AN ANCIENT ROMAN CITY IN ALGERIA.

Second only in antiquarian and historical interest to the discoveries at Pompeii are the ruins of the ancient Roman colony of Timegad, or Timegatte, in Algeria. The city lies among the spurs of the Atlas Mountains, about fifty miles due south of Constantine, and the same distance northeast of Biskra. It was known in Roman times as Thamutuda, Thamugas, and Tamugada, and must have been a place of some importance, for the ruins are about three-quarters of a mile in width and very nearly a mile and three-quarters in length, if we include the Byzantine fortress and the tombs cut in the rocks close by. The city was formerly the center of a wide stretch of fertile country in the center of the granary of the empire, and was also a military station of great importance, by which the mountain tribes of the neighboring Atlas were held in check. Through it ran six Roman roads, connecting it with Lambessa, Diana Veteranorum, Constantine, and other flourishing Roman colonies; and it has been conjectured that the veterans of the thirtieth legion were established here in recognition of their services in the Parthian war, A. D. 106. The country round is now utterly deserted, and there are no inhabitants near the spot, the nearest Arab settlement being some miles off. During the latter empire Timegatte was a very flourishing city, and during the fourth century was one of the great African centers of religious agitation. Many of its bishops were celebrated men, and Optatus, who was head of its church at the end of the fourth century, was regarded as the chief of the Donatists, the strictest among the sects of the church in Africa.

Timegatte seems to have been ruined and deserted about 500 A. D., but the citadel was rebuilt and the city again inhabited toward the middle of the sixth century; and when the Arab invasion took place it was a Christian town, and possessed a church built after the restoration of the city. However, owing to the disturbed state of the country, at the fall of the empire the city was again deserted.

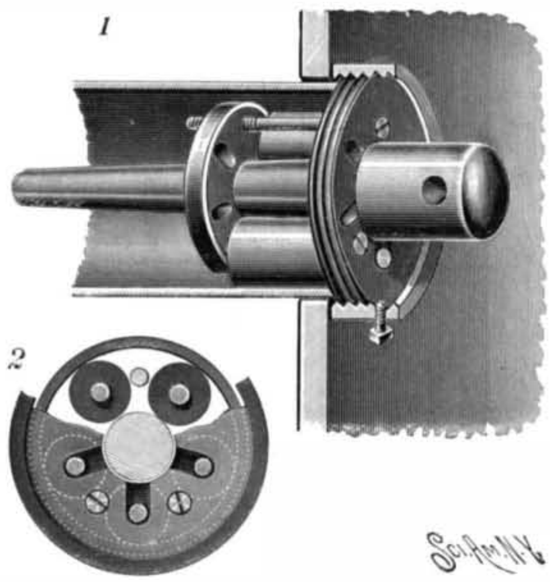
A number of statues, inscriptions, and earthenware vessels are scattered about the ruins, and the houses which are still standing enable us to reconstruct the different quarters of the town without any very great difficulty. The monuments still left in more or less preservation are situated to the north of the watercourse which intersects the plain. They are: the Forum, which has an imposing appearance, with its pavement still intact, its tribunes, its inscriptions, and its columns, which supported a long colonnade running from north to south, and looking out over the fertile valley at the foot of the mountains; the temple, a remarkable ruin full of curious detail, which is supposed to have been a temple to Jupiter; the theater, which still remains in a very fine state of preservation, and is situated on the slope of the hill against which the city is built; a gateway in a half ruined condition; a smaller temple; and the principal street, which is a fine broad thoroughfare flanked on either side by magnificent columns, and terminating in a triumphal arch. This arch is in an almost perfect state, and is one of the most important monuments of the Roman period existing in Algeria. It has three openings, the larger one in the center, and a smaller one on each side, with a niche for a statue above it. Four fluted columns with Corinthian capitals flank the openings, and an entablature connects the pillars and arches. Our engraving shows what remains of this triumphal arch.—The Graphic.

Copyright in Photographs.

A decision by an English court has determined the rule as to photographic portraits. The copyright belongs to the sitters when they order the portrait and pay for its being taken. The only claim for copyright by the photographer is when he invites sitters to have their likeness taken, and when they assent to sit without payment, doing so for purposes of publicity or advertisement.

