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The Rose Tachir

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VOLUME XXX

NUMBER 6



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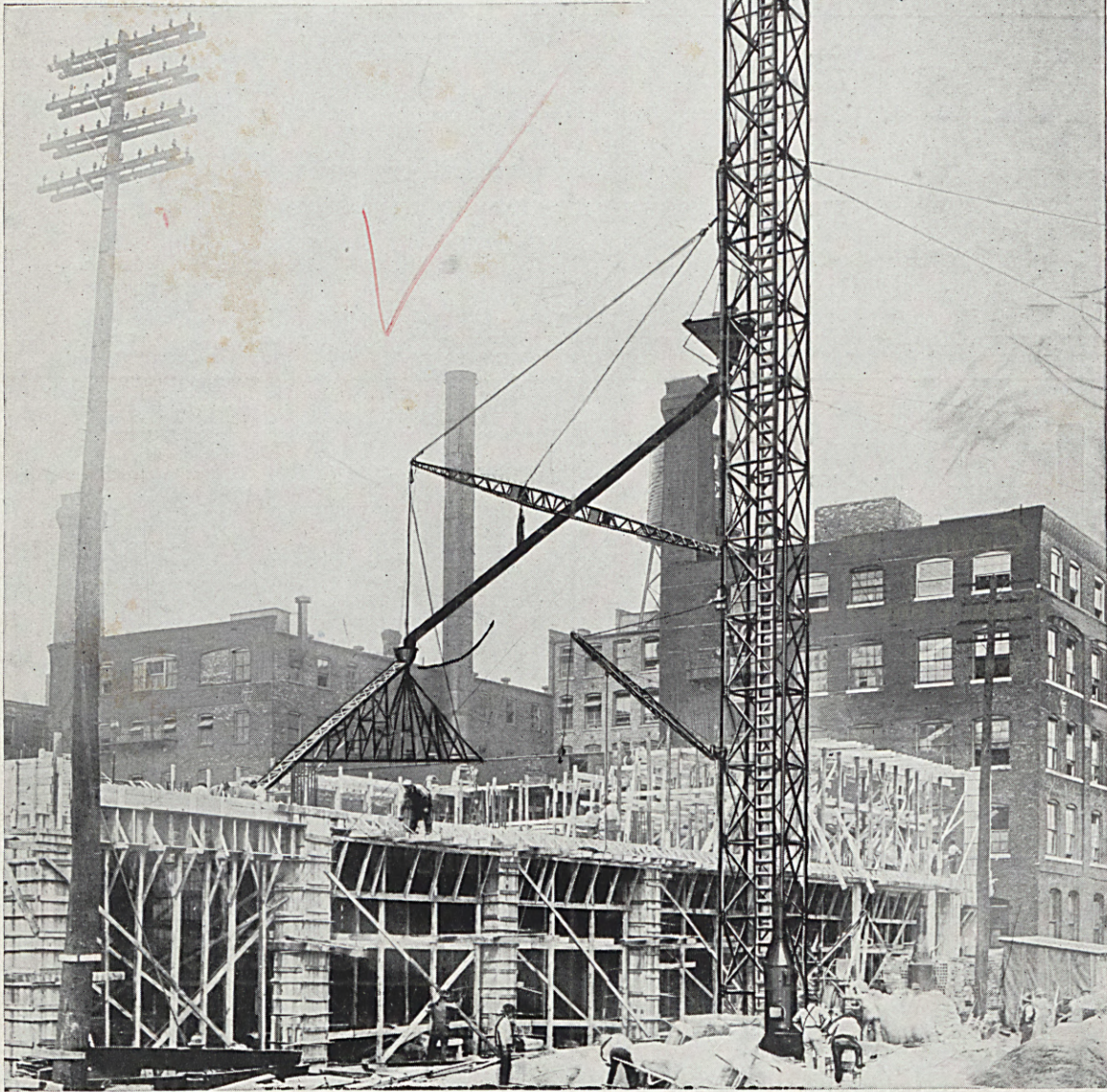
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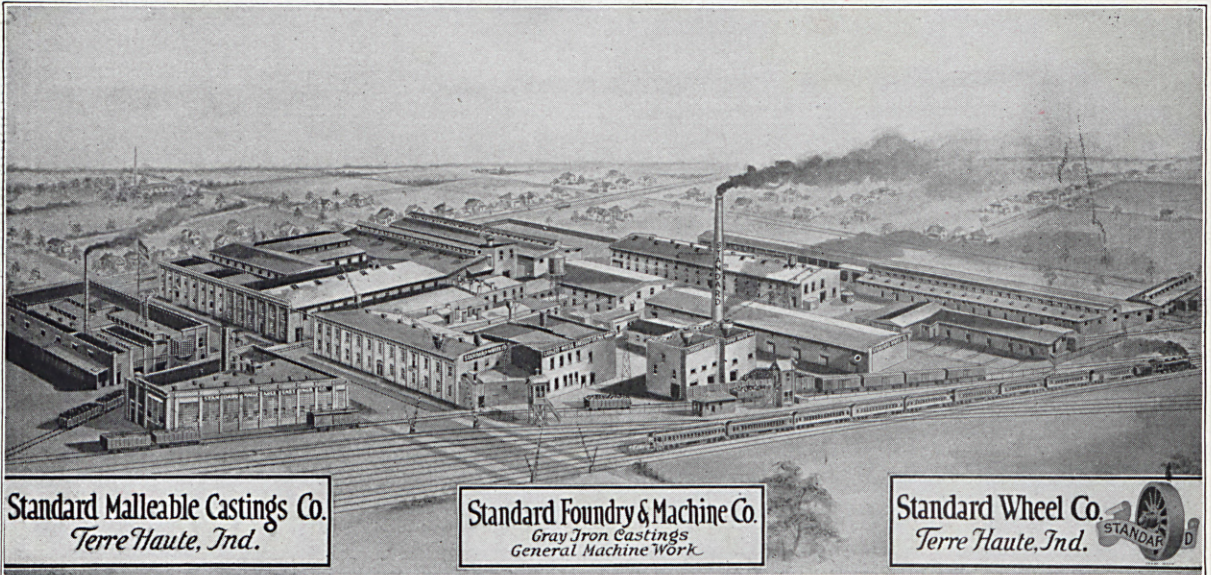
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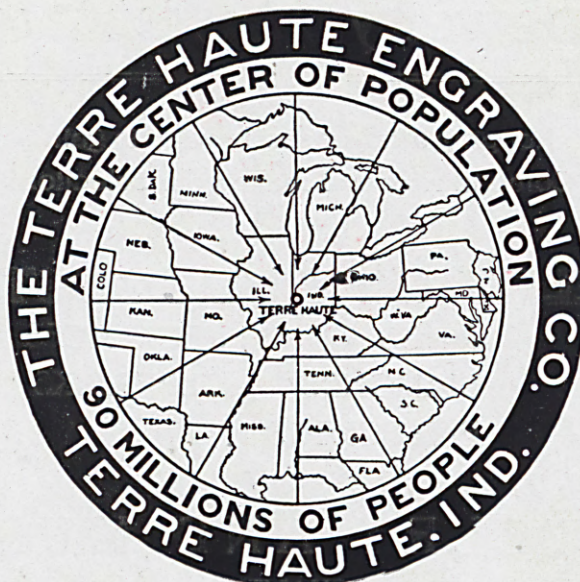
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VOL. XXX

TERRE HAUTE, INDIANA, DECEMBER 15, 1920

No. 6

The Rose Technic

PUBLISHED BI-WEEKLY DURING THE INSTITUTE YEAR BY THE STUDENTS OF THE ROSE POLYTECHNIC INSTITUTE

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The Alumni article for this issue is contributed by Erich A. Mees, '11. Mr. Mees is a member of the firm of Mees & Mees, Consulting Engineers, at Charlotte, N. C. His article on the "12,000 H. P. Hydro-Electric Power Development of the Blue Ridge Power Company" should be especially interesting at this time when there is a general movement on foot throughout the country to develop the available power of our waterways.

We wish to thank E. A. Mees, '11, and C. C. Rose, '23, for the cuts used in connection with Mr. Mees' article. Realizing that the Technic is rather hard up financially, Mr. Mees kindly offered to pay for one page while a donation from Mr. Rose made possible the use of the remainder of the cuts.

At the close of the 1920 football season Coach Gilbert handed his resignation to the Board of Managers. Gilbert came to Rose in the fall of 1917 and has had charge of all athletics since that time. During the four years he has been with us the fortunes of the Rose teams have varied. In 1917, with one of the best football teams that ever represented Rose, he won the I. C. A. L. championship. The same year he put a basketball and a baseball team in the field that never failed to make a good showing. This was without doubt the most successful of his four years' stay. "Gil" has always put all he had into his work and has turned out teams that Rose could well be proud of. He has made a host of friends who will wish him success wherever he goes.

Prof. Wischmeyer has agreed to coach the basketball team until the Board of Managers is successful in obtaining a man to take Gilbert's place. Prof. Wischmeyer was a letter man when in school and coached the team which won the I. C. A. L. championship in 1915. We owe a great deal to him for offering his services at this time. Let's show him we are behind him and we are sure to have a winning team.

12,000 H. P. Hydro-Electric Power Development Tuxedo Station

of the Blue Ridge Power Company

By Erich A. Mees, '11, of Mees & Mees, Consulting Engineers, Charlotte, N. C.

The Tuxedo hydro-electric development, recently completed and placed in successful operation, constitutes the initial project of a comprehensive development scheme on the Green River, a picturesque mountain stream of western North Carolina.

About the year 1905 the Manufacturers' Power Company was organized by a group of enterprising textile mill owners, with the view of acquiring control of a water power to furnish electric current for their industrial plants located in and about Spartanburg, S. C. After a period of painstaking investigation for suitable development sites, the attention of this newly organized company was focused on the power possibilities of the Green River. The highly attractive features of this stream, for the purpose under consideration, led to the gradual acquirement of the necessary property. At the expiration of about ten years, the Manufacturers' Power Company, in its own name, or through controlling interest in the stock of subsidiary companies, had acquired, by purchase, practically all of the property essential to the development of approximately 1,150 feet of fall on Green River within a distance, along the course of the stream, of about 25 miles.

Intermittently, from 1912 to 1915, extensive surveys and stream flow investigations were conducted by the consulting engineering firm of Sellers and Company, Philadelphia. Their findings and recommendations formed the subject matter of a report presented during the summer of 1915. This report confines itself primarily with the recommended initial project, the development of 300 feet of fall at Tuxedo Station, located about six miles from Hendersonville, N. C.

