

GAS AND ELECTRIC NEWS

PUBLISHED BY

THE ROCHESTER RAILWAY & LIGHT CO.

VOL. 6

JULY, 1918

No. 1

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Toluol—The Source of "T. N. T."

WILLIAM H. EARLE

SEARCHING THROUGH chemical texts to find what we were supposed to know about toluol, the writer found brief statements acknowledging the existence of such a product and giving its primary physical characteristics. Ten years ago, such information was representative of toluol's place in the minds even of technical men, to-day is a by-word. From the back pages of a chemical text book it has jumped to the front pages of the daily press. Every layman knows when an explosion wrecks a portion of a chemical works or a powder plant that toluol is at least in part responsible; that it enters vastly into war munitions; and that its industrial casualty lists represent the same supreme sacrifice as those from across the sea.

The properties of Toluol as defined by the "Travelers Standard", are, "Toluol is a limpid, inflammable liquid, having a specific gravity of about 0.87 at ordinary temperatures, boiling at 232° Fahr., and freezing at about -144° Fahr. It does not mix with water. It gives off an inflammable vapor, especially when heated, and the vapor is capable of forming explosive mixtures with air. In these particular respects it resembles gasoline, though there is little or no resemblance between the two when they are considered from the standpoint of the chemist. Chemically, toluol is closely related to benzene (that is, to "benzol"),—and in fact it is identical with benzene, except that one of the hydrogen atoms in the "benzene ring" has been replaced by the methyl radical, CH₃. ("Toluol" and "toluene" are merely different names for the same substance.)

Like benzene (but unlike the hydrocarbons of the paraffin group), toluol may be made to combine, without much difficulty, with various acids

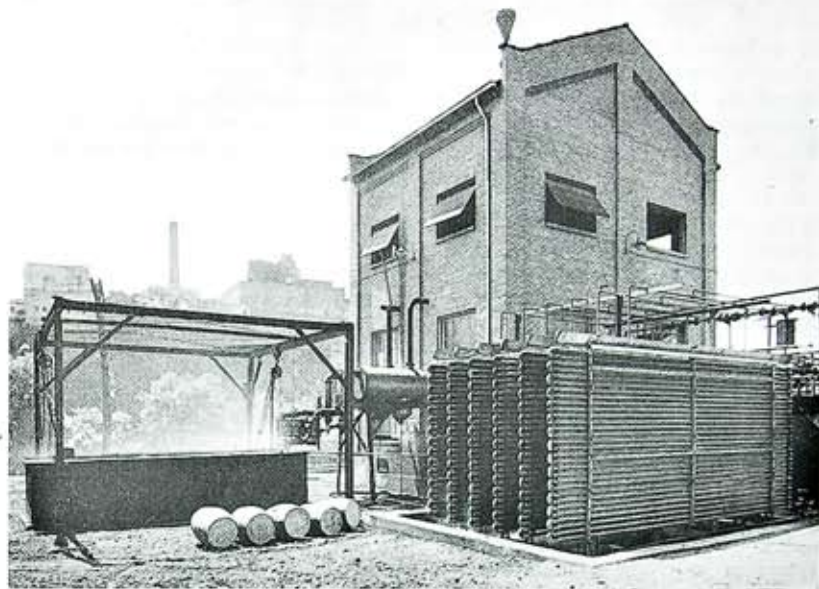
and other chemically active substances, and it is upon this fact that the manufacture of trinitrotoluol depends—the process of manufacture consisting in acting upon toluol with a mixture of nitric and sulphuric acids."

Mr. F. W. Sperr, Jr., Chief Chemist of the H. Koppers Company, says that as late as 1913 not more than 16 plants in the United States were producing toluol and only two or three were producing it in pure form.

It is difficult to find a definite pronouncement from government sources on the national requirements of toluol. In the November, 1917 issue of the *Journal of Industrial and Engineering Chemistry*, an editorial states that up to September, 1918, 22,000,000 gallons would be required by the Ordnance Department for its mobile artillery alone; that the entire output of the American coke ovens, estimated at 11,000,000 gallons, was under contract to the navy; and that other needs were not known.

Where are these millions of gallons to be obtained? Several synthetic processes for its production have been tried, the most successful being the cracking of solvent naphtha in water gas machines, in place of gas oil. The atmosphere of water gas is apparently advantageous to the cracking of solvent naphtha for high toluol yield, and this brings us to the key of the situation. The gas industry in its various phases is the large scale source of toluol, to which the government must look for its supply. What is this industry? What is its scope and stability?

About 1792, Wm. Murdock, a young Scotchman in Redruth, England, demonstrated the possibility of producing illuminating gas by the dry distillation of bituminous coal. After ten years struggle, he induced a manufacturer near Birmingham to



The Toluol Plant at East Station Gas Works

illuminate his factory with the new product. About the same time Minckelers in Louvain, and Lebon in Paris discovered, independently, the same gas-making process. An enterprising German tried to buy Lebon's secret, failing in that he resorted to experiments and finally discovered it for himself. Seeking a field for exploiting his work he went to London, and in 1807, the first public thoroughfare was illumined by gas. In 1812 the direct forerunner of the present London Gas Light & Coke Company was chartered by Parliament, and a few years later the American industry was started in Baltimore.

Statistics are always laggard, hence the best available figures on the American Gas Industry, excluding coke oven operation, are not later than the industrial census of 1914. As long ago as that, 1284 establishments were making gas in the United States, 63,993 persons were engaged in the industry, \$1,252,421,584 was

the capitalization, \$44,330,684 was the annual pay roll, \$13,388,969 was the annual tax budget, \$76,779,228 was spent for material, \$220,237,790 worth of goods was produced, 203,639,260,000 cu. ft. of gas were made. Six million tons of coal, one million tons of coke and 720 million gallons of oil were directly consumed in gas production.

Rochester has kept its place in this procession. The first gas plant was built here in 1848. To-day, the company possesses in its new coal gas equipment, one of the most advanced plants in the country.

What is the bearing of this on toluol recovery? Approximately 300,000,000 cu. ft. of gas will be produced in this country during 1918, again excluding coke oven gas. A thousand cu. ft. of gas will yield on the average approximately 0.4 of a gallon of light oil, 15% to 20% of which will be toluol. Therefore, if all the gas produced could be utilized in 1918, 120,-

000,000 gallons of light oil would be recovered, yielding possibly 20,000,000 gallons of toluol. This would make the maximum recovery 2,000,000 gallons short of the minimum requirements. It is obviously impossible to obtain this maximum recovery. Many plants are too small to make recovery practicable. Many are too remote or isolated and, unfortunately, many are obliged to produce gas under such extreme legislative standards of quality, that it would be impossible to remove the light oil and still maintain the standard. Approximately 4% to 6% of the heating value and 30% to 50% of the illuminating value is removed from the gas with the light oil.

Again Rochester has been at the front in doing its share to meet the government needs. In May, 1917, a month after we entered the war, an agreement with the Pittsburgh By-Product Coke Company was signed for the construction of a plant for the recovery of crude light oil. In June construction was started and on July 19, the plant was in operation.

The plant consists of a tower scrubber eleven feet in diameter and seventy feet high, a still for running the light oil from the wash oil, suitable heat economizers, storage tanks, pumps, etc. The plant is designed to scrub 10,000,000 cu. ft. of gas per 24 hours.

The process is simple. Gas enters the tower scrubber at the bottom and a washing oil is sprayed in at the top. This oil has a solvent action on the light oils in the gas, and by direct contact as the two fluids pass, counter current, through the scrubber, the wash oil absorbs the light oil. From the bottom of the scrubber the wash oil now saturated with its light oil burden flows to the distilling plant. It passes into the still through a system of preheaters, which in turn serves to cool the distilled wash oil and the light oil vapors. In the still, direct steam heat drives off the

benzols, toluols, etc., and the de-benzolized wash oil passes out at the bottom, is cooled and recirculated through the system.

Various difficulties have been encountered, precluding continuous operation of the plant for scrubbing all the gas. The two factors most active in this were naphthalene stoppages throughout the distribution system, and gas oil shortage which forced a shut down due to inability to maintain gas quality. In December the new coal gas plant was started, and the ratio of coal gas to water gas has thereby changed from 15 and 85 to 65 and 35. The light oil yield has consequently been decreased.

Aside from such conditions as these, the plant has operated successfully and in its operation has shown the following approximate results. Total gas made July 19, 1917 to June 1, 1918, 2,149,522,000 cu. ft., total gas scrubbed 1,417,266,000 cu. ft., light oil recovered 569,665 gallons; total toluol produced approximately 125,000 gallons.

The last item represents Rochester's direct contribution to the toluol needs of the nation. Indirectly we are producing several hundred thousand gallons of coal tar every month which, in its ultimate refining, increases our contribution.

Aside from the mere scrubbing of our gas we have cracked a considerable quantity of solvent naphtha in water gas machines. The yield of toluol is very materially increased thereby, but the gas making and enriching properties of solvent naphtha are negligible and therefore its use is greatly curtailed under our gas standard requirements.

The light oil recovery equipment will undoubtedly be used after the war. Benzol is an excellent motor fuel, and toluol when refined to trinitrotoluol or "T. N. T." is destined to meet with wide industrial uses, as an explosive in peaceful pursuits.

