

# GAS AND ELECTRIC NEWS

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No. 12



Tunnel Heading—Main and Front Street Sewer

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## Rochester's New Electrically Driven Sewer Tunnel

BY HAROLD O. STEWART

A Sewer Tunnel under Front Street from Central Avenue to Main Street and under Main street from Front Street to the Erie Canal is now under construction for the purpose of providing adequate drainage for Rochester's business section. This tunnel will be 4400 feet

connected to it by short drifts. The tunnel itself has several curves which have made the alignment rather difficult. The various headings, however, have met very closely. Instead of driving stakes on the ground level, as is customary in open cut work for line and grade, holes are



Intersection of Tunnel at Main and Front Streets

long and approximately 7 feet square in cross section. There are about 2500 feet of branch tunnels or laterals running to the various buildings along the route. In order to work on different parts of the tunnel simultaneously, six vertical shafts were sunk at the locations shown on the plan. These shafts do not run directly into the tunnel, but are con-

drilled in the roof, plugged and used for this purpose.

Electric power is used exclusively on this work, the contractor having found by previous experience that it costs less than any other kind of power. It has also been found to be more dependable and flexible, and easier to handle. From the standpoint of the public, it is perfectly

safe and clean, while all other kinds of power are not. An electric hoist is used at each of the six 45 ft. shafts except one where a compressed air hoist is used.

The tunnel and shafts are electrically lighted throughout. The lighting units in the tunnel should of necessity be quickly removable, so the lamps were placed ten feet apart on a reinforced cord supported by pegs driven into the walls.

midnight Sunday to 12 p. m. the following Saturday. The compressed air line runs on Graves Street to Main Street, there crossing the street and going down the shaft. The remainder of the piping is in the tunnel. Formerly the air line was run on the street beside the curb, but in cold weather the moisture in the compressed air froze in the piping and shut off the air supply. Several drips were installed in the piping to



Section of Tunnel near Plymouth Avenue

Compressed air is used for rock drilling and ventilation. The air compressor plant is located on Graves Street and consists of an air compressor having a capacity of 900 cubic feet of free air per minute, driven by a 150 horsepower electric motor which runs continuously from

collect the moisture, but the experiment was not a success. Surprising as it may seem, the tunnel is comparatively warm, the temperature staying between 50° and 60° F. even in the coldest weather.

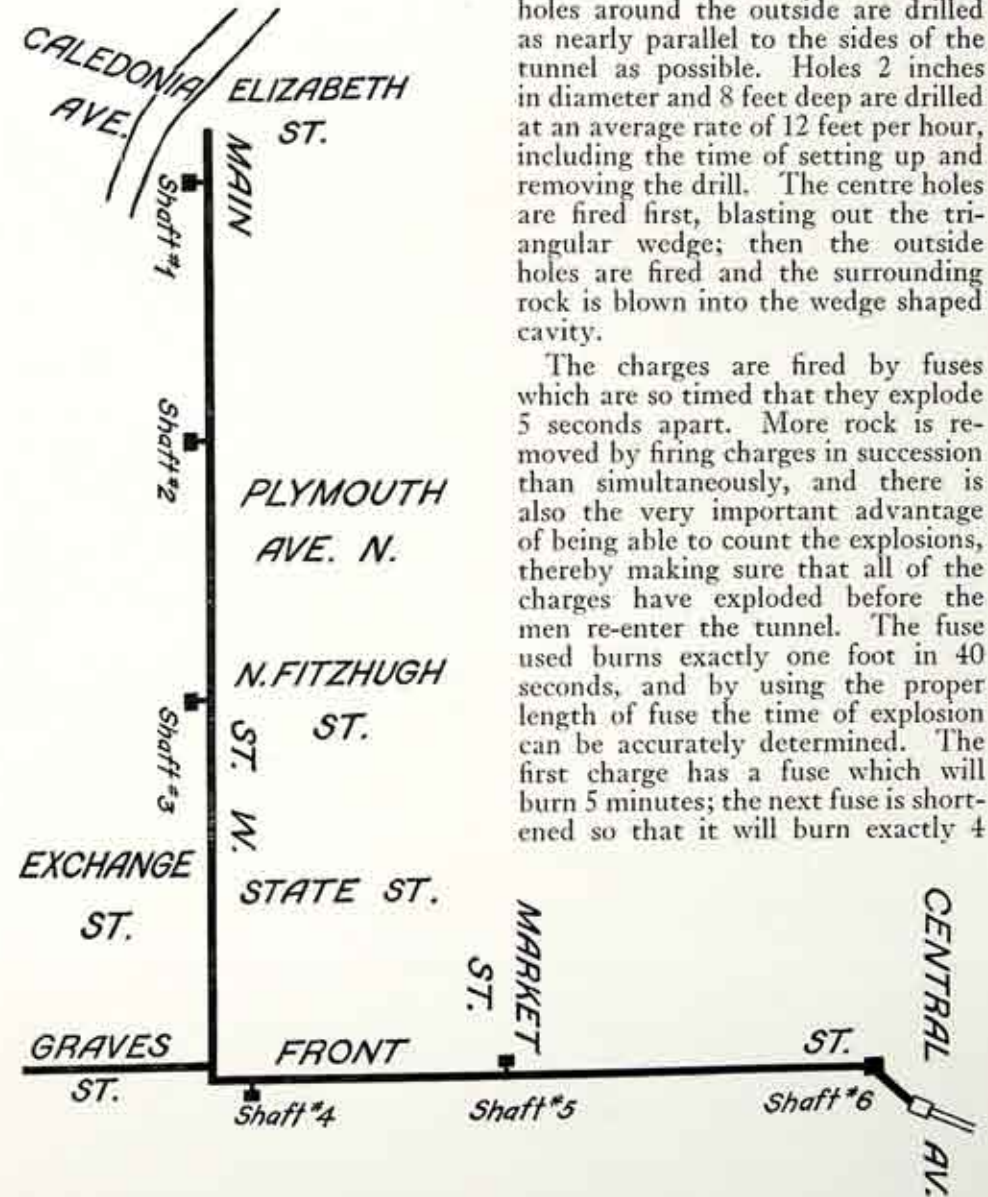
The tunnel was driven through solid shale rock. After the shafts

were sunk from 8 to 12 feet, rock of medium hardness was encountered, with occasional seams of clay.

The method of drilling is as follows: A steel column or post which is to hold the drill is set up and firmly wedged between the rock roof and floor. The drill is mounted on the column and connected to the air line.

Before the drilling is commenced a careful examination of the rock is made to determine the lines of least resistance, and the foreman plans the angles at which the holes should be drilled in order to take out the rock most effectively. The holes drilled near the center of the heading are at such an angle as to first blast out a triangular wedge. The other holes around the outside are drilled as nearly parallel to the sides of the tunnel as possible. Holes 2 inches in diameter and 8 feet deep are drilled at an average rate of 12 feet per hour, including the time of setting up and removing the drill. The centre holes are fired first, blasting out the triangular wedge; then the outside holes are fired and the surrounding rock is blown into the wedge shaped cavity.

The charges are fired by fuses which are so timed that they explode 5 seconds apart. More rock is removed by firing charges in succession than simultaneously, and there is also the very important advantage of being able to count the explosions, thereby making sure that all of the charges have exploded before the men re-enter the tunnel. The fuse used burns exactly one foot in 40 seconds, and by using the proper length of fuse the time of explosion can be accurately determined. The first charge has a fuse which will burn 5 minutes; the next fuse is shortened so that it will burn exactly 4



Map of Main and Front Street Sewer

minutes and 55 seconds; the third fuse is still further shortened so that it will burn 4 minutes and 50 seconds, etc. As many as 30 charges are sometimes fired by this method. The shortest fuse is lighted first; then the next shortest, etc. After the last fuse is lighted the men get out of the tunnel and up out of the shaft as quickly as possible; whereupon the shaft is covered. Muffled explosions are heard one after another and they are carefully counted by several men in order to be sure that all the charges have exploded. On one occasion, through a defective fuse, a charge did not fire for 30 minutes, but went off just as the men were about to re-enter the tunnel to investigate.

Compressed air is turned on in the heading as the fuses are lighted, to clear the heading of blasting smoke. It sometimes takes 30 minutes to blow the smoke away.

After blasting, the men re-enter the tunnel and re-string the electric lights over pegs in the walls. The rock broken up by the blasting is shoveled into buckets resting on flat cars which are pushed into the tunnel as far as the tracks are clear. The cars, when loaded, are run to the shafts on a narrow gauge track which extends throughout the entire tunnel. At the shaft an electric hoist lifts the buckets of rock to the street surface. The rock is finally carted to a motor-driven stone crushing plant on Falls Street and broken up for concrete work.

In prosecuting this work many unusual difficulties were met, such as excess water. In one location a large spring was encountered and two large electric motor-driven pumps were required to remove the water as fast as it ran into the tunnel. It is estimated that this spring supplied about 700 gallons of water per minute.

The early completion of the tunnel saved a number of cellars from the recent flood in March. Ordinarily,

whenever the river was high, numerous cellars along Main, Graves, Aqueduct and Exchange Streets were flooded either by water coming through the walls or by water backing up in the sewers. The Powers Building, Powers Hotel, Duffy-Powers, Wilder Building and other



Ready to be Lowered

buildings near the Four Corners were usually affected by the latter cause.

In order to prevent this trouble this year arrangements were made to quickly connect the old sewers to the tunnel in case of necessity. Branches from the tunnel were cut through the rock to within a few feet of the old sewers. The remainder of the rock was drilled so that it could be quickly blasted out in case of danger. As soon as the water began to come into the cellars, these connections between the old sewers and the tunnel were blasted and the tunnel successfully carried away all the water drained into it.

The contractor, the M. H. Ripton Company, is to be congratulated on the extreme care with which the work has been conducted, and also on the speed. The work is being done at an average rate of 30 feet per day, and will be completed well within the time estimated.

## The Construction of Gas Distribution Systems

BY JAMES FAHY

PRIOR to 1905 The Rochester Railway and Light Company installed all cast iron pipes with a cast lead joint. The pipe was first laid in the trench and lined up as straight as possible. It was laid on a solid foundation of earth, except that in places where rock had been excavated, it had to be blocked up with two inch pieces of blocking.

The making of the joints was the next procedure. The depth of the hub at each joint was about four inches. The joint was spaced with iron wedges and a piece of rope yarn or oakum was firmly packed in the bottom with a tool made for this purpose. When this had been done on several joints the lead was poured. One man would place and replace the clay roll or pouring clamp, and a second would carry the molten lead to a third man who was pouring the joints. The man carrying the lead would at the same time keep the lead supply hot by means of a salamander and a lead pot on a coke fire. The men who did this work usually handled the caulking also. In caulking a chisel was first passed around the pipe to clean off all the lead that projected from the face of the hub on the spigot end of the pipe. Then numbers 1-2-3 and 4 caulking tools were used, the fourth being the finishing tool on all sizes of pipe up to and including eight inch. On sizes from eight inch upward a fifth tool would be used to finish the joint, such joints being of course larger in proportion to the diameter of the pipes. With the caulking completed, the trench was refilled, and the men and supplies moved to the next job by means of a horse and wagon.

In 1905 the Company tried cement joints on small mains with every eighth joint made of lead for expan-

sion and contraction due to temperature. These joints worked out very satisfactorily.

In 1906 the Company discontinued the use of lead joints in favor of cement for small mains, except on joints laid in rainy weather, when it still used the cast lead. In 1907 cement joints were used on all sizes of pipe with the exception of the sixteen inch pipe laid under the bed of the canal, the joints of which were made of cast lead. From 1907 until 1913 the Company used cement joints on sixteen lines of pipe for the following distances.

1907.....	2.64 miles
1910.....	2.00 miles
1911.....	1.50 miles
1912.....	1.78 miles
1913.....	3.00 miles

That laid in 1913 is a high pressure line supplying the west side of the city including Charlotte. It can be arranged to supply the east side also by opening or closing valves at the corner of Lake Avenue and Driving Park Avenue, or the pressure can be reduced by means of a regulator installed at said corner, to supply low pressure gas through a twelve inch spiral pipe across Driving Park Avenue Bridge.

