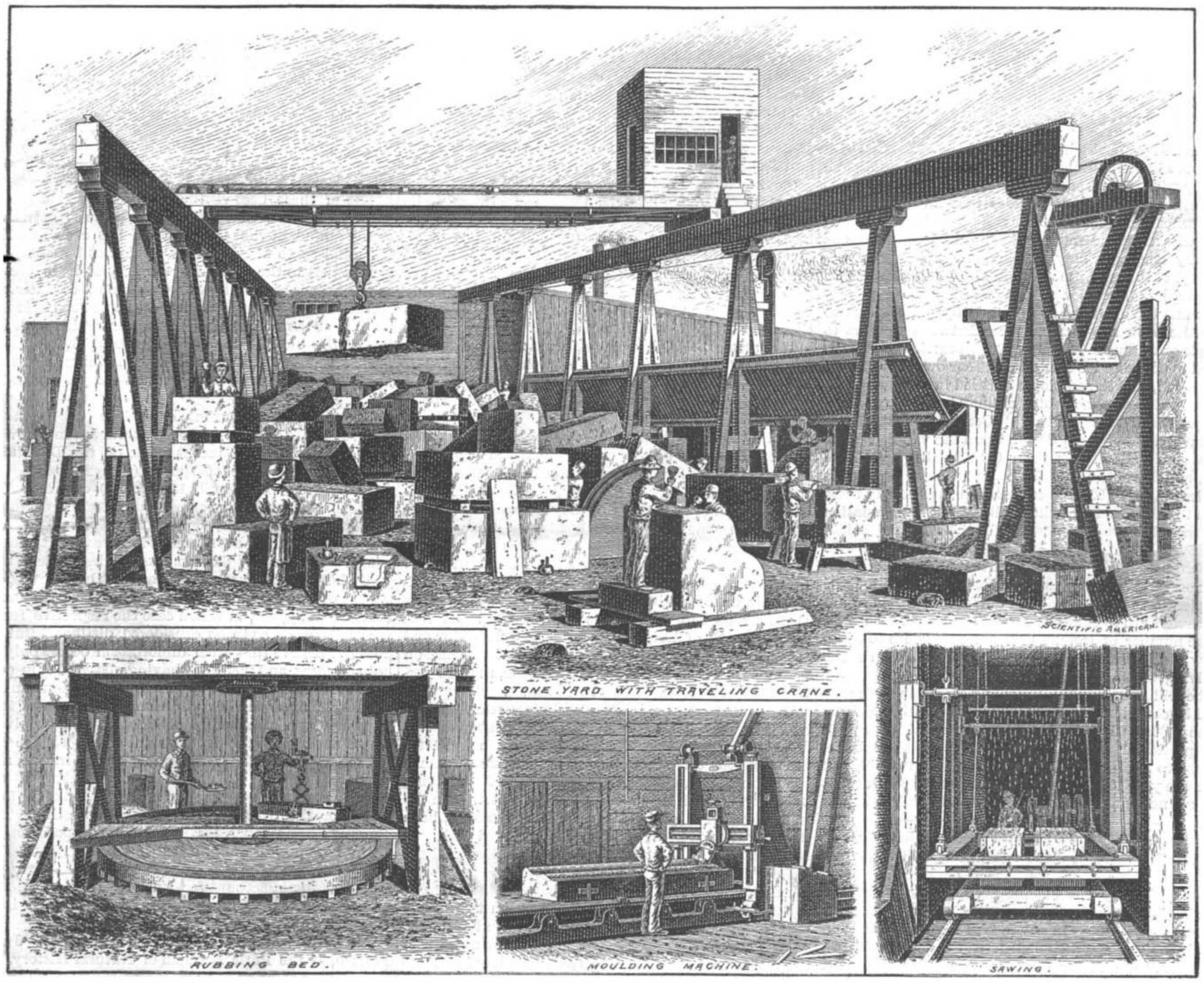
STEAM STONE WORKS.