Summer Coal Saving, a War Necessity and a Business Economy

EDWARD L. WILDER

ONE OF the most serious problems with which our Country is confronted in its prosecution of the war is that of transportation. A great deal of public attention has been given to one phase of this problem, viz., that of getting our soldiers and our supplies across the water, because in this capacity the Country was obviously least prepared. The shipping however, is only a part of the problem, for the transportation of men and supplies to the ports of embarkation is just as important. One may say that it will do no good to transport our soldiers and our munitions to the ports if there are no ships to carry them across, but it is equally true that the ships are of no use if we cannot bring their cargoes to the ports. The two are vitally connected and either will suffer from a failure of the other.

Before our Country entered the war, our railroads were at times worked to their full capacity in order to take care of the demands made upon them. Since the war the business which they have had to handle has increased enormously so that it is not to be wondered at that there is need for their expansion. There are several ways in which this can be secured.

The first and the most obvious one, is to increase their equipment, but such an increase is difficult when we need so much of this same class of material for the manufacture of ships, ordnance, munitions and many other war supplies.

Another way to relieve the situation is to cut down on the transportation of those things which are not essential for the prosecution of the war. This has already been done to a considerable extent, and will probably be done to a greater extent in the future, but even this is by no means

an easy task. Our industrial life is so complex that it is exceedingly difficult to draw a hard and fast line between the essentials and the non-essentials.

There is a third way to help the situation. The operation of railroads is much more difficult during the winter months than during the summer. It takes more equipment and more men per ton-mile of freight during the winter than during the summer. Any load which can be shifted from the winter to the summer makes an actual saving to the railroads and is just as effective in relieving transportation conditions as is the increasing of equipment or cutting down of the shipment of non-essentials. One service which the railroads handle can be partially shifted from winter to summer, viz., the transportation of coal. To do this requires co-operation of the coal users. The railroads cannot ship coal during the summer in quantities greatly in excess of the normal demand, and therefore this shifting of the load must be accomplished by saving our summer coal for winter use.

Although there has been a very rapid advance in the use of central station service in Rochester, there are still many isolated steam plants in operation. These plants operate non-condensing and during the winter months a certain proportion of the exhaust steam is used for carrying a part or all of the heating load during the working hours.

In the Spring, Summer and Fall very little of this steam is needed for heating. The purchase of central heating station service during these months means in some cases that the boiler plants can be shut down entirely, and in other cases a large decrease in steam generation. Some

manufacturing processes require the use of steam throughout the year, usually, however, in rather small quantities.

The first question that naturally arises is whether this shutting down of isolated plants during the warm weather means an actual saving in coal, or whether it means that the coal is burned by our Company rather than by the isolated plant. Even if our entire power supply were steam generated such a shifting of the load would show a large saving in coal consumption. The coal consumption of our stations for additional load is between two and three pounds of coal per kilowatt-hour. The best that the isolated plants can do is double this figure, and many use three times as much. This is because our power is generated in large quantities by efficient units. Our plant is run condensing, and because of the large load that we carry we are able to go to such refinements in coal saving as are given by treating the feed water for the removal of scale forming impurities, the installation of economizers for taking out heat from the flue gases and all the other means which have been developed for fuel saving. Our power generation, however, is only about 30% steam, the remainder being hydraulic. As a result of this our average coal consumption per kilowatt-hour is approximately 0.9 of a pound of coal.

How are the firms affected financially who shut down their isolated plants and use our service during the summer months? This is an important question because we would not recommend such a course if it meant more business to us at a financial loss to the consumer. This plan was tried out last summer in a few places and in every instance the saving effected by the discontinuance of power generation more than paid the bills for electric power. A few weeks ago one firm discontinued the operation of its engine generator set, and is saving coal

at the rate of fifty tons per month, and this in spite of the fact that a certain amount of steam is required for manufacturing processes so that it is not possible to shut down the boiler plant entirely. The electricity is costing about \$100.00 per month. Two Dollar coal looks pretty good these days.

The purchase of power for the purpose of coal conservation may be urged not only upon patriotic grounds, but also upon purely selfish considerations. The coal which is not used for power generation during the summer months, and which may be thus stored for use during the following winter, may mean just the difference between continuing operations and being shut down for lack of fuel. Several firms who are now purchasing power are taking their regular allotment of coal and storing it.

From the Company's point of view this summer business is a desirable load because our generating equipment and our distribution system must, of necessity, be designed to carry the winter peak, which is caused by the overlapping of the factory and lighting loads. It is therefore possible for us to take on additional load during the summer months without increasing our generating or distribution capacity. Our Rate Schedule has accordingly been arranged so as to make the rate for this business very attractive.

Already about twenty manufacturing concerns and large business houses have thrown their summer load upon the Company's lines. We estimate that this will effect a saving of about five thousand tons of coal during this summer. Among those who will effect this saving are the Premo Works of the Eastman Kodak Co.; American Laundry Machinery Co.; The Rochester Button Co.; The Cutler Building; Sibley, Lindsay & Curr Co.; Burke, FitzSimons, Hone & Co.

Fire Insurance

HARRY P. GOULD

THE BEGINNING of fire insurance is lost in antiquity. It is not known who was the first to promise reimbursement for a loss,—that is, to do this in a way that corresponds with our modern contract of insurance.

Insurance may be defined from two points of view: From that of the insured it is a provision against certain contingencies which may occur; from that of the insurer it is a promise to indemnify another on the happening of a certain contingency. The form of contingency is usually fire, life, marine, casualty, etc.

Insurance differs from gambling with which it is sometimes compared. Gambling is an attempt to increase one's capital by a chance not based on any known factors—it is simply a chance and nothing more. Insurance, on the other hand, takes into consideration all the factors that enter into the problem and that may affect the hazard insured against, or the factors that may prevent the contingency from happening.

The subject of this article—"Fire Insurance"—relates to a provision made by the insured for reimbursement in the event of a loss by fire. On the part of the insurer it is a promise to reimburse the insured for the loss that may occur. In making this promise the insurer will take into consideration everything that may possibly increase or decrease the chance of a fire and basing the calculation on these two sets of figures, will undertake to write an agreement or policy and determine the rates.

There are four methods of organization for insuring property from loss by fire. An individual may undertake the risk; it may be undertaken by a group of individuals; by a mutual company; by a stock company. The major part of our fire insurance is carried by the mutual companies, the

balance of our risk being placed with the stock companies.

The mutual form of organization is an agreement on the part of certain individuals, whether few or many, to reimburse any member of the group in case of loss by fire, it being understood that the sum to make up this loss is to be figured on a pro rata basis. The mutual form of insurance is naturally the oldest form, since at first insurance was a part of the merchant's business and he assumed a portion of the risk of his fellow merchants and they assumed a portion of his. The mutual form of insurance today exists in two fields and is quite successful. First, local mutual companies and, second, the so-called New England mutuals, which deal principally with large factories.

Stock companies are organized by a number of individuals, and may be incorporated for the purpose of insurance or re-insurance.

The underwriting is the big job of the insurance companies. In many features and in a large proportion of its work the fire insurance company does not differ from any other corporation. It is engaged in distinctive work—that of furnishing indemnity against fire. It issues its policies, which provide that if the party holding such policy suffers from a loss by fire he will be indemnified up to a sum not exceeding that stated in the policy, the amount of the policy being the limit of the indemnity obtainable from the company. It will be seen that in the general work of the corporation its detail clerical work is perhaps not much more difficult than that of any other corporation; neither is the management of its finances more difficult than those of another corporation. Every moneyed corporation must of necessity have more or less of its income in a transitory

state, either uncollected or in the hands of agents, or in process of transmission. The character of these financial matters and also the safeguarding of the funds does not call for higher ability than that required for similar service by any other corporation. Because of this fact it frequently follows that the underwriter of the company may not be the chief executive, or the one in charge of the financial matters. The underwriter may be the secretary or the vice-president. In most cases he is the vice-president. Whatever his office, there is always some one official in charge of this branch of the business who is held responsible for the acceptance or rejection of risks. The underwriter does not see the papers in every case. As a matter of fact, he sees them in few instances, but he does, however, determine the class of risk to be accepted, the amount to be accepted thereon, the amount to be accepted in different sections of a city or state, and similar important matters. It should be remembered that underwriting is the chief business of the insurance company and whatever else it does is incidental. It hopes to make a profit by furnishing indemnity and to do this, certain risks must be assumed. Without the assumption of these risks there would be no income and there would be no profit. The managing underwriter is therefore one of the most important members of the company.

To draft a form which will accomplish its intended purpose is one of the most important features of the insurance business and one in which the fullest intelligence is not always used. The tendency in nearly all forms is to overdo and use more words than are necessary. A short statement—clear, concise and comprehensive—is far better than a long, rambling one lacking these qualities. The insured constantly seeks to use general language to make the insurance as broad as possible and practically requiring the

company to insure everything he may have on the premises at the time of the fire. The insurer, on the other hand, always seeks for the specific; that is, the company always wishes to know what it is doing. An insurance company never desires to cover, for its own interest, if it can avoid doing so, an indefinite thing; it always desires the positive. It is evident that between two such opposites there will be more or less effort to gain their individual ends—the insured seeking the general and the company the specific.

Volumes have been written concerning forms, but the entire subject may be included in the rules laid down, viz.: The form should be explicit and avoid all indefinite expressions. The question is—What does the party wish to insure, and adequate language should be used to describe it.