In reconstructing joints, all the old cement was removed by the use of a pneumatic hammer in connection with a tool specially constructed for this purpose. First a straight chisel was used to break up the joint. Then a scraper with a chisel edge bent upward was used to clean the bell of the pipe. A second scraper with the edge bent downward was used to clean the spigot end of the pipe, after which the compressed air was turned on to blow out the dust. The joint was remade by first packing oakum very firmly, using a packing tool and

a pneumatic hammer, and leaving but a two inch space for the lead wool, five rings of which were packed into



Special Construction Near Culver Road.

the joint. Each ring was packed separately with a different size of pneumatic tool, and the face of the joint was finished similar to a cast lead joint. Tests have been made on some of these joints when only three rings of lead wool had been packed, and a leak has seldom been found.

In 1908 the Company laid a mile and a half of 8 inch cast iron pipe as a high pressure line on Bartlett Street, from Plymouth Avenue to Genesee Street. This line was laid with cement joints and has been inspected every year, because the greater part of the line is laid between the sidewalk and the curb under many

large trees. From 1908 up to and including 1915, the Department has been able to find only one defective joint.

In December 1908 the Company laid a 12 inch spiral pipe across the Genesee River on the Driving Park Avenue Bridge. The pipe had to be raised above the railing of the Bridge and lowered about 6 ft. to two men who were standing on hanging scaffolds. This job was skillfully handled without an accident of any kind. The joints were made up with flanges and bolts, and this line has given no trouble since its installation. Should an accident occur on this line, a valve 100 ft. from each side of the river may be shut off without depriving a single consumer of gas.

A fan was installed in 1908 on the west side of Favor Street about 100 ft. from West Avenue, to keep up the pressure in the southwestern section of the city. This fan was operated every night from 4:30 to 10:30 for about eight months each year, and on the very dark days of the winter it was operated each morning from 6:00 until 9:00. This absorbed practically all of one workman's time for eight months.

In 1910 the Company laid a low pressure line of 4043 feet of twelve inch cast iron pipe on Arnett Boulevard from Genesee Street to Thurston Road.

In 1912 the Company laid an 8 inch line for a distance of three miles along the Summerville Boulevard. All the joints of this line were made of cement. It is now a low pressure main but may be converted into one of high pressure at any time.

The Company also installed in 1912, a sixteen inch line of cast iron pipe under the bed of the canal at Culver Road. In this installation a combination joint composed of cement and cast lead was used. The pipe was first laid in the trench and the joints packed with yarn. The pipe was surrounded with concrete ex-

cept at the joints. Then the cement joint was put in with a roll of yarn outside, to hold the fresh cement in place, and allowed to set over night. The next day the roll of yarn in front of the cement joint, and all loose portions of cement were removed and the joints filled with cast lead and caulked by hand. Finally a sixteen inch dresser clamp was placed over the face of each joint. Joints of this type have given no trouble so far.

The combination joint can be made by placing either the cement or the lead in the joint first. The Department's experience with the latter variety has been so slight, however, that it does not feel qualified to recommend it although it seems clear that if combination joints were adopted there would be considerable time saved by placing the lead in the joint first. All joints could then be finished directly and the trenches filled in, instead of leaving trenches open all night on account of having placed the cement in the joint first. In the latter case the cement requires about fifteen hours to set before the lead can be put in.

In 1915 the Company installed a 16 inch high pressure line on Clarissa Street, from Exchange Street to Plymouth Avenue, a distance of 700 feet. This line accomplished all that was expected of it, and made it possible to cut the pressure at the Gas Works from 122 in. to 75 in. water pressure, besides eliminating the use of the fan on Favor Street.

The construction of Gas Service connections is described as follows:

In 1904 the Company was laying only 1¼ in. services. A one inch hole would be tapped in the main, and a 1¼ in. x 1 in. street ell screwed into the hole. From this ell the service would be run. It was found that in running services in this way a heavy strain was put on the street ell and on the main itself. Numbers of these services have been broken off at the

street ell and others have been pulled out of the main because as soon as a slight strain came on the service something had to give way owing to the rigidity of the joints.

1½ inch services were first installed in 1905. A 1¼ inch hole was tapped in the main, and a 1½ inch x 1¼ inch x 1½ inch street tee was screwed into the hole. Then a 1½ inch street ell was screwed into the street tee making a swing joint. In this way there was very little strain put on the main. This is the present method, and so far it has not been improved upon for low pressures.



16 inch Gas Main Under Bed of Canal at Widewaters

The average cost of laying services in 1904 was \$0.18 per lineal foot. In 1905 the cost was reduced to \$0.12 per lineal foot. Again in 1915 it was further reduced to \$0.09 per lineal foot or one half that of 1904. This insures the Company a very appreciable saving in view of the fact that about 3500 services are laid annually.

## Motor Driven Pump for Manholes

BY L. C. KIMPAL

IN the Spring of the year and after heavy rains considerable trouble is experienced by the Underground Department because the manholes which have no drains are flooded with water above the cables.

The cable ducts connecting the manholes allow the water to flow from manhole to manhole until a number of manholes have become filled, making it necessary to pump the water out before any work can be done on the cables. In the past a hand pump was used. This was very tedious work, sometimes requiring one or two hours continuous pumping. It was decided to design an electric driven pump and use material in the Company's stock, if possible.

As shown in the accompanying diagram, a  $\frac{1}{4}$  horsepower 1400 r.p.m. vertical motor and a small centrifugal pump were connected by a 3 inch spiral riveted pipe 7 feet long. The pipe acts as a support for the motor, is long enough so that the pump can be lowered into the water without submerging the motor and at the same time conducts the water from the pump to the street level. The shaft of the motor and the impeller of the pump are connected by a  $\frac{5}{8}$ -inch brass rod running through the 3 inch pipe.

The complete apparatus weighs about 170 pounds and is supported by a small crane attached to one of the Company's trucks. The crane is a small pipe with a long radius bend and hook at one end, so that the pump can be swung over the edge of the truck and lowered into the manhole by means of a block and tackle.

The pump requires only a small amount of power, and the motor is operated by the battery which operates the truck.

The utility of the pump is shown by the fact that it will empty a manhole in fifteen minutes, whereas it would take two men almost an hour to do the same work with a hand pump.

The pump is in operation every day, especially during the rainy season, and is in charge of Mr. O. Roth.

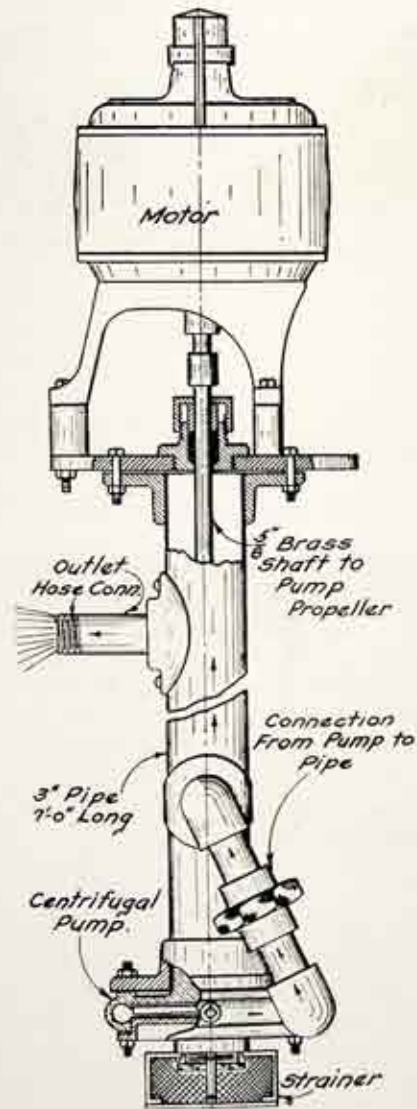


Diagram of Manhole Pump

## Tennis Court Lighting

BY F. C. TAYLOR

AT the present time there are at least four tennis courts in Rochester equipped with lighting systems which provide sufficient light for playing tennis at night. This night play has become so popular that every year players compete for the championship of the "Owl Courts", as they are commonly called.

These "Owl Courts" are especially

appreciated by the business men because for the average business man the tennis court, if unlighted, is available only on Saturdays, Sundays and holidays. By means of a comparatively slight expenditure for lighting equipment, tennis courts may be so lighted that the owner may play whenever he desires.

It is a difficult problem to



Fig. 1.—Day View of Tennis Court at Association Island, N. Y. Side Lighting System



Fig. 2.—Night View of Tennis Court Shown in Figure 1

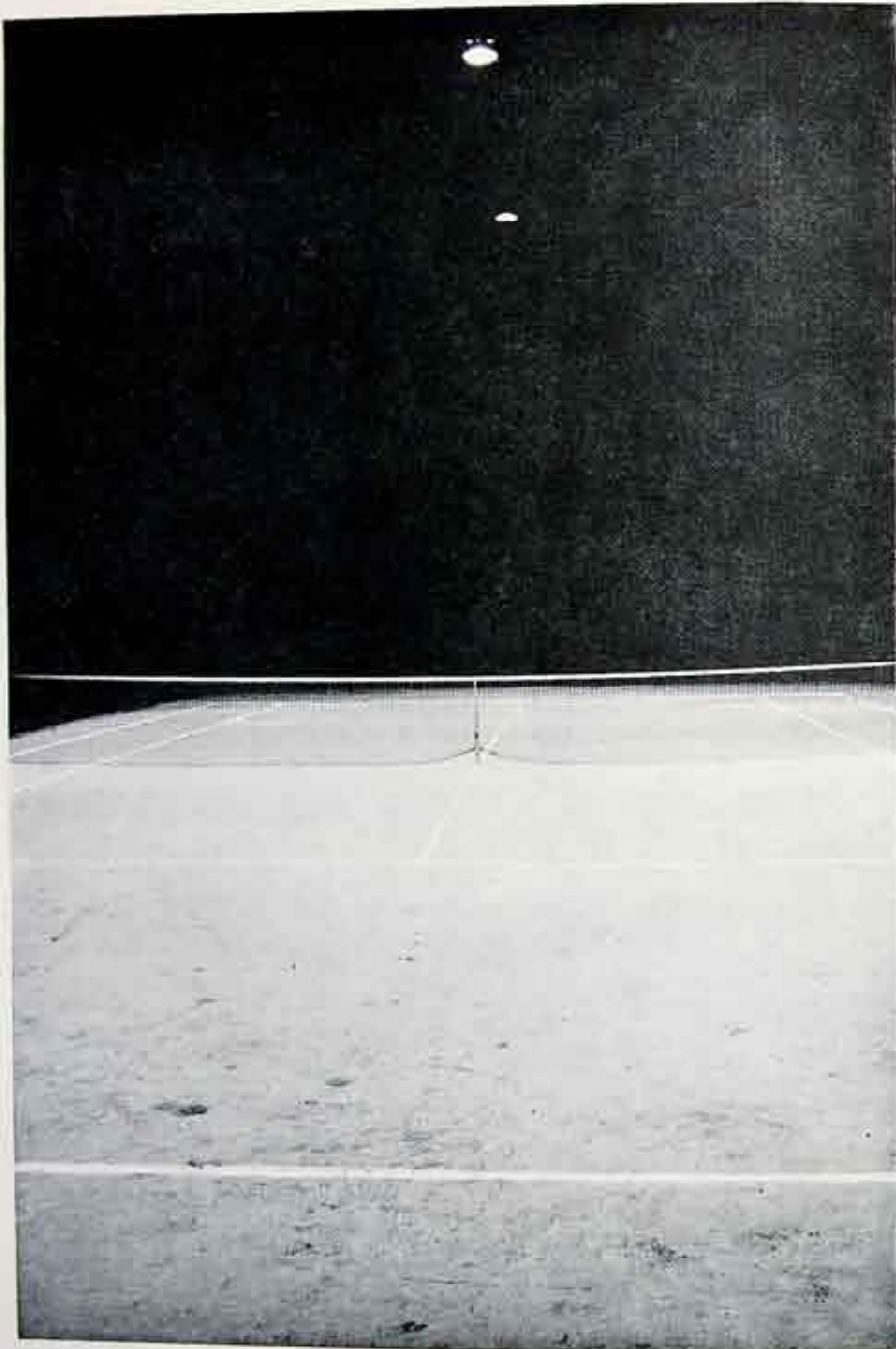


Fig. 3. Night View of Tennis Court of the Mohawk Club, Schenectady, N. Y.  
Overhead System

properly illuminate a tennis court. Some of the requirements which must be met by any system are:

There must be sufficient light so that the players may easily distinguish the ball during its travel.

