

### Co-Operation is Advocated as Watchword of Future

By THEODORE E. BURTON  
It is a proper time for co-operation, and co-operation should be the watchword in our business here in America. We have had too much legislation, too many theorists at work on it, who think that the way business can succeed is by ruthless competition. Many laws have been passed with this object in view.

There naturally will be competition. A reasonable amount of competition in service is all right. There should be laws and regulations to prevent oppressive combinations, but co-operation should be the watchword of the future.

There was an illustration of what may happen which occurred at the time of the armistice. Buyers of iron and steel waited for lower prices and manufacturers diminished production. In a little while prices were higher than before. That very condition would likely intervene if there is a general holding off in the making of purchases.

Some say that things are going to be all right after the first of January. Well, I hope so, but this present condition of prices is more than a banking condition. It cannot be cured at lower rates of money. It touches the whole industrial and commercial fabric, all the ramifications of trade. I hope, and in fact expect, a very material improvement after January first, but I do not think it will do for us to be too sanguine.

The question that interests everybody is, "Have we reached the bottom?" We have been falling for some time, and it does seem the turn must occur soon, but it will be a long process before we get back to the conditions as they were in the early years of the war, or in 1912. I do not say that necessarily it will be years, but at least it will be months.

What are some of the hopeful signs? First, in facing any financial catastrophe we know more than we used to. We can make our calculations more wisely. The very idea of co-operation has helped the situation. If there is any good that has been done by some of these big organizations, it is that they can forecast the future. They are like men that stand on a commanding eminence. They can see what is coming. They can slow up a bit if they are manufacturing too fast, and adapt supply to demand.

Hopeful Sign Is Seen in Good Banking System  
Then we have a better banking system. When we look back on what happened before the Vreeland-Aldrich Act of 1908, it is amazing that this country could ever have gone alone, in the halting way that it did, with a currency system absolutely lacking in elasticity.

Now, we have not only that law, which is practically superseded, but the Federal Reserve law, which began functioning in 1914. I concede there is a tremendous power which rests in that Federal Reserve Board which might be abused, but I trust their authority will be used wisely, and that is our great bulwark in time of storm.

Then again, demand is pitched on a high plane. It will continue high. People can afford to buy for years to come. A good many will have to economize, but the first point of attack in any period, when large expenditure holds away, is mere personal adornment.

Even in this depression the department stores report their sales were more in October and in November than last year. There is a limit to the time when a consumer will hold off in the expectation of lower prices.

Then, again, we have a assured place in the colossal resources of this country, so that we are the favored people of the world. We can adjust the methods and means to meet the situation in a way we could not before.

We have enormous crops, the probabilities of a plentiful supply of food. I am frank to say there is one thing I look upon as rather a moral question than financial; the general tendency of the people to indulge in luxury. There seems to be a tendency of that kind that goes all through our population, the disposition to have a good time.

### Declares All Must Aid to Bring Country Out of Depression

As I compare things in the country town where I used to live, and think of the hardship we went through then, in comparison with the luxury they enjoy now, and as I look upon the wonderful industry and self-denial of the people in the Orient, it makes me afraid that we may lose our grip, and there is urgent need of individual industry and thrift. In talking of economy, advice does not apply to the big corporations and industries alone; it applies to every man and woman in the country. All must put their shoulders to the wheel to bring us out of this mad and depression of financial difficulty.

### Electron Tubes and Their Uses

Electron tubes was the theme of a lecture by W. C. White, of the General Electric Company last week at the Franklin Institute. The lecturer described the more unusual characteristics which are encountered in connection with the use of these tubes, which are known also by the more customary names of vacuum tubes. Following is a summarization of the lecture:

The three-element vacuum tube, known to many under the name of audion, electron tube, plotrom or just vacuum tube, is a new tool developed by scientists for the electrical and particularly the radio engineer. This device is well known to electrical experimenters, and the literature on the subject has grown rapidly, so that at the present time it is really quite voluminous.

Their theory of operation is fairly widely known to those interested in technical matters and is found in most modern textbooks on physics and radio communication. Radio literature is usually generously sprinkled with vacuum tube circuit diagrams. This paper does not take up any of the fundamental theories of operation of the tube or its circuits, but is written in the interest of those who professionally or for pleasure experiment with these devices. The paper also does not attempt to cover the field of vacuum tube operation.