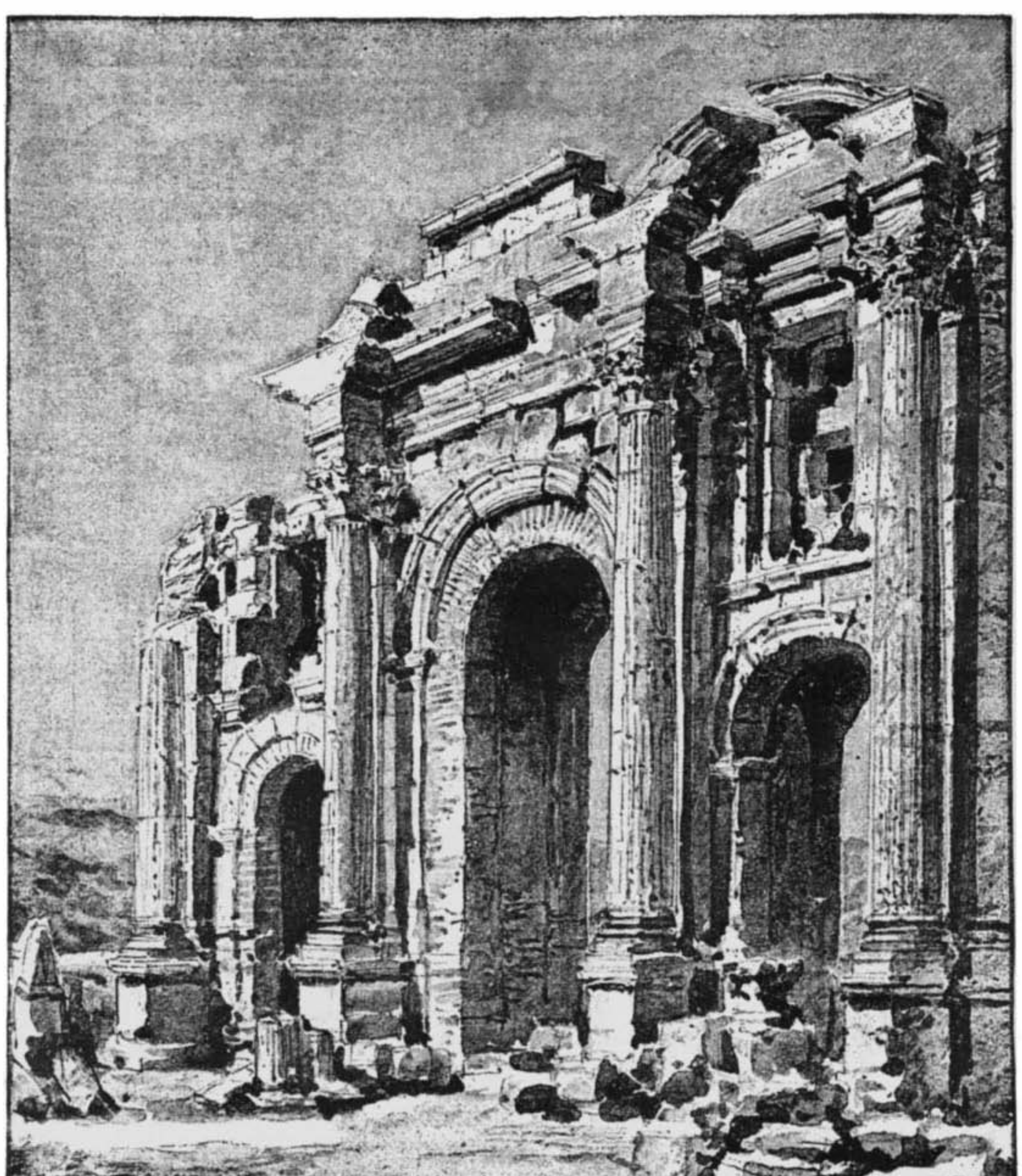
AN IMPROVED FLUE EXPANDER.

For quickly and conveniently expanding boiler flues in place in the flue sheet, to prevent leakage, the implement shown in the illustration has been devised and patented by Mr. David W. Patton, of No. 914 Concannon Street, Moberly, Mo. Fig. 1 represents a side sectional view of the improvement, and Fig. 2 is a face view of the outer head, the stock consisting of an outer and an inner head. In the outer head are re-



PATTON'S FLUE EXPANDER.

cesses extending radially from a central opening and in the inner head are aligned slots, the slots and recesses receiving the trunnions of five rollers, arranged between longitudinal rods connecting the two heads. The central apertures in the two heads form a passage for a tapering mandrel, whose outer head is adapted to be taken hold of by a suitable tool to force the mandrel inward, at the same time pressing the rollers outward and rotating them. When the mandrel is withdrawn, the rollers may be readily taken out of and replaced in the stock. The outer head forms on its inner face an abutment for the projecting end of the flue or pipe to be expanded, and on this head screws a sleeve secured in place by a set screw, the inner edge of the sleeve abutting against the outer face of the flue sheet, and the sleeve being adjusted inward or outward as desired.