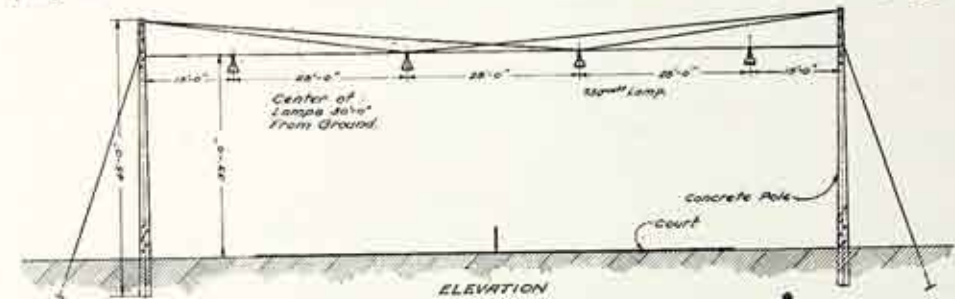
The illumination must be uniform.

There must be no sharp shadows cast by the lights.

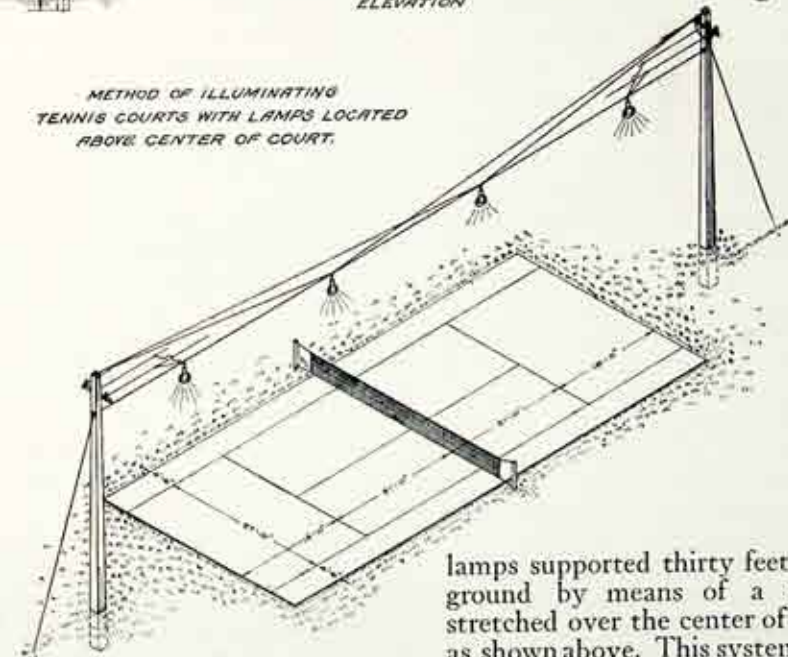
There must be no bright light sources in the range of vision of the players.

tem, is shown in Figures 1 and 2. These photographs show twelve 400-watt, type C lamps, six placed on either side of the court, equipped with angle type reflectors approximately eighteen feet from the ground and seventeen feet apart. This system installed complete will cost between \$175.00 and \$225.00, depending on the method of construction.

The overhead system requires the use of four 750 or 1,000-watt, type C



METHOD OF ILLUMINATING  
TENNIS COURTS WITH LAMPS LOCATED  
ABOVE CENTER OF COURT.



lamps supported thirty feet from the ground by means of a guy wire stretched over the center of the court as shown above. This system installed complete for the average court should not cost more than \$150.00.

There are many variations of these two systems which have proved satisfactory in every way. Decisions as to whether the side or overhead system is better adapted to a certain court depends upon local conditions.

The lighting units must be so placed that they will not interfere with the play of the ball. The poles should be placed where they will not interfere with the players.

Two methods of illumination have been found to give excellent satisfaction. The side lighting sys-

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Gas and Electric News celebrates its third birthday with this issue.

The occasion warrants the statement that the magazine is finding itself, and in so doing is becoming a welcome visitor into the homes of the Company's employees. With grateful acknowledgement of the loyal support which has made the magazine truly representative of the Company's varied interests, it is best to again remind ourselves that continually increasing co-operation is necessary, in order to more nearly approach that standard of perfection which we would all like to have the magazine attain.

Publicity is one of the modern world's most powerful agencies. Use this publication to tell what you are doing. Read it, so that you may know what fellow employees are doing. Be responsive to it and it will help you to attain success. There is no more effective way in which to bring merit forward for observation; no more effective way in which to acquire value making information.

## The Power of Confidence

Confidence is the foundation upon which every successful enterprise is built. It is the key that unlocks the fetters of struggle, and it is the attribute most necessary in every business undertaking or social endeavor.

Confidence, which means credit, has been the most important factor in the development of this country. Men who have possessed this invisible asset have unloosened the purse-strings of capitalists and have built railways across the deserts and over the mountains with their money. They have constructed great irrigation projects and transformed arid regions into beautiful gardens that now blossom as the rose, thus making a million blades of grass grow where one grew before. They have established street railway and lighting systems and created benefits of which our forefathers never dreamed. Not a single enterprise of any magnitude was ever built by men in whom the people did not possess confidence.

Not only is confidence absolutely necessary in business but in every event that contributes to honest pleasure and satisfactory personal relationship with our fellow-beings. Happiness generally radiates the home in which confidence is firmly established; it fills with ecstasy the blissful days of lovers and it eliminates from venerated age the awful fear.

While confidence is an easy attribute to maintain there is nothing so difficult to recover once it is lost. When forfeited, it is like a timid bird that flies from the cage; it never comes back. Friends may overlook your indiscretions but will not extend to you that full degree of confidence you previously enjoyed.

Men and women to whom the golden sun of confidence has long since set have little aim in life. The derelict on the Bowery and the

homeless men in the parks are most miserable examples of forfeited trust. The outcast lying on the grass differs mostly from the well-dressed merchant passing by in his automobile in the degree of confidence which each commands, for not a single human being will trust the derelict with money, while the merchant can borrow thousands from his bank.

Earth, to the great army of men and women who do not possess confidence, is but a long dreary desert over which their miserable caravan is passing and where the wretched pilgrims end their journey far from the refreshing fountain so essential in successful life.

Strive at all times to command confidence. Endeavor to increase the number of people who can trust you implicitly, and the greater the number the better your chances will be to reach the goal you have in view.—*The Road to Recognition, By W. C. Jenkins.*

## Your Best Asset

Some prominent person recently said that "Personality is 80 per cent of a person's value." Presumably a faithful endeavor to do one's work is the other 20 per cent, because, after all, that amounts to but little more than putting in one's time.

On this basis it is easy to explain why some people never get ahead very fast or very far. At first sight there seem to be many positions in the ordinary routine of commercial and industrial life where personality counts for little and mere industry counts for much. But a moment's thought will convince one that even in most of this work there is exceptional opportunity for some few in every organization. What more natural—even inevitable—than that the individuals whose personality marks them as exceptional should be those whom promotion seeks out?

Performance of duty may be about equal, and generally is. But promotion looks not to that alone, but also the innate qualities which make the foundation of individual character, and which more or less distinctly fit the possessor for higher things.

It is written that to them that have shall more be given, and vice versa, and the explanation is the same as that of the saying, "Nothing succeeds like success."

It does not appear that there is any sharp division between qualities as being purely "personal" in the sense of being an exclusive possession. Nearly everyone possesses all the qualities in some degree. It is simply that some, either naturally or by deliberate cultivation, have the higher qualities in a larger measure.

It has been said that in order to get ahead one should strive to be "conspicuously efficient." The present item relates to the "kind" of conspicuousness rather than to the degree of efficiency. A dozen can make perfect scores according to the rules of a contest, but there is a broader basis which counts for more than that particular record when judging the comparative fitness for a succession of higher tests.

To reduce these abstractions to something more definite, it might be said that anything in deportment and in the control of one's reactions to circumstances which evidences the finer, stronger, healthier fiber, is valuable in the "personal" factor, and everything that tends toward the coarser, and weaker is an advertisement of personal limitations, either of endowment or of the will, which cannot be overlooked. And in this respect nothing is trivial, not even the usual tone of voice, the casual conversation that does not relate to business, and a score of similar matters that indicate the inner man.—*Edison Round Table.*



## N. E. L. A. Convention

### Accounting Section

BY E. C. SCOBELL

The accounting problem for Public Utilities has so increased in importance, that in 1915 the Accounting Committee of the National Electric Light Association recommended that the accountants be organized into an "Accounting Section" with the necessary officers and by-laws. The plan met with the approval of the Executive Committee of the N. E. L. A. and the Section was formed.

The work of the Section for the past year has been carried on by committees, and the papers for the Convention were more in the nature of Committee Reports which are much more exhaustive than a paper prepared by an individual could be.

While the entire program was interesting and of value, the "Report Committee on Customers' Records" and a paper on "Correspondence Course in Accounting" are particularly worthy of mention.

The report on Customers' Records tabulated nearly six hundred replies to a list of questions sent out by the Committee. These questions were divided into three main divisions:

- 1st. Meter Reading Information.
- 2nd. Preparation and Handling of the Bill.
- 3rd. Ledger Information.

The replies were further divided according to the size of the companies, that is, companies having less than 1000 meters; from 1000 to 5000; 5000 to 10000, etc. This makes it possible for a company to find the general practice on almost any phase of the work in the Consumers' Ledger Department of companies about their size.

To illustrate, the tabulations of methods of recording meter readings and consumption, and the method of recording extensions, are as follows:

### Method of Recording Meter Readings and Consumption:

	Less than 1000	1000 to 5000	5000 to 10000	10000 to 50000	Over 50000	Total
Machine.....	10	14	6	8	4	42
Longhand.....	173	235	62	47	11	528
Adding Type-writer.....	0	0	0	0	1	1
No answer.....	6	4	0	1	0	11
Total.....	189	253	68	56	16	582

### Method of Recording Extensions:

	Less than 1000	1000 to 5000	5000 to 10000	10000 to 50000	Over 50000	Total
Adding Type-writer.....	.....	.....	.....	.....	1	1
Machine.....	32	11	4	7	4	58
Longhand.....	140	195	41	36	10	422
Rubber stamp	6	37	22	12	1	78
No answer.....	11	8	0	0	0	19
Total.....	189	251	67	55	16	578

This Company comes in the class of those with over 50,000 meters, and we are therefore interested in the column next to the total. If we were classed with the Companies recording and making extensions by the so-called longhand method we would consider we were behind the times and get busy. It does not follow that because the majority are doing a thing that it is the best practice; at least it behooves a Company to investigate what a few of the more advanced companies are doing as the tabulations may indicate.

A copy of this, and all other reports, are on file in Room 1 and are available for those who are interested in reading them.

The paper on a "Correspondence Course in Accounting" is worthy of being printed in full. The course appeals not only to the accountants, but to the operating men who are interested in knowing the costs of their work and realize the value of the accounting end of the business to them.

The course covers the theory of book-keeping, forms, etc., business

English, mathematics of business, care of correspondence, brief history of Public Service Commissions, and the N. E. L. A., scheme of classification of accounts. The student is taught how to read and understand a balance sheet, revenue and expense accounts, etc. The course extends over four years and is as complete as it can be made.

The discussion on this paper showed very clearly that there is a universal desire for knowledge and that attempts to satisfy this desire have been made by the larger companies, and by correspondence courses, which have not proven entirely adequate.

### Technical Section

BY J. O. MONTIGNANI

The 1916 Convention of the National Electric Light Association at Chicago impressed the writer most by the tremendous proportions to which this important gathering has grown, and by the immense amount of executive effort required to make things run smoothly where so many phases of industry are involved.

To record that everything went without a hitch is the best tribute I can pay to those upon whose shoulders rested the responsibility of managing so great an undertaking.

### Underground Line Committee's Report

An interesting feature of the Underground Line Committee's Report was a description of stone conduit which is a conduit made of limestone screenings and Portland cement.

One company reports having installed about ten million feet of such conduit and although several cable burn-outs have occurred on this system, that in no case had the trouble been communicated to adjoining ducts, while experience had shown that with tile duct a bad cable burn-out often resulted in melting the tile walls and spreading the trouble to other cables.

The matter of cable jointing came

in for some discussion and particular emphasis was laid on the time and labor saving features, as well as the high insulating property, claimed by the manufacturers, of the mica cell joint.

For higher voltages, taped joints, the use of a wire gauze sleeve placed over the insulation and soldered to the ends of the lead sheath before the lead sleeve is applied, is recommended by the Committee.

### Overhead Lines Committee Report

The report of the Committee on Overhead Lines and Inductive Interference consisted primarily of a review of the year's developments in connection with public regulation of line construction.

