?"

"That is very natural," laughed Gertrud, "for nobody goes in, not even the minister. Only the old sexton gives himself no rest, and rings the bell for beginning and ending."

"And does no one go to church?"

"No one — not even to mass or confession," said the girl, quietly. "We have had a quarrel with the Pope, and he will not suffer it until we obey him again."

"But I have never heard anything of all this."

"Oh, it has been thus a long time! See, there, comes the sexton, and shuts the door; *he* will not come to the tavern to-night, but sits quiet and all alone at home."

"And will the minister come?"

"Oh, yes, indeed! and is the jolliest one of all. He does not take it very much to heart."

"And how came this all about?" persisted Arnold.

"That is a long story," said Gertrud, "and the minister has written it all out in a great thick book, which you may see if you can read Latin. But," she added, warningly, "do not speak about the matter to my father, for it is a most unpleasant subject with him. But look," she said — "there come the girls and the young fellows out of their houses, and I must hasten home and get ready, for it will never do for me to be the last one."

"And the first dance, Gertrud"? —

"I will dance with you. You have my promise."

The pair walked quickly back to the village, where now an entirely different life prevailed

from that of the morning. Groups of smiling young folks stood about — the girls adorned for the festivity, and the fellows in their best bibs and tuckers; and Arnold, who did not like to be seen among them in his traveling-clothes, went to his knapsack and took out his best raiment, and had soon made a fine toilet, when Gertrud knocked at the door and called to him.

(TO BE CONCLUDED.)

The Union Bridge Works, Buffalo.

THE works of the Union Bridge Company in Buffalo are on the outskirts of the city, near Buffalo River, and not far from Lake Erie, whose blue expanse stretches toward the southwest as far as the eye can see. Situated thus, in one of the great railroad centres of the country, the transportation facilities are very fine. A recent writer has compared the city of Buffalo to a portly and self-satisfied spider reposing on its web. The simile is not overdrawn. The railroads radiate from the city much as the numerous filaments of the spider-web.

The Buffalo works were made famous recently by the construction of the "Cantilever Bridge" over Niagara River, below the Falls. This bridge was built for the Michigan Central Railroad, in the incredibly short time of eight months from the awarding of the contract; which time, considering the new principle adopted, was wonderful. Not an accident happened during the construction. It is made of steel, and consists of two great cantilever arms, projecting out over the river from either bank. These arms are connected by a short middle span, and thus made continuous. Each arm is counterweighted by being anchored into the rock on the river-bank, and is supported at the middle by a large steel tower 130 feet high. The bridge was rigidly tested when completed, and found capable of sustaining a freight train on each track the length of the bridge, the trains being so loaded as to weigh one ton per linear foot, and having two seventy-six-ton consolidation locomotives at the head. The factor of safety is five.

The company is, at the present writing, negotiating for the contract to build a bridge in Australia, over the Hawksberry River. This bridge will cost about \$2,000,000. If the contract is awarded to them, the iron will probably be shipped to Australia via San Francisco. The fact of an American bridge company being given the preference over British competitors, would go far to prove the superiority of American bridges. The best American bridges are lighter than those of English make, and just as strong, because the material is disposed along the lines of strain, so that no part is dead weight. Again, in American bridges all the principal parts are made by machinery, and in similar spans they are of precise, uniform dimensions, and hence interchangeable. The cost is thus reduced to the minimum. The quality of the iron, and the use of riveting instead of the pin connection, so commonly seen in American bridges, might also be mentioned.

The plant of the Union Bridge works is quite complete, and the work is turned out rapidly, with great precision and nicety. This summer (1885) gas furnaces were added, which produce a higher degree of heat for making steel eye-bars. Annealing furnaces and a large upsetting machine have also been constructed for the works.