The illustrations of this subject are taken from the plant of Barr, Thaw & Fraser, Hoboken, N. J. The elevated track is about 20 feet in height and 150 feet in length, and made mostly of 12 by 12 timber. The traveling crane is also made of 12 by 12 timber, and braced with heavy circular rods. It is 52 feet across from side to side and 12 feet in width. Connected to the end of crane are two 3 foot car wheels, which, when set in motion, run back and forth on steel rails. The crane is set in motion by means of an endless wire cable. The ¾ inch cable passes around a 6 foot sheave wheel, which is connected to the main shafting. The upper wire of cable runs up through the bottom of the building on the end of crane and around another 6 foot wheel, and down and out again to the 3 foot sheave wheel at the end of elevated track, where it passes back again to large wheel on the main shafting. The large sheave wheel in the crane building is connected to a piece of shafting, which, by means of belting, connects with the car wheels. By drawing a lever back and forth, and the wire being continually in motion, the shifting of the belting caused by the moving of the lever causes the crane to move backward or forward. The carriage and fall blocks run on 3 foot tracks across the center of crane, and are moved back and forth by wire cables also. These wires are attached to two drums in the crane building. One of the drums is used for drawing the carriage block back and forth by means of a 3 foot sheave wheel on the end of crane. The other drum is used for hoisting the stone. The crane is made to run evenly by means of gearing wheels, one being attached to one of the forward car wheels, and the other to a piece of shafting which runs across the crane and connects with the machinery in the building. The crane is capable of carrying from 15 to 20 tons.

The rubbing bed is a circular sheet of cast iron about 8½ inches in thickness and about 13 feet in diameter. It revolves around inside of a circular wooden frame called a curve. The rubbing bed when put together is in two pieces. Cast to the bottom of the upright shaft are a number of flanged arms, which project out 7½ feet each way. The rubbing bed is laid on and bolted on the under side to these arms. The lower end of the upright shaft revolves around in a ball socket. The upper end is geared to the main shafting. The blocks of stone are placed on the bed by hand, or by a small derrick, until the surface of the stone is smooth. Water and sand is used for the rubbing. Hot water is used when the weather is cold. The tools for moulding and grooving are of various shapes, generally chisel shaped, and are made of steel. They run from 8 to 12 inches in length.

The rough stone is first placed on the perforated iron table of the moulding machine and made perfectly fast by means of wooden wedges. The machinery is then started and the table and stone move forward, and the chisels begin to cut out their work. As they cut, the stone crumbles up into powder and small chips. After the chisels have gone over the stone the table is run back, the chisels shifted, and the stone started again. The chisels can be regulated to cut shallow or deep. The face of the stone becomes perfectly smooth after the chisels have gone over it. The stone blocks to be sawed are first placed on a car and run under the sawing shed. The cars are about 1½ foot in height, about 5 feet in width, and about 8 feet in length. They are put into position and then blocked fast. An 8 by 13 foot saw frame is then lowered so that the saws rest on the stone. The saws are made of ¼ inch steel, and are 13 feet in length and about 6 inches in width. They have no teeth, being flat both top and bottom. Connected to the center of one end of the saw frame is a wooden connecting rod, with crank and fly wheels. This connects with the main shafting by means of belting. When the wheels revolve, the connecting rod draws the saw frame back and forth, and the weight of the frame causes the saws to cut. A little sand and shot or crushed steel keeps the saw biting until the stones are sawed through. Water is kept constantly running on the stone by means of a perforated iron pipe placed about 4 feet above and across the stone. This pipe has the same motion as the saw frame when running, keeping the whole surface of the stone wet. When the stone is sawed through, the frame is raised by means of a belt chain. The stone is then washed clean, and the car drawn out to be replaced by another. The works are run by a 45 horse power engine, with 80 pounds steam. The plant cost about $30,000.



ILLUSTRATIONS OF STONE CUTTING, SAWING, AND POLISHING.