Most particularly was attention called to the National Electrical Safety Code which the Bureau of Standards is preparing to issue and which some State public service commissions have already signified their intention of making mandatory; an example which would probably be generally followed. It was brought out by the Committee, and strongly supported by statistics, gathered from all parts of the country, that the effect of enforcing any such rules for line construction as the Bureau of Standards proposes to issue would be fatal to the smaller rural companies and would materially discourage the larger companies from extending their lines into suburban districts.

### Lightning Protection

An interesting paper was read by Mr. D. W. Roper, of Chicago, on lightning protection for line transformers on 4000-volt circuits, in which he outlined the methods used in his city to reduce transformer damage on all distributing lines.

As the result of investigations extending over a number of years, in which careful records were kept of the damage resulting to line transformers from the effects of lightning, the Chicago company has decided to

equip all its transformers with lightning arrestors, mounted on the same pole.

The cost of carrying out this practice would be prohibitive to smaller companies. It would be prohibitive in Rochester if generally followed, but this Company might profit by the Chicago company's experience and carry out such transformer protection to an extent which seems economically justified.

#### Street Lighting Committee's Report

The report of the Committee on Street Lighting dealt principally with statistics showing notable installations made the past year; class C Mazda lamps being greatly in the majority.

It was interesting to note that prominent mention was made of the 1000 candle power lamps on concrete posts installed on Lake Avenue, this city. The report was accepted after a short discussion on the matter of lamp spacing, in which it was brought out that where foliage or other conditions do not interfere, very efficient and economical lighting can be effected by the use of high candle power lamps hung high above the street and spaced at wide intervals.

In suburban districts as much as 1000 feet apart was considered not excessive when skillfully located.

With the growing extent of incandescent street lighting, considerable interest has been aroused in the use of isolated regulating systems for series circuits. The one system consists of lamp circuits connected directly across distributing lines of standard voltage and having reactances in shunt with the lamps. In the other system the circuit is supplied from a line transformer with a fixed reactance in its secondary wiring, to compensate for lamp burn-outs or breakage. The manufacturers of both these systems were there to laud the merits of their respective methods.

### Power Sales Section

BY H. O. STEWART

One of the interesting features of the recent N. E. L. A. Convention was that of the Power Salesman's banquet. At this dinner there were twelve speakers of prominence, each of whom spoke for a period of about five minutes.

The first speaker told of the different N. E. L. A. conventions which had been held in Chicago. At the time of the first convention the largest electric generators in Chicago were of eighty kilowatts capacity, whereas the largest generator at the present time is of 35,000 kilowatts capacity. This shows that within 25 years the generating capacity of single units has increased 44,000 per cent.

One of the unusual and very pleasant features of this dinner was the friendliness displayed by the speakers who were customers of the Edison Company. Mr. Fred Pearson, Chief Engineer of the Marshall-Field Company, the largest department store in the world, spent sometime enumerating all the electrical equipment in the Marshall-Field store which uses 10,000,000 kilowatt hours per year. The most interesting feature regarding this enormous Company is the fact that they use central station power throughout the store, and also in their fourteen mills throughout the country. Their policy is to put their money into the productive end of the business rather than to tie it up in power plants.

Mr. John C. Parker, formerly head of the Engineering Department of this Company, told what he is trying to do in the Electrical Engineering Course at the University of Michigan in order to make those graduates who expect to specialize in central station work, as valuable as possible to the industry.

A former member of this Company's Engineering Department, Mr.

R. H. Tillman, described the enormous electric furnace load which the Baltimore Company owns and operates. There are two electric furnaces taking 21,000 kilowatts operated entirely as an off peak load to improve the load factor of the Baltimore Company.

The Committee on Local Industries arranged for a series of trips to local industrial plants including the plants of the Snyder Electric Furnace Company, the Electric Steel Co., Lincoln Ice Co. and grain elevators.

The type of illumination in the various first class department stores and hotels is of a very high grade. Semi-indirect lighting is largely used and in most cases the glass ware is tinted to give a yellowish light, the results of which are very pleasing and effective.

### National District Heating Association Convention

BY E. L. WILDER

Among the things of especial interest at the convention of the National District Heating Association held in New York city on May 16-19, was a very optimistic paper by S. Morgan Bushnell, of Chicago, on "Factors in the Growth of District Heating" which brought forth a very lively discussion on steam rates.

It has been clearly demonstrated that it is not possible for a steam heating company to sell steam in competition with coal on the basis of price alone and it has been equally well demonstrated that this is not necessary. When steam is purchased for heating, the system can be operated much more economically than with a boiler plant. With purchased steam the supply can be regulated exactly in accordance with the demand, and at a comparatively small expense automatic regulators can be installed which will hold an even temperature at all times regardless of outside conditions.

The elimination of the care which the heating boiler requires, the smoke and dirt, and the necessity of handling ashes all make heating service from a central station much more valuable than the mere cost of operating a private heating plant.

An interesting paper was presented, describing the method by which Harvard University purchases steam for the heating of its buildings. Steam is delivered through a steam flow meter and almost all of the condensed steam is returned to the heating company. The quality as well as the amount of steam delivered is measured and the quantity and the temperature of the hot water returned is also measured. This enables a calculation to be made of the number of heat units delivered to the University and the charge is made at so much per heat unit.

A new type of condensation meter was shown and it seems to have some advantages over the types in use at present. This meter works on the dump principle but is so arranged that its calibration can be checked at any time by the use of a gage, and if the meter is out of calibration it can be set right without being taken apart.

There is an interesting installation being made by the New York Steam Company. The difficulties which are experienced in Rochester in running steam mains, seem very simple when compared with the trouble which they have in the down-town streets of New York City. One of the most striking features of this construction is the fact that a copper expansion joint is being installed every 25 feet. Our own experience with expansion joints has not been very favorable and we have been endeavoring to avoid this trouble by getting rid of the joints. The New York Company is trying to avoid the same trouble by using more of them.

## Keeping Track of the Company's Steam Customers

BY E. L. WILDER

PEOPLE have been using gas and electricity for a great many years and are educated to the fact that they can do all their cooking and all their lighting at a reasonable cost, provided they exercise care and judgment.

In Rochester the use of steam for heating is comparatively new and consumers do not always realize that it is just as possible to waste steam in heating a building as it is to waste electricity in lighting or to

of temperature and with changes in wind direction and velocity, and for this reason the daily reading of the meter, which is usually sufficient for checking the consumption of gas and electricity, does not give enough information. The Company recommends that its steam consumers read their meters at least once a day and study these readings in connection with the outside temperatures. This will give a very close check on the operation of the heating system.

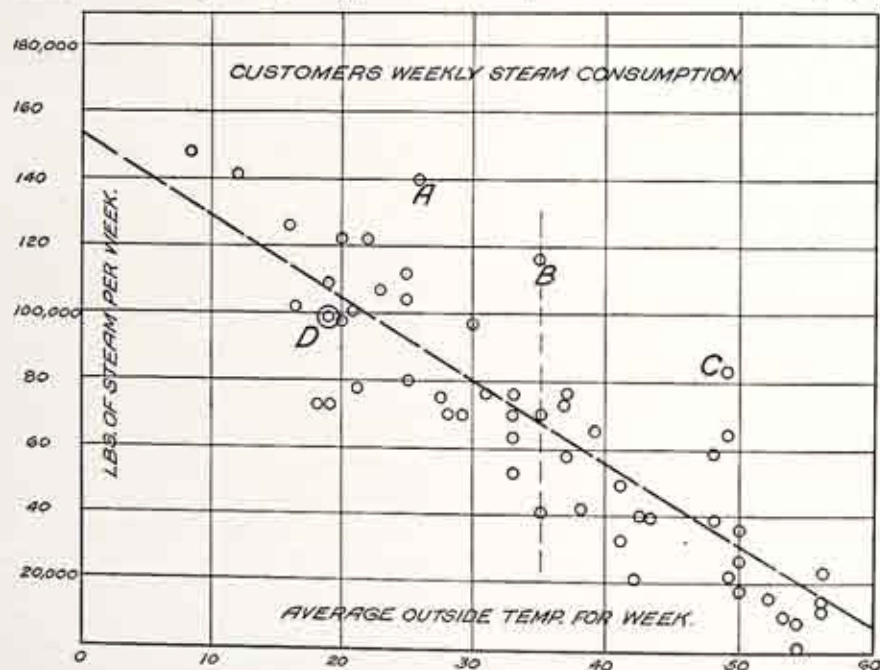


Fig. 1. Typical Chart Kept for Each Steam Customer

waste gas in cooking a meal. Furthermore, it is not as easy to gage the amount being used. If a window is opened so that cold air blows directly upon a steam radiator, its steam consumption will be increased one hundred per cent or more, but there is nothing in the appearance of the radiator to indicate this fact. The heating requirements of a building vary from day to day with changes

The best way of doing this is to plot the readings on cross section paper as will be described below. The company is desirous of assisting consumers to operate their heating systems in an economical manner, and for the purpose of keeping track of their operation the consumption of each consumer is plotted each week against the average outside temperature for that week, as illustrated in

Fig. 1. This figure represents the operation of one consumer over a period of three years. A point is plotted for each week's consumption and its position represents not only the steam used during that week, but also the corresponding average temperature. For example, point A indicates that during a certain week 140,000 pounds of steam was consumed and the average temperature during that week was 26 degrees. In the same way point B indicates that during a certain week 116,000 pounds of steam was used and that the corresponding average temperature was 35 degrees. The amount of steam used for any week should evidently be proportional to the corresponding temperature and an inspection of the figure shows that most of the points plotted fall fairly close to the diagonal line drawn.

Let us study this sheet for a moment. Immediately below the point B are two other points, all three of which represent steam consumptions for weeks having the same average outside temperature, 35 degrees. The lowest point indicates a consumption of a little over 40,000 pounds of steam, the next one a consumption of 70,000 pounds and the highest a consumption of 119,000 pounds. It is not to be expected that there will always be the same steam consumption for the same average outside temperature since one important factor—the wind velocity—is not taken into account, but one can safely say that the point B, as well as the points A and C, represent a wasteful operation.

One of these sheets has been made up for each of the Company's steam customers and the record to date has been plotted. Each week the consumption of the previous week is plotted and the point thus obtained enclosed in a lead pencil circle so as to distinguish it from the other points, as illustrated at point D. The sheets are then inspected and if the points

do not fall reasonably close to the diagonal line, which may be considered the standard performance, the consumers' attention is called to this fact.

As was stated, the Company recommends the taking of daily readings. The study of the week's consumption gives a good idea as to how carefully the heating system has been operated, but does not assist greatly in locating the exact faults in operation when the consumption is found to be too high. It is not possible for anyone to keep in mind for a whole week just what was done every day, especially if there is no record to indicate at just what time the waste occurred. The high consumptions indicated by points A, B and C in Fig. 1 may have been caused by faulty operation during only two or three days in their respective weeks.

It is sometimes advisable to take readings as often as two or three times a day for a time in order to study the effects of different possible methods of operation. In factories it often happens that during the hours when no work is being done, two or three times more steam is used than is necessary. Readings taken night and morning will reveal such a condition. Factories which have a large glass exposure towards the west can sometimes dispense almost entirely with artificial heat for two or three hours in the afternoon.

The plotting of the steam consumption does not give an absolute measure of the efficiency of operation since comparison is made with the previous performance rather than with the ideal. This ideal operation can be calculated quite accurately for any given inside temperature and when plotted, the ideal performance will take the form of a straight line similar to the one in Fig. 1. In this way a comparison may be made not only with previous performances but with the ideal performance as well.

### Preparedness Parade

Nine hundred Railway and Light Company officials and employees marched in the Preparedness Demonstration on Saturday, June 10th. A band of sixteen pieces preceded Vice-President G. A. Hollister, Vice-President R. M. Searle, General Manager J. T. Hutchings, Assistant General Manager Herman Russell, Assistant Treasurer C. A. Tucker and W. S. Wallace who were in the first line of the Company's section. The ladies, dressed in white followed carrying a large American flag, and won much applause as they headed over eight hundred men all wearing white hats and red arm bands with the initials R. R. & L. Co. Three electric delivery autos, equally spaced in the section, were equipped as ambulances with first aid facilities to be used in case of an emergency. Dr. Baldwin was in the first ambulance as director of the ambulance corps.