A visit to the works is full of interest. The bridge may be traced from its inception to its completion. General plans and detail sheets are first drawn in the draughting-room. An order is sent to one of the great rolling-mills, and in the course of a week the material for the bridge arrives, in plates, angles, bars, and flats of steel and iron. Blue prints are taken of the traced sheets. One set of these is sent into the pattern-shop, where the "templates" and patterns for the cast parts of the bridge are made. Another set is given to the workmen in the shops along with the templates. The castings are not made at the works, but at the King Iron Works. The heavy iron and steel plates and angles are rolled in on cars, and taken off at the punching-machines by suitable derricks, where they are punched. These plates and angles

are fastened together with drift-pins, and brought to the riveting-machine. Here they are suspended, while being riveted, by means of chains, from travelers running on tracks overhead. The finished pieces are assembled in the yard, where they receive a coat of red paint. Some of the parts have to be "faced," and are sent to a machine for that purpose. In another part of the shop a great steam-hammer is at work, pounding out eye-bars. The nuts, bolts, and rivets are made in the blacksmith-shop, which is quite a long building. When all the parts of the bridge, the posts, pedestals, sheets, rods, chord-sections, portals, have been assembled and inspected, the shipment commences. Derricks, cables, timber, bolts, etc., with the parts of the bridge which are needed during the early stages of the erection, are shipped first. Soon the yard is cleared of one bridge, and the interesting process commences again. The iron rolls into one door, and rolls out as a bridge at another.

A. B. E.

Noticeable Articles.

The first paper in the *Fortnightly* for December is an anonymous one, entitled "The coming Contests of the World," and is an argument to prove the importance to England of securing possession of Egypt as the key to her great Asiatic possessions. The statistics of the increase of the Anglo-Saxon race are striking: "In a period of little less than one hundred years, from 1788 to 1885, the aggregate populations of France, Spain, and Italy have only increased from 51,000,000 to 82,500,000. On the other hand, the populations of Germany and England during this period have each trebled. Germany in 1788 had a population of about 15,000,000; in 1885 it had increased to 45,000,000. Great Britain, in the same way, had in 1788 a population of 12,000,000; in 1885 the figure is 36,000,000. Another country, largely but not exclusively populated by the Anglo-Saxon race, America, has in less than a hundred years increased nearly thirteen times; that is, from less than 4,000,000 in 1790, to nearly 60,000,000 in 1885. Finally, it must not be forgotten that Canada, Australia, South Africa, as well as other British dependencies, collectively, contain a population of some 10,000,000, chiefly Anglo Saxon."

The next paper is a learned one on the policy of the great Cardinal Richelieu, by Lady Dilke. Lady Dilke is the newly-married wife of the English Radical leader in Parliament, Sir Charles Dilke, and widow of the learned scholar Mark Pattison, of Oxford. Here is a sentence which contains a good deal of the philosophy of history: "Every great political and social system which has given a new aspect to history, and constituted itself a power among men, has necessarily had for the very principle of its existence the consent of some great moral truth. In the affirmation of this truth has lain the source of strength, but also of weakness; for in pushing it to extreme conclusions, the negation has been reached of other truths, opposite in character, but equal in value, which have in their turn asserted their existence, and put to confusion those who had ignored their force."

It is odd to see in an English magazine a paper following, entitled, "Is the Caucus a Necessity?" Caucus is a Boston word, and the thing has heretofore been American; but the writer concludes that it is a necessity of party government in England too.

"Vamadeva Shastin," who professes to be "a Hindu with somewhat conservative and old-fashioned Brahmanic ideas," and who writes on progress in India, is no less a person than Sir Alfred Lyall, author of that extremely valuable and interesting volume entitled "Asiatic Studies." He does not take a very hopeful view. "Nothing depresses me more, as I survey the triumphant advance of material prosperity, than the gradual discovery that the English, while they are involuntarily undermining the whole fabric of our religious convictions, have nothing to offer that is likely to be accepted by the coming generation in India to replace that which is passing away." Let us hope that this view is too pessimistic.

Mr. Theo. Child writes very amusingly on the American newspaper press, whose gigantic proportions seem to strike him with amazement. His conclusion is expressed as follows: "Judging the American press as a whole, and from impressions formed not at a distance, but in the very country where it is written and read, I should characterize it generally as trivial, sensational, and essentially vulgar;" and there is more truth in this condemnation than an American quite likes to acknowledge. Here, is a curious item: "There are some 600 papers published in the German language, half a score in French, as many in Spanish, and others in Dutch,

Italian, Portuguese, Welsh, Irish, Hungarian, Chinese, and Cherokee;" and he might have added Hebrew. There is a paper on the Bulgarian Imbroglia, and another on the Irish Problem. W. P. A.