The Deadly Alternating Current.

A peculiar fatality at a fire in New Orleans is thus described: The wind was blowing hard and made fire fighting a hard task. Chief O'Connor was in charge and was directing Matthew Hannon, a hoseman of Columbia, No. 5, who was playing a stream of water on the fire. The chief took the brass nozzle and continued pumping on the blazing debris, while Hannon went to recover his hat, which had blown off. About this time a telephone wire fell and hung down in the doorway. The chief paid no attention to it and continued pumping. Suddenly he struck the wire with the stream. The water proved to be an excellent conductor, for a current of electricity ran down the stream and the brass nozzle and through the chief. The telephone wire was crossed with an electric light wire. The chief for a few seconds was stunned. Meantime Hannon had secured his hat, and came back to continue his fight on the fire. Unconscious of his danger he bounded to the chief's side, and as he did so the swinging wire struck him on the shoulder. He cried, "Oh, my God!" and threw out his arms. The wire swung away from him, but rebounding came in contact with Hannon's left arm. The unfortunate man shrieked once more, and then, as if to throw the deadly wire from him, he grasped it with both hands, and without a moan fell face downward, dead. One thousand people saw Hannon die, and the ordeal was so terrible that the firemen were for a time demoralized.

Remedy for a Cold.

In the SCIENTIFIC AMERICAN of December 2, 1876, we published the following remedy, which a correspondent, who has derived benefit from it, asks us to reprint:

The medical journals, last spring, published repeatedly the formula for Dr. Ferrier's new remedy for cold in the head. As the season for that distressing malady is at hand, we print the recipe, which is:

Trinitrate of bismuth, 6 drachms; pulverized gum arabic, 2 drachms; and hydrochlorate of morphia, 2 grains.

This is used as a snuff, creates no pain, and causes, says the London *Lancet*, the entire disappearance of the symptoms in a few hours.

The President on Car Couplers.

Railroad men of all shades of politics will find interest in the following extract from President Harrison's message:

"I have twice before urgently called the attention of Congress to the necessity of legislation for the protection of the lives of railroad employes, but nothing has yet been done. During the year ending June 30, 1890, 369 brakemen were killed and 7,841 maimed while engaged in coupling cars. The total number of railroad employes killed during the year was 2,451 and the number injured 22,390. This is a cruel and largely a needless sacrifice. The government is spending nearly one million dollars annually to save the lives of shipwrecked seamen. Every steam vessel is rigidly inspected and required to adopt the most approved safety appliances. All this is well, but how shall we excuse the lack of interest and effort in behalf of this army of brave young men who in our land commerce are being sacrificed every year by the continued use of antiquated and dangerous appliances? A law requiring of every railroad engaged in interstate commerce the equipment each year of a given per cent of its freight cars with automatic couplers and air brakes would compel an agreement between the roads as to the kind of brakes and couplers to be used, and would very soon and very greatly reduce the present fearful death rate among railroad employes."

The *American Journal of Railway Appliances* discusses this proposition editorially, as also the bill which has been introduced by Senator Cullom, of Illinois, evidently with the purpose of carrying out the President's suggestions. This bill provides that all common carriers whose duties include the coupling of cars, and persons who are members of established organizations of railway employes, may within six months after the passage of this act vote upon the choice of an automatic car coupler. Such coupler may be of the vertical type, but must be so devised as to couple by impact, and to dispense with any person going between the cars to couple or uncouple. Every common carrier is to be entitled to one vote for every freight car owned, leased or controlled, and the employes entitled in the aggregate to one-third as many votes as may be cast by all the common carriers, the Interstate Commerce Commission to have the power to decide upon the validity of the votes cast. If not less than 600,000 votes have been cast, and the entire vote for any particular coupler is not less than 500,000, the commission shall certify these facts to the President, who shall issue a proclamation declaring the coupler chosen to be the standard safety car coupler for use in interstate commerce, and in case no choice is made the President shall appoint a commission of five competent persons to determine the coupler best to be used. The bill further provides that all carriers are to equip at least 10 per cent each year of the number of freight cars used, and also to equip every engine with the lower brake known as the "driving wheel brake."