THE ROMAN TRIUMPHAL ARCH AT TIMEGATTE.

Paper Trays and Battery Jars.

An inexpensive photographic tray or battery cell, which is practically water, acid, and alkali proof, may be made out of a pasteboard box by covering it with a coating made by melting together equal parts of paraffine and guttapercha chips. The guttapercha should be melted first over a slow fire, the paraffine is then added and the whole composition thoroughly mixed and brought to a very fluid condition. It is then poured into the box or box cover, which should be dry and warm. The composition should be allowed to run along the edges, so that the entire inside of the box is waterproofed, the excess is poured off and the box is then allowed to cool. The outside should then be waterproofed in the same manner. In case any spot fails to receive the composition, some of it may be made into sticks and applied to the bare places with the aid of a hot iron, which may also be used to smooth up any unevenness of the surface. Some photographers like ridges in the tray to keep the plate off the bottom and to facilitate in lifting it out. These ridges can be easily built up with the aid of a hot iron. These pasteboard trays are light and are not liable to be broken by a fall. Old dry plate boxes may be utilized for this purpose. Wooden trays may be waterproofed in the same manner and can be used for batteries if desired.

Modern War Ships.

Old-fashioned naval officers have a habit of comparing the new ships with the old, to the disadvantage of the former.

The deck of the modern man-of-war is no longer a broad, open space up and down which the eye may roam, seeing all that goes on. It is cut up by all sorts of contrivances having relation to the business of the craft, so that one really sees at any one time only a little corner of the deck. As for the officer of the deck, he in many ships now walks aloft on the bridge out of communication with his fellows, a solitary figure, able, indeed, at a touch of the electric bell, to set in motion the most powerful machinery of modern warfare, but no longer able to exchange a friendly word with his fellows.

There is one serious drawback to the modern steel ship that is not the result of any mere sentimental consideration, and that is the deathlike coldness of the interior. It is possible, indeed, to warm the ship with steam, but nothing can warm the sides in cold weather, and the man that sleeps near the unsympathetic steel is liable to contract rheumatism in an unconscious effort to warm it by the sacrifice of his own vital heat. The closed air port drips icicles and the seaward wall of the state room is as cold as an ice box.

The Largest Steamer Company.

The North German Lloyd —Norddeutscher Lloyd— has from a small beginning worked its way to the very front, being now the largest steamer company in the world. The company enjoys a subvention from the German empire for five lines, on the condition that the steamers call at certain ports, that the mail-carrying boats shall be built in German shipyards, and that the speed be at least twelve knots. The company capital is now 83,000,000 marks, or about $20,750,000, and its fleet consists of 83 steamers of an aggregate tonnage of 242,367 tons, besides tugboats. The company's traffic comprises 22 lines, viz., 8 European, 6 North American (twice weekly from Bremen to the United States), 2 South American, 5 to Eastern Asia, and 1 Australian. The staff of the company consists of 8,000 men, and in the year 1873 there was formed a seamen's and pension fund, by donations and an annual charge of 2½ per cent of the pay. The captains have to pass through the various degrees, and if there is an accident, they have to resign.

Gas of 240 Candle Power—Acetylene.

The time was Wednesday, January 16; the place, the well known lecture theater of the Society of Arts, London; the man, Professor Vivian B. Lewes; and the matter, commercial acetylene. From this combination resulted, then and there, a sensation which, unless appearances are utterly illusory, will echo and re-echo through the industrial world for a very long time to come. When the announcement was made that Professor Lewes would read a paper on "The Commercial Synthesis of Illuminating Hydrocarbons,' no indication was given of the particular turn which the communication would take: but that a high degree of interest and importance would be found to attach to Professor Lewes' matter was foreshadowed by the steps taken, with the co-operation of Sir H. Trueman Wood, the secretary of the society, to secure a fit audience for the occasion. In consequence of this effort, a goodly contingent of gas engineers and others interested in the gas industry put in an appearance at the society's house last Wednesday evening; but it is not to be supposed that a single individual among this critical portion of the audience had the faintest expectation of what was coming, or entertained the slightest idea that he was about to assist at what will, in all probability, come to be regarded throughout the gas and the allied interests as an epoch-making demonstration. Professor Lewes' and the society's secret was perfectly kept; and its disclosure at the proper time was, therefore, all the more astounding. For his design was no other than the first exhibition to the world of one of the most striking of the fruits of modern scientific discovery in the new territory of physico-chemistry, the product of that remarkable research of Mr. T. L. Willson—carbide of calcium—the nature and properties of which were by a pure coincidence, described in our last week's "Technical Record.' The absorbing interest of this programme, and the brilliant manner in which it was carried out, are not likely to fade from the minds of those who had the good fortune to attend on this historic occasion.