In the spring of 1917, C. A. Mees, Consulting Engineer, Charlotte, N. C., was retained by the Blue Ridge Power Company, sub-

siary of the Manufacturers' Power Company, to verify the previously obtained data, prepare plans and specifications and supervise the construction of the Tuxedo development.

Green River finds its source in the Blue Ridge Mountains of southwestern North Carolina, at an elevation of about 3,000 feet above sea level. The mean annual precipitation in this district is about 70 inches, a maximum for any section of the United States, and the forest covered mountain slopes produce a very high percentage of mean annual runoff. In view of the fact that large storage basins can be economically created, by means of high dams constructed across narrow gorges, practically the entire mean annual runoff can be conserved and utilized for power purposes. The only losses entailed are those due to abnormally high floods, leakage and surface evaporation.

The ultimate complete development scheme of the power sites owned by the Manufacturers' Power Company, contemplates the construction of four power plants and eleven storage basins, impounding a useful volume of stored water of more than three billion cubic feet.

The principal data of the fully developed properties are herewith given:

Table No. 1—Storage Basin Data.

Power Station	Storage Reservoir	Useful Storage Cubic Feet	Height of Dam-Ft.	Drainage Area Sq. Miles	Pond El. Referred to Sea Level
Tuxedo	Mayburn Lake	250,000,000	50		2200.0
	Terryl Lake	350,000,000	60		2200.0
	Bell Lake	1,000,000,000	110		2100.0
		350,000,000	120	45	2010.0
	Camp Cr. Lake	75,000,000	60		1910.0
	Cove Lake	600,000,000	65		2000.0
Fish Top Foster	Pulham Lake	100,000,000	100		1800.0
		250,000,000	170	88.5	1692.0
		75,000,000	85	105.5	1050.0
Turner	Bright Lake	75,000,000	50		1100.0
		153,000,000	70	135.8	955.0

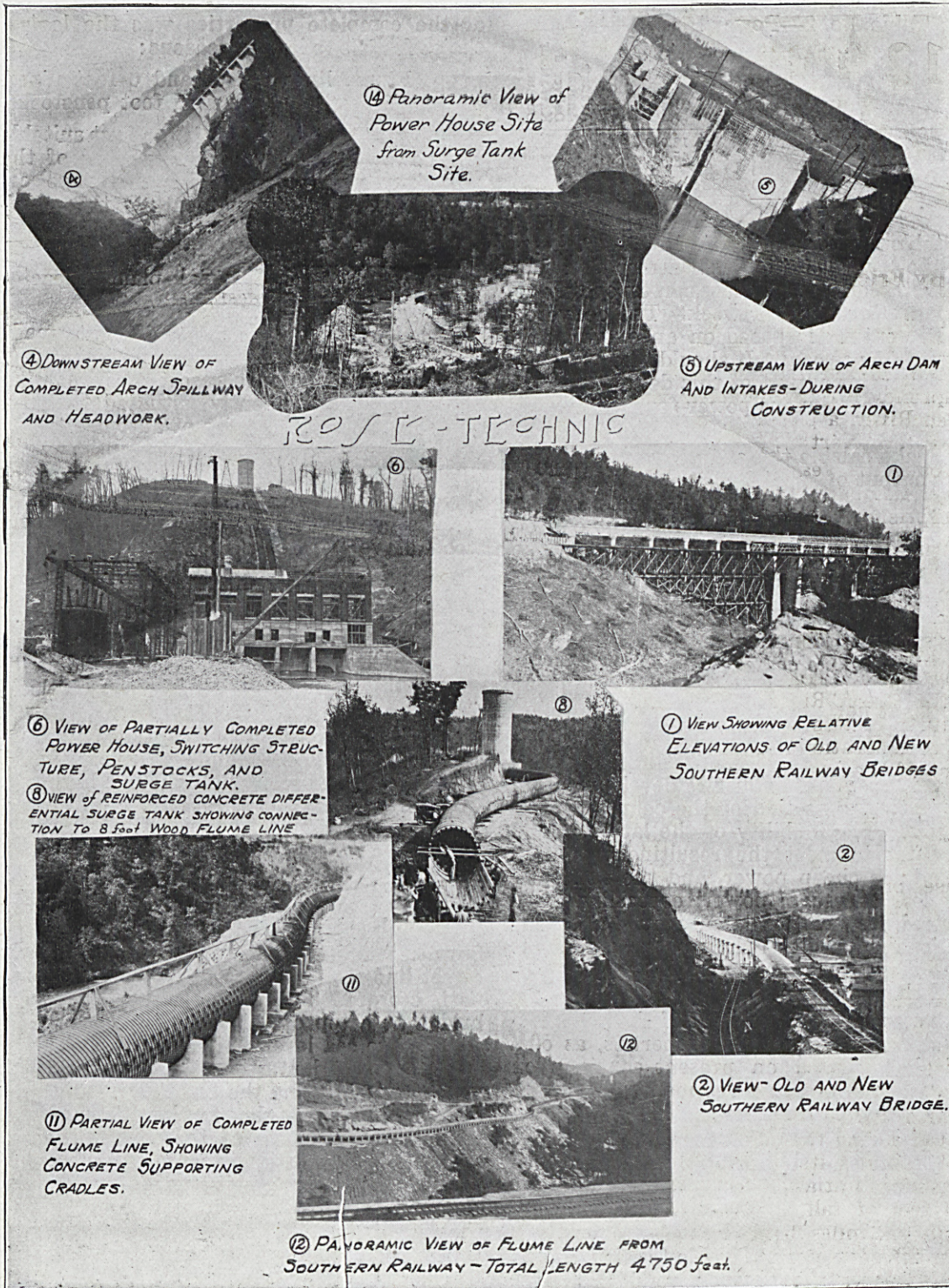


Table No. 2—Power Plant Data.

Power Station	Gross Head Feet	Ultimate Av. Reg. Continuous Flow in Sec. Ft.	Ultimate Installed Cap. H. P.	Average Annual Delivered K. W. Hour Output
Tuxedo	296	150	12,000	21,000,000
Fish Top	580	295	45,000	80,000,000
Foster	85	325	7,000	13,000,000
Turner	68	390	7,000	12,000,000
	1027		71,000	126,000,000

In table No. 2 the ultimate installed capacity at the several stations is based on a station load factor of 35 per cent, corresponding to 60 hours operation per week. The delivered Kw. Hr. output is based on an overall efficiency of 65 per cent. It should also be noted that the entire output of this development is primary or continuous power for the average flow conditions.

To make salable the entire average annual power output of these hydro-electric stations as primary power, there must be provided only sufficient auxiliary steam plant capacity to make up the deficiency between the water power output during the years of minimum runoff and the average year. Auxiliary capacity of 15,000 to 20,000 Kw. will satisfy this requirement. Under these peculiarly favorable conditions, the elimination of auxiliary steam plant capacity and the consequent necessity for selling a large part of the water power output as secondary power at reduced prices, is inadvised.

The tremendous industrial development in this particular section of the country in recent years, the inability of the larger power companies to meet the resulting increased demand for cheap power, and the abnormal high cost of steam power, especially when produced in small isolated plants, will unquestionably result in the rapid development of the many remaining valuable water powers of the South.

The complete development of the Manufacturers' Power Company's properties, as outlined above, based on present construction costs, will require an investment of approximately \$11,000,000. The cost of power, conditioned upon the sale of the entire capacity, will approximate 1.20 cents per K. W. hour, including interest, depreciation, maintenance, taxes, insurances, transmission, operation and administration.

The construction of Tuxedo Station, as the initial step in the progressive development

of the complete properties was the logical choice for the following reasons:

Flume lines 8 foot and 6 foot pipes, 4,750 feet long; three 5 foot penstocks,

A—Tuxedo Station is the first suitable power site in the upper reaches of the river which affords large storage capacity, thereby augmenting the regulated stream flow for the succeeding stations.

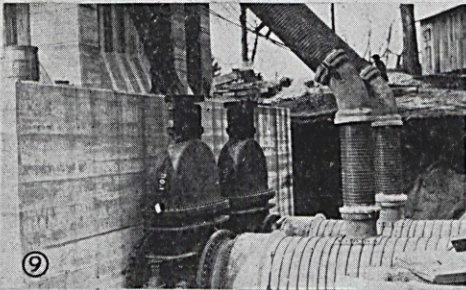
B—The entire initial plant capacity could be immediately sold.

C—Construction of this plant made possible the early development of a mountain pleasure resort of surpassing beauty, conveniently situated with respect to main arteries of automobile and railway travel.

The principal development structures of Tuxedo Station are a masonry arch dam, wood stave flume line, concrete surge tank, wood stave penstocks, power house, transmission system, including lines and substations, power house, switching structure and transformer repair house, and operatives' cottages.

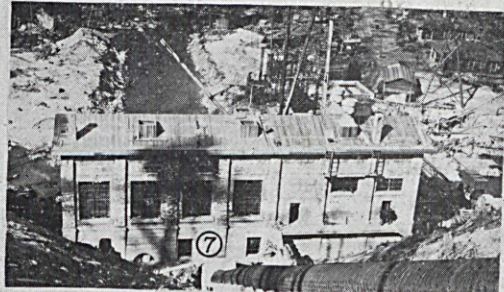
Contingent work included the building of roads, clearing of large wooded areas, relocation of a section of the Southern Railway tracks, including the construction of a concrete railway bridge, and the relocation of portions of the Greenville-Asheville highway.

The masonry arch dam spans a deep gorge at a point where the river makes a sharp 180 degree bend around an isolated granite knob rising nearly 200 feet above the river bed. Diametrically opposite and upstream from the dam, at a distance of only 350 feet, the Southern Railway Company's, single track, direct line from Charleston, S. C., to Cincinnati, crossed the river on a timber trestle bridge at a top of rail elevation of 2,006.50 referred to sea level. Since construction of an economical dam above the railway bridge was impossible, and the building of any dam of substantial height farther downstream would have necessitated the construction of an entirely new bridge to replace the existing wooden structure, it was deemed advisable to build the dam at the selected site to the maximum feasible elevation and relocate, at the required grade, a considerable length of the Southern Railway tracks.



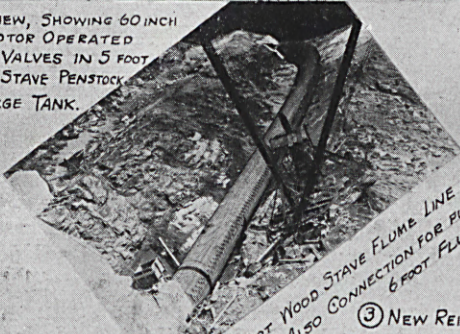
⑨

⑨ VIEW, SHOWING 60 INCH MOTOR OPERATED GATE VALVES IN 5 FOOT WOOD STAVE PENSTOCK AT SURGE TANK.