The chemists are advised to read the leading editorial in *Nature* for November 26th, on "The Whole Duty of a Chemist." It is a vigorous review of a recent address by Prof. Odling, by one who evidently believes that man should not live by bread alone.

The *American Journal of Science* for October contained an interesting article by Prof. Mabery, on the reduction of boron, silicon, and aluminum, from their oxides, by means of a recently devised electrical furnace. W. R. N.

The Winter Games.

THE Athletic Club held a winter meeting at the gymnasium Saturday, Dec. 19th. The various contests were close and interesting, and the tug-of-war for the class championship was very exciting. The attendance was small, though many ladies were present; and this may be in part accounted for by the fact that there were no sparring events.

There were five entries for the fence vault. G. L. Billings, '87, and G. A. Armington, '87, dropped out at 6 feet 2 inches. J. H. Mirrlees, '87, and W. L. Dearborn, '88, were the next to fail. H. F. Hill, '87, continued until he had vaulted 6 feet 9½ inches, but the handicaps allowed made Mirrlees and Dearborn a tie for first place, and Dearborn finally won by vaulting 6 feet 8 inches to Mirrlees 6 feet 7 inches.

P. R. Fletcher, '87, put the shot (16 lbs.) 34 ft., and won the event; his sole opponent, F. R. Young, '86, making a put of but 31 ft. 6 in.

The first heat of the tug-of-war was between '88 and '89. The teams were as follows: '88, W. L. Dearborn (anchor), H. W. Clement, E. S. Daniels, and E. S. Jones; '89, A. Amory (anchor), G. D. Marcy, F. L. Pierce, and C. Cheney. The Freshmen held the slight advantage they had obtained in the drop until the last few seconds, when the Sophomores, by a well-timed heave, won the pull by half an inch. The result was unexpected, as '89 was represented by a strong team, and '88 had been unfortunate in one or two particulars.

In the running high kick, W. L. Dearborn, '88, dropped out, and H. F. Hill, '87, soon failed, leaving S. Sturges, '87, the winner, with a record of 8 feet 6 inches.

The second heat of the tug-of-war was between '86 and '87, represented by the following teams: '86, A. G. Robbins (anchor), A. S. Garfield, F. E. Foss, and E. L. Pierce, Jr.; '87, P. R. Fletcher (anchor), H. F. Hill, W. C. Fish, and G. L. Billings. The Juniors got an inch and a half on the drop, but steady heaving by the Seniors counterbalanced this, and as the close of the five minutes drew near, the excitement was intense. At the last, '87 won by about half an inch.

In the running high jump, W. L. Dearborn, '88, R. Devens, '88, and F. R. Young, '86, all failed at 5 feet 4½ inches. The bar was lowered to 5 feet 2¾ inches, and each contestant was allowed two tries. Devens was the only one to clear it, and so was declared the winner.

Devens and Young appeared for the standing high jump. Devens jumped 4 feet 3 inches, and Young jumped 4 feet 8½ inches.

The last event was the final heat of the tug-of-war. As some doubt had been expressed as to whether all the teams were within the weight limit of 600 pounds, they were weighed, early in the afternoon, with the following results: '86, 593¾ lbs.; '87, 599¾ lbs.; '88, 584¾ lbs.; '89, 596 lbs.

The drop yielded an inch to the Juniors, and the inch had been made two when time was called. The 599¾ lbs. was shouldered and borne to the dressing-room, while "Technology! Rah! rah! r-a-h! Eighty-seven!" was borne out on the frosty air.

The officers of the meeting were: Charles Wood, '86, Clerk of Course; W. A. Davis, U. A. A. C., Referee; F. H. Briggs, '81, and Everett Morse, '85, Judges; R. P. Borden, '86, T. D. Brainerd, '87, and R. Morgan, '89, Stewards.

Opening a chestnut burr — Taking the wrapper off of your last copy of *Puck*. — *Harvard Lampoon*.

CEGHNIGAL.