It is a rather usual occurrence to those working with vacuum tubes in an experimental way to encounter unlooked for difficulties and obtain unexpected results. A number of these more unusual effects are discussed, and with the aid of diagrams their cause and remedy or control described.

The discussion is confined to tubes having a tungsten filament as the source of electron and a number of the characteristic or tungsten filaments as used in vacuum tubes are given. These point out various factors to be observed so as to obtain the most satisfactory results and the longest tube life.

A number of the causes of tube failure are given and the symptoms accompanying them described. Various methods of filament operation are described, together with some of their advantages and disadvantages. Several oscillating circuits are described as these are of chief interest in connection with a power or transmitting tube. These circuits described are chosen to illustrate certain peculiar or not well-known or appreciated effects.

Finally several points in connection with circuits for radio telephone transmitters are described. The various points in connection with circuits for radio telephone transmitters are described. The various points taken up were briefly as follows:

Variations of electron emission and life in a tungsten filament as function of filament current and voltage. Operation of filaments at constant voltage rather than constant current. The general rules are given, the observance of which should greatly increase the filament life.

### The importance of operating tubes in the correct position.

The effects which occur in an electron tube when it has a poor vacuum. The method of determining whether this is due to leakage or gases evolved from the anode due to overload. The indications of large amounts of leakage air.

The importance of not overheating the glass of the bulb so that the vacuum may be left at a high value. The effect of the plate current of the tube causing an unequal distribution of the filament current and thus shortening the filament life.

A possible difficulty in the use of a low-voltage direct current generator for supplying the filament energy. The advisability of using alternating current for filament lighting and the best method of connection.

The importance of having both the filament and plate energy sources on the ground side of the circuit. The necessity of reducing to as low a value as possible oscillating circuit resistance and losses so as to obtain good outputs at satisfactory efficiencies.

Precautions in the use of a capacity coupled circuit to obtain satisfactory outputs and protection for the apparatus. Suggestions for the proper functioning of tubes operated in parallel. The proper proportioning of inductance and capacity in certain forms of oscillating circuits.

The protection of direct current generators used for supplying plate voltage for power tubes by means of aluminum all-lighting arresters. A method of maintaining a virtually constant frequency. A method of obtaining high voltage at high frequencies.

Electrolytic action in the glass of certain types of tubes as a possible limiting factor for voltage of operation and power output. More electro-oscillations is required for a modulated oscillation tube than a simple oscillating tube. The use of a miniature incandescent lamp as an indicator of the amount of modulation being obtained in a radio telephone transmitter.

### Alligator Shooting

An enthusiastic hunter who spends his winters in Florida describes a canoe trip in company with two Seminole Indians, Micochee and Kowika, who were engaged in their regular occupation of hunting alligators for their hides.

The canoe was a dug out, made by Micochee himself out of a huge cypress log. The trio made camp late in the afternoon, and after awhile Mr. Munroe discovered—that he had not before suspected, that the hunting was done at night.

"Darkness had hardly fallen before the bellowing of alligators was heard—a sound much like the roar of angry bulls. Micochee listened with evident satisfaction. Allapatta plenty. Me catch 'em, Uncah!"

"We had killed five of the monsters when we turned our prow up stream. Micochee wielded his push pole from the stern; Kowika sat in the middle of the canoe, while I with jack-light on my head and rifle in hand, occupied the position of hour in the bow.

"The alligators had ceased their mutterings, and I had begun to think we had killed or frightened them all. Just then I was startled by a slight motion on the bank but a few feet away. At the same instant two coils of fire gleamed through the blackness. What could they be?"

"I was about to speak, when a sharp 'hist' from behind told me that the moment of action had come. Taking a hasty aim at one of the lurid coils, I fired.

### Germans Flood Markets in Berlin With U. S. and English Imitations

Berlin—German manufacturers have flooded the markets here with imitations of American, English and French wares, some so cleverly made it is difficult to detect them, but others of an almost ludicrous clumsiness.

A purchaser who goes into a tobacco shop and asks for a standard English or American cigarette probably will be handed a package with a label closely resembling the trademark of the original. The price will be much less and frequently, pleased with the bargain, the customer puts the box in his pocket without closely examining it.

The fewer imported tobaccos on sale are very expensive, and those which have not been smuggled in bear the import tax stamp.

Street vendors of tobaccos, candies, and other articles display imported tobaccos and German imitations side by side, so that eventually purchasers learn the difference and become wary, although the German tobaccos are not inferior to some imported brands.