⑦

⑦ POWER HOUSE, PENSTOCKS, TAILRACE, STEEL BRIDGE OVER TAILRACE, AND SWITCHING STRUCTURE.

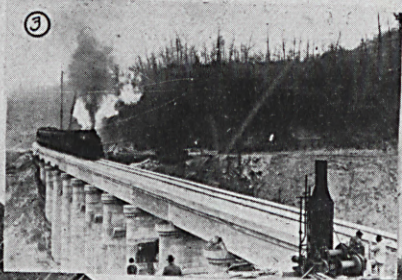


⑩

⑩ VIEW OF 8 FOOT WOOD STAVE FLUME LINE AT DAM INTAKE, ALSO CONNECTION FOR FUTURE 6 FOOT FLUME.

③ NEW REINFORCED CONCRETE DECK GIRDER BRIDGE-SOUTHERN RAILWAY

③



⑩



⑩

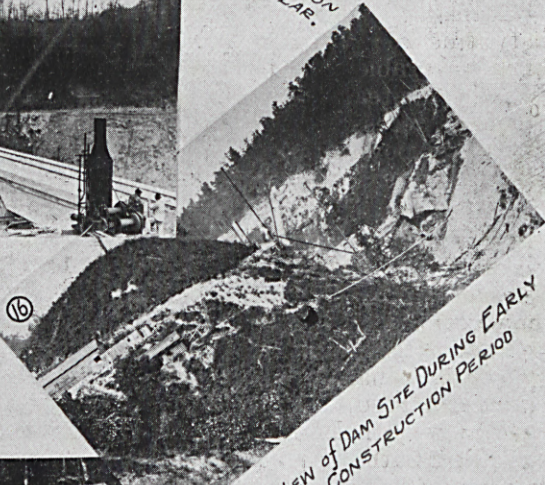
⑩ HAWLING 1000 K.V.A. TRANSFORMER EMPLOYING THE USE OF STEAM TRACTION ENGINE AND CLEVELAND CATERPILLAR.



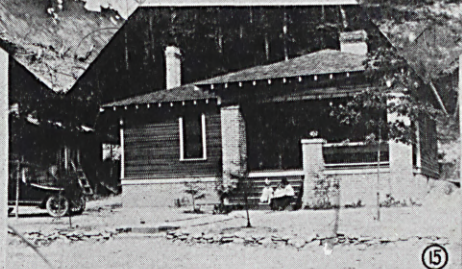
③

③ VIEW OF POWER HOUSE SITE, SHOWING TAILRACE EXCAVATION, CONSTRUCTION CAMP No. 2 and PERMANENT OPERATIVES COTTAGES.

⑩



⑩ VIEW OF DAM SITE DURING EARLY CONSTRUCTION PERIOD



⑤

⑤ TYPICAL OPERATIVES COTTAGE.

Elevation 2,010.0 was finally fixed as the permanent dam crest. The narrow span of the gorge and the substantial character of the abutting rock cliffs, permitted the selection of the most economical type of spillway dam; i. e., a simple arch. The dam rises to a maximum height of 122 ft. above the foundations. The upstream face is vertical, built on a constant radius of 160 feet. The maximum thickness at the base is 31.75 feet. The downstream face is constructed on a constant slope of one horizontal to four vertical, to elevation 2,001.0. The thickness of the section at the crest is only 3.5 feet. The transition from the constant batter to the top thickness being made by a simple curve of 73.5 foot radius. The central angle varies from 40 degrees at the base section to 93 degrees at the crest. This deviation from the usual economical average central angle of approximately 120 degrees was necessitated by the sloping contours of the north rock abutting surfaces. On the south end the arch thrust is taken up directly by the rock abutment; on the north end, above elevation 1,940, the arch thrust is taken by the massive concrete intake structure, which is built to elevation 2,016. The maximum computed compressive stress for an overflow depth of 5 feet, due to arch action alone, does not exceed twenty tons per square foot.

In the construction of the dam Blaw-Knox sectional steel forms were used throughout. The masonry consists of a concrete mixture of maximum density, approximately 1:2:4, and about 15 per cent of sound graduated plums, varying from 1 to 9 cubic feet in volume. Above elevation 1,950 only small plums were used and hydrated lime was added for waterproofing. All rock abutting faces were carefully prepared to solid vertical planes; quarry bars and channelers were used for this purpose. The total volume of masonry in the completed structure approximates 16,750 cubic yards. Of this total only 12,000 cubic yards are contained in the arch proper. About 10,000 cubic yards of earth and rock excavation were required in the preparation of foundations, etc.

The intake structure provides an outlet to the 8 foot flume at elevation 1,961, and an outlet to a future 6 foot pipe line at elevation 1,991. The flow to both outlets is controlled by motor operated structural steel

head gates. Large bell mouth intakes are provided to reduce the entry loss of head. Small filler sluice gates and vents are provided to prevent gradual filling of the lines and prevent collapse due to vacuum. Timber rack bars are used, supported by reinforced concrete beams and trusses, designed to withstand full hydrostatic pressure, in case it should become necessary to blanket the racks to make repairs to the head gates. The use of concrete rather than structural steel was dictated by the abnormal conditions prevailing at the time of construction.

From the dam, water is conducted through pipe lines to a surge tank, and thence to turbines placed in the power house. The pipe line provided for the initial development is a wood stave pipe, 8 feet internal diameter and 4,750 feet in length, laid to a grade of one foot per thousand. In the final development an additional 6 foot pipe will be laid to carry the added flow from the storage basins to be built above Tuxedo Lake. The design of the pipe lines was based on an ultimate carrying capacity of 430 second feet.

This pipe line, as well as the wood stave penstocks, was built in place by the Washington Pipe and Foundry Company, Tacoma, Washington. The wood staves for all pipes are straight grained, black, yellow and red cypress, milled from 3 and 4 by 6 inch thoroughly air dried stock. Staves for the 8 foot pipe are 3½ inches thick and for the 5 foot penstocks, 2½ inches thick. The faces of all staves are milled to true circles and the edges to radial lines. All ends are cut off square and accurately slotted to take splines of No. 10 iron, two inches wide. The average length of the staves is 14 feet and less than 10 per cent of the pieces are a minimum length of 8 feet. Steel bands for all lines are designed to take up maximum stresses at any point. Bands are mild, open hearth, ¾ inches round steel bars with upset threaded ends, bent cold to a true radius. Shoes for connecting the ends are sound malleable gray iron castings. Bands are spaced for a working stress of 15,000 pounds per square inch, including an allowance for initial cinching stresses. The spacing of bands varies from 6¼ to 15⅞ inches on centers. Suitable manholes, drain and vent connections are provided at certain points on the several lines. Special steel sleeve connections are provided to connect

the wood stave lines to the dam intake, surge tank and turbine casings. All necessary grading and preparation of foundations to receive the pipe lines was undertaken by the Power Company's forces. The beams for the 8 foot flume and the future 6 foot flume vary in width from 12 to 20 feet. Owing to the presence of a number of great rock cliffs, the prevailing steep slopes and the unstable character of the thin veneer of earth covering, this portion of the work presented tremendous difficulties. The alignment of the flumes was chosen with the view of balancing the cut and fill as nearly as possible, maintaining a minimum radius of curvature of 300 feet. All earth slopes are $1\frac{1}{2}$ to 1. At certain points masonry retaining walls were constructed to maintain stable slopes for earth fill. The largest single fill is 80 feet high and contains 45,000 cubic yards. A 4 by 4 foot concrete box culvert 250 feet in length drains the basin formed by this fill. The greatest depth of cut is 60 feet, and the maximum section of retaining wall is 35 feet high. The total amount of mixed earth and rock excavation and embankment approximates 275,000 cubic yards.

The completed pipe lines are supported on concrete cradles spaced 8 feet on centers. About 4,000 cubic yards of concrete were required for retaining walls, cradles and culverts.

Both flume lines, present and future, enter the reinforced concrete surge tank at a center line elevation of 1,960.25. The surge tank is of the Johnson differential type, constructed under the patentee's license and in accordance with an approved design. The outer shell of the tank has an internal diameter of 25.25 feet, a wall thickness of 15 inches, and rises from elevation 1,969.25 to 2,036. The concentric inner shell is 6 feet internal diameter, has a wall thickness of 6 inches and rises to elevation 2,033; it is supported laterally by two sets of concrete struts extending to the outer shell.

The tank base is an irregular hollow prismoid, resting on rock foundation at elevation 1,948, and is covered by a 30 inch slab, which supports the circular shells. Water is freely admitted from the base to the inner 6 foot shell, and four small parts, proportioned to discharge 38 second feet under one foot head, admit water from the base to the main tank. Ports of equal discharge capacity are

located at elevation 2,010 in the inner shell.

The function of the surge tank is to reduce pressure variations in the pipe lines to a safe minimum and thereby also to effect better speed regulation of the turbines. The criteria imposed for the design of this tank were as follows:

A—Maximum surge in tank for full load rejected never to exceed 18 feet.

B—Surge in tank for 15 per cent load demand, attaining full gate opening, about 3 feet below the steady full load gradient.

C—Extreme low water level in tank following 1,600 H. P. sudden demand with water in the pond at elevation 1,980, never to be less than 1,970.

D—Full gate discharge of three 4,000 H. P. units, 429 second feet, under 287 foot head.

Flume lines 8 inch and 6 inch pipes, 4,750 feet long; three 5 inch penstocks, 650 feet long; mean tail water elevation, 1,714.

The vertical drop from the surge tank to mean tailwater at the power house is 240 feet, within a distance, along the slope of the penstocks, of 650 feet. The 5 foot wood stave penstocks conduct the water to individual turbines, two of which are now installed and provisions being made for a third unit for the complete installation. The flow of water to the turbines is controlled by 60 inch motor operated Ludlow Gate Valves, installed at the surge tank. Penstocks are supported on concrete cradles and held in place against the vertical water thrust, by means of creep anchors and concrete anchorages.

The power house is a concrete-brick structure of simple design, approximately 25x104 feet in plan, having a maximum height, from bottom of draft tube excavation to lower chord of roof truss, of 52 feet. Steel sash, doors, trusses and stairways are used throughout. The generator floor level is at elevation 1,741.5; the basement floor level, which corresponds to the center line of the turbine, is at elevation 1,730. Mean tailwater is at elevation 1,714.