As soon as the insurance rates have been determined the premium can be figured. The percentage clauses can be arranged in the following order: 75%, 80%, 90%, 100% and flat. These percentages are figured on the actual value or cost to reproduce a certain building, apparatus, or stock of materials to be insured, and the result multiplied by the rate gives the premium. The higher the percentage, which means a greater amount of insurance carried, the lower the cost, or lower earned premium rate, and of course the flat rate is the highest or costliest. For example, suppose you were about to insure a brick or concrete building, that the entire cost was \$50,000 and the roof was of wood construction—that is, necessary rafters covered with boards and shingles. To construct this wooden roof original cost \$2,000. Now, should a fire occur and the roof be damaged there would be the loss on the roof and a possible damage of \$500 to the contents of the building. Now, supposing the flat rate to be \$3.00 per thousand dollars of valuation, the insurance cost on the premium would be \$7.50 against

a cost figured on the full value of the building—\$50,000. The last cost, using the 100%—which would be about 60c per thousand dollars of valuation, makes the insurance cost or premium \$30. Thus, the difference between \$30 and \$7.50, or \$22.50, is the money that has been saved by using the flat rate. A considerable risk would be run in attempting to carry only \$2,500 insurance on a \$50,000 plant, because the unexpected might happen and the plant be a total loss.

Some day, Mr. Reader, you expect to be General Manager of some company and one of your first problems will be insurance, and when you come to buy flat rate insurance you, no doubt will decide that it is rather risky, taking into consideration the fact that you have only a small amount of insurance or protection, that is, the amount of protection compared with the actual value of your plant, and the real question you will ask yourself will be—what is the best kind of insurance for me to carry? In the first place, build all your plants fire-proof in every way that is possible, and equip each building with the necessary fire-fighting apparatus.

Your next question is—what effect will this have on my insurance problem? And my answer to this is as follows:

When the insurance underwriter is promulgating the rate he takes into consideration the location of the plant or station—whether it is in a congested district, and the construction, fireproof or otherwise. The building should have all necessary fire hose and other fire fighting apparatus. Automatic sprinklers where it is possible to use them are the best fire protection that I know of. All of the above or lack of them act as a debit or credit to your insurance rate.

Before placing your insurance it will be necessary to go over the inventory of each plant separately listing each building, together with its

contents. Omit, for insurance purposes, the foundation wall valuations and also all concrete foundations of all heavy machinery, if it is a fact that they have been built to resist fire and will not be affected should fire occur. After learning your values you are ready to select the percentage clause and rate which you will use.

The next thing to do, and it is a very important one, is to select some reliable insurance company or insurance agent with whom to place your insurance. The strongest asset that an insurance company can possess is the reputation of paying its losses promptly. Their wide experience and ability to give valuable advice, which can be had for the asking, should always be at your command.

Up-to-date insurance companies furnish their inspectors with properly filled out blanks with headings such as these: Oily Waste, Steam Pipes, Elevators, Fire Doors, Small Hose, Fire Brigade, Watchman, Light Automatic Sprinkler, Yard System and General Remarks. After the inspector has filled out these blanks and made his recommendations, copies are sent to the insured for his consideration and adoption. It is a good plan to number all these reports under plant number that the inspections cover, together with copies of all letters that are used in explanation of when and how the recommendations were treated.

About ten years ago the Rochester Railway & Light Company was carrying about \$1,200,000. fire insurance at a cost of an annual fire insurance premium of about \$12,000. At the present time it is carrying nearly \$4,000,000. at a cost of \$6,000., nearly four times the valuation at about one-half the cost.

The stockholder or investor in Rochester Railway & Light Company securities should gather considerable satisfaction and security from the above facts.

The Making of a Draftsman—From the Teacher's Standpoint

LEONARD I. HALL

A GOOD draftsman must really have the ability to become an interpreter between the engineer and the workman, and if the interpreter himself cannot thoroughly grasp the ideas, how in the world is the workman to do so? Drafting is therefore in many ways a symbolic language and many of its conventional symbols have today a common acceptance even as some of the characters of our alphabet have also become thru the years so familiar to us all.

So we may say perhaps that to be a real success as a draftsman, a person must have "grasp," he must dig into the other fellow's mind till he is sure of what is desired, then dig into his own for the correct means to represent such knowledge to others.

The student should have a reasonably good foundation in English grammar, spelling, etc. How many times have you jumped to a conclusion as to the caliber of a draftsman because of the way he spelled certain simple words? Was it carelessness, or ignorance, that made him do it? He should be well grounded in ordinary mathematics, particularly mensuration, geometry, trigonometry and logs, and later on perhaps other branches as he may find useful. Some students do not even know how to reduce fractions or even read them, much less understand the functions of angles. He should certainly be master of a first class style of lettering, especially the clear, open, free hand type, as soon as possible.

He should of course be careful of his personal appearance, be neat in his ways, systematic, and use his common sense and judgment. He must try to get the habit of standing off and looking impersonally at his own work, catching his own mistakes and trying to visualize in his own

mind just what the idea is he is at work on. This leads us to something the teacher must at all times strive for,—teaching the students just how to look at an object, just what a line or mark really represents, why it is done thus and so.

Again the student must be carefully and minutely given to understand the best and simplest way of handling his work, his instruments and himself. These little tricks of the trade, as it were, are oftentimes just simply ignored. They need to be taught as soon as possible so as not to allow one to get into a bad way of working. The need for a correct posture, of fresh air, correct position of lights, etc., all should be mentioned. If some of these points were carefully gathered together and handed, in say blue print form, to each scholar on commencing his studies, and then a little time spent to go over them with him, much would be gained by the instructor who does not thereafter need to worry over forgetting some point and the scholar at all times can refer back if needs be. A student learns a good deal easier when he can closely watch your methods as you make a drawing and hears you explain points while you work.

One thing that is more and more coming to the front in these days is the question of a person's adaptability to a particular line of work. Not all men are cut out to be draftsmen. Therefore it certainly seems as if one of the duties of an instructor should be to find out accurately if possible the probabilities in each case under his care, and to make a sincere attempt to assist any students who seem in need, or suggest the taking up of some other line of work.

Another field in which the drawing

teacher, if a practical man, can be of assistance especially in the advanced studies, is by advice as to the best text and handbooks a draftsman should secure and study. Certainly the self-trained man needs to very carefully pick first class books and magazines, yet not too many for reference. Sometimes a man will take to design work like a duck to water. He works spontaneously and if he can train himself to care in details, concentrated effort and sincerity of character, he is on the high road to big success.

All in all from a teacher's standpoint the draftsman is much of a conundrum. It takes time to train him right; it costs money if you don't; and if he hasn't brains, you can't. Time, money and brains can accomplish anything, but which is the most important I don't profess to say. However, if he doesn't have enthusiasm, even time and brains won't bring him the successful life he hopes for. "Andy" Carnegie was once asked his opinion as to which of the three factors mentioned above was the most important, and in reply he asked "Which is the most important leg of a three-legged stool?" So there you have it.

Time was when the draftsman was considered as a non-producer whose efforts were tolerated, criticized and reluctantly paid for.

But those days have passed and gone, and the up-to-date concern that can really make good without a well systematized drafting department is a rarity. The technical draftsman is coming into his own. He is recognized today as an engineer, embryonic 'tis true in many cases, but potential and to be reckoned with.

However, your jack of all trades draftsman of some years back, today is ambitiously studying many varied branches of engineering and also along special lines. It is almost impossible today to pick up any work of man that somewhere or somehow has not felt the touch of the draftsman.

He stands as the alchemist of thought, the manipulator of ideas, the interpreter between the engineer and the builder, and the nearer he approaches this ideal the more his value increases.

When work is planned it must then be carefully plotted out in detail so as to anticipate if possible any alteration for further additions or improvements before the actual construction has commenced. Here is where the draftsman has a great opportunity to eliminate losses or waste of various kinds.

Drawings should be made, bearing in mind two objects, i. e., to have a dependable and plainly understood expression of what really is required, and also when the work is accomplished, that the drawings may still be of value as a record of what was done.

Let us then assume that at last the draftsman has made good. Does this mean he must immediately begin to feel that soon he will be shoved aside if he does not move up or on to a somewhat different line? By no means; as we all know that the man of long experience, possessing the other necessary requirements, is the man that is depended on today for design work of a high grade. Many times it has come to my notice as chairman of an Employment Committee that real good men are apt to be timid and lack initiative and aggressiveness.

A draftsman should try to broaden his interests as his work naturally has tendency to make him narrow and introspective at times.

A few firms still look on the draftsman as a non-producer. Whether he is or not is largely a question of the efficiency of the orders or instruction under which he works.

There is a bright future ahead for the right sort of man in the profession and he need have no fear he will not be recognized if he learn the meaning of a plus personality.

GAS AND ELECTRIC NEWS

Published Monthly by the
ROCHESTER RAILWAY and LIGHT CO.
34 Clinton Ave. N., Rochester, N. Y.

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Vol. VI JULY, 1918 No. 1

"Our present and immediate task is to win the war and nothing shall turn us aside until it is accomplished."
—President Wilson.

Mental Attitude Toward Corporations

THERE ARE some peculiar, unfair and immoral ideas about corporations which are very common, even among corporation employees. Some very intelligent, self-respecting and in most things honorable men and women believe them, or have accepted them as facts without thought or investigation.