The bill provides further that a violation of the act shall be considered a misdemeanor, and punishable by a fine of $500. The commission may extend the time to any particular company within which it shall be required to comply with the provisions of the bill, and after the year 1900 any company may refuse to accept any car not equipped as required by the bill.

Influenza a Hundred and Sixty Years Ago.

An Italian correspondent reminds us of the historic epidemic of influenza in Milan between the years 1730–33, described by the contemporary physicians, Drs. Gagliardi, Bellegatta, and Crivelli. The last named, a Milanese practitioner in advance of his time, found in the air the "chief and efficient cause of the influenza visitation." In 1730 and 1733 the climatic conditions were as nearly as possible the same as those prevalent in the last two epidemics in Italy; that is to say, a mild temperature, the sirocco wind predominant, and much humidity, with fog and rainfall alternating. Dr. Crivelli's description of the symptoms of an influenza patient might (our correspondent says) be transcribed from the phenomena of to-day:

"Gravedo and coryza, general languor with indisposition to exertion of any kind, loss of appetite even in presence of the daintiest viands, pain in the sinciput, giddiness, dimness of eyesight, high fever, with rigors and *horripilatio* extending over the whole body; cough sometimes moist, sometimes dry enough to induce a choking sensation."

These symptoms, not very grave in themselves, says Dr. Crivelli, are apt to reach an acute and even pernicious stage—"the patient finding himself suddenly oppressed with a suffocating catarrh (*un catarro soffocativo*), or, in other cases, with a pleurisy, or a pleuro-pneumonia. One patient falls as by an apoplectic stroke, another complains of intolerable cephalalgia—the old, the phthisical, the asthmatic, rarely outriding the storm." It would be difficult to give a truer account of the course and issue of the influenza cases now occurring at this hour in the Alta Italia. Dr. Crivelli further shows himself ahead of his age in his severe condemnation of indiscriminate venesection, stigmatizes the abuse of diluents, and rests his system of treatment on vigilantly regulated diet and the support of nature. Of course, he used heroic measures when time was precious—even blood-letting when engorgement of the circulation was a distressing sympton—and he found great efficacy in the Hippocratic prescription: "Alvus curanda est per clysterem subducentem et frigefacientem." Other less rational measures he also recommends, taken from a pharmacopœia happily superseded. But, according to the lights available at the time, he seems to have been a thoughtful and ingenious clinician, and his treatise has a quite special interest for the student of the history of medicine.—*The Lancet.*

Natural History Notes.

Animals and Steam.—In a German engineering journal a writer contrasts the behavior of different animals toward steam machinery thus: The ox, that proverbially stupid animal, stands composedly on the track of a railway without having any idea of the danger that threatens him; dogs run among the wheels of a departing railway train without suffering any injury; and birds seem to take a particular delight in the steam engine. Larks often build their nests and rear their young under the switches of a railway over which heavy trains are constantly rolling, and swallows make their home in engine houses. A pair of swallows have reared their young for a year in a mill where a noisy 300 horse power engine is working night and day, and another pair have built a nest in the paddle box of a steamer which plies during the season between Pesth and Semlin.