A new process of steel manufacture is soon to be tried at Manchester, England. It has been described as a compromise between the Bessemer and the crucible process.

The Cunard Steamship Oregon, recently made the voyage from New York to Queens-town in six days and eleven hours, which is very good time for this season of the year.

The tallest brick structure in existence is the famous chimney at St. Rollox, Glasgow, which is 420 feet in height. The calculated pressure on the bricks at the base is 6,670 lbs. per square foot. — *Manufacturers' Gazette*.

The largest shears in the country have recently been erected by the Atlantic Works, at their wharf in East Boston. They are 130 feet long from the base to the top, and overhang the water 30 feet. Each leg is an immense wrought-iron tube, made of 37 courses of plate-iron with seams double riveted. A steel-wire rope, 2¼ inches in diameter and 285 feet long, forms the main guy, which is anchored to a large propeller sunk deep in the earth. The cost of the shears was \$10,000.

At the last session of the Legislative Assembly of the Territory of Dakota, provision was made for the establishment of a school of Mines for Dakota, at Rapid City. Instruction in mining, metallurgy, geology, and chemistry is to be given, and will be gratuitous to all citizens of the Territory. A brick building, costing \$10,000, has already been erected, and the equipment and organization of the institution intrusted to Prof. W. P. Blake.

Slag from the Basic-Bessemer process has been used as a fertilizer, in Germany, with considerable success. The slag, as obtained from the converter, is simply allowed to weather for some time, and then ground fine. It contains, on an average, 18.75 per cent of phosphoric acid; but the trouble is, that it is available only for certain kinds of soil, which can decompose the slag.

Among the many uses to which blast-furnace slag has been put is that for paving. Another of these paving materials has been recently introduced, and is now on trial in London. It is composed of slag and granite, in certain proportions, which are ground and mixed with Portland cement. This pavement is said to be cheap, durable, and easily laid.

Many attempts have been made to devise an instrument by which the distance from an observer to an object, more or less distant, can be measured without triangulation or telemeter. Especially important is this to military engineers and officers, and an instrument for this purpose has been recently invented in England. The instrument is of the size of a watch, containing two prisms cut at different angles, and is used in the following manner: "The observer brings first one prism to his eye, and observes in it the reflected object whose distance he is desirous of ascertaining. He projects this object upon some other object in the distant landscape, and makes a mental note of their apparent conjunction. Then presenting the other prism to the object in the same way, he notes that the two images will not come into the same place unless he moves his position — it may be some yards ahead. When this is done, the distance he has paced is taken as a base line, which, multiplied by fifty, will give the solution of the problem desired." This instrument has been adopted by the English War Department.

Another instrument for the same purpose is the telemeter of Lieutenant von Ehrenberg, which is simply a stop-watch, with which he notes the difference of time between the flash and report of a gun from the enemy's line, and calculates the distance upon the assumption that sound travels three hundred and sixty yards per second.

The Poetsch system of freezing a water-bearing stratum for the purpose of sinking through it is about to be applied in France to a shaft that has collapsed. This undertaking will be a difficult one, and the result is awaited with interest in mining circles.



Technique is being sold very rapidly.

The Freshmen erected a little snow-fort on the campus after the recent storm.

W. H. Gleason, '87, will pay fifty cents for a copy of THE TECH, No. 7, Vol. I.

In the Athletic Club games, of the six events, '86 won one, '87 won three, and '88 won two.

STARTLING ANNOUNCEMENT. — *Professor of Geology (beginning a lecture)*: "At the close of our last lecture we left the earth."

The Glee Club, which took such a promising start in the fall, has suffered a relapse, but we hope it will make itself heard once more.

Members of the '89 Battalion are allowed to appear in part uniform on Tuesdays and Thursdays, while full uniform is required in the Saturday drills.

The orchestra meets regularly every Tuesday and Saturday, at the close of Institute sessions, in the Y. M. C. A. Hall. The average attendance is good, and the outlook is encouraging.

The junior chemists and architects have begun photography, with experimental work in focussing, exposing, and developing wide angle pictures. Eight-page printed notes are provided.