The generating units are placed 17 feet on centers. At the north end of the building sufficient space is provided for installation of the future third unit and the dismantling of a single unit. The entire floor is served by a fifteen ton traveling crane.

In the south end of the building a balcony is constructed at elevation 1,750.5. The switchboard is erected on this balcony, and back of same is located the station operator's office, locker room, lavatory, etc. The space beneath the balcony, at elevation 1,741.5, is divided into two rooms, one containing storage battery equipment, the other, auxiliary station transformers, generator rheostats, and auxiliary motor-generator exciter set. The corresponding basement floor space contains potential and current transformers, oil switches and bus bar compartments.

The power house is approached by a steel bridge spanning the river bed. The power house transformer station is located adjacent to the bridge approach. Two banks of transformers are symmetrically placed on concrete foundations and a single 1000 K. V. A. transformer is held in reserve. Transformers are mounted on wheel bases and can readily be moved by transfer truck to the repair house.

Each of the two present installed hydraulic units is a 36 inch bronze Francis-Pelton single discharge runner, mounted in a split cast iron spiral casing, direct connected to 2,500 K. W., 80 per cent P. F., 6,600 Volt, 600 RPM., 3 phase, 60 cycle, vertical General Electric Company's generator.

Turbines are governed by 15,000 Ft Lb. Pelton, vertical, belt driven, oil pressure governors, with mechanical hand control and electric motor speed control for operation from the main switchboard.

Circulating oil pumps, geared to the main turbine shafts, supply oil for all generator and turbine bearings. Two self contained centrifugal, motor driven, open system, oil pumping units, each capable of taking care of both turbines, are installed on the generator floor. Air brakes are provided to bring the units to rest.

The guaranteed turbine efficiencies are: 83 per cent at $\frac{1}{2}$ gate; 90 per cent at $\frac{3}{4}$ gate; 86 per cent at full gate.

The flywheel effect of the generator motor is 115,000 feet square pounds, and the guaranteed speed regulation is 24 per cent for instantaneous 100 per cent load change. The guaranteed full load generator efficiency is 95.3 per cent. Generators are equipped with upper and lower guide bearings, and G. E. type spring thrust bearings. Vertical, 65 K. W., 250 Volt, Exciters are direct connected

to the extended generator shafts. Emergency direct current for excitation and operation of station auxiliaries is supplied by storage batteries and motor generator sets.

The station switchboard consists of nine dull black, marine finished slate panels, mounted on self supporting pipe framework. Instruments are finished dull black. Grille work encloses sides and back of switchboard. The principal station busses are as follows:

A—Main 6600 volt, to two banks of 6600/44000 volt, 3 phase transformers, 1000 K. V. A. capacity each.

B—Auxiliary 6600 volt, to two banks of 6600/2200 and 6600/220-110 volt, 75 K. V. A., 3 phase transformers.

C—220-110 volt, single phase, to lighting circuits.

D—220 volt, 3 phase, to pump motors, filter press and machine shop circuits.

E—250 volt, D. C. to exciter bus, crane, air compressor, penstock valves and governor pump and pilot valve circuits.

Motor generators and head gate hoists at the dam receive current from the 2200 volt secondary side of the 75 K. V. A. transformers of item B. In an emergency the head gate hoist motors receive current from the synchronous motor-generator set, the latter receiving current on the D. C. side from the storage batteries.

The picturesque valley at the dam site provides an attractive setting for the appropriate 4 and 5 room bungalows erected by the Power Company for the station operators.

The main transmission line extends from the Power house, on a more or less direct route across the mountains to Spartanburg, S. C., a distance of about 37 miles. Archbold-Brady Company's double circuit flexible, steel A. frame and square strain towers are used. Standard spacing for towers is 400 feet. Flexible towers have a base width of 10 feet and a height above ground of 46 feet. Cross arms are spaced 3.5 feet on centers, and measure 5.5 feet between conductors. Only one No. 1/0 copper circuit is installed at present. Ground wire, $\frac{1}{4}$ inch steel, is strung on top of towers, 3 feet above the highest conductor. A telephone circuit is placed 6.5 feet below the bottom cross arm. The minimum distance to ground from the nearest No. 1/0 conductor is 25 feet.

The principal substation is located at the Spartanburg terminal and has an installed transformer capacity of 4,500 K. V. A.

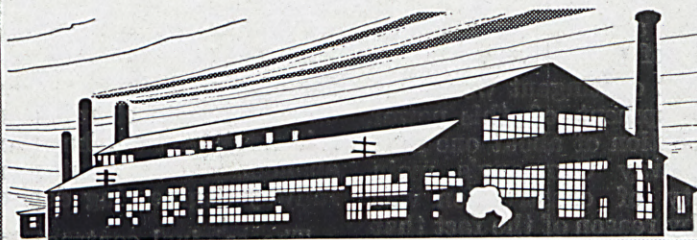
The most important contingent work carried out in the development of this power project was the relocation of about one mile of the Southern Railway Company's main track. The difficulty of construction was materially added to by reason of the fact that the normal train operating schedule had to be maintained. Heavy side hill shovel excavation to a depth of eighty feet was required for laying temporary tracks. The new bridge, a reinforced concrete, single track, deck girder bridge, with 40 foot spans and river piers 100 feet high, is located 40 feet downstream from the old structure and parallel thereto. The total length of the structure is 720 feet and the top of rail elevation 2,024.50, 18 feet above the old structure.

The superstructure girders are 2.5 feet wide and 8.5 feet deep, designed for Coopers E-60 loading. The most economical design contemplated the use of hollow piers, 65 feet on centers and clear spans of 40 feet in the mid-river section, however this design was abandoned on account of opposition from the railway engineering department.

The original contract for the construction of the dam and railway bridge was let to Willard-Boggs and Co., Spartanburg, S. C. Unsatisfactory progress, on the part of the contractors, led to the organization of a construction department by the Power Company. The entire work was taken over and completed by this department under the direct supervision of the Engineers.

The total cost of the development approximated \$1,600,000.





ALUMNI - NOTES

Claude E. Reese, '13, who for the past two years has been assistant engineer for the Public Utilities Commission of the State of Illinois, writes that he has accepted the position of associate editor of the Gas Age and will also edit the Gas Engineering and Appliance Catalogue. His future address will be care The Gas Age, 52 Vanderbilt Ave., New York City.

Paul J. Grafe, '20, who has been for the past year with the A. R. Cummings Co. in Detroit, passed through Terre Haute on Sunday last on his way to St. Louis where he expects to be located in the future. He still retains his connection with the A. R. Cummings Co.

Robert A. Weinhardt, '16, and Miss Pauline Taylor of Pittsburgh were married in Pittsburgh Wednesday, Nov. 24. They will be located at 1220 Illinois St., Indianapolis.

News has reached the Institute that William L. Edwards, '10, was accidentally shot and killed in hunting at Donna, Tex., on Nov. 24. Edwards has been in the employ of the Nordyke-Mormon Motor Co. but had recently gone to Texas to assume charge of a ranch belonging to his father.

During the war Edwards, who was a Qua-

ker, joined that section in rehabilitation work in France and did noble work in the cause, making in full measure the needed aid to his country and their allies, though prevented by his conscientious belief from active participation in the fighting. He was a loyal Alumnus and always took great interest in the welfare of the Institute.

Among visitors to the Institute during the holidays may be mentioned the following:

"Jap" Davis, '17, with the National Malleable Castings Co. at Indianapolis. "Jap" looks mighty fit.


Albert W. King, '20, now science instructor at Morris-Harvey College, Huntington, W. Va. King teaches all the "ologies" and has several fair co-eds in his classes to aid in making life interesting. He reports himself as greatly pleased with teaching.

William R. Bell, '12, has left the Baton Rouge Electric Co. and is now sales manager of the Haverhill Gas Light Co. at Haverhill, Mass.

We wish to extend our deepest sympathy to Fred Fishback, '02, Richard Fishback, '12, and Miss Mary Fishback upon the death of their mother, Nov. 15. Miss Fishback will be remembered as former assistant librarian.



ROSE LEAVES

BERGMANN — 

NEW MEMBERS OF OUR FACULTY

The beginning of the scholastic year of 1920-21 at Rose found several new faces in the Faculty. By this time, however, they have become more or less acquainted with the students and the Rose customs. The new members are Dr. Sousley, Prof. Brown, Lieut. Montgomery and Miss Gilbert. Mr. Stone and Mr. Exline are also new additions to the Faculty, however both were students at Rose until this year and consequently are very well acquainted with both Faculty and students.

The new Faculty members in an interview with a Technic reporter gave an idea of their feelings in regard to Rose:

Dr. Sousley—

"I am very happy to be connected with the Rose Polytechnic Institute and to know the members of the Faculty. I appreciate my acquaintance with members of Freshmen and Sophomore classes and am desirous of meeting more members of the upper classes. I am anxious to fit in with the excellent customs of Rose and be a help in the advancement of engineering education in this state."

Lt. Harry A. Montgomery—

"It is with a great deal of pleasure that I came to Rose Polytechnic Institute. That pleasure, anticipatory at first, has, now that I have had an opportunity to become acquainted with the members of the Faculty and student body, become an actual realization.

"I wish to extend to both the Faculty members and students my appreciation of the kindness and good will extended to me from the first. It is my sincere wish and hope that my term of duty at Rose Poly may be a lengthy one."

Miss Gilbert—

"Coming to Rose to take, not to fill, the place of one of your warmest friends, I might easily have been discouraged, but the Fac-

ulty and the student body have been so courteous and helpful that I know already that this is as Mrs. Burton told me, the nicest job in the world."

Prof. Brown—

"Contrary to the way of romantic fiction, my first impressions of Terre Haute do not constitute a startling case of love at first sight. In the flurry of my arrival I had not immediately noticed that the atmosphere of gloom prevailing at the Union Station was not confined to the train sheds. Directed by one of the indigenous, I threaded my way across several railroad yards before I became aware that the sun was off color. The mists about me did not seem to resemble any fall haze I had ever classified, therefore I removed my spectacles with a view to cleaning them. To my amazement the miasma did not disappear. I flagged a passer-by and inquired whether Mrs. O'Riley had upset that lantern again and whether chances were that the configuration would or would not destroy the entire town. As I spoke, a large and flippant flake of soot fell upon my upturned nose. It was my baptism, my christening, my initiation into the dark mysteries of the unknown city.

"Now I would not for worlds reveal the things I felt when I first saw Rose. You don't know the half, and I couldn't tell you anyway. Suffice to say, earlier impressions have given way to later and happier ones.