Observations on the Camel.—In a recent paper on the camel, Herr Lehmann refers, among other things, to its relations to temperature and moisture. Neither the most broiling heat nor the most intense cold nor extreme daily or yearly variations hinder the distribution of the camel. It seems, indeed, that the dromedary of the Sahara has better health there than in more equably warm regions; though, after a day of tropical heat, the thermometer sometimes goes down several degrees below freezing point, and daily variations of 90 degrees occur. In Semipalatinsk again, where the camel is found, the annual variation of temperature sometimes reaches 187 degrees. In Eastern Asia, winter is the time the animals are made to work. In very intense cold, they are sewed up in felt covers. Of course each race of camel does best in the temperature conditions of its home; a Soudan camel would not flourish in Northeast Asia. Camels are very sensitive to moisture. In the region of tropical rains they are usually absent, and if they come into such with caravans, the results of the rainy season are greatly feared. This sensitiveness expresses itself in the character of the different races. The finest, most noble-looking camels, with short silk-like hair, are found in the interior of deserts, and they cannot be used for journeys to moist regions. Even in Fezzan (south of Tripoli) the animals are shorter and fatter, with long, coarse hair; and in Nile lands and on coasts it is the same. These animals, too, are less serviceable as regards speed and endurance.

Water Beetles Found in an Old Gasometer.—An interesting note is published in the *Entomologist's Monthly Magazine* for March, 1890, which indicates that *Dytiscus marginalis* may live under extraordinary conditions. A number of specimens were found living in rusty water at the bottom of a hole left when the iron casing of a gasometer had been removed, both water and mud being strongly impregnated with gas. Mr. T. H. Hall, the writer of the note, who secured the specimens, states that they carried a strong odor of gas, even after they had had two or three baths of fresh water. The old gas holder must have been their home for a long period of beetle life, judging from the time of year when they were found and from the number of both sexes seen. The water was partly inclosed and was quite stagnant, being unconnected with any other water. They could have migrated had they desired to do so. They were quite active, and seem undoubtedly to have remained entirely from choice.

Composition of Chlorophyl.—Mr. N. Monteverde has made a series of experiments for the purpose of determining the number of distinct pigments present in an alcoholic solution of chlorophyl. If an alcoholic extract of green leaves is treated with baryta water and the precipitate extracted with alcohol, the solution has a yellow color. If this is again shaken with petroleum ether after the addition of a few drops of water, a separation takes place of the yellow pigments, the petroleum ether having taken up the carotin, identical with the coloring matter of the carrot, together with the green pigment, while the alcohol contains the xanthophyl. The pigments contained in the petroleum ether are termed by the author "upper pigments," those contained in the alcohol "lower pigments." By careful manipulation the whole of the green pigment (upper green pigment) can be removed by treatment with alcohol from the petroleum extract, leaving behind a golden-yellow solution of carotin; this "upper green pigment" is not capable of crystallizing. The alcoholic solution contains, in addition to xanthophyl, a "lower green pigment," which crystallizes in tetrahedra, hexagons, or stars, but most usually in irregular forms. The author believes that living leaves contain only the "lower green pigment," the "upper green pigment" being a transformation product resulting from the action of boiling water or of alcohol.

Duration of Life of Various Animals.—Elephants, 100 years and upward; rhinoceros, 20; camel, 100; lion, 25 to 70; tigers, leopards, jaguars, and hyenas (in confinement), about 25; beaver, 50; deer, 20; wolf, 20; fox, 14 to 16; llamas, 15; chamois, 25; monkeys and baboons, 16 to 18; hare, 8; squirrel, 7; rabbit, 7; swine, 25; stag, under 50; horse, 30; ass, 30; sheep, under 10; cow, 20; ox, 30; swans, parrots, and ravens, 200; eagle, 100; geese, 80; hens and pigeons, 10 to 16; hawks, 30 to 40; crane, 24; blackbird, 10 to 12; peacock, 20; pelican, 40 to 50; thrush, 8 to 10; wren, 2 to 3; nightingale, 15; blackcap, 15; linnet, 14 to 23; goldfinch, 20 to 24; redbreast, 10 to 12; skylark, 10 to 30; titlark, 5 to 6; chaffinch, 20 to 24; starling, 10 to 12; carp, 70 to 150; pike, 30 to 40; salmon, 16; codfish, 14 to 17; eel, 10; crocodile, 100; tortoise, 100 to 200; whale, estimated, 1,000; queen bees live 4 years; drones, 4 months; worker bees, 6 months.