### Women's Club Party

The regular monthly meeting of the Women's Club of the Rochester Railway & Light Company, scheduled for Thursday, June first, took the form of an outdoor picnic given at Durand-Eastman Park. Sixty of the members of the Club left the offices of the Company at 5:30 o'clock in electric trucks which had been donated by the management. Mrs. Gay, Miss Moore and Miss Pratt of the Demonstration Department, preceded the picnickers by an hour's time and supper was ready to be served when the sixty hungry girls arrived at 6:30. The "Piece de resistance" was hot-dogs and many of them. Of course, there were other things to eat but the feast will always be referred to as the "hot-dog party."

After supper the girls had a good time playing baseball and singing songs. After viewing a beautiful

sunset on the Lake, they left the park at 8:00 o'clock for home. The affair was one of the most successful the Club has held since its organization, and will probably be repeated during the summer months.

### Service Maintenance Department

The men in the Service Maintenance Department are very popular in the districts where they are working. The customers realize the service they are rendering, and in many cases are very anxious to have the "man with the cap" come to their home before he is scheduled to arrive there. The following incident cited by Mr. Chas. O'Laughlin of the Service Maintenance Department is but one of many similar ones:

"I called at a house on Blank Street and presented my credentials, at the same time explaining fully why I called. Admittance was refused, and the lady of the house informed me that all gas fixtures were in perfect condition.

The daughter came home later and spoke of the very satisfactory work done by the Service Men for many of her friends, and was surprised that the mother refused admittance to the "service maintenance man". I was called in later and after investigating, found that a bracket was loose in one bedroom, while in another bedroom the drop light was loose, both being in a very unsafe condition. Most of the keys on the fixtures were loose, and some were so tight that they could not be turned. These conditions were all pointed out and corrected and when I left the customer expressed the greatest appreciation for the work that was done."

The ones who think our jokes are poor, would straightway change their views,

Could they compare the jokes we print, with those that we refuse.

## Gas and Electricity in the Home

BY THE GAS DEMONSTRATORS

Mrs. Gabrielle Gay, Miss Frances E. Moore, and Miss Mona A. Pratt

### Picnic Lunch

What a world of pleasant thoughts the word picnic brings to our minds!—especially at this season of the year when visions of many good times loom up before us. It may mean a day on the water, an auto trip, or an afternoon or a few hours at the park. But who ever saw a good picnic without a lunch basket?

The following suggestions will consider only the cold luncheon which must be carried in a box or basket and not the meal which may be cooked on the shore or along the roadside.

In planning a lunch three things are important; the selection of food, its preparation, and the packing of the luncheon. It should contain a substantial food in the form of sandwiches, salads, etc., a succulent food as fruits and jellies, and a dessert or dainty such as cakes, cookies, raisins, dates, figs, etc.

Sandwiches are important so let us consider a few rules for their preparation:

Cut the bread in thin slices—they are more appetizing and easier to handle.

Butter both slices because the butter keeps the bread moist and prevents the filling from soaking into the bread.

Creaming the butter makes it easy to spread and does not pull the slices apart. Remember that ragged crumbly soaked sandwiches are not very tempting.

With a little thought and skill any number of delicious fillings may be made from little left overs. For instance, dried ends of meat ground and mixed with salad dressing or cream are delicious.

Remember that a picnic lunch is

deserving of as much care in preparation as any other meal.

The most nutritious and best prepared lunch is spoiled if it is not carefully packed. Unattractively packed food is not eaten with the same relish it would be if it were packed properly. All food should be wrapped separately in oiled paper and packed so that it will not shake about.

### Tempting Picnic Cookies

SNICKERDOODLES

- 1/2 cup sugar
- 1 egg
- 1/2 cup cold water
- 1/4 teaspoon cloves
- 1/2 lb. dates
- 1/2 cup butter
- 1/2 teaspoon soda
- 1 1/2 cups flour
- 1/2 teaspoon cinnamon
- 1/8 lb. nuts.

Cream the butter, add sugar, and egg. Sift the flour, soda and spices, add these and water to mixture. Lastly add the fruit and nuts which have been covered with a little flour. Drop from spoon onto greased pan and bake in a hot oven.

CHOCOLATE JUMBLES

- 1/2 cup butter
- 1 cup sugar
- 2 squares chocolate grated or 2 oz. of cocoa
- 1 teaspoon vanilla
- 2 eggs
- 2 teaspoons baking powder
- 2 cups flour and enough more flour to roll out
- 1 tablespoon milk.

Mix in order given, place on a floured board and roll to an inch in thickness, cut with a doughnut or cookie cutter. Just before putting

into the oven, dust over with granulated sugar and bake ten minutes.



### Some Sandwiches that Are Different

#### PEANUT BUTTER AND PIMENTO SANDWICH

Mix equal quantities of olives and pimentos, chop fine and mix with peanut butter. Spread on thin slices of bread.

#### PEANUT BUTTER AND WATERCRESS SANDWICH

Cut the watercress into small pieces and mix with peanut butter. Spread between thin slices of bread and sprinkle with lemon juice.

#### BEAN SANDWICHES

Make a paste of the beans by adding, salad dressing, cream or chili sauce. To this may be added chow-chow or chopped pickle. This makes a very nutritious sandwich filling.

#### FRUIT SANDWICH

Remove stems and finely chop figs; add a small quantity of water, cook until a paste is formed then add a few drops of lemon juice. Chopped peanuts may be added.

#### CLUB SANDWICHES

Arrange on slices of bread (toasted or untoasted) thin slices of cooked bacon, cover with slices of roast chicken and cover chicken with salad dressing. Place a slice of bread on top.

#### TOMATO SANDWICH FILLING

One quart can of tomatoes boiled down to one cup,  $\frac{1}{2}$  lb. American cheese and  $\frac{1}{2}$  lb. dried beef ground together. Mix, add salt and pepper, boil to desired thickness for spreading.

#### DEVILED HAM SANDWICH

To a can of deviled ham add chopped olives or pickles and enough salad dressing to make moist. Place between thin slices of buttered bread.

If you have never tried an oil pickle sandwich, do, it will be a pleasant surprise.

#### PICNIC SANDWICHES

- $\frac{1}{2}$  lb. cooked ham
- 2 or 3 hard cooked eggs
- 6 small sweet pickles
- $\frac{1}{2}$  cup salad dressing.

Put first three ingredients through food chopper. Mix with dressing and spread between thinly cut and buttered slices of white bread.

#### Sandwiches and Fillings

Cold flaked fish with lettuce and salad dressing; graham or white bread.

Celery and cream cheese sandwiches seasoned with onion juice.

Minced ham, celery and cream cheese with salad dressing.

Salmon and chopped celery with salad dressing and white bread.

Cottage cheese and chopped pickled beets with buttered white bread.

Crisp slices of cold bacon between slices of white bread spread thinly with cottage cheese.

Tuna fish, celery and salad dressing with graham or white bread.

Deviled ham with chopped English walnuts—brown bread.

Deviled ham, thin slices tomatoes, lettuce leaves, white bread.

Deviled ham and chopped hard boiled egg—equal quantities—leaf of lettuce, white bread.

Cream cheese, chopped pecans, sweet cream, brown bread.

A good dressing for salads or sandwich filling:

- $\frac{1}{2}$  teaspoon salt
- 1 teaspoon mustard
- $1\frac{1}{2}$  tablespoon sugar
- Few grains cayenne
- $\frac{1}{2}$  tablespoon flour
- Yolks 2 eggs
- $1\frac{1}{2}$  tablespoons melted butter
- $\frac{3}{4}$  cup milk
- $\frac{1}{2}$  cup vinegar.

Mix dry ingredients, add yolks of eggs slightly beaten, butter, milk and vinegar very slowly. Cook over boiling water until mixture thickens. Strain and cool.



## Sales



### Pumping Plant at Barge Canal

In order to finish the section of the Barge Canal between the Genesee River and Lincoln Park it was first necessary to drain that part of the canal already completed. The excavation is about two miles long, 100 feet wide at the normal water level, and contained over 160,000,000 gallons of water.

A motor driven centrifugal pump-plant was installed to remove this water and also to keep the canal dry

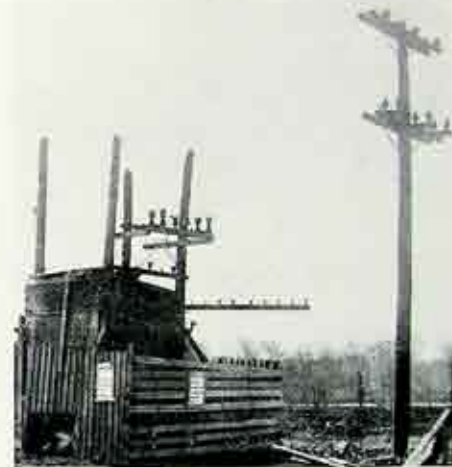


Fig. 2. Temporary transformer installation—Barge Canal

during the time the work was being carried on. A shelf was first cut in the bank at the water level, and sheet piling was then driven around the outer edge to keep the soft bank from sliding into the cut.

The work required three ten inch and one eight inch centrifugal pumps each belted to an induction motor. The total capacity of the pumps is 13,000 gallons of water per minute, and it requires 195 motor horsepower to operate them.

Illustration No. 1 is a view of the canal practically dry after the pumping plant had been in operation one week. The flume carries the water from the pumps to the old canal which runs along the Pennsylvania Railroad tracks.

The transformer equipment consists of a 150 kilowatt three phase transformer in the pump shed and three 15 kilowatt transformers in the outdoor enclosure as shown in illustration No. 2.



Fig. 1. Four electrically-driven 10-inch pumps discharging into flume.

### Illumination of Regina Millinery Store

The accompanying pictures show an interior and exterior view of the International Millinery Company's new store at 247 East Main Street.

In some respects the interior lighting is rather novel, but at the same time interesting both from an eco-

nomical and an illumination standpoint. The room by this arrangement, has been relieved by three semi-indirect fixtures equally spaced along the center of the ceiling.

It will be noted that the windows on all three floors are used as enclosed show windows. These windows are illuminated by type C nitrogen filled lamps.



Semi-indirect illumination in millinery store.

nomical and an illumination standpoint.

The side wall show cases and store proper are illuminated by the semi-indirect method. Concealed sixty watt lamps are installed directly over the side wall cases. The tops of these show cases have ground glass tops which enable the lamps to effectively light the goods in the case, and at the same time illuminate that part of the store directly in front of the cases. The shadow which would be thrown along the centre of the

room by this arrangement, has been relieved by three semi-indirect fixtures equally spaced along the center of the ceiling.

The Haloid Company is one of the latest manufacturers to be connected to this Company's lines. The Haloid Company manufactures a high grade photographic paper for professional use. The paper itself is imported from Germany and comes in large rolls a foot in diameter and four feet long. The paper is coated, dried, cut and packed at this plant.

A motor generator set is used to

furnish direct current to operate the adjustable speed fans and coating machines. The remainder of the motors including those in the refrigerating plant (which is used to keep the emulsion cool in hot weather) are operated on alternating power.



Mr. William A. Ehlers, Industrial Fuel Specialist of the National Com-

mercial Gas Association, was in Rochester from May 10th to the 17th in conference with the members of the Industrial Gas Department, in regard to the industrial fuel situation in Rochester. Mr. Ehlers' work takes him to many different cities of the East and in this way he is able to gather and dispense a wealth of information. Mr. Ehlers' services are at the disposal of all member companies of the National Commercial Gas Association.



At the Academy of the Sacred Heart on Prince Street, two sections of "Garland" hotel ranges and one "Garland" hotel broiler are being installed to supplement their present coal cooking equipment. The gas equipment was installed to decrease labor expense and to make the kitchen work more agreeable, especially during the summer months.



Meyerhoff Brothers will install a two-ton refrigerating machine in their new up-to-date market at the corner of Lake Avenue and Ridge Road. Refrigerated counters will enable Mr. Meyerhoff to give his customers added service.



The Kelso Laundry has shut down its gasoline gas plant which was used for generating gas for general laundry use and is now using gas purchased from this Company.



The American Express Company has installed a gas fired Tire Heater in its blacksmith shop, to heat steel tires which have to be set or removed.



The Rochester Club has installed a large Rex Ray surface combustion broiler, the first to be installed in Rochester.



The Monroe County Jail has purchased a Garland Hotel range and broiler to replace its coal ranges.



Night view of Regina Millinery Store.



Electrically Driven Pumps Used to Pump Out Main Street Cave-in.

## Electric Generation

In view of the trouble recently experienced, due to lightning disturbances on the Niagara system and on this Company's local overhead system, it has been deemed advisable to entirely separate the Niagara power from the local hydraulic and steam generation. This new method of operation should result in a very material improvement in service for customers who are supplied from this Company's power plants. While it will not be possible to carry the same Niagara load factor, due to the absence of the regulating effect of the local generation, it appears to be justified under the circumstances.