"Words of wisdom are not found exclusively in dog-eared tomes, nor do they alone emanate from lips of wise men. When the refrain of a popular song liltily insists: 'You can't judge a book by its cover,' it points a simple and unmistakable truth. Taking the underlying truth to heart and applying it, you will find that neither can you judge the worth of an institution by its walls, even though unenlightened design and perennial smoke barrages may have made its walls sug-

gestive of the original cubist conception of a pessimist suffering from acute gasteritis.

"The fact is, clothes do not afford an index to the character of a man. Brick and mortar are no indication of the character of a school. The character of a school depends almost solely upon the combined characters of its Alumni, its students and its Faculty.

"Character may seem an intangible thing, but it is a most real attribute of men and institutions. Character expresses itself in, and is itself dependent upon consistent loyalty to an ideal, constant struggle for the development of the better, finer, truer self.

"The test of a man or of a school lies in the fight he or it makes for quality. Rose stands for quality. Now since character makes for quality, and since character is at its best when it is conscious of itself, consciousness that Rose stands for quality ought always to be kept acute.

"In measure as it is kept acute, in measure as individual effort is made from day to day to improve in quality of thought, of reading, of friendship—in fact of every activity of life, the words sung so enthusiastically at every mass meeting and every football game will come to have increased meaning, and something more than surface sentiment will accompany the voiced chorus of 'Dear Old Rose!'"

Miss Hazel Huffman, secretary to the president, underwent an operation for appendicitis last Friday at the Union Hospital. Miss Huffman's condition has become very much improved during the last week. We trust it will not be long before she will again be able to resume her former position.

CLASS MEMORIAL

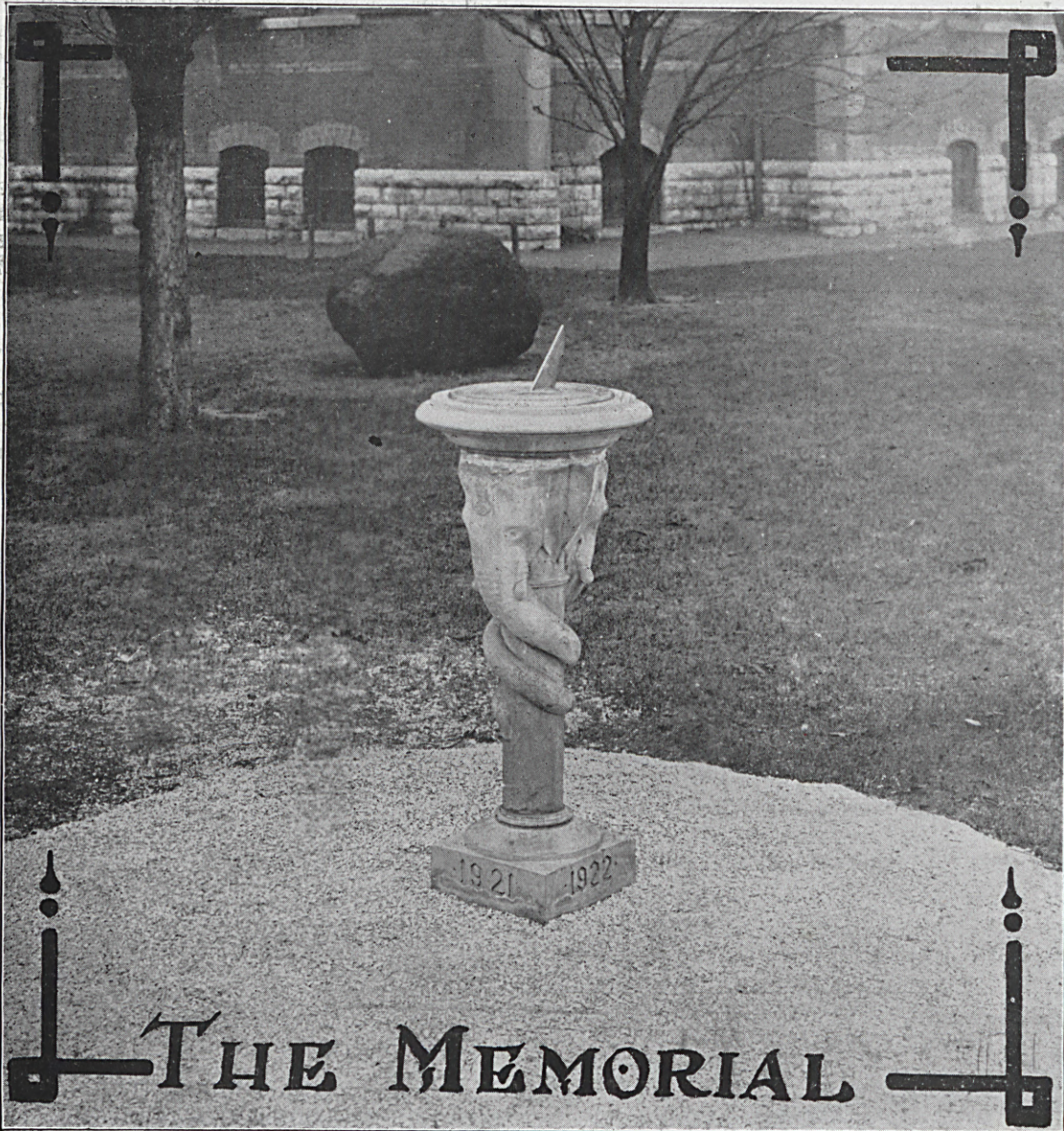
We present herewith a picture of the sundial left as a memorial to the school by the classes of '20, '21, '22 and '23. It was designed by Miss Anna Vaughn Hyatt, the famous sculptress who made the well-known Jean d' Arc monument in Riverside Drive, New York. It is of marble composition casting and stands four feet high. Embodied in the design is, of course, the time-honored Rose elephant, there being two elephants' heads on the column, entwining their trunks around it.

The present Senior class at their Junior banquet last year decided to leave some memorial that would both be beautiful and of such a character that it could be moved to the new school site, when the school is completed, and still fit in very nicely with the surrounding architecture. Accordingly the committee appointed conferred with school officials and with Mr. Van Pelt, the architect who designed the new school. The latter suggested the plans for the sundial and offered his services in securing a competent sculptor. It was, however, seen that this was going to be more than the one class could do, but still wishing to have a memorial that would be useful rather than one which could never be moved, they proposed to let the other classes in on it rather than see it drop. The class of '20 hadn't left any memorial during their Junior year, due to war conditions, and readily voted to go in. The other classes, '22 and '23, soon came in line and the thing was put over. Work was completed on the dial last spring but unusual freight congestion prevented its arrival here until this fall. It has now been erected in the southeast corner of the campus and has created quite a bit of very favorable comment. When (and that should be italicized) the new school is completed, the sundial is to occupy a position in the center of the main driveway leading to the main building.

THE GLEE CLUB

Shall Rose have a glee club this year? I think you will all agree with me that a glee club is worth while and that we ought to have one. We ought to have a **good** one. We have the material but in order to bring out a good club we must have the loyal co-operation of the whole student body.

The education you are receiving at Rose is two fold. That which you receive from books and personal contact with your professors, second that which you receive from taking your part in student activities and the contact with your fellows. The one is no less important than the other and you will obtain "value received" from both these forms of education in direct proportion to the effort you invest in the venture. The man who displays energy and earnest effort in both lines



THE MEMORIAL

of activity will be pretty sure to succeed after he quits Rose to enter upon his life work. Half-hearted effort never brings out a good football team or a good glee club.

Last year, after a number of years of inactivity, due to the war and other things, the glee club tried to "come back." We who put considerable effort into the venture think the club made a creditable beginning. A good many of the men who sang on the club last year are still with us. That is a big advantage. There is a lot of good material among the new men as well as among those who did not come out last year. Don't feel bashful about coming around to rehearsal or about coming to see me personally. I am available almost every day after four o'clock at the laboratory. We need especially men who sing first tenor and second bass.

The glee club is a particularly good form of advertising for Rose because it furnishes an effective avenue through which to keep the alumni in touch with our activities. To the man who is not good in athletics the glee club furnishes another chance to join in student activities. I do not need to stress the educational value of music, or the team work necessary to bring out a good glee club. You probably think music is a far cry from engineering but let me assure you that the engineer of today must train every resource he has in his system. I know of an isolated camp way down in Chile. The morale of that lonely camp was kept up almost entirely by one or two young chemists who could sing and play the banjo. They kept the others from getting down-hearted and home-sick through their music and cheerful optimism.

After the Christmas holidays we expect to get down to hard work in order to be ready for some concerts at the earliest possible moment. Beside singing we want, if possible, to have some instrumental work this year. Mr. Albert Dunlap has agreed to take charge of the instrumental work. We want to put the club far ahead of what it was last year. That means hard work and plenty of it.

In closing let me make one more appeal for the backing of the whole student body. Let's give Rose the best possible glee club. GIVE US A HAND.

Officers of the Glee Club Association: Mr. Kearney E. Harmas, president; Mr. Donald L. Griffith, vice president, and Mr. Alfred J. Suttie, business manager.

ALFRED T. CHILD,
Director.

FRATERNITY --NOTES--

The members of Iota Chapter of the Alpha Chi Sigma Fraternity will give their annual dinner dance Thursday evening, Dec. 23. One big purpose of these affairs is to gather the Alumnae of the chapter together again and special efforts are being made this year to have as many of the old heads present as possible.

Brothers Paul B. Curtis, '18, and Albert W. King, '20, were in the city recently and looked up the members of the chapter.

Iota had as its guest recently William A. Hamor of the Mellon Institute at Pittsburgh. A banquet was given in his honor and chemical and scientific problems of the day were discussed in a very interesting and instructive manner over the cigarettes and coffee.

ALPHA TAU OMEGA

The local chapter entertained with a skating party at the Armory rink last Wednesday evening. It was voted a huge success by the twenty couples present.

During the Christmas holidays Gamma Gamma will inaugurate her first annual Alumni day. A dinner and smoker will be staged at the chapter house. A large number of graduate A. T. O.'s have already expressed their desire to be present and the affair promises to be the best "get-together" of the year.

Immediately following the Christmas vacation another house dance will be given.

THETA XI

Kappa Chapter will hold its next house dance on Dec. 21. Several novel ideas are under way to insure those attending of a very enjoyable evening.

Brother Carr Skinner returned from Louisville to spend the Thanksgiving holidays as guest of the chapter.

Several of the members of the chapter

went home for Thanksgiving. These were Bros. Eichen, Newby and Turner.