In some of the high class restaurants only imitation cigarettes are sold. The drug stores are perhaps the chief dispensers of the German imitations. Imported toilet articles and particularly soap, shaving cream, tooth paste and face lotions are very scarce. But all the well known American brands have been imitated.

Trademark imitations have displayed their best work in the saloons, where whisky bottles bear the labels of well-known English manufacturers. The bottles have been filled with German made whiskies, often white, but sometimes colored, and the substance reeks of grain alcohol. French liquors and imported gins are virtually never sold. The German inventive talent has been carried further, to include all sorts of wearing apparel. A suit of clothes, displayed in a window and bearing a remarkably reasonable price tag, catches the eyes of the passerby. Upon careful examination, it will be found the cloth is made of paper. Many hats, caps, vests, trousers, and even shirts are made of paper. Paper strings are in general use. Shoes which can be purchased for a small sum crack and dissolve in water. They are made of paper. American and English-made clothes have been so carefully imitated that only an expert can detect the difference.

### Cheapest Light in the World

It is said by those who have experimented with them that the light given by the fire-flies of Cuba is the "cheapest" in the world, produced, that is to say, with the least heat and the smallest expenditure of energy, and that a successful imitation of it would prove to be a most profitable substitute for gas and electricity.

The insects are beetles two inches long, and belong to the family of "snapping bugs," so called, because, when one of them is laid on its back, it snaps itself into the air with a clicking sound. The secret of the light this firefly gives it as yet undiscovered. Apparently it is connected in some way with the mysterious phenomenon of life and chemists and physicists have sought in vain to explain its origin.

On each side of the beetle's thorax is a luminous membranous spot, and these flash at intervals; so that the Cubans put a dozen of the insects in a case together, and so obtain a continuous illumination bright enough to read by. This light is accompanied by no perceptible heat, and is seemingly produced with almost no expenditure of energy.

How great an improvement it represents upon all known artificial lights can be imagined when it is stated that in candle light, lamp-light, or gaslight the waste is more than ninety-nine per cent. In other words, if they could be so obtained as not to throw anything away, they would give nearly one hundred times the illumination which they do afford. Even the electric light is mostly wasted.

### Vicompte Tries Suicide as Wife is Ignored

Paris—Because his parents refused to recognize as his wife a working girl whom he married recently, Vicompte de Torillant, 30 years old, jumped into the Seine one morning last week. He was rescued in a serious condition by lifesavers after he had gone down three times.

The Vicompte is a non-commissioned officer in an artillery regiment stationed at Tours. A few days ago he obtained permission to visit Paris in a final effort to seek paternal approval of his marriage. Physicians of the Val de Grace Hospital expressed doubt regarding his recovery.

### Keeping Down Mine Dust By Sprinkling Empty Cars

The presence of dust in the mines is one of the many disagreeable features of life underground. It affects the lungs and nasal and throat passages of some persons and besides this is a constant menace, for it forms a dangerous explosive. It has been said that the presence of dust in the air of the mines is the means of spreading the force of the explosion throughout the mine, whereas had it not been for the presence of the dust the damage might have been restricted to the portion of the mine where it originated.

A very effective way of keeping down the dust in the mine has been found in sprinkling the empty coal cars. This scheme is followed in one Kentucky mine and the result shows a great improvement over the former conditions. The sprinkler is located on the main entry and near a pump, about 2000 feet from the drift mouth. For the supply of water to the sprinkler it has been connected to the discharge pipe of a pump which has been installed for the purpose of forcing the water from the pump to the outside. The man who tends the pump turns the water on the sprinkler whenever an empty trip is passing. The water that misses the cars, falling between them and at the sides, flows back into the pump.

It has been found that the sprinkling of all empties works wonders in keeping dust down. Cars now enter the working places soaking wet and when dry coal is shoveled into them dust does not rise as it would if the coal were shoveled into dry cars having loose dust all over them. This method has another important advantage. Before the cars were sprinkled, the motion of the train through the entries against the air current would blow the fine dust from the dry cars and deposit it on the floor. When the cars are all wetted, water drips from them as they travel and so keeps the entry moist.

From the excellent results secured by this method, it is expected that by installing more of these sprinklers to be able to keep the mines moist enough to be free from dust in all working places, except possibly within rooms.