We wish to call the attention of our out-of-town subscribers to the fact that *Technique*, the new Institute annual, which is reviewed elsewhere, will be sent post-paid to any address on receipt of 60 cents.

The head-piece of *Technique* page 127 of the annual, is particularly ingenious, the letters being made up of emblems of the different

departments. The tail-piece of the volume is a dorsal view of the board of editors.

MR. F. H. Newell, '85, formerly an editor of THE TECH, and more recently connected with the Ohio State Geological Survey, has been in town during the past fortnight. He is to read a paper before the Boston Scientific Society next week.

The K, S held its second regular monthly meeting, on the 18th inst., at Young's. Interesting papers were read by Messrs. Noyes, Kendall, and Lane. On account of the approaching semi-annuals the next meeting will be held early in January.

Prof. Drown has decided to give each student in quantitative analysis an examination of five questions on his work for the past term. The answers will not require more than from one to two hours' writing. This is a new departure, as hitherto the students have not been examined on quantitative work, although at one time it was customary to examine second-year men at the end of the first term on qualitative analysis.

The class of '89 met on the 17th inst., and voted to reduce the number necessary for a quorum from fifty to forty. They then elected the following: President, to succeed Mr. J. P. P. Fiske, resigned, Mr. H. D. Smith; Executive Committee, Messrs. L. H. Olzendam, C. L. Simpson, E. L. Brown, E. S. Hutchins, and H. H. Bailey; Gymnasium Committee, A. Amory, Jr., and C. Cheney; Sergeant-at-Arms, W. B. Thurber; Director for THE TECH, Franklin W. Hobbs.

It is reported that a new machine for determining the carbon in steel is about to be introduced to the analytical laboratory. By a sort of crank movement, the proper amount of the given substance is weighed out, dissolved in acid, the color of the solution compared with standards, the results calculated, entered in the student's note-book, and handed in punctually before one o'clock. Chemists and miners are anxiously hoping that the principle will soon be applied to the analysis of other substances.

It is well known that the '87 tug-of-war team underwent a siege of fasting, in order that

their weight should fall below the 600 pound limit.

Their classmates, to show their appreciation of the successful efforts, after such deprivations of the team, gave them a dinner at Young's, Tuesday, Dec. 22d. About twenty sat down to a table, the central ornament of which was a bank of ferns on which tug-of-war teams of plush monkeys were pulling mightily. Toasts were proposed by Mr. Guy Kirkham to the team, the class, past members, etc., and these received happy responses. Mr. Cooley was voted the spoon. Mr. Fletcher was presented with a large sponge, and each of the team was given a small pair of scales. Altogether it was a very enjoyable party, and Messrs. T. D. Brainerd and Harris deserve credit for the way in which they made the arrangements.

Cross-Purposes.

We have paused to watch the quiver
Of faint moonbeams on the river

By the gate.

We can hear something calling,
And a heavy dew is falling,

Yet we wait.

It is no doubt very silly
To stay out in all this chilly

Evening mist;

Still I linger, hesitating,
For her lips are plainly waiting

To be kissed.

So I stoop to take possession
Of the coveted concession

On the spot;

But she draws back with discreetness,
Saying, with tormenting sweetness,

"I guess not."

Her whole manner is provoking:

"Oh, well, I was only joking,"

I reply.

She looks penitently pretty,

As she answers, "What a pity;

So was I!"

—*Harvard Lampoon.*

One of the simpletons who bother public library attendants, is said to have actually made the following request: "I don't recollect the title of the book I want, but there was a remarkable passage in the last part, which I should remember if I saw it."—*Ex.*

THE COLLEGE WORLD.

HARVARD.—Mid-year examinations begin a week earlier than usual this year.—A large number of students have petitioned the Faculty to make attendance at prayers voluntary.—The 436 rooms in the college dormitories bring an annual rental of \$63,811 a year.—There are three crews of ten men each in training for the Freshman crew. The Columbia Freshmen have challenged them to race.—Harvard foot-ball players have elected a captain for a University team next year, in the hope that they will then be allowed to play again.—'89 has formed a chess club.