One of the most common heresies is that a corporation has no soul, and therefore, the ordinary rules of ethics, right and justice do not apply to it. Many believe that a corporation will lie to its employees, its public, or its customers about their work, pay or claim, so, like David Harum, they lie to it in self defense, or cheat it if they

can, only do it first. Then too, some believe that just because it is a corporation it must have an unlimited amount of money. Therefore by fallacious reasoning it is justifiable to waste its supplies, knock its equipment to pieces, and never under any circumstances use the property as carefully as one would use his own. Again, too, when some people are injured by a corporation, all the blame is laid upon it, even though the individuals injured are partially responsible. Many will not settle on a fair and honorable basis, but "Sting It," for all they can and then boast to their friends how they "Put One Over." So also, many try to find some way to interfere with a corporation's work and demand a "Settlement" based upon a stretched legality or as the saying is, "Make it come across."

Some business men are peculiar and remain bitter as long as they live if a corporation employee does them some real or fancied injury. They or their own business never made a mistake, so its a case of "Hold it out on them" and put it in the will for the children to carry the grudge also. Likewise, many men who serve on juries act on the theory that the corporation can stand the loss easier than the individual who opposes it, and so "Give him something" anyway, right or wrong.

Some corporation employees do not take any interest in its affairs. They say "It doesn't take any in mine," "I should worry if it loses money through my indifference." So the details about its business are never studied, and no heart or soul goes into the work. "The corporation will not appreciate or reward you for it." You are "Only a cog in the wheel and don't have any chance anyway." Has not every one often heard these phrases? So when the corporation tries to meet these employees half way with a plan for mutual betterment, they "Buck it" on general principles.

"It's probably a new dodge to squeeze us some more."

All this and more is said and done in A. D. 1918, and when the great majority of corporations and corporation employees live close to the Golden Rule, at least as close as the average individual, is it fair, and does it make the world worse or better? Remember this, that most corporations are self-respecting servants of the body politic under the law and that it is our moral duty to ourselves to form correct opinions about them. The corporation has made American Business and has brought to the humblest citizen an amount of physical comfort that kings of olden times would envy. Most corporations stand on their merits, and the Public Service Corporation in particular has everything to gain and nothing to lose by fair and honorable dealings with its employees and its public. Legally and morally it "Plays the game on the level" within the limits of human frailty. "Our Company" operates with pride, a clear conscience and a determination to continually make a better record. Let us live up to our opportunities with it.

Let us never forget that we as individuals make up the corporation, and that our collective prosperity is proportional to our collective efforts.

Believing in the Sincerity of Others

IN ALMOST every organization there are a few individuals who, when they see a company magazine or bulletin, or hear a little talk on safety or efficiency, say "Aw, that Bunk makes me tired," or words to that effect.

Perhaps the persons are insincere in their ridicule, being partially convinced that such methods of imparting information are desirable, but fear the unfavorable comment of their less conscientious companions who possibly are in the class of the one of

whom the Prophet spoke, saying, "Ephriam is joined to idols, let him alone." It is best to be concerned with the former here for he can save himself, and the other may not be worth saving. In considering the companions of the seemingly disbelieving individual, one is reminded of the familiar story of the rotten apple which by contact spoiled a dozen good ones.

Every good organization needs loyal hearts, and the loyal hearts need the organization. Put your trust in men who want to help you to success with them, rather than in men who want to hold you down to their level. Some organization managements are interested in seeing men and women advance to places of greater pay and responsibility.

Obligations

E. H. Harriman once said that the really rich man was not the one who owned a million but the man who owed a million.

Credit is one of the most important factors, perhaps the most important, of our business structure. The man who can borrow a million dollars must possess more than a million dollars in his reputation for business integrity and honesty combined with his ability to achieve results.

The qualities that insure such big successes are often the result of small beginnings. The test is in the start.

Just as our big captains of industry obligate themselves for the capital necessary to achieve success, so can the small man obligate himself to save out of income until he reaches a point where the investment of his capital produces an income equal to or greater than his needs.

Just as private debts become doubly hard to pay when due, so will you experience a sense of gratification as pleasant as the other is irksome by paying money to yourself in the accumulation of your competency.—*Bond Topics.*

Confidence in Rochester and Its Future Lies Behind the Splendid Results Attained in the Sale of Our 7% Preferred

The campaign for the sale of 7% Preferred Stock of the Rochester Railway and Light Company marks an epoch in the history of the financing of this utility Company. Never before has the opportunity been broadly given to those who contribute toward the Company's success to also share in its profits, and the result thus far obtained demonstrates the fact that hundreds of persons in Rochester were ready and eager to invest their capital and become partners in the gas and electric business.

The Company is well and favorably known in the community, and this fact inspired confidence and a desire to be associated financially with such a successful enterprise.

It Has Brought to the Company Over Eleven Hundred Subscribers to Its New Preferred Stock

The gratifying feature of the sale of stock thus far is its wide distribution over all parts of the city and surrounding territory, and among people in all walks of life, from the one share subscriber to the one hundred share subscriber. The bulk of the sales have been in lots of from one to twenty shares, with five to ten share lots predominating. This is as it should be. It brings to the Company the combined interest of hundreds of stockholders to supplement the successful efforts of the management in building up the business to serve the community satisfactorily and in returning to the stockholder partners a reasonable interest on the investment.

The first offer of \$500,000 of 7% Preferred Stock to the customers and employees of the Company was taken up by five hundred and ten customers for 4,587 shares and by one hundred and sixty employees for 441 shares. While the subscriber for stock had the option of paying for it in full with accrued dividends at time of subscription, or paying for it on the monthly plan, the greater part was paid for in full. Nevertheless a goodly portion was taken on the monthly plan, an excellent way, as it induces one to save and thus makes less demand upon the banks to supply immediate funds.

There have been many interesting features about this sale. Considerable family history has been revealed, and many tales are told of how the money was saved to make the investment. Many have bought two different lots, and quite a number have bought three times; others have bought four different lots, in increasing amounts each time. Sales have also run in families, as many as four in one house in two instances being purchasers.

The "people," our customers, and employees, earn and save their money, and want to invest it safely to receive a good return. When they put it in the Company's Preferred 7% Stock, they have made choice of a security that has unusual merit.

The confidence manifested by the large number of sales and the "repeat orders" is, in fact, confidence in Rochester and its future, which of necessity includes confidence in our Company and its future.

This safe and sane 7% Preferred Stock is offered at par (\$100.00) per share and accrued dividends.

Dividends are payable quarterly and are cumulative.

You can buy one or more shares by paying \$10.00 per share per month and receive at the rate of 7% per annum on your payments while you are paying for the stock.

"Issues of \$4,000,000 7% Preferred Stock by the Rochester Railway and Light Company. Passed by the Capital Issues Committee of the Federal Reserve Board (Opinion No. 66) as not incompatible with the interest of the United States, but without approval of the merits, security, or legality thereof in any respect."

Start Your Savings Plan Now—Call or Telephone

Rochester Railway and Light Company
BELL—MAIN 3960 HOME—STONE 3960

INQUIRY COUPON

1918

Rochester Railway and Light Company,
Rochester, N.Y.

Please send me complete information about your savings and investment plan.

Name _____

Address _____

City _____ State _____

Sub-Station No. 1—A Company "War Baby"

ANDREW S. MAC DOWELL

THE PAST year has seen a tremendous increase in the Company's electrical load due principally to the establishment of several large war industries in the City, and also to the fact that a large amount of power is being sent to Niagara Falls over the Niagara transmission line, to supply a part of the industrial demand at Niagara Falls for which the Niagara Power Company has insufficient generating capacity at present. Fortunately the Rochester Railway and Light Company's large hydraulic plant No. 5 at the Lower Falls was completed and in operation before the new local factories were ready to begin their activities which condition has enabled the Company to carry a considerable part of the load by water generation. Extensive additions are now being made in steam boiler and turbine capacity at Station No. 3 to take care of the still greater fall load with steam generation during the low water period.

In order to supply the demands of these new industries it was necessary to provide increased generating capacity, and in addition to install more copper in the distribution system to transmit the power to the factories after it had been generated. The location of the factories had a considerable effect on the cost of the line extensions. From the Company's standpoint it was obviously the best policy to have the plants located in one section of the City as the necessary lines with reserve capacity could be installed at a much lower cost than with the plants scattered in widely separated districts. This general plan fitted in well with the requirements of the three largest war industries two of which were located within a half mile, and the third within 200 feet of Substation No. 1. The sites chosen gave them excellent railroad



Sub-Station No. 1

facilities as well as good power service. Station No. 1, our latest Substation was, by this condition converted from a mere Company baby to a War baby, and the growth of its output has been phenomenal.

It became necessary in 1916 to erect a substation in the Eastern part of the City to supply the increasing demands of that section. Street lighting and railway extensions, together with the increase in industrial load of the factories which had located along the New York Central Railroad made the question of distribution from the more centrally located stations more and more costly. A survey of the situation developed the fact that a piece of Company property on Leighton Avenue partially occupied by the concrete pole plant was an ideal center of distribution for the Eastern section. It was, therefore, decided to locate the Substation on one corner of this property. Plans were drawn in February, 1916, and the Substation was erected and ready for operation in October of the same year. The initial installation con-

sisted of two 1,000 K. W. Railway Rotary Converters, supplying four railway feeders, two 2 circuit arc transformers for four street lighting circuits, one 11,000 volt feeder circuit to East Rochester, and two 5,000 K. W. transformers for lowering the voltage from 11,000 volts to 4,150 volts to supply two regulated and one unregulated A. C. feeder circuits. Power for the Substation was transmitted over two 11,000 volt tie lines from Station No. 6. During the month of December, 1916, the kilowatt hour output was 87,000. In the Spring of 1917 three additional A. C. circuits were added which increased the output to 800,000 K. W. H. during the month of June. In the fall and winter of 1917-18 the war factories were erected and four more 11,000 volt feeder circuits were run from the Substation to furnish them with the necessary power; also the number of tie lines from the generating plants was increased from two to four. In June, 1918, the output of the Substation was 3,200,000 K. W. H., an increase of four hundred per cent in one year. As the new factories are not yet operating at a maximum production the monthly output this fall will undoubtedly be greatly in excess of the June output. The Substation was designed for a maximum peak of 10,000 K. W., and the prospects indicate a fall peak of 15,000 K. W. In order to take care of this great increase it was necessary to make several changes in the general Substation layout. These were made without increasing the size of the building although a somewhat more crowded condition of the apparatus was necessary, which was not, however, carried to a point of sacrificing safety.