What Professor Lewes said will be found reported in full in another column. Our present purpose is to draw attention to the text of the paper, and to supplement it with independent testimony as to the demonstrations by which the lecturer proved his statements. He commenced by laying out the ground for the structure he was about to raise, inviting the attention of his audience to the twin methods of chemical research, analysis and synthesis, to make it quite plain that he was not going to ask them to take from him anything arrived at by occult means, or needing to be hedged about by the devices of charlatanry. Only too often, in the history of so-called new discoveries in chemical industry, there is something kept back. The result, whatever it is, is stated to be attained by the employment of some "chemical," the nature of which is not disclosed. Of course, a man of reputation in science does not mix himself up in such schemes; but things of this kind occur often enough to point the observation we now offer regarding the transparency of Professor Lewes' exposition. And when the lecturer had, by easily followed steps, arrived at the top of the first stage of his structure—the announcement that it was the synthesis of acetylene in bulk which it was his purpose to deal with—he was careful to show that there is nothing absolutely new about carbide of calcium, or the phenomenon of its giving off acetylene when wetted with water. He carefully told the story of the early experiments with this compound; and only "let himself go," in the capacity of the exhibitor of a new thing, when he came to deal with the production and uses of it on a commercial scale by the method of Mr. Willson.

And a very startling exhibition it was—as utterly fresh and convincing as good matter in the hands of a master in the art of science exposition could make it. Carbide of calcium, as known to science, was a chemical curiosity until Mr. Willson happened upon a way of preparing it in bulk in the course of his experiments upon the manufacture of calcium alloys by the agency of his electrical furnace. But this discovery put a new face upon the compound. When an article that has only existed in grains comes to be turned out by the ton, it is, to all intents and purposes, a new article. In this sense, carbide of calcium is very new indeed; and its industrial possibilities are newer still, inasmuch as only the most direct and obvious of these developments have as yet been so much as hinted at.

Take it that the material can be produced by the ton, and it is impossible to surmise what chemical industry will be able in the fullness of time to make of it. The product of fusing together, in an electrical furnace, such common materials as lime and carbon in any suitable form was exhibited by Professor Lewes as a greenish-gray stone-like substance greatly resembling the commonest description of serpentine rock. When kept in the air, a light coating of lime soon forms on its surface. Upon handling it, a faint, unpleasant odor, suggestive of garlic, and also not altogether unlike the familiar reek that emanates from the ironwork of an old gas purifier, manifests itself. To all appearance, it is a dull, inert stone, devoid of any other properties than those of common road metal, and not more likely to be credited by the casual observer with gas-yielding capabilities. Upon a piece of this material, Professor Lewes sprinkled a few drops of water from a wash bottle, and put a lighted taper to it. The nascent gas—acetylene— immediately ignited with more than the brilliancy of the pitchy flame of highly bituminous coal in an open fire, and continued to burn fitfully over the wetted surface until all the water was gone. Then came the display of the same gas evolved in a jar (standing upon the lecture table) which contained pieces of the carbide in water, and stored in makeshift glass holders. It was a dramatic denouement of Professor Lewes' little plot when he applied a light first to a single open flat-flame burner, and then to a group of five similar burners, and people saw for the first time, in a public place, the intensely brilliant, white, and solid-looking flame of burning pure acetylene.

It is indeed a flame to wonder at. Nothing like it ever before came within the ken of a gas manager or dazzled the vision of a photometrist. There is something startling in the suggestion that gas of 240 candle power—calculated, in accordance with photometrical practice, upon the basis of a consumption of 5 cubic feet per hour—can be burnt by means of an open flat-flame burner. When the carbide of calcium first came into Professor Lewes' possession this had not, in fact, been done, and, in order to get a flame of acetylene at all, the American handlers of the gas had fallen back upon the brutal device of diluting it with a certain proportion of air. This was to repeat the crude American way of rendering naphtha gas usable. But the dilution of acetylene with air is even more objectionable than is the same treatment in regard to naphtha gas, inasmuch as it is more easily converted into a violent explosive mixture. Professor Lewes, in succeeding in burning acetylene in the pure state in which it comes from the mixture of calcium carbide and water, has saved its prospects as an illuminant. He showed on Wednesday those wonderful acetylene gas flames already mentioned, each produced by burning the gas as made in the simple way described, without any adventitious mechanical or chemical aid, after the rate of half a cubic foot per hour, and stated to yield a measured illuminating power of 25 candles. This could easily be credited. But what it is more difficult to convey in mere words is the impression of steadfastness, whiteness, and, so to speak, solidity which the flames in question made on the observer. At a little distance, no non-luminous zone could be perceived; but, on a close inspection, a tiny speck of blue over the top of the burner was visible. No smoke or smell escaped from these flames, which, although exhibiting in their color the evidence of intensely active combustion, were found to be much cooler than oil gas or albo-carbon gas flames of the same size. This is a most striking feature of free-burning acetylene. The incandescent electric lamps, of normal brilliancy, by which the lecture theater was lit were made to look as dull as "red-hot hair pins" by the aggressive acetylene, which itself, by virtue of the irradiation produced by its dazzling white flame, appeared to form balls of almost blinding light when viewed directly in face or sideways of the flame. The mantle of the incandescent gas light is no whiter than, if it is so white as, the naked acetylene flame, which does not flicker or change color; but, in the absence of means of making a direct comparison between the two lights, it is rash to say which would bear the palm for purity of tint.