YALE.—The first annual catalogue of Yale College was published in 1796.—There are seventeen Amherst alumni in the Yale Theological Seminary.—The Glee Club makes its Western winter trip between Dec. 28th and Jan. 7th. The cities to be visited are Chicago, St. Louis, Cincinnati, Pittsburgh, and Brooklyn, in all of which concerts will be given.—Yale's expenses exceeded her income last year by \$11,543.—At a recent meeting of the Yale navy, it was decided to give the undergraduates the control in the management of the crew, instead of the alumni, as heretofore.—It is proposed to form a University Shooting Club.

IN GENERAL — The \$200,000 bequeathed by the late Wm. H. Vanderbilt to Vanderbilt University, in Tennessee, will be used in the erection of a fire-proof library building.—Cornell junior and senior studies will hereafter all be elective, except a two-hour course in English during the junior year.

A Mohammedan university, nine hundred years older than Oxford, is still flourishing at Cairo, as in the days of Arabian conquests. It contains but one room, the floor is paved, and the roof is supported by four hundred columns. Ten thousand students are said to have been educated there to preach the Moslem faith. — *Crimson*.—Union College has 3,000 graduates living; this exceeds the number of living graduates of either Harvard or Yale. — *Ex*.



HER BOOT.

You dainty boot, of finest kid,
Just peeping forth—half lost, amid
Her rustling skirts of silken sheen,
That settle round and intervene,
Like curtains round some shrine forbid.

I watch your head's high pyramid
Creep out from its light, fringed lid,
And wonder if she knows I've seen
You, dainty boot.

Ah, yes! I think she knows I did,
And that is why she slyly slid
You from beneath your silken screen;
She knows you're lovely, sweet, I ween—
But no!—she frowns!—and now you're hid,
You dainty boot.

—*Life*.

AT NICE.

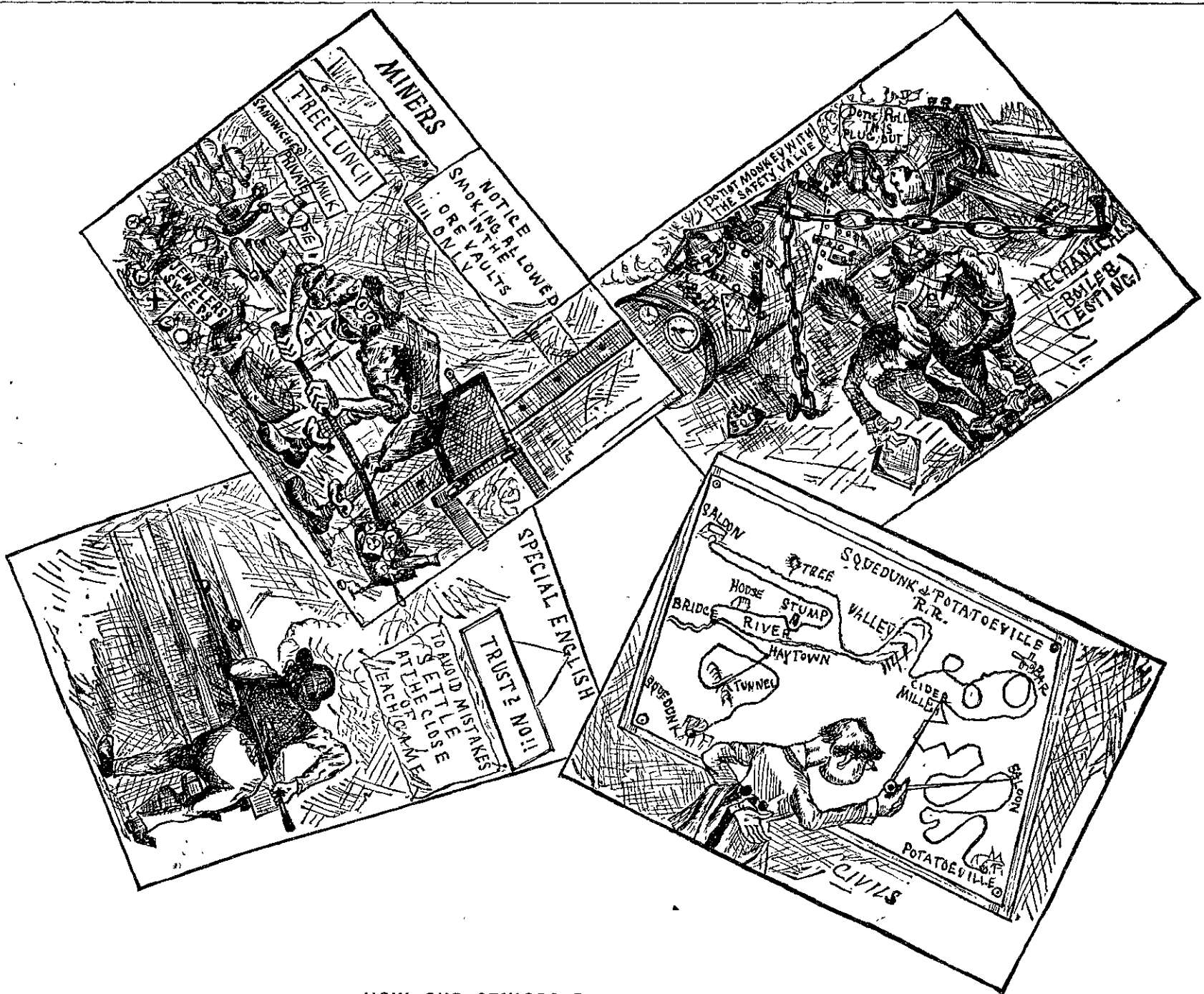
She: "She is fascinating, and a perfect beauty. Everybody is carried away with her. *Mais ça va sans dire*."