The property west of the Substation formerly used by the Company as a storage yard for poles, pipe and other construction materials, is now occupied by a well constructed munition plant approximately 700 ft. x 200 ft., employing many hundred men.

The Best War Slogan

ONE of the cartoons used to advertise the third Liberty loan carries the best war slogan that we have seen. The purpose of the loan, as of all these Liberty loans, is

"To make the world a decent place to live in."

This we now fully recognize as our first great task. We started actively into this war to "make the world safe for democracy." After a year, spent largely in getting ready to begin fighting, we find that before the world can be made safe it must be made clean, that making it a "decent place to live in" must precede making it a safe place for government of, by and for the people.

Militant and official Germany has gone far in making the world unclean and indecent, as well as unsafe. We, with the rest of the world, are responsible for allowing Germany to spread its malign doctrines and to extend its menacing practices. This was one feature of our national unpreparedness. We have acknowledged our responsibility and have set about the biggest job of scavenging the world has seen.

Germany has made the world unclean, indecent and unsafe by besmirching civilization, travestying Christianity, degrading humanity, defiling honor, and befouling honesty. All this foulness must be cleaned up, and the cleaning up process is our present job. It is not a pleasant undertaking; scavenging never is pleasant, but it is most necessary and we shall go through with it.

Then, having made the world a decent place to live in, we may undertake that other task, or other part of our task, and see that the world is made safe for democracy. If we do the first part of the job well, we may promise ourselves success with the second part. Until the world is decent it never can be safe.—*The Value World.*

Lightning Storms

THOMAS H. YAWGER

EVERY YEAR in this section of the Country, starting along in May and continuing through September, Nature gives us a brilliant and intermittent display, with varying degrees of intensity of electrical discharges, which we call a thunder and lightning storm. These storms are enjoyed by a great many people on

quantity, but during every storm our apprehension of the damage that may be caused to the Company property and interruption of service to our customers is very great. To minimize this damage and service interruption through lightning has been a great problem to the Company, more so of late years than in the earlier days as



Night Photograph of Lightning Flash

account of their grandeur and as a manifestation of the power and wonders of Nature. In others the enjoyment is somewhat lessened by fear of personal and property injury. The element of personal fear among the employees of the Rochester Railway and Light Company's stations, line and other departments is a negligible

not only is our distribution system covering more territory and hence presenting more exposure, but also because we are dealing with a much greater power. The damage caused by direct strokes of lightning we have no hope of combating, but as these direct strokes are of extremely rare occurrence we can afford to neglect them

and spend our energies on the so-called secondary and induced charges.

What really happens when our distribution and transmission lines and other equipment are "struck by lightning" is that the lightning in finding its way to the ground takes the path of least resistance and in doing so finds our overhead lines a convenient path to use. Thus the higher lightning potential breaks down the insulation of lines and goes into the ground. If the line is dead or like the telephone or telegraph wires has a very small voltage and power, nothing very serious results, but in the case of power wires like our own carrying high voltage and large amounts of power, as soon as the insulation is broken a short cut path is found for the current which being of enormous magnitude burns and destroys the equipment. We now see that by this theory it is not the lightning per se that causes all our troubles but our own current.

It is on this theory, therefore, that all protective devices are designed, and the function of lightning arresters is not to stop the lightning but to prevent the power current from following after the lightning has destroyed the insulation. The original lightning arresters consisted of a minute air gap between two conductors which were interposed between the line to be protected and the ground, thus allowing the lightning charge to jump the gap in preference to following other paths. This arrester with modifications is still in use today by the telephone and telegraph companies, but its limitations as the voltage and power increased soon became manifest and what is called a magnetic blow-out arrester was invented, and is still used with good success on many power lines of limited voltages and power. This type was followed by a variety of devices, among which may be mentioned: horn lightning arrester; multigraph; water jet; electrolytic; compression,



Complete Three-Phase American Aluminum Arrester with Charging Resistance for a Non-Grounded Neutral Circuit

etc., all of which have been of great assistance in the development of protection from lightning disturbances. They are all comparatively simple, although developed through much special study and intricate calculation. Commercial voltages of 100,000 are still extremely high, but modern lightning arresters successfully baffle and neutralize the effects of lightning discharges having potentials of many hundred thousand volts.

How to Prevent Accidents

Every man and woman employed in the Rochester industries should be a booster for public safety. Each one of you have the advantage of seeing how accidents can be reduced in the industries through educational and other measures. Therefore **YOU KNOW THE VALUE** of safety.

You also realize that if it is possible to eliminate the greater part of all industrial accidents through **THINKING AND ACTING** safety, then it is perfectly feasible to do away with the majority of accidents on the street and in the home if the same course is followed.

Nothing is dearer to you than your

mothers and fathers, your wife or children; and this is but another reason why you should practice safety yourself and teach it to others. By so doing you may be the means of perhaps saving the life of some one near and dear to you. Never before in the history of our country has there been so great a need for the conservation of life as there is today.

WHO WILL BE KILLED OR MAIMED FOR LIFE IN ROCHESTER NEXT MONTH? We do not know their names yet, but the answer is that the toll of street and home accidents will include every victim of carelessness—either his own or that of some one else. You know that it is just as easy to be careful in your homes and on the street as it is where you are employed.

It is not enough to know the rules of safety but you must think safety. By so doing you will protect yourself and set an example for others. You can dedicate yourself to no higher purpose than to do all in your power to prevent accidents which mean unnecessary suffering and sometimes death. Let us resolve today not only to practice the following rules but to go out of our way and tell others to do likewise.

Before stepping from the curb to cross the street, look to the left, and when you reach the middle of the street, look to the right. If everyone will observe this simple rule, the majority of street accidents will be prevented.

If you own an automobile be sure you **ALWAYS GIVE THE RIGHT OF WAY** to vehicles coming into the street from the street at the right, and when you turn the corner, **TURN IT ON THE SQUARE**. Police reports show 66 per cent of auto accidents here occur at intersections.

Look for hazards in your own home. See that the stairways and railings are safe; that boiling water, matches, poisons, and pins and needles are not left within the reach of children, and

that the yard is free from broken bottles and sharp objects.

Instruct your children not to play or do roller skating in the street; show them the danger places near their own home, warn them of the danger, and teach them the rules of street safety.

Everyone should learn to swim, and if you have not learned, begin now. Teach your children to swim and do not let them get into deep water until they have learned.

Never neglect to warn others of danger. If you find a broken wire in the street, guard it and call the police; if you see children playing in dangerous places or engaging in dangerous practices, stop them.—*Public Safety Committee Chamber of Commerce.*

Recent Company Accidents

Mr. William G. Fluker, of the Collection Department, while riding a motorcycle, collided with a truck at the intersection of North and Alphonse Streets. His face was cut and his right arm and left leg bruised.

♦

Mr. Raymond C. Williamson, of the Meter Reading Department, while riding a motorcycle, collided with an automobile on Adams Street. He was cut and bruised on the left hand, and bruised on the left leg.

♦

Mr. Louis Tokarsky, of the Collection Department, was thrown from his bicycle, injuring his ankle. The fall was caused by a piece of paper hiding a depression in the pavement.

♦

Mr. Paul Bitzke, of the Gas Shop, while setting a meter in a dark cellar, stepped on a nail, injuring his right foot.

♦

Mr. George Dengler, a laborer in the Construction Department, while at work at Station No. 3, injured his back severely lifting timber.

Gas and Electricity in the Home

BY THE GAS DEMONSTRATORS

Miss Frances E. Moore and Miss Irene Walsh

Home Canning

THE CRY is for food; food for our own men; food to give strength to the Allied soldiers who are pouring out their blood for us. Perishable fruits and vegetables are to a large degree substituted for the staple foods now being sent to feed our soldiers. Perishables wasted here, lessen the supply "over there." Bear in mind that Home Canning is a National Obligation.

The housewife can be more sure of success in canning if she understands why fruits and vegetables, canned or uncanned, spoil. There are two main reasons for spoilage. First, because of the presence in or on foods of small living organisms which feed on them and change them so that they cease to be desirable, and even become harmful to us; second, because certain substances which, although not alive, are the products of living things and have the power of causing fruit to ripen, seeds to start growing, and cause final decay in all. Any food that may some day give rise to life is subject to change. Therefore the efforts of the person canning should be directed towards the killing of the bacteria and life processes.

Twenty years ago most housewives used only the boiling or open kettle method of canning, because they knew no other. Since then great progress has been made in the methods of canning just as there has been progress along all lines of work. With the old method there is always danger of spores and bacteria being introduced during the cooking and on the spoons or other utensils while the jars are being filled. Where a large amount of sugar acts as a preservative and where the form or color of the fruit is not considered, as in jellies and preserves, the old method is still used.