As the system was formerly operated, the Niagara and local generation were tied together at Station 3 through reactance coils which were designed to confine all Niagara disturbances to a limited part of the

system. The lightning storms this year, however, have been of such unusual severity, comprising direct as well as inductive strokes, that the reactance coils have been unable to prevent surges, etc., from affecting the apparatus on the other side of the Niagara section, and it is for this reason that the systems have been separated.

The work of repairing the No. 2, 7500 KW 25 cycle turbine was completed on Saturday, May 30th. This work was started Tuesday, April 11th.

On taking the machine down, it was found that the first-stage wheel was loose on the shaft. This wheel was taken off, sent back to Schenectady by express and bushed, returned by express and forced onto the shaft.

The shaft was worn and the G. E. Co., sent a draw filing expert from

Schenectady to draw file the shaft so as to bring it back to a round, uniform diameter. With modern manufacturing methods where almost everything is done by machinery, it is a rare thing to find a mechanic expert enough to do this kind of work with nothing but a file and an oil stone. The fact that this shaft had to be finished so that the variation did not exceed 1/1000 of an inch, gives an indication of the accuracy required.

Some of the intermediate blading was replaced and after other minor repairs were made the machine was put in operation May 20th. Since that time it has been operating as it should.

A 300 KW alternating current, 60 cycle water wheel generator with water wheel and penstock connections, has been removed from Station 5 to provide space for the installation of a 1500 KW railway rotary converter. At present, this station has a railway capacity of 1300 KW, comprising a 500 and a 300 water wheel set, and a 500 KW motor generator set. The two water wheel sets are located in the east end of the station which will have to be unwatered in order that the new construction work can be carried on. Work is now under progress to divert the tail water of these two sets to the west tail-race in order that a reserve capacity of 1300 KW railway generation may be available in case of trouble on the 1500 KW rotary.

In the construction work at Station 3 for the 10,000 KW, 60 cycle turbine which is to be installed this fall, a new departure was made in the method used in excavating the rock from the main pit in which the turbine foundation will stand. In previous work of this nature the Company used rock drills entirely, but in this case a rock channeler was rented from the Shongo Construction Company.


This channeler consists of a vertical cylinder with a piston operating in a vertical plane and carrying rock chisels on the end. The whole apparatus is moved back and forth on a track while it cuts a vertical channel very much more rapidly than can be done with rock drills, and at the same time the surface of the pit walls is left in a perfectly smooth condition.

The machine was operated by means of compressed air. The channeling proved very satisfactory and not only resulted in an economy, but enabled the men to use smaller dynamite charges in shooting out the rock than would otherwise have been the case.


All drilling for the pit was done by the small "Jackhammer" drill shown in the accompanying picture. The holes were drilled at the rate of about 1 foot a minute. Considering the conditions under which the work had to be done, a month was a short time to excavate a pit approximately 40 feet by 30 feet by 18 feet deep.



Small Drill Used in Excavation of Pit for New 10,000 KW Steam Turbine.



## Auditing



### Monthly Report on New Business

#### Net Increase in Consumers in First Four Months of 1916

	Dec. 31, 1915	Apr. 30, 1916	Increase
Gas.....	69,090	69,880	790
Electric.....	19,664	20,314	650
Steam.....	41	43	2
	88,795	90,237	1,442

#### Net Increase in Consumers in Twelve Months Ending April 30, 1916

	Apr. 30, 1915	Apr. 30, 1916	Increase in year
Gas.....	68,061	69,880	1,819
Electric.....	17,603	20,314	2,711
Steam.....	37	43	6
	85,701	90,237	4,536

#### Statement of Consumers by Departments as of April 30th

Apr. 30th	Gas	Elec.	Steam	Total	Increase Each Yr.
1908	37,143	5,399	.....	42,542	.....
1909	41,398	5,777	.....	47,175	4,633
1910	46,337	6,745	.....	53,082	5,907
1911	51,500	8,087	17	59,604	6,522
1912	55,951	9,736	20	65,707	6,103
1913	60,714	12,399	23	73,136	7,429
1914	65,173	14,559	30	79,762	6,626
1915	68,061	17,603	37	85,701	5,939
1916	69,880	20,314	43	90,237	4,536
Inc. in 8 Yrs.	32,737	14,915	43	47,695	

#### Increase in Consumers by Months

	1914	1915	1916
Increase in January.....	228	364	252
Increase in February.....	231	144	219
Increase in March.....	281	247	317
Increase in April.....	469	460	654
	1,209	1,215	1,442

#### Company' Savings Depositors

##### STATEMENT TO JUNE 1ST, 1916

No. of depositors May 1, 1916.....	70
Increase during May, 1916.....	5
Amount deposited June 1, 1916.....	702.00
Increase during May, 1916.....	154.50

#### Miscellaneous Data

	Apr. 30, 1915	Apr. 30, 1916	Increase
Miles of Gas Main.....	423	435	12
Miles of Underground Cable.....	981	1,040	59
Miles of Overhead Line..	1,660	1,770	110
Miles of Subway Duct..	857	912	55
No. Street Arc Lamps.....	4,310	4,147 (Dec.)	163
No. Street Incandescent Lamps.....	3,634	4,530	896
Total No. Street Lamps	7,944	8,677	733
No. of Employees.....	1,042	1,157	115
Amt. of Payroll (Mo.)..	\$77,893.90	\$87,930.11	\$10,036.21

### Employees Benevolent Association

#### Statement to April 30, 1916

Receipts	
Cash balance on hand 1st of month.....	\$2,155.70
Dues—Members.....	\$470.29
Fees—Members.....	25.00
Assessment No. 2	
Members.....	.75
Sale of Buttons.....	.50
Group Life Insurance.....	13.60
Members Additional Life Insurance.....	14.72
	524.86
	\$2,680.56
Disbursements	
Sick Benefits.....	\$221.69
Accidents on Duty Benefits.....	42.71
Group Life Insurance.....	62.69
Medical Examiner's Expense.....	51.00
Members Additional Life Insurance.....	53.16
	431.25
Cash balance on hand April 30th, 1916.....	\$2,249.31

#### Membership

March 31st, 1916.....	705
Affiliated During April.....	13
Unaffiliated during April.....	6
No. of Members ending April 30th, 1916.....	712
June 1st, 1915—No. of members.....	602
Increase in eleven months.....	110

#### Statement to May 31, 1916

Receipts	
Cash Balance on hand 1st of month.....	\$2,249.31
Dues members.....	\$473.77
Dues Company.....	944.06
Fees members.....	27.00
Fees Company.....	52.00
Assessment No. 2.....	.75
Sale of buttons.....	2.00
Int. on Bank Bal. ....	41.30
Group Life Ins.....	8.33
Members additional Life Insurance.....	3.45
	1,552.66
	\$3,801.97
Disbursements	
Sick Benefits.....	\$188.51
Accidents off Duty Benefits	26.50
Accidents on Duty Benefits	35.28
Group Life Insurance.....	46.64
Medical Examiner's Expense.....	27.00
Members Additional Life Insurance.....	21.72
	345.65
Cash balance on hand May 31st, 1916.....	\$3,456.32

#### Membership

April 30, 1916.....	712
Affiliated during May.....	33
Unaffiliated during May.....	8
No. of members ending May 31, 1916.....	737
June 1st, 1915, No. of members.....	602
Increase in twelve months.....	135

### The Perfect Light


Light without heat is the end of all experiment in artificial illumination. The best incandescent lamps convert only a minute fraction of the energy in coal into light. The rest is all wasted. Nature does far better than that. A firefly converts nearly all of its luminous energy into light, for which reason it can be held in the hand without scorching the skin.

The study of nature's ideal cold light was begun some years ago by the late Professor Samuel P. Langley, at the Smithsonian Institution in Washington. It has recently been taken up anew by Doctors Ives and Coblentz as a part of an elaborate study for the object of improving artificial illuminants. As a result of their work, carried on with more modern and, therefore, more improved apparatus, they have shown that the best electric light in existence is a poor thing indeed. By burning coal under a boiler, heating water to make steam, using the steam to drive a dynamo, leading the current generated by the dynamo to the most economical electric light which engineers can produce, we painfully obtain a glow which is only about four per cent. as good as the firefly's luminosity. Our worst electric light, which is the ordinary incandescent carbon filament lamp, has only about 0.43 per cent. of the firefly's efficiency.


The light of the firefly, if it could be artificially imitated, would not be generally acceptable because of its green hue. It would be too much like the radiation of those luminous mercury tubes under which the skin appears a cadaverous green, and the veins rivulets of purple blood. Disagreeable as it is, this peculiar greenish hue happens to be the most intense light attainable with a few colors or a single color. Doctors Ives and Coblentz, therefore, conclude that the firefly has carried luminous efficiency too far to be acceptable for human purposes. It has produced the cheapest form of light known, so far as amount of light for expenditure of energy is concerned, but it has produced it at the expense of color.—*Saturday Evening Post.*

Yesterday is an outlawed account. Tomorrow is a risky promissory note. Today is real money—invest it!





## Electric Distribution



The two men carrying the tile duct in the accompanying picture are using a new S shaped device which was made for the purpose. The edges of the heavy tile duct sections are sharp and covered with small

cycles, which supplies energy for the Rochester Button Co., was struck by lightning. Taking into consideration the large number of overhead conductors that are exposed to electrical storms and the fact that lightning always seeks the path of least resistance, it seemed very strange to the Distribution Department that this particular circuit should be subjected to a lightning stroke. About 95% of the circuit is underground, and it rises within two hundred feet of the German-American Button Company's plant, to supply energy to a bank of transformers. In a manhole at N. Union Street and East Avenue, the lead cable forms a sharp bend, and at this point the lightning surge found an outlet through cable to the ground.

Mr. Montignani played a trick on the Company's type Q street lighting system. The type Q system has 600 and 1000 candle power lamps mounted in an 18 inch globe setting on a concrete standard. The top of the globe is equipped with a copper ventilator, and it occurred to Mr. Montignani that the ventilator was the exact reproduction of a cuspidor, and that ten cents could do the work of \$1.25. As a result the new lamps will be equipped with the latter device which the Distribution Engineer has named a "cuspidator."

The load increase on the 11,000 volt 25 cycle circuit No. 425, emanating from Station No. 33, has made it necessary for the Underground Department to install cable of a greater capacity from Station No. 33 to Genesee Street, where the circuit


rises and continues overhead to the Charlotte Sub-station. This cable was originally three conductor 41-742 C. M. and has been replaced by three conductor 133,079 C. M.

During the large fire in Canandai-

gua last month, the water pressure dropped considerably in a short time. The electric driven pumps were immediately started, and the water pressure at the fire increased about thirty pounds, thereby enabling the firemen to save many valuable buildings.



## Gas Distribution



During the month of April 1916—577' of 4" and 2370' of 6" gas main were laid in Rochester and 144' of 4" main in Greece. These figures bring up the totals of the Company's distribution pipe lines as follows:

Rochester.....	1,902,844'	of 1½" to 30" Main
Irondequoit.....	95,848'	of 1½" to 8" Main
Gates.....	63,558'	of 2" to 16" Main
Chili.....	2,457'	of 6" to 8" Main
Greece.....	109,683'	of 1½" to 12" Main
Brighton.....	81,400'	of 2" to 8" Main
Pittsford.....	2,848'	of 6" to 8" Main
Charlotte.....	38,020'	of 2" to 12" Main

Grand Total..... 2,296,658'  
or 434.9 miles of Gas Main throughout the present distribution system.

On May 1st, Main Foreman Walter VanEpps and service foreman Patrick Byrne with a gang of thirty men, including two pipe welders and one operator of the new Austin trenching machine, broke the first ground for installation of gas mains at East

Rochester. The work has progressed rapidly notwithstanding the unfavorable weather conditions. Up to May 22nd, 2000' of 2" steel pipe and 3000' of 4" steel pipe had been laid together with twenty ¾" services averaging 50' in length.

The Company has equipped many of its motorcycles with a third wheel and box so that the work of the repair men can be facilitated. Mr. Hod-dick's department repairs over sixty gas meters a day in various parts of the city, and the new wheels enable the men to carry a gas meter together with necessary fittings. If the trouble on the meter is serious, it can be taken out and replaced by the new meter immediately.

Repair parts for gas stoves are also carried on the motorcycles, thereby saving time and giving the Company's customers added service.