He: "But she must be stupid on the street."

She: "On the street?"

He (who understands French, you know):
Why, yes, if she walks without talking.—*Life*.

HER QUICK REPLY.—When a Chicago woman wants to get a seat in a street-car, she wraps up her poodle dog and carries it in her arms as though it were a baby. But the trick is now becoming well known, and doesn't always work. The other day a lady got into a full car with what looked like an infant in her arms. A very rapid-looking young man inspected her for a moment, and then said: "Madam, if that is a kid you can have my seat, but if it is a pup you can't." "Well, it's a pup," snapped the lady, "but not as big a one as you are." The rapid-looking young man at once got off and went to the wheat pit. — *Ex*.



HOW OUR SENIORS PREPARE THEIR THESES.

THE AGE OF REASON.

Uncle George (reading): "And when the man got safely home he thanked God."

Ethel: Why did he thank God, Uncle George?

U. G.: Because the bear didn't eat him.

Ethel: Then why didn't he thank the bear?

— *Life.*

TALKS ON ART.

He: "How lovely Miss De Lancy looks! She reminds me of an old picture."

Rival Beauty: "Yes, a *very* old picture, and restored."— *Life.*

A young lady ate some arsenic to improve her complexion, and the young men now universally agree that she looks like an angel.— *Ex.*

A QUESTION OF PRINCIPAL.— *Miss Angelus:* Well, I must say, Mr. Follibud, you seem to me a young man totally without principle."

F. F.: "But don't say I am wholly without interest for you."

P. S.: *Jack has the interest of \$900,000, and she reflects.*— *Life.*

THE COMPLIMENTS OF THE SEASON.

Burglar: "A Happy New Year, Sir!"

Host: "Thank you, thank you; but we are not receiving, this year. Didn't you see the basket at the door? And—really, you are rather early."

Burglar: "I didn't come in by the door, and it is more blessed to give than to receive. The early bird, etc.—you understand?"— *Life.*