Mr. Douglas, a member of Sigma Kappa Delta, whose chapter at Armour Tech. is petitioning Theta Xi for a charter, spent Saturday and Sunday as a guest of the chapter.

F. M. Pence has accepted a position with the Nela Lamp Works of Dayton, Ohio.

Among those returning to their homes for the Xmas holidays are Stone, Brunning, Eichen, Bixby, Newby, Turner and Boyd.



HOW HE WON HIS SCHOLARSHIP

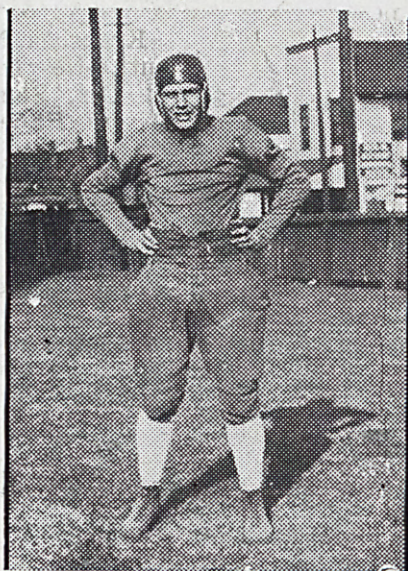


FOOTBALL

Rose, 20; Alumni, 12.
 Rose, 74; Merom, 0.
 Rose, 0; St. Louis University, 12.
 Rose, 6; Earlham, 7.
 Rose, 0; Wabash, 35.
 Rose, 7; Franklin, 40.
 Rose, 0; St. Xavier, 56.
 Rose, 7; Butler, 35.
 Rose, 28; Normal, 7.

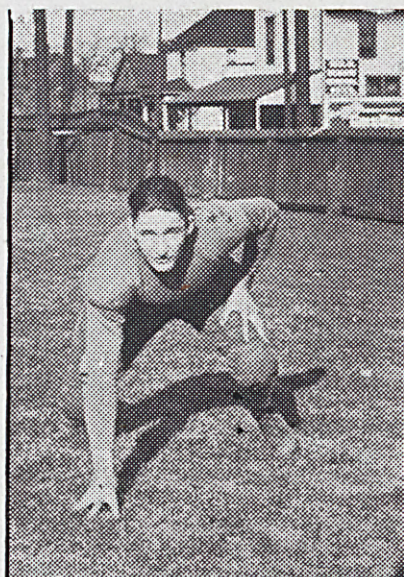
This year was marked by one of the most unsuccessful football seasons Rose has ever experienced; not only were most of the games lost but many men were injured, some seriously. To begin with, Dix, star back-field man of last year, was injured in the Alumni game and did not get back into harness until the Butler game. Engelhard, Harris and Standau, our trio of all-state men, were handicapped by injuries and forced to remain on the sidelines a great part of the time. Only

by a team, individually superior to any in the I. C. A. L., Rose did not win a single important game. The one thing that brought joy to the hearts of Engineers was the great Rose victory over Normal.



ENGELHARD, CAPTAIN 1920

four men from a squad of twenty-five escaped this flood of bad luck with the result that Rose was usually represented on the field of battle by a patched-up outfit. Represented



STANDAU, CAPTAIN ELECT 1921

Captain Joe Engelhard was the strength of the backfield throughout the year and proved to be one of the best football players Rose has ever developed. Joe played in the Normal game against doctor's orders and was easily the best backfield man on the field. He has been named as left halfback on the second all-state team.

Claude Gray, two hundred and five pound guard, played four years on the varsity and was a star every year. "Head" has been placed on the all-state honor roll.

Dutch Krausbeck played the other guard position and showed the same fight that has made him an "all around" athlete.

Earl Moses, end extraordinary. "Mose" did not get to play much because of old football injuries but always starred in the big games.

Milton Steffen caught the forward pass that spelled defeat for State Normal in the Rose-Normal game. "Steff" played guard and end. "Dusty" Dedert broke into most of the games and showed a lot of fight. This was "Dusty's" fourth year on the squad.

"Ick" Reinhard's punting and passing were a feature of every game. "Slim" played his first year in the backfield and made a good fullback.

"Bud" Conover was the fastest man on the squad. Watch him next year.

"Hank" Offutt, end, played his first year of college football and won a regular berth for himself.

"Stuffy" Taggart was slowed by injuries this year but broke into the Normal game and did a lot of ground gaining. Bill Dedert and Gruessing, linemen, will probably fill regular berths next year.

Roland Dix proved that he was one of the best men on the squad by his brilliant performance in the Normal game. "Dixie" played in two games this year and starred in both.

"Al" Standau, mentioned as all-state material, played a wonderful game all year at tackle.

"Ray" Harris, also an all-state man, is the other half of a combination of tackles hard to beat.

"Jack" McDargh, one hundred thirty-five pound center, was one of the strongest points in the line.

Hager, guard and center, made up in fight what he lacked in weight. "Shaky" was one of the most valuable men on the squad.

Joslin was handicapped by injuries this year but should go big next season. Jack is an end.

Heck, tackle, should be a tower of strength next year.

Forsythe, freshman quarterback, ran the team in great style.

Wilson, tackle, was used at nearly every position and proved to be a very valuable man. "Jock" is just getting out of the hospital, having been injured in the St. Xavier game.

Hauer and Skeeters, freshman backfield material, should help a lot next year. Both are big and fast.

The loss of Engelhard, Gray, Moses, Krausbeck, Steffen and Dedert will be keenly felt

but the chances for a good team next year are excellent.

BASKET BALL

The coming of the basket ball season finds Rose in a state of unpreparedness. Since the resignation of Coach Gilbert, another mentor has been unavailable; there is no suitable playing floor to stage home games, and no kind of a schedule has been completed. However, Professor Wishmeyer, newly appointed faculty athletic manager, has taken hold of affairs and promises to straighten things out. Professor Wishmeyer coached a Rose team that won the I. C. A. L. championship in 1915.

With Captain Krausbeck, Reinhard, Standau, Conover, Ellis, Harris and Walker as a nucleus a powerful combination should be put together. Among the freshmen are such high school stars as Boland, Skeeters, Bogardus and the Watson brothers.

Rose has a three game series with Normal this year and have an excellent chance to average the defeats of last year.

FOOTBALL LETTERS AWARDED

At a recent meeting of the Athletic Board nineteen "R"s, nine reserve "R"s and thirteen class numerals were awarded to the following men:

"R"s: Engelhard, Gray, Krausbek, Moses, Carl Dedert, Steffen, Offutt, Harris, McDargh, Standau, Forsythe, Dix, Reinhard, Taggart, Hager, Heck, Skeeters, Hauer and Conover.

Reserve "R"s: W. Dedert, Grusing, Joslin, Hocker, Morehead, Wallace, Campbell, Fisher and John Wilson.

Class Numerals: Wright, Lentz, Wolf, Watson, Fortune, Quinlan, Tyler, Heidenger, Wesley, Fitzsimmons and Stock.

The Managers and Assistant Managers of the various branches of Athletics were also elected. They are as follows:

Basket Ball.

Manager—Carl Schroeder, '21.

Assistant Manager—Carl Royer, '22.

Track.

Manager—Carl Dedert, '21.

Baseball.

Manager—Robert E. Sewell, '21.

Assistant Manager—Robert H. Hartough, '22.

Football.

Manager—Alfred Suttie, '22.

Assistant Manager—H. T. Lentz, '23.

GOBOON

VOLUME II.

NUMBER 5

A New Contest.

Rivaling the gum-chewing contest, which was recently exploited in these columns, was the contest held by the members of Prof. C. C. Knipmeyer's Triple E class to see who could make the lowest mark on the mid-term. For sheer novelty and in point of the keen competition shown, it seems to far surpass the afore-mentioned contest. Owing to the large number of entries, the winner has not yet been determined, it still being necessary to choose between some half dozen students who have out-distanced the field. Due to the extreme modesty of these leading contestants no names can be mentioned at this time. The winner of the contest is to be awarded a pair of perforated ear-muffs.

Technic Declares Dividends!

During a recent investigation by the Technic Staff it was found that the finances of the Technic were such that dividends are to be paid to its stockholders immediately. The cause of this sudden development is not entirely brought to light, but several reasons are plainly evident. Bidding for the advertising space has recently developed into such a condition that long waiting lists are filled. Advertising prices as high as \$3.46 an inch have been offered. The editorial staff is also an important factor in the boom, but the nucleus of all is the work of Ben Grossman, 23. This young author has come to light and his articles are priceless. Scouts have been sent out by many of the leading magazines in order to secure his essays, but being extremely clothed with school spirit, he has refused even the highest offer they have made.

In connection with young Grossman it might be said that his ability as a chemist is almost as widely known as his fame as an author. He has already refused numerous offers of positions, prominent among these being that of no less a personage than Lydia E. Pinkham. Had he accepted he would have

directed the manufacture of this famous lady's well known Vegetable Compound. However, he has so far persistently declined all offers no matter how remunerative.

Sad Accident.

It has been suggested that a high-chair with all the accompanying paraphernalia, including straps, be provided for R. K. Price in Junior graphics. This suggestion comes as a result of an accident which occurred last Wednesday up in the Civil's ward. Price was seated on his stool apparently deeply absorbed in a graphics plate on which he was working, when all at once he fell from the stool to the floor which is of hard wood. To all who are acquainted with the height of these stools, it will be evident that "Pete" fell quite a distance. However, as far as could be determined, no bones were broken and the young man was able to resume his work. Prof. Thomas was of the opinion that the mishap was caused by the slick floor but it is generally believed that it was due to bad dreams.

These Trying Times.

Clyde Ellis,
Well-known Rose
Athlete, was
Discussing industrial conditions
With
An acquaintance
Just the other
Day.
"Well,"
Said the friend,
"These are
Certainly hard times.
They
Laid off
One hundred and forty
Men at the Van shops
Yesterday."
"That's nothing,"
This from
Clyde,

"They laid off
About a half dozen
Men
Up at
The school last
Week"

Normal News.

It is rumored that Coach Hanna of Normal will be retained during the basket ball season to instruct the players in the proper way to run out on the floor before a game; as he has had considerable experience along this line. It was he who so patiently spent several hours the day before the first Merom game teaching the boys the most spectacular entrance upon the field. It is supposed that he was also the originator of the impressive formation assumed by the Normal team while kicking goal after touchdown. However, the exits from the field were not so heroic, especially after the last two games.

Harry Kinkle, well-known Normal student, appeared at Baur's one evening last week with his spelling book under his arm. He reported that this was his most difficult subject, so he is studying hard to keep from "conning" it next fall.