## Gas Manufacture



Improvements have been made on the new tar still at the Gas Works in order to increase its productive efficiency. A compressed air line was connected to the still so that it can

be emptied by air pressure instead of by pump, thus saving at least an hour and a half per day. The still has also been fitted with an old tar pump for loading, to relieve the

New Method of Carrying Tile Duct

burrs which are apt to cut the men's hands. Formerly the ducts were carried by means of pick handles or a piece of wood inserted in each end of the tile.

During one of the recent severe electric storms that passed over the City, circuit No. 331, 4100 volt, 60

burden of the other oil tar pumps. The total time saved by the two improvements is about two and one-half hours per day, which in terms of light oil recovered means an increased daily production of 25 gallons of oil.

An opportunity was afforded to determine the economy of the gravity water system at the Gas Works on May 20, when the system was idle due to repair work on the line at Station 3. Holly water was used to replace the gravity system and the meters registered a consumption of over 1600 cu. ft. per hour, which at 75 cents per thousand would cost about \$50 per day. Considering the cost of pump-

ing on the gravity system, the saving is about \$40 per day.

The first carload of light oil to be shipped under the new contract, left the Gas Works on May 26. The tank contained 10,670 gallons and on an analysis basis, the revenue from this shipment should be approximately \$900.

Mr. A. M. Beebe went to Newark recently and remedied trouble which developed in a new gas plant. The plant was operated for a week after it was installed, but was shut down a year before it was started again last month.

## Engineering and Construction

### Station 5

Preliminary construction work is still in progress at Station 5. The old boiler house of the original Brush plant has been razed in order to make room for the new power house.

One of the interesting features of the work at present is the removal of loose earth and stone from the cliff back of the old boiler house. The loose rock which is apt to fall on the workmen below is scaled off by means of a stream of water issuing from a fire hose under 60 pounds pressure. This is a much faster and cheaper method than to bar or pick out the loose pieces by hand.

There will be a large amount of lumber required for concrete forms, and a woodworking shop has been built to facilitate the carpenter work.

The high water in the river has somewhat delayed the construction of the coffer dam at Station 15, but the work will be under way in June.

A crusher has been installed to

crush rock excavated from the tunnel for reinforced concrete work.

### Station B

Steady progress has been made in the preliminary stages of construction work during the past month. The excavation for the Retort House was completed, and forms were laid so that the concrete foundation work was started on May 18.

A 20 ton Locomotive Crane carrying a 60 ft. boom and a 2 yard bucket, recently purchased from the Link Belt Company has been delivered. It was sidetracked at Brinker Station in order to remove the stack which was too high to pass the St. Paul Street subway. From State street the crane was moved to the flats under its own power.

The crane will be used for utility work during construction, but after the new plant is completed it will become a permanent part of the coal and coke conveying apparatus.

## Athletics



Hear Ye! Hear Ye! At a meeting held May 16, at the Richford Hotel to form The Rochester City Baseball League, the committee selected the Rochester Railway and Light Team as one of the teams that will comprise the league. The league is composed of six of the fastest semi-professional teams in the City as follows: Eagles, Independents, Kodak Park, Maltops, Premiers and Railway and Light. The schedule begins June 11th and each team will play fifteen games during the summer. There will be a game every Sunday on each of the following diamonds: Maple Street Diamond, Kodak Park Athletic Field, and Searle Park the recreation grounds of the Rochester Railway and Light Company.

Over forty candidates have been out to try for the Company team. The boys have been practicing regularly, and they are gradually polishing off the rough spots. Four practice games were played prior to the opening of the league on the 11th. On May 28th, they played the Nationals, and after a fourteen inning pitchers battle they lost by a score of 2 to 1. Connell pitched a great game.

On June 3rd, a practice game was played with the Kodak Park Team at Searle Park. The Park was almost inundated, but the contest was played in order not to disappoint a large crowd of boosters. The Kodak Park boys were better swimmers and won by a score of 10 to 3, getting all their runs in the first and last inning.

A schedule of the league games will be posted on the Bulletin Boards. Don't fail to get out and boost the team.

## Personals

If you change your address don't fail to report the change to those in charge of your department. It is also wise to sign a change of address card at the Post Office.

Mr. A. M. Beebe motored to Ithaca on May 27th for the Cornell Spring Day festivities.

Miss Madeline P. Brown, sister of Miss Marie Brown of the Order Group, died on Friday, May 12th.

Mr. Morris F. King, brother of Miss Mary E. King of the Meter Reading Group, died May 16th.

Mr. George Goddard has recovered from a painful operation performed on his throat.

Mr. George Lauer and Mr. Howard J. Keil have been added to the Meter Reading Group.

Mr. R. VanRiper of the Addressograph Department has returned from his vacation.

Mr. Switzer reports that the new debit posters are in operation and working perfectly.

Mr. H. C. Nichols of the Domestic Sales Department will fill the position vacated by Mr. H. M. Elwood.

Mr. Roscoe J. Pfromm of the Electric Meter Department has resigned.

Mr. Edward Carroll of the Gas Works recovered the use of his right arm, and reported for work on May 19.

Mr. Houlahan reports that during the month of April, there were 2909 meter applications received at the office.

Mr. James Ward of the Addressograph Department has returned from a week's vacation at Oswego, Palmyra and other small towns in the East.

The editors notice the names of many new employees in these columns and are glad to welcome the new men into the Company's organization.

Miss Frances Katsky has returned to work after an absence of a week. Miss Katsky was painfully injured in an auto accident on May 18th.

Mr. Faulstick, of the Purchasing Department, reports that the sale of scrap material for the month of April amounted to \$7,369.26.

Mr. Richard Tanner of the Line Department, was presented with a twelve-pound boy. Congratulations to Mr. and Mrs. Tanner.

Mr. Warren C. Feldmeyer, formerly with the Shongo Construction Company, is now timekeeper on the Station 5 improvement work.

Mr. Harold P. Gridley has been employed in the Drafting Department to take charge of blue printing work.

Mr. Max Werner of the Cashier's Group, has resigned on account of ill health and Mr. E. E. Tucker has been employed to take his place.

Mr. John T. Heckel who was formerly Draftsman on Subway work is now Instructor of Mechanical Drawing at No. 26 Vocational School.

Mr. E. V. Norton formerly with the Eastman Kodak Company has been employed in the Domestic Sales Department.

Mr. S. S. Amdursky has completed his course at Syracuse University and will continue his work as Engineer in the Industrial Sales Department.

Mr. Frank Houlahan is the proud father of a 9½ pound girl. Miss Houlahan arrived May 2nd, and she has been asking for information ever since.

Some men imagine they are ambitious when they are merely wishing

for things. A day of real, purposeful action is worth a lifetime of dreams without action.

The editors would be glad to receive back copies of the Gas and Electric News—especially the January, December, November and earlier numbers.

Mr. Begy of Station 4 does not object to the spring floods. He says the fishing is great at the Station. During the last flood he caught a 25 pound carp.

Mrs. William Hummell, wife of Mr. Hummell clerk at the Coke Office, has been in the hospital for several weeks, and is reported as greatly improved in health.

Mr. Charles Lazeroff has been transferred to the Addressograph Department, and Mr. Ray Van Riper has been transferred to the Electric Meter Department.

Mr. Kenneth C. Richmond, who is known to many of us, has completed his course at the Massachusetts Institute of Technology. Mr. Richmond will assist on the new construction work.

On May 5th, in the Main Office, Mr. Houlahan found a stray bill fold containing \$50.00. The owner, Mr. George Christ of No. 1 Franklin Street, was indeed a happy man when he received the missing "change."

Mr. W. N. Whitney, Cornell 1914, joined the engineering staff of the Gas Manufacturing Department the first of May. Since leaving college Mr. Whitney has been engaged in State Highway work.

We regret to announce that Mr. Walter Drew, Assistant Foreman at the Gas Shop, has been confined to his home for some time with inflammatory rheumatism. It is hoped he may have a speedy recovery.

Mr. Frank Howes had his auto stolen on June 8, by three men who

took it to Adams Basin. The Hotel proprietor became suspicious and as a result the car was returned—by way of sheriff.

Foreman Patsy Brown of the Gas Street Department had a surprise party at his home on May 22. Twin baby girls called for a permanent visit. Needless to say Mr. Brown is all smiles over his popularity with the girls.

Mr. Clarence Salisbury has been added to the Drafting Department force to do tracing and detail work. Mr. Salisbury is a graduate of Mechanics Institute, and comes to us from the Stromberg-Carlson Company.

Mr. Walter H. Clawson will work on the drafting required for Stations 3 and 5. Mr. Clawson was with the State Engineering forces on the Barge Canal, and with the Elbert Clarke Company of Rochester, prior to his employ in this Company.

Assistant General Manager Herman Russell and Mr. J. P. Haftenkamp, Supt. of the Gas Manufacturing Department, visited Philadelphia, Detroit, Toledo, Chicago and Milwaukee last month in connection with the new plant at Station B.

Mr. Alameth Kay has been employed as transitman for the improvement work at Station No. 5. Mr. Kay has had a long experience as transitman with the Hudson and Manhattan Railroad Company in New York City.

Mr. Royal Parkinson, General Manager of the Despatch Heat, Light and Power Company, was elected President of the Rochester Efficiency Society on May 15th. We now see the reason for the efficiency in the Despatch Company.

The Line Department was very busy for two weeks erecting poles at Exposition Park for the purpose of supporting scenery for the Shakespeare Pageant. This is somewhat outside of

their usual line of work, but the boys progressed very well as stage hands.

A customer came into the office recently and complained about a high gas bill. Mr. Yatteau suggested that the customer was depending on the human element to turn the lights off and on. "Oh no," said the customer earnestly, "the janitor turns them on and off."

A report from Mr. F. Miller shows that during the year ending May 1st, 1916, 48,700 square feet of blue prints were made in 1100 hours—an average of over forty-five square feet an hour—on the new blue printing machine. The saving in printing time over the old machine for the same period is over \$200.00.

Mr. J. H. Vail of the Engineering Department, Mr. John Williamson of the Drafting Department and Mr. H. M. Elwood of the Domestic Sales Department, will work on the Station 5 improvement. Mr. Vail will have charge of the records, while Mr. Elwood and Mr. Williamson have been assigned to the surveying and inspection force.

General Manager J. T. Hutchings, Leo Sullivan and H. C. Deffenbaugh attended the Spring Day exercises at Cornell University, Saturday, May 27th. "Bill" Lines, who was formerly with this Company but at present Power Engineer for the Portland, (Oregon), Railway and Light Company, was in Ithaca at the time and sent his regards to all his friends in this Company.

Mr. Norman H. Guinter has been employed as Resident Engineer for the new Station No. 5 Improvement. Mr. Guinter comes to this Company from the Long Island Railroad Company. Mr. Guinter has also had extensive experience as Assistant Engineer on tunnel and subway work with the Hudson and Manhattan Railroad Company, and with Jacobs and Davis, Consulting Engineers, in New York City.

Mr. William A. Schell is working on the design of Station 5. Mr. Schell has had considerable experience in the West on irrigation and power plant projects, and at the present time is also Assistant Instructor at Mechanics Institute's Night School. Prior to entering the employ of this Company, Mr. Schell was with the North East Electric, and Pfaudler Companies of Rochester.

Every employee in the Company is expected to be a contributor to the magazine. It is found that there are many employees who have suggestions, articles, or items of news (everything that happens is news) but fail to give them to their department correspondents. If you have anything for the magazine, just write it on a sheet of paper, sign your name and send it in; or better yet—drop it in one of the small boxes provided for "suggestions."

### Marriages

When the safe was opened on the morning of May 10th, the boys found a box of cigars, a large box of candy, and a note from Cashier Ray L. Davis. The mystery was solved when it was learned that Mr. Davis and Mrs. Laura E. Brown of the Domestic Sales Department, were married on that day. Mr. and Mrs. Davis took a short Eastern trip, and are now at home at 25 Wisteria Street.

Mr. A. J. Wagner, Electrical Engineer in the Operating Department, and Miss Eileen M. Mann of Detroit, Michigan, will be married June 17th, at the home of the bride. After an extended tour through the Great Lakes, Mr. and Mrs. Wagner will reside at 209 Lark Street.

Mr. Paul Miller, of the Auditing Department and Miss Ruth Robinson, of No. 309 Jefferson Avenue,

were married on April 20th at the home of Dr. F. F. Fry, 163 Westminster Road. Mr. and Mrs. Miller took a trip to Atlantic City, Bridgeton, N. J., and Philadelphia, and are at home at 51 Earl Street.