### The London Fog Placed on the Scales

London's famous fogs are to be measured, calibrated, weighed and otherwise assayed this winter in order, if possible, to determine their influence on the city's death rate. Dr. John S. Owens, secretary of the Advisory Committee on Atmospheric Pollution, is to be in charge of the experiments, which will be conducted by forcing a fixed value for fog through white paper. The relative deadliness of the fog will then be gauged by the degree of discoloration of the paper. Dr. Owens believes that the ratio of dirt in the fog corresponds with its harmful effects on the respiratory organs, and he also hopes to be able to present figures showing that the smoke which makes up no small part of London's fogs represents a decided loss of efficiency in the use of fuel. Although old timers say with assurance that London's fogs are not what they used to be, the answer is not improbably, "They never were."

Meanwhile, with London rejoicing because St. Martin's summer has brought four consecutive days without rain—something which has not happened for a long time—telegrams from Johannesburg, South Africa, state that airplanes are being employed there to drop dust on the clouds in the hope of forcing the showers which are so badly needed. The initial experiments were not successful, but the people there have not given up hope. Apparently no one has considered condensing London's fogs, after they are weighed and analyzed and shipping them out where they really are needed.

### ROSES BLOOM IN NANTUCKET

Nantucket, Mass.—Rambler roses still bloom along the fences in Nantucket; farmers are plowing their fields and fishermen go about their daily business as if it were midsummer instead of the first day of winter.

In past winters this little island town has been cut off from the mainland for days or weeks at a time by great ice barriers, but this year there has been no snowstorm and no ice has formed.

Last year the young folks were enjoying coasting and skating long before Christmas and sleds and skates were welcome gifts, but this year dealers are all stocked up with these goods.

Butcher—"Come, John, be lively now; break the bone in Mrs. Williamson's chops and put Mr. Smith's ribs in the basket for him."

John (briskly)—"All right, sir, just as soon as have sawed off Mrs. Murphy's leg."

Willie was very much interested while the choir sang the anthem in church last Sunday. At its conclusion, he turned to his mother, and in a stage whisper, asked: "Say, mamma, which beat?"

### Suggestions From Rebuilt French Cities

Excess condemnation and final resale or leasing of lands adjacent to areas being taken for street widening and opening has enabled many cities and towns in the devastated region of France to finance the whole of these improvements. An outline of this practice, together with a suggestion that it be adopted more generally in the United States, and also that benefits as well as damages to the street improvement be assessed against the abutting property, was presented at the recent meeting of the American Society for Municipal Improvement by George B. Ford, of the Technical Advisory Corporation. Contrary to the generally accepted views the French are permitting many street changes in rebuilding their cities. They are more prone to do this since the government pays the larger part of the bill. Co-operative societies have been formed in most of the towns which enable the employment of one contractor, one engineer and one architect instead of many of each, and to standardize the many unit parts of their buildings, such as windows and doors.

### Origin of the Word "Trolley"

Most persons who use the word "trolley" do not know the origin of this term, or why this name was given to the apparatus by which the electric current is conveyed from an overhead wire.

Seventy years ago the word was used to designate "a form of truck which can be tilted, for carrying railroad materials or the like." This is the only definition of the word in Webster's Dictionary of the edition of 1848.

In the edition of 1892 of the same work, three other definitions are added: 1. "A narrow cart that is pushed by hand or drawn by an animal." It is noted that this meaning of the word is in use in England, not in the United States. 2. "A truck from which the load is suspended on some kind of cranes." This meaning is technical, according to Webster, and employed only in speaking of machinery. 3. "Electric railway. A truck which travels along the fixed conductors, and forms a means of connection between them and a railway car."

It is easy to see how the primitive form of the electric trolley, which travels upon the wires, came to receive its name from its resemblance to other types of trolley; and the name, having been immediately given to the primitive form, was naturally retained when the method of connection was changed from a little truck moving on a wire to a mast having at its end a wheel pressing on the lower surface of the wire.

### Had the Measels

Queen Wilhelmina, when she was a little girl, was fond of dolls, and she imagined they were subject to all the ills flesh is heir to. One day, after the main part of the dinner was over, Her Majesty, as was her wont, made her appearance when the dessert was served, and placed herself next to a courtly old general. After eating some fruit the little girl turned her gaze up at him and seriously claimed:

"I wonder you're not afraid to sit next to me!"  
Everybody at the table turned toward the childish voice.  
"On the contrary," said the general, "I'm but too pleased and honored to sit next to my future Queen. Why should I be afraid?"