The single period cold pack method

is a simple and sure way of canning. It insures a good color, texture and flavor to the vegetable or fruit canned. It saves time and labor for the housewife in the kitchen and over a hot range.

However, too few housewives realize that it is the preparatory steps which decide whether or not the canning is to be a success. The jars and rubbers must be chosen wisely and tested thoroughly. If your family is small pint jars are best, for with them no food is wasted. Examine the jars and see that there are no invisible cracks, that the cover and clamp fit tightly. Rub your finger around the edge of the jar as well as the cover to see if the glass is smooth. Fill the jars with water and see if there are leaks.

Be very particular about the rubbers you use. Do not use your last year's but buy new ones every year, as rubber deteriorates from one season to another. A good rubber when tested is elastic, flexible, and when stretched will return to its original size. The rubber should fit the neck of the jar snugly and be fairly wide and thick when folded and pressed tightly, and should show no crease or break. Do not use the rubbers that come with the jars unless they measure up to these tests.

Can fresh vegetables, and if you have not a war garden, plan your canning so you can buy your vegetables on market day. The fresher the vegetable, not only the more choice will be the canned product but the smaller the percentage of spoilage. Asparagus, peas, beans or corn should be canned within five hours of the time of picking. Then too, do not handle too large a quantity of any vegetable at one time, especially in hot weather on account of flat sour.

The most important step in canning

is the preliminary one of blanching, that is, putting the prepared vegetable into cheesecloth or a wire basket and plunging into boiling water, keeping it there from five to fifteen minutes to reduce the bulk, set the color, remove excess acid and kill surface bacteria, and then dipping *immediately* into cold water. Do not allow the vegetable to stand in hot water but pack in the tested jars, fill with water and add one teaspoon salt to the quart. Put on the rubber which has been dipped into boiling water, the top, and adjust the bail but do not seal. If the screw top type of can is used, put on rubber and screw top slightly.

The sterilizer need not be elaborate. A large kettle with a tight cover, a firm rack of galvanized wire cut to the size of the bottom of the kettle can be used as a false bottom, to prevent the jars from touching either the bottom or sides of the boiler. A wash-boiler can be fitted up nicely with a rack, purchased at a reasonable cost. Put the jars containing the vegetables on the rack in the sterilizer and fill it with water enough to come up to the shoulders of the jars. If a number of jars are put into the sterilizer, pack a towel or a piece of cloth between to prevent them from touching and cracking. Sterilize the required time, counting from the time the water begins to boil. When the vegetables have been sterilized, remove immediately and seal, not allowing them to stand in the sterilizer to cool. Store in a cool, dark, dry place.

For fruits as well as for vegetables the cold pack method is best. However it is done with exceptions. Blanch only the hard fruits such as apples, apricots, gooseberries, pears, peaches, quinces and rhubarb. The others, berries, clean pack in the tested jars and cover with a syrup made by boiling for two minutes one part of sugar to two parts of water. Pour the syrup slowly into the jar, using a fork to distribute the heat and

prevent the glass from cracking, or let the syrup cool or have the jar hot before packing. Put on the rubber and top, adjust bail or screw top slightly, put in sterilizer for the required time. Take out immediately. Seal and store.

Table for Sterilizing and Blanching

| | Blanch | Sterilize |
|-------------------|-----------------|---------------|
| Greens..... | 15 minutes | 2 hours |
| Asparagus..... | 15 minutes | 2 hours |
| Peas..... | 5-10 minutes | 3 hours |
| Beans..... | 5-10 minutes | 2 hours |
| Carrots..... | 5 minutes | 1½ hours |
| Beets..... | 12 minutes | 1½ hours |
| Corn..... | 5-10 minutes | 3 hours |
| Tomatoes..... | 1½ minutes | 22 minutes |
| Squash..... | Prepare boil | 2 hours |
| Pumpkin..... | until thick | 2 hours |
| Berries..... | None | 16 minutes |
| Plums..... | None | 16 minutes |
| Pineapple..... | 3-5 minutes | 30 minutes |
| Rhubarb..... | 1-3 minutes | 20 minutes |
| Quinces..... | 1½ minutes | 20 minutes |
| Peaches..... | To loosen skins | 16-25 minutes |
| Pears..... | 1½ minutes | 20 minutes |
| Gooseberries..... | 1-2 minutes | 16 minutes |
| Currants..... | None | 16 minutes |
| Cherries..... | None | 16 minutes |
| Apricots..... | 1-2 minutes | 16 minutes |
| Apples..... | 1½ minutes | 20 minutes |

Seasonable Recipes

BET RELISH

1 quart cooked beets ½ tsp. paprika
1 cup grated horseradish Vinegar
1 tsp. salt

Chop cooked beets, add the horseradish, and seasons. Then pour over scalding vinegar to cover, reheat to boiling point. Store in hot sterilized glasses.

RASPBERRY AND GOOSEBERRY JAM

1 qt. raspberries 1 qt. gooseberries
Equal weight of sugar

To gooseberries add a small quantity of water about ¼ cup to 1 quart of fruit. Simmer until tender. Then add raspberries and sugar. Cook until thick, stirring to prevent burning. Pour into sterilized glasses.

SPICED CURRANTS

4 lbs. currants 2 teaspoons cinnamon
4 lbs. sugar 1 teaspoon allspice
2 cups vinegar 1 teaspoon cloves
Pinch of mace and salt

Boil vinegar, sugar and spices. Add currants and simmer 20 minutes to ½ hour. Pour into hot sterilized glasses.

Resume of the Work of the Subway Department

THOMAS H. CHRISTIE

IN THE year 1892 the Rochester Railway & Light Company started the construction of the Underground Subway through the streets of Rochester to take the place of the so-called Edison Tube, which consists of an iron pipe inclosing a copper conductor and filled with a compound which was, at that time, the only underground system in operation.

It is gratifying to note that from 1892 to the present time the Subway Department has constructed the following:—231½ miles of general subway in streets; 775 miles of tile duct; 156 miles of wood duct (creosote); 19 miles of iron duct and 19 miles of fiber duct.

The total number of linear feet of each kind of duct amounts to 4,094,072' of tile duct; 100,559' of iron duct; 100,131' of fiber duct and 826,209' of wood duct.

The Department has during this time also built 3144 man holes; 4128 hand holes and 348 sub-man holes. Of this number 1493 have been sewered and drained which keeps them clean by eliminating mud and water. The remainder which are not drained, were given a general inspection, pumping and cleaning during the past year.

The street lighting system has also progressed rapidly. The number of concrete standards set up to the present time amounts to 3844 with 5 Isles of Safety. The Department has this year repaired 1136 standards that have been chipped and broken off by wear and tear.

By careful inspection the work of cleaning and repairing the subway system can be cheaply done, as it can be held as a filling in job. Work on new subways is very expensive and has been practically discontinued during the war, as only absolutely necessary line extensions are made.

Industrial Sales

Mr. Peter Mirras, of 1486 Dewey Avenue, has installed a confectioner's gas furnace.

Mr. B. Levin of 1620 Lake Avenue, has displaced his coal range with a Garland Hotel Range and a 6-burner short-order stove.

Mechanics Institute has installed 10 Johnson furnaces in the tinshop.

The Bridgeford Machine Tool Company has put an additional Garland Range into its restaurant.

The Seneca Hotel has placed an order with us for four additional sections of Garland Range which will displace all its coal ranges.

The Symington Anderson Company has installed an additional bake oven in its restaurant.

The Ritter Dental Manufacturing Company has purchased an additional case-hardening furnace.

The Rochester Stamping Company has installed an additional 700 lb. soft metal furnace.

The Wilmot-Castle Company has added five Johnson furnaces to its present equipment.

The Taylor Instrument Companies have installed an additional high speed steel furnace.

The Symington Forge Company has installed two Garland Ranges, two Vulcan bake ovens, three 15-gallon coffee urns, and one No. 6 Ruud Heater in its restaurant.

The Parker-Rishor Company has installed burner equipment under a 100-gallon caldron furnace; also six hot plates to be used in the manufacture of special soap.