Miss Violet M. Patrick of the Accounting Department and Mr. John Gilgunn of the Eastman Kodak Company were married on Monday, May 15th, at the rectory of the Holy Rosary Church. Mr. and Mrs. Gilgunn are at home at 123 Electric Avenue.

Mr. H. C. Marquardt of the Domestic Sales Department and Miss Florence C. Lang of New Haven, Connecticut, will be married June 17th. After a Canadian tour, Mr. and Mrs. Marquardt will make their home at 522 Benton Street.

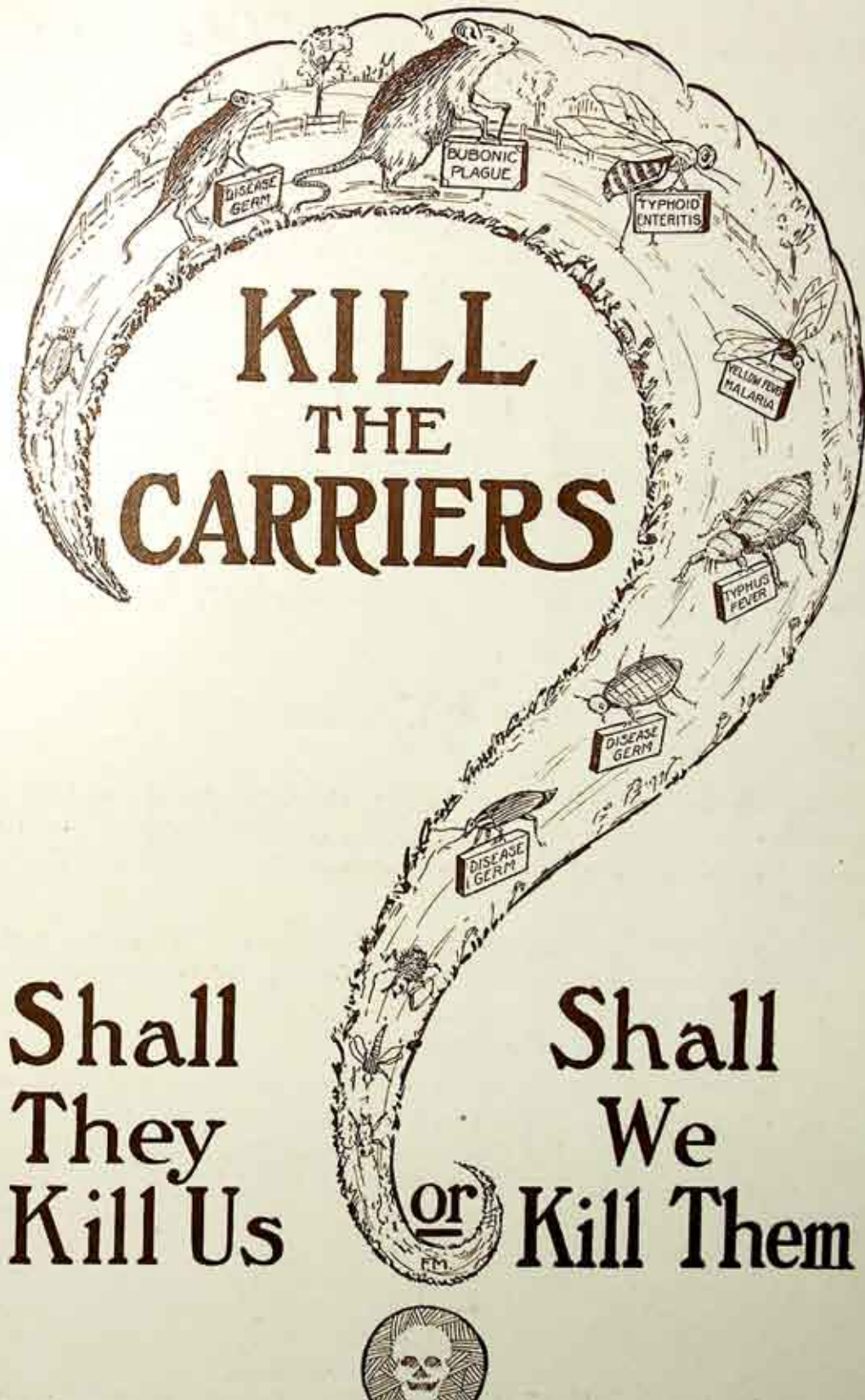
Mr. Harry Chittenden, night telephone operator, and Miss Laura Robinson of Holly, N. Y., were married on May 20th. Mr. and Mrs. Chittenden reside at 20 Stratford Park.

### Case Students Visit Rochester Plants

This year's itinerary of the annual eastern inspection trip of the Junior Electrical Engineering Class of the Case School of Applied Science, Cleveland, Ohio, included an inspection of the Rochester Railway and Light Company's larger generating and sub-stations.

Tuesday morning, May 30, the party visited Station 33,—in the afternoon their schedule was open. Wednesday morning Stations 3 and 2A were visited, and in the afternoon the visitors were taken through Stations 5 and 15.

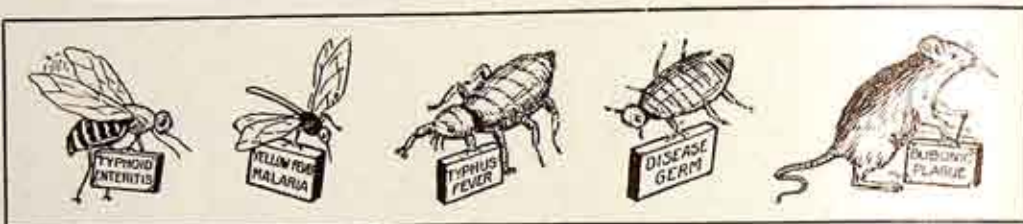
After leaving Rochester the party visited plants at Schenectady, Pittsfield, New York, Perth Amboy, N. J., and Washington. This year's class of 25 students was in charge of Professor H. B. Dates.



Disease is Carried by Flies and Other Insects  
Also by Rats and Mice

THEREFORE

## KILL THE CARRIERS



Because RATS and MICE, FLIES, MOSQUITOES and other INSECTS are GREAT TRAVELERS, they are a danger to you and your family as well as to those who live in less sanitary conditions.



FLIES are known to carry typhoid, summer complaint and other fevers by alighting first on infected matter and then on food. In one season the offspring of a fly may amount to 195,312,500,000,000 more flies.

1. PREVENT by destroying breeding places. Flies lay their eggs in damp or wet rubbish, in garbage, ashes, manure piles or other waste.
2. COVER closely all garbage cans.
3. KEEP OUT, by screening all doors, windows and porches.
4. KILL, by using
  - (a) Sticky fly-paper.
  - (b) Wire-cage fly-catchers.
  - (c) Fly-swatters.



MOSQUITOES of a certain kind carry yellow fever and malaria by biting first the sick and then the well.

1. Mosquitoes breed in stagnant water; therefore FILL UP all hollows that can hold water.
2. COVER the surface of open water, with kerosene, which kills the baby mosquitoes (called wigglers).
3. KEEP OUT by means of wire screens at doors, windows and porches.
4. PROTECT YOURSELF by rubbing on hands and face, or ankles, wherever mosquitoes are troubling you, one of the following remedies:

- (a) Equal parts of kerosene, oil of Pennyroyal and oil of Citronella. Have druggist mix them.
- (b) Oil of Citronella - - - - - 1 oz.  
Spirits of Camphor - - - - - 1 oz.  
Oil of Cedar - - - - -  $\frac{1}{2}$  oz.  
Have druggist mix them.



BED BUGS can carry disease by biting first the sick and then the well.

1. KILL, by scalding with boiling water all furniture in which they can hide.
2. SPRAY all possible hiding places with 5% naphthalin in alcohol, taking precautions against risk of fire, as it is inflammable.
3. SCATTER about wherever they may be, fresh insect powder that has been kept air tight. Air destroys its usefulness.



LICE carry typhus and other fevers by biting first the sick and then the well. The following is a good and safe treatment.

1. KILL; take  $\frac{1}{2}$  pint kerosene and  $\frac{1}{2}$  pint sweet oil or lard, mix, and saturate the hair thoroughly, then tie the head up in a towel and leave over night. Next morning wash the head with hot water and soap until the oil has been entirely removed. Dry thoroughly. Then saturate the hair with vinegar, and brush with a stiff brush, separating the hair into strands for this purpose. This must be repeated until not one nit is left.

2. **KILL**, by rubbing into the scalp the following mixture, which must be mixed. Use in a room where there is no fire, as it is inflammable:

50% Alcohol  
20% Turpentine  
20% Oil (Petroleum)  
5% Naphthalin

After the lice have disappeared, spray into the hair an oil-naphthalin mixture and comb thoroughly to kill the nits. Repeat this until the nits have disappeared.

(For other treatment you are referred to the Board of Health.)



**RATS and MICE** are known to carry infection of the plague, and of rat fever, and are suspected of carrying other diseases.

To get rid of Rats and Mice:

1. **RAT PROOF** all buildings. Rats gnaw corners; therefore, shield all sharp corners with tin. Use concrete, sheet metal, wire netting.
2. **STOP UP THEIR HOLES** with a mixture of cement, sand and broken glass, first sprinkling chloride of lime in the holes.
3. **GUARD** all openings around pipes, wires, ventilators, skylights and cellar windows, with wire netting.
4. **STARVE THEM!** Keep the cover on the garbage cans. Rats will not stay where there is no food for them.
5. **REMOVE** their nesting places, that is, rubbish piles.
6. **TRAP THEM.** Traps should be metal, either wire or steel. After setting they must be heated in a flame to remove the human odor; then handle only with tongs or paper. Keep all food except that in the trap, out of reach.

**Home-made Trap:** Cover a barrel with a cloth or stiff paper in the centre of which place food. After rats or mice are used to taking this food, slit the centre of the cloth or paper, and place food in bottom of barrel, and the rats and mice will fall into the barrel.

7. **KILL THEM.** Set out one of the following mixtures and place a pan of water near by.
  - (a) Plaster of Paris, 1 part  
Flour, 3 or 4 parts  
(Drinking after eating this, kills them.)
  - (b) Carbonate of barium, 1 part  
Oatmeal, 5 parts

**PUBLIC HEALTH COMMITTEE  
ROCHESTER CHAMBER OF COMMERCE**

JUNE 1916



HEALTH  
BULLETIN

No. 22

*BACKACHE*

Rochester Ry. & Light Co.

REPUBLISHED FROM  
BULLETIN ISSUED BY

EASTMAN KODAK COMPANY

## BACKACHE

1—SPRAINED BACK. This is by far the most common form of backache among active people. A sudden strain or twist may affect the muscles of the back in such a way that pain results when bending the back.

The best thing to do for a sprained back is to have the back strapped with adhesive plaster. This usually gives much relief, although in severe cases it may be necessary to rest quietly in bed for a day or two. Of course, lifting and violent exertion should be avoided for a few days until the strained muscles have regained their former strength.

2—FATIGUE. We are all familiar with the "tired back" that sometimes follows unusual use of the muscles, such as in shoveling snow or in spading the garden. The improvement which results from simple rest shows this to be all that is necessary. Occasionally, however, cases of "tired back" result from habitual improper sitting or standing positions. In order to correct the faulty position a special brace, belt or corset is helpful. Still another cause of this form of backache is foot strain. Examination of the feet may show them to be flat and pain is complained of which extends up the lower ex-

trimities to the back. The use of an arch support or raising the heel of the shoe usually gives relief in these cases.

3—ON-COMING SICKNESS. Certain sicknesses, such as typhoid fever, small-pox, scarlet fever and grip, begin with a backache. Headache and fever are usually present along with the backache. In these cases one should consult a doctor as the trouble soon develops into something more serious than a simple backache.

4—LUMBAGO. When a cold "settles" in the back a soreness called "lumbago" is the result.

The use of liniment, thoroughly rubbed in, is helpful and a hot water bag applied to the sore spot adds much to one's comfort. It is best to omit meat from the diet for several days and to drink plenty of water.

5—KIDNEY BACKACHES. It is a popular idea that kidney or so-called Bright's disease causes backache. This is almost never the case. There are, however, certain rare conditions, such as abscess of the kidney and stone in the kidney which cause pain in the back. Kidney-stone causes a sharp, knife-like pain and the X-ray will usually tell if this is the trouble. Remember, then, that the kidneys are seldom to blame for backache.