It is not for us to say what may be done with this new servant of a community that ever clamors for more light; and gets it more easily and cheaply every day. Considerations of the cost at which the carbide of calcium will be producible, and of the prospects of its utilization as a means of generating portable gaslight or as an enricher of common coal gas, suggest themselves to every one who sees or hears of the substance and its qualities. But it is premature to discuss such questions at present; all that need be said upon these points for the time being was said on Wednesday by Professor Lewes, and by those who took part in the extremely cogent little discussion that followed his brilliant discourse. When the time is ripe for more, it will doubtless be forthcoming. Meanwhile, it is only doing justice to all the parties concerned in last Wednesday's memorable proceedings in the Adelphi to acknowledge the high interest of the whole subject, and the adequate manner in which it was presented to the general and technical public. The discoverer of the system is to be congratulated upon the promise of the new industrial development; Professor Lewes may be complimented upon the deft and convincing way in which he performed the part of introducer of the novelty; and—if last, not least—the Society of Arts deserve to be credited with having proved once more the practical value of the agency wielded by the council and the secretary of this useful institution, for giving publicity readily and promptly to warrantable novelties in science and the industrial arts.—Journal of Gas Lighting.

[Professor Lewes' lecture in full is given in SCIENTIFIC AMERICAN SUPPLEMENT, No. 998.]

A St. Louis Fast Line.

An extract from the Detroit (Mich.) Advertiser of November 7, 1839, gives an account of a fast through passenger service which was then established between New York and St. Louis in the following terms:

"It is no longer to be doubted that the lake route from St. Louis to Buffalo and New York is equally the cheapest and most expeditious. This fact begins to be very generally conceded, and the large number who already prefer it to all others is an argument conclusive that very soon no other route will be thought of, either by men of business or pleasure. For the information of those who may hereafter wish to make the trip, we have procured and herewith publish the time necessary to make the trip from New York to St. Louis:

From New York you, of course, take the steamboat to Albany, say	12 hours
Railroad to Auburn	12 "
Swiftsure line to Rochester	8 "
Railroad and stage to Buffalo	9 "
Steamboat to Chicago	5 days
Stage to Peru	12 hours
Steamboat to St. Louis, good water	24 "
Total time	8 days 5 hours

"Thus, in eight days and five hours the entire distance from New York to St. Louis can be traveled by the way of the Western lakes! With these facts before them, who will hesitate to choose between the different routes open to St. Louis? Looking at this route just as it is, we cannot conceive it possible that any other route can be long thought of. But it is, nevertheless, susceptible of improvement, and this improvement will be effected when the railroad is completed from this city to St. Joseph. That road will save nearly two days' time, and the entire journey may then be made in a trifle over six days.

"Thus is Yankee enterprise annihilating space and bringing the two extremes of the new world into close approximation."

Ship Building Wages Here and Abroad.

In an interesting paper recently made public by Mr. C. H. Cramp on the above subject, he gives the following comparative table of wages now current in this country and in Great Britain, in occupations pertaining to ship building.

	American rate per week.	British rate per week.
Patternmakers	$18.00	$9.00
Machinists	15.00	8.50
Boilermakers	15.00	8.50 to 9.00
Chippers and calkers	15.00	7.80
Riveters	12.00 to 14.00	7.50 to 8.00
Beam and angle smiths	15.00	8.40
Fitters up	15.00	7.80
Ship carpenters	18.00	9.60
Joiners	16.50	9.00
Painters	18.00	9.60
Coppersmiths	18.00	8.60 to 9.00
Shipshed machinemen	15.00	7.20
Furnacemen	11.00	6.00
Holders on	9.00	4.20 to 4.80
Riggers	11.00	7.00 to 7.20
Plumbers	18.00 to 19.00	9.00 to 9.60
Drillers	11.00	6.40
Sheet iron workers	15.00	8.50
Moulders, iron	14.50	9.00
Moulders, brass	15.00	9.00
Laborers, as helpers	9.00	5.20
Laborers, as handlers	8.00	4.20

Purification of Water.