Auditing



New Business

Net Increase in Consumers in First Five Months of 1918

| | Dec. 31, 1917 | May 31, 1918 | Increase |
|---------------|---------------|--------------|----------|
| Gas..... | 78,657 | 79,114 | 457 |
| Electric..... | 27,774 | 28,436 | 662 |
| Steam..... | 51 | 55 | 4 |
| | 106,482 | 107,605 | 1,123 |

Net Increase in Consumers in Twelve Months Ending May 31st, 1918

| | May 31, 1917 | May 31, 1918 | Increase |
|---------------|--------------|--------------|----------|
| Gas..... | 76,442 | 79,114 | 2,672 |
| Electric..... | 26,408 | 28,436 | 2,028 |
| Steam..... | 49 | 55 | 6 |
| | 102,899 | 107,605 | 4,706 |

Statement of Consumers by Departments as of May 31st

| May 31 | Gas | Elec. Steam | Total | Increase |
|-----------------|--------|-------------|---------|----------|
| 1908 | 38,905 | 6,155 | 45,060 | |
| 1909 | 42,728 | 6,715 | 49,443 | 4,383 |
| 1910 | 48,042 | 7,938 | 55,980 | 6,537 |
| 1911 | 53,650 | 9,583 | 63,248 | 7,268 |
| 1912 | 58,316 | 11,617 | 69,933 | 6,705 |
| 1913 | 63,494 | 14,647 | 78,141 | 8,210 |
| 1914 | 67,711 | 17,062 | 84,801 | 6,638 |
| 1915 | 70,446 | 20,301 | 90,784 | 5,983 |
| 1916 | 72,759 | 23,387 | 96,187 | 5,403 |
| 1917 | 76,442 | 26,408 | 102,899 | 6,712 |
| 1918 | 79,114 | 28,436 | 107,605 | 4,706 |
| Inc. in 10 Yrs. | 40,209 | 22,281 | 62,545 | 62,545 |

Net Increase in Consumers by Months

| | 1916 | 1917 | 1918 |
|---------------------------|-------|-------|-------|
| Increase in January..... | 341 | 194 | 54 |
| Increase in February..... | 253 | 19 | 56 |
| Increase in March..... | 339 | 386 | 183 |
| Increase in April..... | 684 | 608 | 322 |
| Increase in May..... | 765 | 568 | 508 |
| | 2,382 | 1,737 | 1,123 |

Subscribers to 7% Preferred Stock

| | |
|-----------------------------|------|
| No. Subscribers June 1..... | 928 |
| No. Subscribers July 1..... | 1087 |
| No. Shares June 1..... | 6596 |
| No. Shares July 1..... | 7538 |

Miscellaneous Data

| | May 31, 1917 | May 31, 1918 | Increase |
|---------------------------------|--------------|--------------|-------------|
| Miles of Gas Main..... | 444 | 488 | 44 |
| Miles of Overhead Line..... | 1,840 | 1,899 | 59 |
| Miles of Underground Cable..... | 1,071 | 1,127 | 56 |
| Miles of Sub-way Duct..... | 954 | 1,003 | 49 |
| No. of Street Arc Lamp..... | 1,570 | 1,716 | 146 |
| No. of Street Inc. Lamps..... | 7,892 | 8,664 | 772 |
| Total No. of St. Lamps..... | 9,462 | 10,380 | 918 |
| No. of Employees..... | 1,201 | 1,350 | 149 |
| Amt. of Pay-roll (Mo.)..... | \$104,387.38 | \$134,697.19 | \$30,309.81 |

E. B. A. for Month of June, 1918

| Receipts | |
|--|-------------|
| Bal. on hand 1st of month..... | \$2,792.53 |
| Dues—Members..... | 530.81 |
| Dues—Company..... | 530.81 |
| Fees—Members..... | 12.00 |
| Fees—Company..... | 12.00 |
| Assessment No. 14—17 Mem.. | 14.75 |
| Assessment No. 14—17 Com.. | 14.75 |
| Int. on Bank bal. and Inv..... | 11.69 |
| Group Life Insurance..... | 26.94 |
| Members Additional Life Insurance..... | 18 1,153.93 |
| | \$3,946.46 |

| Disbursements | |
|-----------------------------------|----------|
| Sick Benefits..... | \$380.51 |
| Accident on Duty Benefits..... | 57.38 |
| Death Benefit No. 15..... | 275.00 |
| Death Benefit No. 16..... | 275.00 |
| Medical Examinations Expense..... | 30.00 |
| Military and Naval Expense | |
| Members Dues..... | 48.10 |
| Total Payments for Month..... | 1,065.99 |
| Balance on hand July 1, 1918..... | 2,880.47 |

| | |
|--------------------------------------|-----|
| Membership ending May 31, 1918..... | 738 |
| New Members..... | 37 |
| Resignations..... | 13 |
| Increase for June..... | 24 |
| Membership ending June 30, 1918..... | 762 |

Electric Generation

The new 5,000 K. V. A. transformer for Station No. 35 was shipped on July 10th, and on its arrival will be installed at once to relieve the over-loaded condition existing on the 4,150 volt, 60 cycle tie lines between No. 3 and No. 35 Stations.

Work on the foundation for the new steam turbine at Station No. 3, through the co-operative effort of the General Construction Department is progressing rapidly. Shipment of the turbine is promised for August 1st and on its arrival will be installed as quickly as possible to assist in handling the heavy fall load.

New rotary converters are being installed at three of the Company plants, one 1,000 K. W. 250 volt Edison machine at Station No. 34; one 2250 K. W. 250 volt Edison machine at Station No. 3 and a 1500 K. W. railway machine at Station No. 5. These rotaries are supplied with power through the transformers from the 11,000 volt, 60 cycle system, and will assist very materially in taking care of the expected heavy fall and winter load on the systems which they are designed to supply.

On Saturday, June 22nd, the electric load reached the highest momentary peak for the month, 39,250 K. W. at 9.00 A. M., an increase of fifty-one per cent over the high peak for the corresponding date in June, 1917; and the largest generated load for twenty-four hours for June was 613,094 K. W. on June 25th, an increase of 85.9 per cent over the corresponding date in 1917. These figures show in a brief way the remarkable growth in electric generation during the past year.

Gas Manufacture

The Light Oil Plant at East Station, formerly operated directly by the Pittsburgh By-Product Coke Company, has been taken over by the operating organization of the Gas Manufacturing Department and its employees have been transferred to the Company. Mr. Harry Donovan who has served the Company in various capacities for several years has been made foreman of the Light Oil Plant.

About 3 A. M. on Sunday, July 6th, the water gas operators running No. 4 machine at East Station heard the air blower speed up. They started down stairs to the blower room but, fortunately for them, did not get inside. The peripheral speed had evidently reached its limit and the receiver burst, tearing through the cast iron casing rupturing the blast pipe in three or four places, but the motor was not damaged. The blower was a No. 10 Sturtevant Centrifugal Fan with direct connection to a 135 H. P., 4150 volt, 60 cycle, A. C. motor running at 1800 R. P. M. The explanation is that governor trouble on a turbine at Station 5 caused the frequency to increase and at that hour in the morning the blower set was about all the load there was on the line and it received the entire jolt. The shut down was brief however, the operators immediately changed over to No. 1 blower and continued their work. An old blower of the same type has been installed to replace the damaged one, and a new unit ordered from the Sturtevant Company.

The boiler plant at East Station has been transferred to Mr. Crofts Department, and will be under the supervision of Mr. W. H. White.

Letters From Company Men in Service

Camp Library, Camp Greene,
Charlotte, N. C., June 24, 1918

Dear Mr. Durfee:

Still alive and feeling fine. Since returning to camp, I've been on special duty at the Library. It's a wonderful job. I work forty-five hours a week and the rest of the time belongs to me. I go and come just as I wish.

The other day I was working on one of the Dear Buicks. It was just like home. A young lady had some brake trouble and me to the rescue. The Library has one of the well-known Fords. Believe me, it gets a lot of work on these nice warm nights. Tomorrow I expect to overhaul the motor. We can do the job for \$1.25—buy the parts in the 5c. and 10c. store.

From some of the moves made here, I guess my stay in this part of the country is short. All the boys are quite anxious to get over. If I'm lucky enough to reach there, I'll drop a line. All the fellows I left home with are in Italy now—a long ways from home.

Well, Mr. Durfee, it's time to go to bed. Give my regards to all the boys and girls. I remain your old friend,

J. A. McDERMOTT.



Camp Upton, N. Y., July 6, 1918

Dear Leon: Have been trying to find time to write you since we landed in camp, but this is certainly a busy place—something doing every minute. When we do have time off we have clothes to wash, buttons to sew on, shave, keep our shoes, leggins and uniforms dusted up; but it sure is a great life.

We left Rochester at 7:15 Thursday and reached Camp Upton at 4:45 P. M. the next day. We went through Newark, N. J., and Jersey City to the ferry, crossed to N. Y. City, from there to Long Island City, took the L. I. R. R. to camp and it sure was a tired bunch. We did not sleep at all on the train. Three or four fellows had different instruments and played and sang all night. We were fed and went to bed. About 100 fellows in our barracks, all from the second division, are such a good bunch, I wish we could stick together.

At 5:45 the whistle blows and everybody jumps. It takes some time to get the uniforms on, laced and buttoned, and get downstairs at 6 for roll call, and if you forget to button one of your shirt pockets you hear from it, but the bunch has got so now they don't forget very often. Then we wash, put our bedding out and go to mess, drill from 8 to 12 with 10 minutes rest each hour, go to mess at 12:30 and in the afternoon play games out on the drill grounds, go to retreat at 4 P. M. and go to mess again at 6.

The feed here is very good. The fourth of July for dinner we had chicken, mashed potatoes, peas, rice, bread, coffee, pie and peaches. I am eating good and feeling finer than silk.

Last Tuesday we were examined, vaccinated and inoculated. The inoculation made me pretty stiff and sore for a couple of days but it is all gone now and expect to get the needle, as the boys call it, again next Tuesday. Then Friday we will be out of quarantine and when off duty can go where we like.

The weather has been fine here. It is hot but a breeze blowing all the time.

I am at the Y. M. C. A. now. There is going to be a boxing match and then moving pictures. We have all kinds of entertainments—more than we can go to.

The lights go out in the barracks at 9 o'clock but we do not have to get in and go to bed until 11. Nobody gets lonesome in our barracks—the gang is fooling all the while off duty. There is a little fellow that looks like Charlie Chaplin here. He was sleeping last night and a fellow got hold each end of his cot and bounced him up and down. You would split your sides laughing to see some of the tricks they do.

Oh, yes, I am a real soldier now—I even salute an officer when I see him.

Well, Leon, this is about all I can think of now. Give my best regards to the bunch at the office and don't forget to write.