The Bumble Bee in New Zealand.—The introduction of the bumble bee into New Zealand a few years ago to secure the fertilization of the red clover, and the remarkable success of this venture, are matters of record. In a recent paper in the *New Zealand Journal of Science*, noticed in the *Entomologist's Monthly Magazine* for May, 1891, Mr. George M. Thomson, F.L.S., presents an interesting article on the introduced Bombi in New Zealand, giving also a list of the plants and flowers which are visited by these bees. He makes the interesting statement that, with a few exceptions, he has never heard of these bees visiting the flowers of indigenous plants, but states that they have become so extraordinarily abundant that the question has even arisen in his mind as to whether they would not become as serious a pest to the apiarist as the rabbits have proved to the farmer and cultivator, on account of their absorbing so much of the nectar of the flowers. He also points out the remarkable fact in connection with the life of the bumble bee in New Zealand, that in many parts of the colony it does not seem to hibernate at all, but is to be seen daily on flowers all the year round.—*Insect Life.*

Occasional Development of Wings in Normally Apterous Hemiptera.—Mr. J. W. Douglas, in a review of Mr. F. B. Pascoe's recent work on the Darwinian theory of the origin of species (*The Entomologist's Monthly Magazine*, April, 1891, p. 109), calls attention to the statement that "some of our Hemiptera, *Nabis*, *Pithanus*, *Pyrrhocoris*, etc., ordinarily wingless, are sometimes found in hot summers to have well developed wings." As Mr. Douglas remarks, all these species normally have rudiments of elytra, but there are other species quite apterous in which at times macropterous individuals appear, in which case the respective forms are so divergent as to be considered distinct. But he does not believe that such dimorphism occurs only in hot summers, and mentions having observed it in cold seasons also, when there was nothing exceptional in the weather to favor such development. He believes that at present no satisfactory explanation can be given. May it not be that the development of wings is dependent somewhat on the food supply of the insects, and they are produced to enable a more extended migration, rendered necessary by a diminution of the food supply or the overdevelopment of the species? The abnormal appearance, locally, of winged specimens of a wingless species cannot be satisfactorily explained by the theory of a reversion to a winged ancestral type, since this would account for isolated cases, but would hardly explain the general appearance of winged individuals.—*Insect Life.*

Preservation of Botanical Specimens.—Mr. Jules Poisson, of the Paris Museum of Natural History, recommends a solution of 30 grains of salicylic acid in 1 quart of water for the preservation of specimens of plants in their natural form and color.

Ether as an Assistant of Digestion.

The effect of ether on the digestive processes in healthy subjects has been recently investigated by Dr. Gurieff, who gave thirty drops of sulphuric ether to six healthy persons during dinner, which consisted of about half a pint of soup, four ounces of meat, and six ounces of bread. It was found that the ether had the effect of stimulating the action of the gastric glands, increasing the free hydrochloric acid in the gastric juice, and causing the peristaltic movements of the stomach, together with its power of absorption, to increase; thus on the whole exercising a favorable effect upon the gastric digestion. The same result was obtained when the ether was administered by means of hypodermic injections. It would appear, therefore, that the effects must be ascribed to a general rather than to any merely local action on the mucous membrane of the stomach. Dr. Gurieff is disposed to think that there is a stimulation of the cephalic centers. This view is partly based on the observations of other Russian observers—Bekhtereff and Miloslevski, and Pavloff and Shumova-Simanovskaya—on the dependence of the gastric functions upon the central nervous system.—*Lancet.*

What is Electricity?

The average man will be glad to know that such an authority as Prof. William Crookes, President of the Institution of Electrical Engineers, England, is yet in doubt as to the various theories advanced to explain the electric phenomena. He says: "We know little as yet concerning the mighty agency of electricity." In his recent presidential address there is much of interest to the engineer, and we quote the following from the *Railroad Gazette:*

"We have happily outgrown the preposterous notion that research in any department of science is mere waste of time. It is now generally admitted that pure science, irrespective of practical applications, benefits both the investigator himself and greatly enriches the community. 'It blesseth him that gives and him that takes.' Between the frog's leg quivering on Galvani's work table and the successful telegraph or telephone there exists a direct affiliation. Without the one we could not have the other.