In 1873, when preparations were being made for the Ashantee war, Dr. Crookes was requested by the Army Medical Department to suggest a mode of protecting our troops against the use of the highly impure waters of the Gold Coast.

After some experiments on polluted waters, he recommended as an addition to the impure water the following mixture:

Calcium permanganate	1 part.
Aluminum sulphate	10 parts.
Fine clay	30 "

This mixture, in the proportion of 1 c. c. to 10.000 parts even of London sewage, effects a rapid purification.

The addition of the other ingredients along with the permanganate has the object of expediting the process and of precipitating other impurities and living organisms upon which permanganate alone has no immediate action. It was found that moving organisms survived for more than a day in an intensely red solution of permanganate. This latter fact, however, though it shows that permanganate is of little use for soldiers on the march, does not disqualify it as an addition to the reservoirs and clarifying beds of a municipal water supply.

Remedy for Insect Stings.

A paint for the stings of insects, in which ammonia is kept in close and prolonged contact with the affected part, is prescribed as follows:

R. Aq. ammoniæ	m cl.
Collodion	gr. l.
Acid salicylici	gr. v.

A few drops to be applied to each bite or sting.

—Medical Chronicle.

Effects of Strong Electrical Currents.

M. Bernhardt, in the Centralblatt fur die Medicinischen Wissenschaften, has collected several instances of death by electricity. In one recorded by Dr. J. Kratter a man aged twenty-six was traversed by a current of high tension—1,600 to 2,000 volts—and was found breathing stertorously a few steps from the point where he made contact. Death soon took place. The post mortem examination, after the lapse of twenty-one hours from the time of death, disclosed two small wounds—one on the left index finger and the other on the back—and there were large extravasations of blood in their vicinity. All the organs of the body showed hypervenous blood, acute œdema of the lungs was present, and there were extravasations into the sheath common to the carotid and vagus, along all the vertebræ, into the intercostal spaces, around the œsophagus, beneath the peritoneum and elsewhere. The muscles of the body were in an extreme condition of rigor mortis; the heart was partially relaxed. No macroscopic changes could be seen in any part of the nervous system.

Kratter thinks that the electrical shock suddenly paralyzed the heart, which was the immediate cause of death, accompanied by œdema of the lungs causing hypervenosity of the blood. There was a marked contusion on the left side of the diaphragm at the point of contact of the heart. Experiments made on animals showed that in them the respiration was usually primarily arrested, which caused asphyxia and secondary stoppage of the heart's action, though sometimes the heart was first affected.

In a second case, reported by M. D'Arsonval, a man was struck with a current of 4,500 volts (the ampere meter indicated 750 milliamperes). The current entered at his hand and issued at his back. Half an hour or more elapsed before any attempts at resuscitation were made, but on artificial respiration being practiced on Silvester's method, recovery took place.

Lastly, Dr. Donnellan reports a case of the passage of a current of 1,000 volts through a man, which instantly caused coma, dilated pupils, pallor of the face, and sweating; delirium, and tonic alternating with clonic spasms followed. The pulse was 80. The respiration, at first stertorous, passed into the Cheyne-Stokes type. After the injection, first of morphia and then of strychnia, the patient fell into a deep sleep, from which he awoke convalescent.—Lancet.

Eye Mistakes.*

Conversation with other physicians convinces me that there is more real misunderstanding regarding the import of eye symptoms than concerning those of any other portion of the human body. Why this is so I can hardly apprehend, unless it comes from the fact that so many eye troubles are purely mechanical, and so are outside the sphere of ordinary medical thought and study. To many the eye seems also to be a mystery into whose sacred precincts they fear to enter, and the mechanical and optical principles which to the oculist seem so plain and easy are entirely overlooked or but dimly grasped by the general practitioner. This fact will be illustrated by the following common mistakes that are made regarding eye troubles.

One very common mistake is that of belittling the importance of ophthalmia neonatorum. Many are the children who have either been entirely blinded or have had their eyesight impaired for life by reason of carelessness or neglect. It is important that proper measures be taken to prevent its occurrence, for it is to a large measure a preventable disease. The physician should always know by inspection the exact state of the cornea in these cases, so that proper measures may be taken to prevent any impairment of its transparency. Unless a physician feels that he has the knowledge and is competent to treat such cases, he should call to his aid one who does know how.