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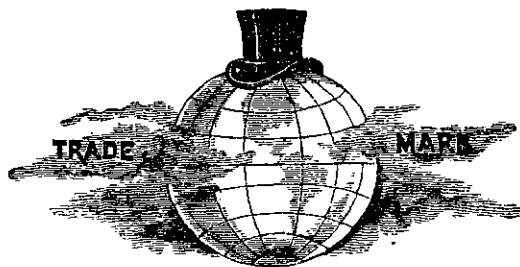
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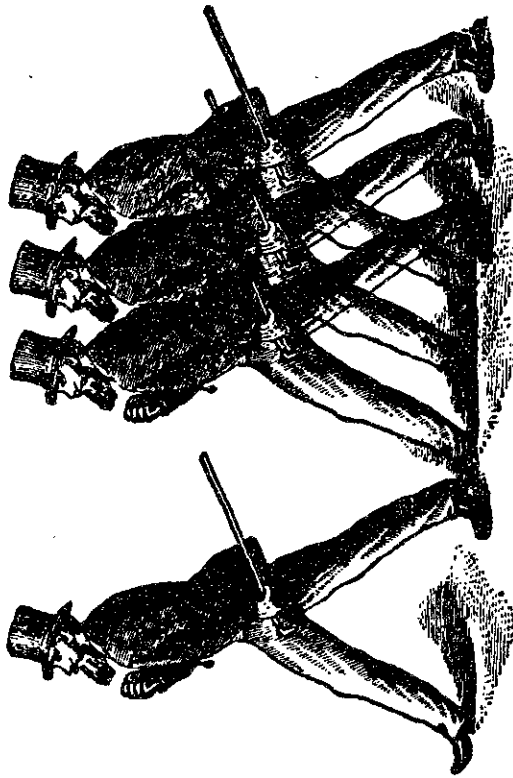
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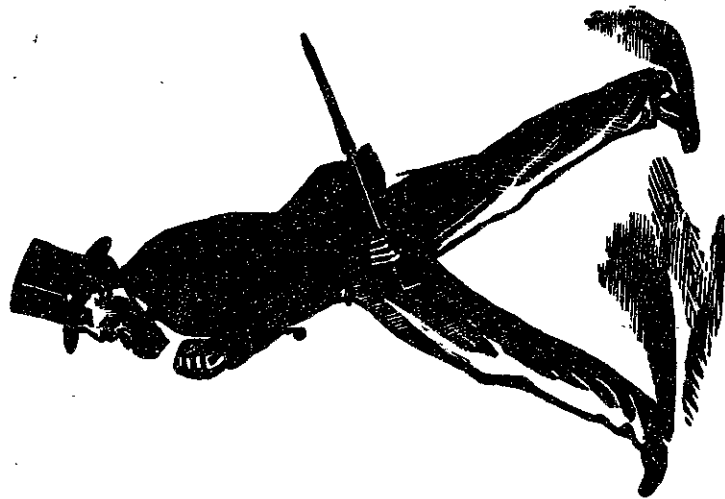
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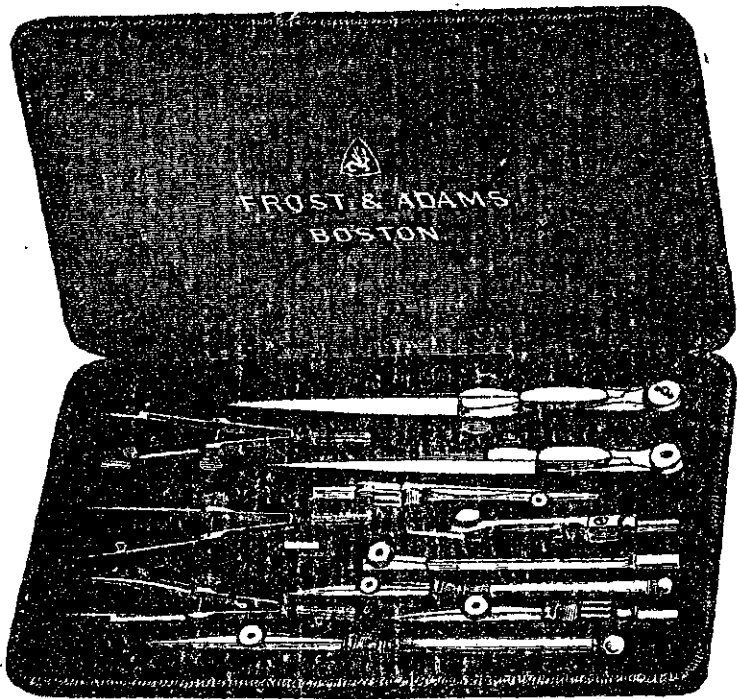
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