"Cause," and the little girl looked quite woebegone, "my dollies have the measles—they're all of them down with it."

### Greenland Source of Icebergs

The source of practically all the icebergs of the Arctic and sub-Arctic regions is Greenland. Owing to the northward set of the West Greenland currents the bergs on this side are carried first to the north, and it is only at about 74th or 75th parallel of latitude that they begin to make their way westward to come on the American side.

When you sink into a reverie you are merely buried in thought.

### Washington Fashion

By MARGARET WADSWORTH  
Washington society, recruited season from every large city coast to coast, and many foreign fashions as well, is quite unperturbed by the reiterated statement of Fashion's spokesman, that changes are at hand, and that men wish to look stylish, they buy new clothes in January, how well supplied they believed themselves to be in November.

Mrs. Marshall, the popular wife of the most popular Vice President Washington has known for years, and Mr. Riano, wife of the Spanish ambassador, for example, are both wearing stunning new dinner gowns in black that die in every detail, yet are equally smart.

Mrs. Marshall inaugurated her new black gown at the large dinner party of last week when Mrs. Thomas F. Walsh entertained in compliment to the Vice President and wife. This gown is satin, with short, close skirt ten inches off the round, but overhanging in black lace, encircled in jet the lace forming irregular line from tree to six inches below the satin hem. There is also a train of lace, while the top which is sleeveless has a U-neck line in front with short cross-bar or jet and lace. The back of the bodice is V-shaped, but not extremely low, Mrs. Marshall being as conservative in clothes as in most other matters.

Madame Riano, American born, and reared in Washington, is also conservative in dress, with her black gown of soft velvet in classic lines that reach to the instep, with long pointed train and V-shaped bodice, both back hand front.

Mrs. Owen, wife of the senator of Oklahoma, and her daughter, Mrs. Cameron Hawkins, now on a visit to her parents, were two of the notably well-gowned women at the large ball the Secretary of Agriculture and Meredith gave a week ago. Mrs. Owen usually wears trained gown evening occasions, wore cloth over, brocaded in velvet, in wiferal design, with draped skirt train of the brocade and the top with garlands of flowers reproducing the colors of the brocade extending across the left shoulder to the line which is low and tapering.

Mrs. Hawkins' gown was damask length, of a dark, rather dull red embroidered in spangles in geometric lines and mounted on self-colored satin. The neck line was neither high nor low and the short sleeves an girder were of tulle. The distinction of this gown is largely in its unusual color, a wonderful background, for Mrs. Hawkins' blonde beauty.

The most colorful gown of the Meredith ball was the striped cerise and silver creation worn by Miss Theresa Roney. This is right from Paris, a narrow, straight skirt with closely fitted top, without any waist line, merging into points at each side.

Miss Louise Lattauer gave a strong color note to a ball-white gown at the Junior League dance by wearing with a very modest short frock of velvet brocade chiffon two large sprays of emerald green heron feathers as collar ornaments. These sprays, long and full, started from the low collar in the back and fell over the brow. A green tulle scarf emphasized the contrast.

Miss Olive Greaf, daughter of Mr. and Mrs. H. Campbell Greaf, of London, New York, Washington and Virginia, was another of the belles at the Junior League. She wore a smoke-colored tulle frock, spangled in gold and silver in small brilliants and mounted on a natural toned satin, a gown old in color, but very youthful in line and most becoming to the blonde wearer.

### A Pup Beyond Price

On a certain Sunday a clergyman in the course of opening remarks of his sermon, explained how his preaching that morning would be on the brief side, as his manuscript had been torn by a lively dog that he happened to possess.

"So," he said, "I will continue to read my sermon from where it has not been torn."

As he concluded his sermon he apologized for the brief period he had been in the pulpit.  
When the service was over, and most of the people had left the church, an old woman came to the clergyman.  
"Your Reverence," he asked, could you give my rector a pup of that dog you spoke about this morning? His sermons are too long."

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Slices of lemon, topped with grated horseradish, make a tasty garnish for veal.

Rub soiled places on the rugs with ammonia. If the color fades, apply chloroform.

Leftover cauliflower may be mixed with some other vegetable and baked in scallop shells.

If ashes are allowed to accumulate in the fireplace, they will burn the feet off the andirons.

A wart may be removed without soreness by applications of oil of cinnamon three times a day.

A large marble boiled in milk or custards will automatically stir the liquid and prevent burning.