Regarding the selection of glasses, the gravest mistakes are made. I frequently meet physicians of good general ability and large practice who not only encourage their patients but they themselves set the example of selecting such glasses as they seem to see best in, from any vendor that happens along, or into whose shop they chance to stray. In this respect they treat the eye with less consideration than they do their backs, since every one knows that to secure a comfortable and well fitting coat it is necessary that first there shall be definite measures made with the eye. They will put on glasses thus without any definite measurements whatsoever.

Now the simple truth is that proper measurements of the eye cannot be made by simple tests of the sight. The eye is an optical instrument set for seeing things far away, but provided with a focusing apparatus (the accommodation) by which it automatically can adjust itself to near objects. This power is a muscular one and is entirely involuntary. The eye always adjusts itself for the best seeing of any object at its distance.

*By E. M. Howard, M.D., Camden. N. J. Read before the New Jersey State Homeopathic Medical Society, and reported in the Hahnemannian Monthly.

It is just this fact that vitiates all attempts to measure its defects. It is like trying to measure the length of a rubber band that is constantly stretching and contracting. Hence it is that it is simply impossible to measure the refractive errors of the eye by any of the ordinary tests at the disposal of the opticians and spectacle venders. Every eye that needs a glass at all needs first of all to have its optical status accurately measured by an oculist who alone is able to determine what methods and means and drugs (mydriatics) are necessary and safe.

I suppose one reason why this truth is not really believed is because when the oculist utters it, it looks as though it was a scheme on his part to increase his business. This again is an error, for if every person were thus examined for glasses upon the first evidence of eye strain, a great mass of eye troubles would be prevented and the oculist's business would be immensely lessened. I will only mention in illustration that in this way those banes and specters of advancing age, senile cataract and glaucoma, would become almost unknown, since they are most probably always more or less directly the result of eye strain.

Another phase of eye mistakes is illustrated by the remark of a very able practitioner. He was speaking of a school wherein, through the vigilance of its teachers, a large proportion of the scholars were wearing glasses. His remark I cannot repeat, but it was made with a covert sneer, and the caustic hint that probably many of the children did not need them at all. Now I don't believe there are any oculists who are prescribing glasses when not needed. I have never found such a person nor such a patient so treated. The truth is that the error is all the other way, and that many eye defects of low degree are not corrected as they should be. The oculists have erred on the side of too few rather than too many spectacles. It seems difficult for the laity and even the practitioner of medicine to realize the enormous strain that modern civilization is placing upon the eye. It follows as certainly as does the day the night, that there must be an increasing amount of attention paid to the preservation of the sight, and congenitally defective eyes can and must be corrected by glasses to a much larger extent. But please remember all such work must be done upon a basis of accurate measurements. All other attempted corrections are worse than useless, and it is the duty of physicians to so warn and instruct their patients.

Grave mistakes are commonly made regarding the fitting of the frames for glasses. All frames ought to be so accurately centered and adjusted that the line of vision should be through the optical center of the lens, excepting, of course, those few cases in which the oculist purposely decenters in order to obtain prismatic effects. In other words, the center of the pupil of the eye should be behind the center of the lens. All cylindrical glasses must also be held at definite angles, and any deviation therefrom is disastrous. Unfortunately, well fitting frames are the exception and not the rule, with the result that the best selected glasses fail to relieve, and may, indeed, increase eye strain. To this may be added the deplorable fact that the cosmetic effects of ill-fitting frames are such as to enhance the natural aversion to the wearing of spectacles. Observation of the frequent manifest disfigurement of the features of such persons deters many ladies especially from thus wearing these much-needed helps. As a matter of fact, I think well-fitting glasses really add to, rather than detract from, the beauty of the features.

Quite a frequent mistake is made by practitioners regarding the import and cause of the various inflammations of the margins of the lids, such as blepharitis and herdeolum or sties, etc. Physicians go on prescribing for recurring attacks of these troubles, forgetful of the fact that their development is, in the great majority of cases, due to eye strain, and that it is glasses, and not medicines, that are needed.

Grave mistakes are very commonly made in the treatment of phlyctenular conjunctivitis. The first thing to be done is to remember that dietetic errors are always present, and that no good results will be obtained without a strict and carefully regulated diet taken at regular intervals. It must not be forgotten, also, that in addition to well selected constitutional remedies, atropine instillations will be required when photophobia is excessive.

It is easy to make serious mistakes in the diagnosis as well as the treatment of iritis and glaucoma.