Coat Changes Hands.

Robert H. Hartough of the Junior Chemicals, appeared at the economics class recently wearing an overcoat. When asked if he was cold, young Hartough replied in the negative but added that he merely wanted to show all of the boys that he had an overcoat. It is said that he obtained the coat by a rather shady deal from Henry Offutt.

Perhaps He's Not Alone.

Alonzo Watson, upon receiving his grade on the recent economics mid-term, was rather surprised that it was so low. He said that he could not account for it, stating that he had discussed the subject pro and con—pro now and con next fall.

Popular Student Exposed!

The secret is out at last! It has just been learned that Harold D. Brown, 22, is now daily rehearsing so that he can successfully play the part of Santa Claus for his young child Christmas eve.

Those Green Caps.

It has been heard that instead of petition-

ing the Student Council to allow them to discard their green caps during the cold weather, the Freshmen are going to ask permission to wear them all winter. From all appearances the first year men like to wear the caps. As evidence of this, several of the Freshmen who are out for basket ball wear this type of head-gear to practice in. Also, Herbert Hagenwald, the class lady-killer, was seen about 5:30 o'clock one Saturday evening ambling down the main drag wearing his green cap. In the case of young Hagenwald it is probably his intense school spirit which prompts him to so religiously wear his green cap. Hagenwald has always been interested in the Rose athletics, especially as shown by the fact that about three hours after the Rose-Normal football game, he accosted "Mike" Ronald and anxiously inquired who had won. Alexander Kolinsky has become so accustomed to wearing a green cap that he would feel queer without one. It has been suggested by some that since all of the Freshmen like to wear the caps so well it might be a good idea to make them wear green shirts or trousers.

Is It Possible?

It has been rumored that "Professor" E. S. Whitlock is to replace Prof. R. S. McCormick as instructor in Junior applied mechanics. At least Mr. Whitlock has been preparing for such a move by attempting to obtain a list of the correct answers to all of the problems in the text.

You Can't Blame Them.

Evidently the editorial staff of the Normal Advance has not yet learned of the Millikin-Normal football game. At any rate, an account of this game has not yet appeared in the columns of "America's Livest and Best Normal School Weekly."

Ambitious Lad.

We write these lines to E. H. Wolff,

A soldier brave and bold.

Among the R. O. T. C. "vets"

His name is now enrolled.

He fought his first two years at Rose;

The going then was tough,

But he's signed up again this year;

He didn't get enough.



DIFFERENTIALS

Whatever That Is.

Professor Child (in Chem. Tech.)—Be sure in using linseed oil, to have your foots livered off.

She called Ray Harris Mr.
She frowned because he Kr.
So the next night,
Just out of spite,
The naughty Mr. Kr. Sr.

Gone, But Not Forgotten.

Engel—I can't remember my hour-plan.
Hard—Neither can I. Every noon when I get up I have to look to see what I've missed.

Economically Speaking.

Ick—What's your class grade in this stuff, Watson?

Watson—I don't know, Ick, I never could understand fractions.

In French.

McComb—The perfect is the same as the past.

Cramer—My past is not nearly perfect.

There is a senior named Mose
Who is happy when the wind blows.

For him it's a treat,
When walking the street,
To see all the beautiful hose.

Bob Failing—I got my mid-term grades today.

McCormick—Pass in any?

Bob—Nope. I am Failing in everything.

Don't Kid Us, Big Boy.

Professor Child (again)—There is an awful mystery in things we don't completely understand.

Never Again.

Red—What made all those little holes in your clothes—moths?

Earnie—Must have spilled some of that mule on myself.

Paul—How does he get so many clothes?

Maul—By pressing them. He's in-creas-ins trousers now.

A wealthy old farmer named Skinner
Had a hen that was surely a winner.

One day she tried

To lay eggs that were fried,
But she couldn't because they weren't in her.

Said the bridge to the river, "I think I'll fall on you."

Said the river to the bridge, "I'll be damned if you do."

"Prices or skirts?"

The higher they go the faster my heart beats.

No matter how unpopular a fellow may be,
he can always make a date with the calendar.

Izz—That rug is sure the champion.

Dizz—How come?

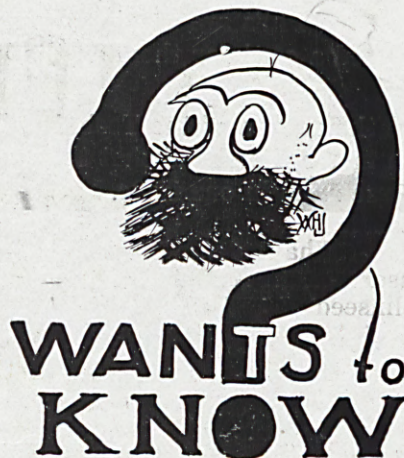
Izz—It's unbeaten.

A Little Advice.

Do your Christmas hopping early—if you wait until the last day before the Christmas vacation you'll be presented with a double unexcused absence as a holiday greeting.

WHAT WE WANT FOR CHRISTMAS

Standau—A shave.
 Goodman—A scrap.
 Rose Poly—A basket ball team.
 Prof. Child—Anything.
 Defel—To be like Prof. Child.
 McDargh—Avoirdupois.
 State Normal—An alibi.
 Dedert—A new nickname.
 "Toddy" Boland—His nickname.
 Tommy—Chalk.
 Dix—More members for the married men's club.
 Failing—Two soft credits.
 Sewell—More dope for the Technic.
 Walker—More time and money. Also a vanity case.
 Camera Club—A camera.
 Mike—A quart.
 Sigma Nus—A house.
 Gilkison—A rabbit.
 Duke Epps—Talcum powder.
 Sat Treadway—Specs so he can read the cards.
 Clark—A girl.
 Doc White—Hazel.
 Jojo—The rainbow.
 Conover—A pair of knucks.
 Jaenisch—Something easy in Machine Design.
 Eichen—A wild woman.
 Hartough—June 5th.
 Bruning—Hair tonic.
 Head Gray—A conscience.
 Taggert—An audience.
 Suttie—The hook.
 Bixby—Some pep.
 Penno—A marriage license.
 Offutt—Some equilibrium.
 Roundbottom—Nothing.
 Bill Junker—Better roads west.
 Joe—A flute.
 Ick—More shots at the goal.
 Hazel—Some attention.



If Bill Junker was late because Mary couldn't possibly walk alone down dangerous Ohio street at 9 a. m. in the morning.

How the Sarge makes Mabel laugh.

Whether Cramer ever received that letter from St. Mary's.

If Sid Reibel carries that steam gage around to impress the Freshmen.

If Sylvester will let us hang around when he uses his thirty eight on the fellow that stole the target rifle.

Who the lucky barber was that received the patronage of the chemistry department.

What Goodman will give Fessor Childs for Xmas.

What made the mine mules stop when someone yelled "Defel" on the Senior mine trip.

If the Logansport division of the Pennsylvania is not losing money since Clark stays home Sundays.

If Defel thinks his portfolio makes him look like a professor.

Why Ed Carnarius and Bill Dedert didn't fire a shot on a five day hunt.

If this column is going to get any contributions from the lower classmen.

If Fawcett thinks he compares favorably with Fessor Wagner.

If somebody will give Tommy a box of colored chalk for Xmas.

If Fessor Childs buys his quotation marks (?) by the car lot.

If Steffen ever had any money of his own.

If the Beta Phi's are staging a comeback. (We noticed a card for them on the bulletin board.)

When the editors of the Technic will have so much material on hand that they won't be able to use it all in one issue.

How many Juniors have changed their courses after having heard Knippy's famous lecture on why we should follow the footsteps of Steinmetz.

When Bob Walker reformed and for how long.

Where some of the upper classmen get that Freshman loving stuff.

If we're goin' to have to fall back on sassafras after all.

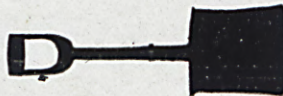
If Clarence P. will be a candidate for baseball coach next spring.

If single-trees come in pairs.

If Boland fell into the cellar, and if he did, what he slipped on.



THIS AINT No "BULL"



Christmas Greetings

George Graham Holloway

PHOTOGRAPHER

26½ South Seventh Street

THE SEASON GREETINGS FROM THE

American and Orpheum
Theatres

COMING SOON:

Cecil B. DeMilles production - - - "Something to Think About"
Thomas Meighan in "Civilian Clothes"
Alice Joyce in "Vice of Fools"
Fatty Arbuckle in "His Wedding Night"
Mae Murray in "The Right to Love"
Douglas Fairbanks in "The Mark of Zono"
D. W. Griffith's "The Love Flower"
"The Penalty" Eugene O'Brien in "A Wonderful Chance"

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Freshmen!

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DRAWING EQUIPMENT

Discount to Rose Students

Indiana Blue Print & Supply Co.

521½ Ohio Street—Second Floor

BOYS!

Send Her a box of
Liggett's Chocolates

or a

Kodak

**VALENTINE'S
ECONOMICAL DRUG STORE**
Wabash at 6½ Street

She stood before her mirror
With eyes closed very tight,
And tried to see just how she looked
When fast asleep at night.

—Siren.

She (just back from Paris)—I can't go to
this dance tonight—my trunks haven't ar-
rived.

He—Good Lord! What kind of a dance
do you think this is going to be?—Lampoon.

One Can Never Tell.

Lily—What is that I smell on your breath?

Cuppe—It isn't on my breath; it's my hair.

—Juggler.

"Is 'pants' singular or plural?"

"If a man wears 'em, it's plural."

"Well, if he doesn't?"

"It's singular."—Lampoon.

Society Brand Clothes

**FOR YOUNG MEN AND MEN
WHO STAY YOUNG**

Suggestions for Christmas:

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sives and adopt the *Hig-
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They will be a revelation
to you, they are so sweet,
clean well put up and
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London, Chicago.

FOR PARTICULAR
PEOPLE

Holsum Bread

IDEAL BAKING CO.

'24—I don't see how he gets away with it.

'23—With what?

'24—Cutting so many classes.

'23—Oh, he's a pretty keen guy.

He—Why do women speak less in February than in any other month?

She—Why?

He—Because it hasn't so many days.

—Panther.

BUY THE BEST

Kuppenheimer Clothes

For Sale By—

CARL WOLF

629 Wabash Avenue

The Zwang Syncopated Orchestra

is

"Something to Think About"

We set the pace for the last Technic Hop
GUESS WHO'S PLAYING FOR THE NEXT?