PRIVATE JAMES C. PLATT,
36th Co., 9th Bn., 152nd D. B., 4th Platoon.



U. S. Naval Academy,
Annapolis, Md., June 30, 1918

My dear Mr. Yawger: Thank you very kindly for replying so promptly to my telegram from New York asking for a letter of recommendation.

I've been enrolled an ensign in the Naval Reserve and am now at the Naval Academy at Annapolis for a short period of training before going directly into active service. There are about 150 fellows here, some from the fleet but most from civil life like myself. We are kept very busy, studying and drilling. None of us know just where we'll go except that it will be engineering duty on one of the ships. Personally I'm hoping for a big ship—the bigger the better.

Asking to be remembered to all of my friends with the Company and with kindest regards to you, I am

Very sincerely,

W. RAYMOND YORKEY.



Personals

Miss Rose Schroth and Mr. Matthew W. Kinney of the Garage were married May 28th, 1918.

Mr. James E. Cooper spent his vacation at Little Falls and New York City. Jim now drives an Overland Roadster.

Miss Elsie Forsberg, of the Billing Department has been transferred to the Gas Manufacturing Department office at West Station.

Word has been received that Mr. James Culligan, formerly assistant Supervisor of the Meter Reading Department, has arrived safely overseas.

Mr. Clarence J. Heyden, formerly of the Meter Reading Department, now at Camp Upton, writes that he is well and enjoys camp life.

Mr. Norman H. Ginter and Mr. John Williamson have gone with the Dock Contractor Company at Niagara Falls.

Miss Emily L. Cutler of Rochester, a graduate of the University of Rochester, has joined the Gas Manufacturing organization as chemist.

Mr. Roger Mossrop is doing special work at West Station during the Summer vacation. He has completed his sophomore year in Chemical Engineering at M. I. T.

Mr. Ivar Lungaard has been appointed Chairman of Engineering Division of the Executive Committee, Sixth Regional Industrial Commission, Rochester District.

Mr. Ralph H. Furner, at one time in the Information Department, now of Cleveland, Ohio, made a short call on his friends. Ralph is looking well and happy.

Miss Mabel Albert, of the Purchasing Department, is on a three months leave of absence. She expects to spend most of the time with Miss Mae Dickson at Fox Lake, Wisconsin.

Mr. Fred Klein received a card from Private H. Greenberg of Company C 49th Engineers, Fort Meyer, Virginia. He is well and expects shortly to be sent overseas.

Mr. Samuel S. Amdursky, of the Engineering Department, has gone to Washington, D. C., to join the Department of Mechanical Research, Bureau of Mines Experiment Station.

Word is received that Sergeant Sidney A. Swanson of the 309th Field Artillery Company has arrived safely overseas. Before joining the Army, Mr. Swanson was Line Foreman with this Company at East Rochester.

Mr. Joseph Furlong, of the Engineering Department, has returned from a very pleasant vacation spent at Lancaster and Buffalo, New York, with a short stay at Crystal Beach, Ontario.

Mr. Roy I. Rodell, formerly of the Meter Reading Department, is now at Vancouver, Washington, and expects soon to go "into the timber." He is with the 14th Co. Cas. Det. A. S. S. C.

Mr. George A. Yatteau, son of Mr. Frank A. Yatteau of the Complaint Department, has arrived overseas. He is with Machine Gun Company 108, and writes that he is well and had a fine trip over.

Mr. Philip F. Stephens, who resigned from the Engineering Department to take up work with the Austin Company of Cleveland, Ohio, has been sent to Indian Head, Maryland, on construction work.

Assistant General Manager Herman Russell is with us again after his recent illness. Vice-President Searle says, "Mr. Russell is all over the chicken-pox. Two weeks ago the chicken-pox was all over Mr. Russell."

Mr. Warren Lyon, formerly stenographer in the Engineering Department, more recently with the New York Central Railroad Company,

visited the office a few days ago. He has enlisted in the Navy as second Class Yeoman.

Mr. Ivan Brady, of the U. S. Radio Service, Great Lakes Training Camp, called on his friends a week or so ago. He is delighted with his work and the life, and certainly looks the part. Before his enlistment Mr. Brady was connected with the Telephone Department.

Mr. Arthur J. Wagner, connected with Electric Generating Department since March, 1912, has resigned to take a position with the Taylor Instrument Companies. "Art" has been very active in promoting the efficiency of electrical operation and will be missed by his many friends throughout the Company.

Mrs. Amelia Harold Kohl, of the Mailing Department, has returned from a ten days vacation spent in Wrightstown, New Jersey, visiting her husband who is in Battery A 335th Field Artillery stationed at Camp Dix. She says John is looking the picture of health and in the six weeks training at Camp has become expert in the handling of horses and mules, riding bare-back, etc.

Miss Ethel Benton, of Spencerport, daughter of Supreme Court Justice George A. Benton, and Mr. Alexander M. Beebe, of the Gas Manufacturing Department, were married on June 29th, 1918. Mr. and Mrs. Beebe spent their honeymoon at Kalaria Island, the summer home of Mr. Arthur Castle, in the St. Lawrence. They will live at 615 Hazelwood Terrace.

1st Lieut. William A. Schell, formerly of the Drafting Department, called on his friends in the Company June 24th. Lieut. Schell was recently transferred from Camp Devens to Camp Taylor as Instructor in the 76th Division of the 303rd Regiment of Heavy Field Artillery, O. T. C., and reports very interesting

work in the scientific problems of heavy ordnance.

Mr. John Stokes, Staff Sergeant in Paymaster's Division, M. D. No. 2, Second Central Ontario Reg. Canadian Infantry, called at the office recently while on a four-day furlough. He has been to France with the Railway Conveyance Company and brought 700 wounded men of various units back with him. He is stationed at Niagara-on-the-Lake.

The stork has been very kind to several members of the Company recently, and consequently happiness is reflected in the following announcements:

Mr. and Mrs. Ivar Lundgaard, a daughter, Harriett Annette, born June 26th, 1918.

Mr. and Mrs. Sidney Alling, a son, David Wheelock, born July 5th, 1918.

Mr. and Mrs. James C. Briggs, a daughter, Margaret Mary, born May 7th, 1918.

Mr. and Mrs. James Quinn, a son, Leo George, born April 28th, 1918.

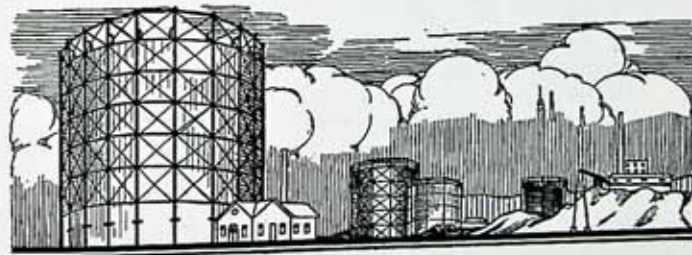
New employees for the month of June are: Miss Blanche L. Smith, stenographer, Electric Meter Dept., Mrs. Millie C. Allen, clerk General Construction Dept., Miss Bertha M. Sauer and Miss Florence McVea, operators Telephone Dept., Miss Margaret M. Leader, clerk Tabulating Dept., Mrs. Maude Ghysel and Miss Eileen Crossett, clerks Relief Dept., Miss Florence M. Chittenden, clerk Payroll Dept., Miss Lulu Ketterer, clerk Order Dept., Mrs. Lena Oslerhoudt, clerk Domestic Sales Dept., Miss Essie A. Levy, clerk Appliance Dept., Miss Hattie Neuhierl, teller Treasurer's Dept., Miss Grace H. Elger, bill deliverer.

Messrs. Lawrence E. Bagnall, Frank K. Brennan, Leon A. Townsend and Arnold Donovan, meter readers, Mr. Willis Dagg, station messenger, Mr. Allen O. Crosier, clerk Addressograph Dept..

The Voice of the Immortals

IN this state of absolute freedom and perfect security, who will grudge to yield a very little of his property to support the common interest of society, and insure the protection of government? . . . Where is the man to be found who wishes to remain indebted for the defense of his own person and property, to the exertions, the bravery, and the blood of others, without making one generous effort to repay the debt of honor and gratitude.

—George Washington, 1783.



How To Co-operate



Pick out the folks you like the least and watch 'em for awhile;
They never waste a kindly word, they never waste a smile;
They criticize their fellow-men at every chance they get;
They never found a human just to suit their fancy yet.
From them I guess you'd learn some things, if they were
pointed out,

Some things that every one of us should know a lot about.
When some one knocks a brother, pass around the loving cup,
Say something good about him if you have to make it up.

It's safe to say that every man God made, holds trace of good
That he would fain exhibit to his fellows if he could;
The kindly deeds in many a soul are hibernating there,
Awaiting the encouragement of other souls that dare
To show the best that's in them and a universal move
Would start the whole world moving in a hopeful, helpful
groove;

Say something sweet to paralyze the knocker on the spot,
Speak kindly of his victim if you know the man or not.

The eyes that peer and peer to find the worst a brother holds;
The tongue that speaks in bitterness, that frets and fumes and
solds;

The hands that bruise the fallen, though their strength was
made to raise;

The weaklings who have stumbled at the parting of the ways;
All these should be forgiven, for they know not what they do;
Their hindrance makes a greater work for wiser ones like you,
So when they scourge a wretched one who's drained sin's
bitter cup,

Say something good about him if you have to make it up.

—*Current News.*