Let me enumerate the classical symptoms which ought to lead to a certain diagnosis of iritis: Ciliary neuralgia, ciliary and subjunctival injections, showing fine, deep vessels radiating outward from cornea in straight lines, a discolored and sluggish iris—these point unmistakably to the trouble. And now comes the greatest and very common mistake of general practitioners in its treatment. Atropine is either neglected or given hesitatingly and in too weak solutions. It must be used early in sufficient strength to produce complete dilatation, or the eye will be more or less permanently ruined by adhesions of the iris to the lens. The only exception to this rule is the evidence of a beginning glaucoma, when atropine must be used cautiously, if at all. The differential diagnosis of iritis from glaucoma is not always so easily made.

The following are the chief diagnostic points of glaucoma in the order they will be likely to be observed: We will first notice that the pupil of the affected eye is dilated larger than the other eye, and that it is fixed, inactive, will not respond to light. The patient will complain of seeing a halo of rainbow colors, the outer ring being red and the inner bluish. It will be found that the cornea is lacking in sensibility, and this will lead to a test as to the tension of the eyeball, which will be found increased. An examination of the fundus will then be made for the characteristic cupping of the disk. To these symptoms may be added enlarged ciliary veins. A shallow anterior chamber, which can be easily made out by a side view of the front of the eyeball, and impairment of the right pons, are usually present, and are sometimes the most marked symptoms leading to the erroneous diagnosis and treatment for a simple neuralgia. But pons is not always a prominent symptom, as is commonly supposed, at least in the earlier stages, when a diagnosis is most valuable.

It is a grave mistake to overlook and neglect these cases and no physician should attempt to treat them without a thorough knowledge of the benefits and limits of an iridectomy, which alone, in many cases, can save the sight.

Saturated Waste for Oiling Cars.

Mr. B. Haskell, superintendent of motive power on the Chicago & West Michigan and the Detroit, Lansing & Northern Railway, is using burlap for packing tender and engine truck boxes. The material is the burlap or sacking that the baled waste is wrapped in. The material is springy and will not mat. Its elasticity keeps it up in contact with the journal and its texture permits the oil to pass through it freely. The material is cut up quite fine preparatory to use. Mr. Haskell writes the Railway Engineering and Mechanics that he finds it to be equally as good as woolen waste and it has the advantage of costing nothing. He furnishes his trainmen with saturated waste instead of oil for oiling cars. To prepare this waste he has built a special tank. It is circular and will hold about six barrels of oil. A coil of steam pipe is run around the inside of the tank, and a shelf of stack netting is secured on one side. About two barrels of oil is put in the tank and waste enough to absorb that quantity of oil. Steam is then turned on and the oil heated slightly, making it thin enough to be absorbed readily by the waste. It is then allowed to soak for at least twenty-four hours, and after being again heated, the waste is put on the shelf to drip. The second heating is to make the waste drip more quickly than it otherwise would. A little experience in heating the oil will enable the operator to prepare it so that the oil will drain from the waste without any handling or pressing. It has been found so convenient that since the plan has been adopted the trainmen are not given oil, but saturated waste instead, and the cost of oiling cars has been greatly reduced thereby.

Ancient System of Manufacturing Salt in Mexico.

Mr. James Mactear describes, in a recent number of the Journal of the Society of Arts, a very ancient method of manufacturing solar salt, which is still carried on in Mexico, near a village called Ixtapa de la Sal, in the State of Michoacan. The village lies at an elevation of 4,200 feet above the sea in a volcanic district, and brine is found at various points oozing from the rocks and in pits which are dug for the purpose of collecting it.

The method of evaporation is very curious and interesting: the small hills are terraced, and on the broad steps thus formed flat-topped stones or bowlders, chiefly of a black close-grained volcanic rock, are carefully arranged and leveled. On the flat surface of each of these stones a small ring of clay is built up about an inch high, and in the small vessel thus formed the brine is evaporated. There are many thousands of these to be seen close to the road. The evaporation takes about four days, the little vessels being filled from time to time by men who carry the brine up from pits in the valley in large earthenware jars. The salt is of very large grain and, as might be expected, rather dirty in appearance; but the production of the district is very considerable, and the method dates back to time immemorial.

Home Made Powder.

The Naval Ordnance Bureau is greatly gratified with the excellent results it is obtaining from the 6 inch samples of smokeless powder, manufactured at the government manufactory, Newport. This powder was fired in a 6 inch gun, 40 calibers in length, with the ordinary charges and ordinary weight of projectiles. It gave a velocity of 2,344 ft.-sec., with 12·6 tons pressure in one round; 2,407, with 13·8 tons pressure, in a second; and 2,495, with 15·1 tons pressure in the third. Altogether this is very gratifying, and the experts are proud of it.