LET US SUGGEST FOR XMAS

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**Leather Novelties, Hand-Painted Baskets, Greeting Cards
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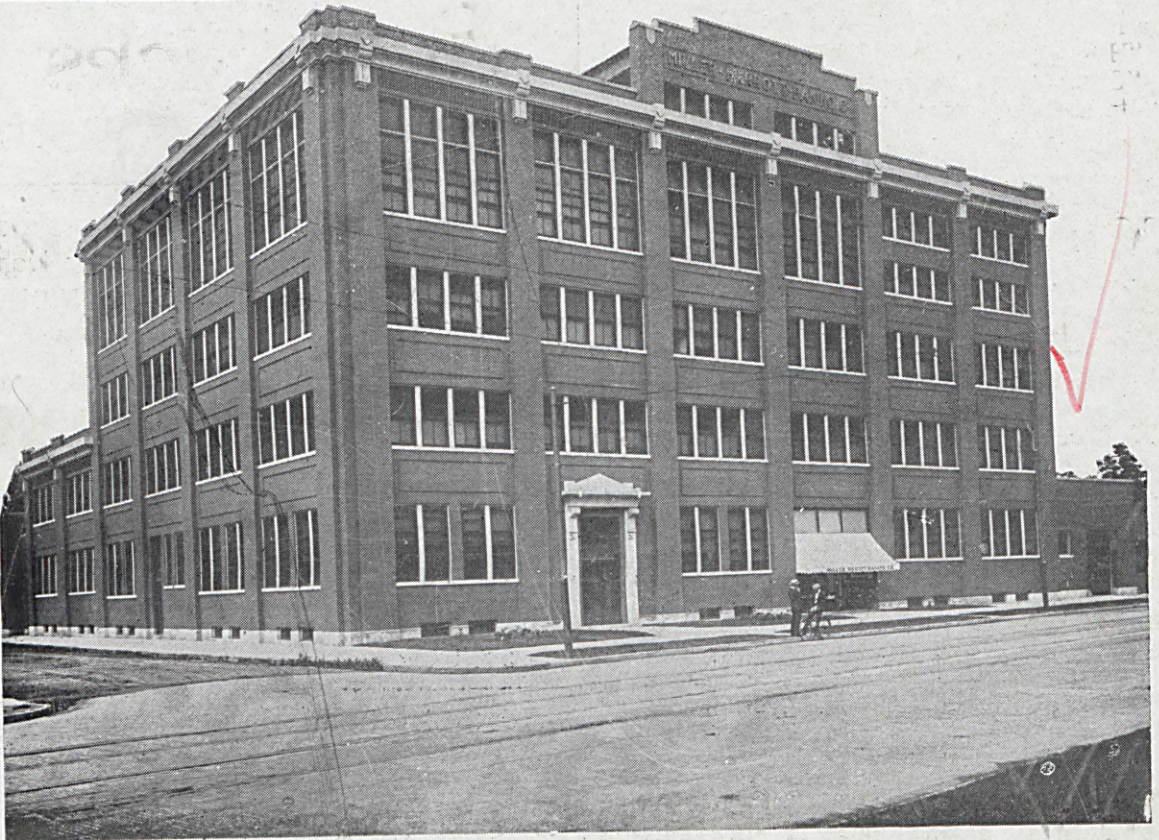
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—Think HOOTON

HOOTON LUMBER CO.

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CHEER UP
WIENAND
KLEANS KLOTHES KAREFULLY

652 North Seventh St.

PHONE 4201

My girl is sure some alchemist—
That's why I'll have to drop her;
For every time I'm out with her
My silver turns to copper.
—Johnstown Leader.

"I want some good current literature."
"Here are some books on electric lighting."
"Ohmm! Ah ha! I ampering at them."
Watt I want is light reading for Eddie's sons
until they armature."—Ex.

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HAIR CUT

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Candies for Xmas

Fancy Boxes and Bulk
Greatest Assortment
in the city.

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Writing Ma-
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Barber Shop**

28 South Seventh St.

SANITARY THROUGH AND THROUGH

Always an Argument.

It matters not what course you take;
You think it is the best.
You stand up for the one you've picked,
And ridicule the rest.

Electricals say Chemists have
Completely lost their head,
And think the poor Mechanicals
Are all unburied dead.

The Civils and the Architects
Are always crabbing, too,
And saying when they graduate,
What all they're going to do.

Each knocks the other all the time
On campus and in hall.
I guess the safest thing to do
Would be to take them all.

WHEN YOU THINK OF FLOWERS, THINK OF

HEINL'S

129 South Seventh Street

Terre Haute, Ind.

Sparks' Holiday Gift Shop *For Men and Young Men*

We have the largest line of Bath Robes, Neckwear, Gloves, Hosiery, Shirts, Initial Belts. GIVE HIM AN ORDER ON US FOR A SUIT.

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Tailor and Haberdasher

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MANUFACTURERS OF

Mining Machine Cutter Chains and Cutter Heads
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ELECTROTYPES **MATRICES**

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Voice from bathroom—Say, John, got any Ivory soap?

Voice from the dead—What for? Going to wash your head?—Purple Cow.

“Why the muzzle?”

“Oh, it's only a hair net. I washed my moustache and I can't do a think with it.”

—Voo Doo.

“Combination shot,” murmured the lady cue-artist as she leaned too far over the billiard table.—Puppet.

Beggar—Kind sir, will you give me a dime for a bed?

'24—(cautiously)—Let's see the bed first.
—Gargoyle.

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We are on your Battery's trail, and we'll get it sooner or later,
for “We Fix When Others Fail”

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FOR HER--

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Under NEW Management

All Rose men will stop,
After inquiring around,
That the best “Shave Shop”
Is located under-ground

Basement--T. H. Trust Building

BRUCE D. ARTERBURN

SEASON'S GREETINGS

With passing years the customs change, but one is worth repeating;
And so we send to all our friends, this good old fashioned greeting.

The McFarling Sales Company

W. L. McFARLING, Mgr.

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Yards: 10½ and Mulberry

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Mullane's Taffy---Bunte Hard Candy
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IMPORTED DRAWING INSTRUMENTS
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Special Gifts for Xmas

Patient—I've just been down to the drug-
gist to get something for the pain in my
stomach, and he—

Doctor—Oh, I suppose he gave you some
idiotic advice.

Patient—Well, maybe so; he told me to
come up and see you.

—Standard Remedies.

Tune Bros.

Show the Newest Styles in

Hart, Schaffner
and Marx
Clothes

MEN'S HATS,
SHOES AND SHIRTS

Save Your Money for Xmas

HAVE YOUR OLD SUIT CLEANED

for a small charge and save the price of a new one,
this will give you additional money for your
Xmas shopping

We Serve to
Serve Again

ERMISCH
My Cleaner

The Rose Technic Dance

December 17, 1920

K. of C. Hall
9 to 12

Price \$1.50

Music by Z. wang

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Pianos-Players-Talking Machines
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Loose Leaf Note Books and Other
SCHOOL SUPPLIES

All Standard Fiction.

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Records

Check.

Bacon—I see a folding drum for orchestra
musicians has been invented that is extended
to full size by hinged ribs between the heads.

Egbert—That sounds good to me.

“What?”

“A drum that you can shut up.”

—Yonkers Statesman.

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EVERYTHING SANITARY
SEVEN CHAIRS

BEST BARBERS IN TOWN

GIVE HER AN EASTMAN KODAK or CAMERA for CHRISTMAS

Bring your Kodak films here and
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Gillis Drug Co.

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For Xmas, Birthday,
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"GIFT"
occasion, be sure to see
Tucker's Line of
Quality Gifts.

TICK TOCK TUCKER

814 Wabash Avenue

At the sign of the clock--- In the middle of the block.

In 1920.

Little Willie, rough as hell,
Shoved his sister down a well;
And his mother, drawing water,
Said, "It's hard to raise a daughter."
—Froth.

Buntin Drug Co.

AGENCY FOR

Waterman & Conklin Fountain Pens.

We also call for and deliver your
Drug Package and Prescriptions Free

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6th and Wabash

...Let us help you remember your...

Gentlemen FRIENDS

We Offer a Few Suggestions:

A Sweater	A Bath Robe
A Pair of Gloves	A Silk Shirt
A Borsalino Hat	A Pair of Silk Hose
A Traveling Bag	A Cheney Tie
A Muffler	A Box Handkerchiefs

And Many Other Items
Come In and See

Thorman & Schloss

666 Wabash Ave.

Every Rose Student

Should properly begin
the New Year by trad-
ing exclusively with
ROSE ADVERTISERS

*and every loyal
Rose man will!*

Frank J. Smith THE REAL CLEANER

Everybody's Work Done Right

Phone 515

20 South 8th St.



What Is Air?

BEFORE 1894 every chemist thought he knew what air is. "A mechanical mixture of moisture, nitrogen and oxygen, with traces of hydrogen, and carbon dioxide," he would explain. There was so much oxygen and nitrogen in a given sample that he simply determined the amount of oxygen present and assumed the rest to be nitrogen.

One great English chemist, Lord Rayleigh, found that the nitrogen obtained from the air was never so pure as that obtained from some compound like ammonia. What was the "impurity"? In co-operation with another prominent chemist, Sir William Ramsay, it was discovered in an entirely new gas—"argon." Later came the discovery of other rare gases in the atmosphere. The air we breathe contains about a dozen gases and gaseous compounds.

This study of the air is an example of research in pure science. Rayleigh and Ramsay had no practical end in view—merely the discovery of new facts.

A few years ago the Research Laboratories of the General Electric Company began to study the destruction of filaments in exhausted lamps in order to ascertain how this happened. It was a purely scientific undertaking. It was found that the filament evaporated—boiled away, like so much water.

Pressure will check boiling or evaporation. If the pressure within a boiler is very high, it will take more heat than ordinarily to boil the water. Would a gas under pressure prevent filaments from boiling away? If so, what gas? It must be a gas that will not combine chemically with the filament. The filament would burn in oxygen; hydrogen would conduct the heat away too rapidly. Nitrogen is a useful gas in this case. It does form a few compounds, however. Better still is *argon*. It forms no compounds at all.

Thus the modern, efficient, gas-filled lamp appeared, and so argon, which seemed the most useless gas in the world, found a practical application.

Discover new facts, and their practical application will take care of itself.

And the discovery of new facts is the primary purpose of the Research Laboratories of the General Electric Company.

Sometimes years must elapse before the practical application of a discovery becomes apparent, as in the case of argon; sometimes a practical application follows from the mere answering of a "theoretical" question, as in the case of a gas-filled lamp. But no substantial progress can be made unless research is conducted for the purpose of discovering new facts.

General Electric
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