"We know little as yet concerning the mighty agency of electricity. 'Substantialists' tell us it is a kind of matter. Others view it, not as matter, but as a form of energy. Others, again, reject both these views. Prof. Lodge considers it 'a form or rather a mode of manifestation of the ether.' Prof. Nikola Tesla demurs to the view of Prof. Lodge, but thinks that 'nothing stands in the way of our calling electricity ether associated with matter, or bound ether.' High authorities cannot even yet agree whether we have one electricity or two opposite electricities. The only way to tackle the difficulty is to persevere in experiment and observation. If we never learn what electricity is, if, like life or like matter, it should remain an unknown quantity, we shall assuredly discover more about its attributes and its functions.

"Experimentalists are reducing the wave lengths of the electrical rays. With every diminution in size of the apparatus the wave lengths get shorter, and could we construct Leyden jars of molecular dimensions, the rays might fall within the narrow limits of visibility. We do not yet know how the molecule could be got to act as a Leyden jar, yet it is not improbable that the discontinuous phosphorescent light emitted from certain of the rare earths, when excited by a high tension current in a high vacuum, is really an artificial production of these electrical rays, sufficiently short to affect our organs of sight. If such a light could be produced more easily and more regularly, it would be far more economical than light from a flame or from the arc, as very little of the energy in play is expended in the form of heat rays. Of such production of light, nature supplies us with examples in the glow worms and the fireflies. Their light, through sufficiently energetic to be seen at a considerable distance, is accompanied by no liberation of heat capable of detection by our most delicate instruments.

"Alternating currents have at the best a rather doubtful reputation, but it follows from Tesla's researches that as the rapidity of the alteration increases they become not more dangerous, but less so. It further appears that a true flame can now be produced without chemical aid—a flame which yields light and heat without the consumption of material and without any chemical process. To this end we require improved methods for producing excessively frequent alternations and enormous potentials. Shall we be able to obtain these by tapping the ether? If so, we may view the prospective exhaustion of our coal fields with indifference. We shall at once solve the smoke question, and thus dissolve all possible coal rings. . . . Electricity seems destined to annex the whole field, not merely of optics, but probably also of thermotics. . . . Rays of light will not pass through a wall, nor, as we know only too well, through a dense fog. But electrical rays of a foot or two wave length of which we have spoken will easily pierce such mediums, which for them will be transparent."

The Physiology of Tears.

This subject is considered in a bright and interesting paper recently published in the *Asclepiad*. The editor of the New York *Medical Journal* condenses from the lengthy article as follows:

Fear, grief, and joy, to say nothing of pathos and anger, bring tears to the eyes. They are said to come from the heart: and this is true, for no one ever reasoned himself into weeping without a first appeal through the imagination to some emotion. Tears are the natural outlet of emotional tension. They are the result of a storm in the central nervous system, giving rise to changes in the vascular terminals of the tear-secreting glands. These changes induce profuse excretion of water, and weeping results. In a mild degree some excretion is always in process, to bathe eye and clear it of foreign matters. The controlling center is at a distance, though the secretion may be kept up by the small trace of saline substance that is present in the tears themselves. The lachrymal glands lie between the nervous center and the mucous surface of the eyeball. Tears afford a good illustration of the way in which nervous fibers are capable of conveying to a secreting organ exciting impulses from both sides of a gland lying in their course. Afferent and efferent communications bring about a similar result. Internal nervous vibrations and external excitation or reflex action cause a flow of tears. In both instances the exciting impulse is a vibration. Niobe, "all tears," and the unfortunate pedestrian with a minute particle of steel from the rail of an elevated road in his eye, are unwilling exponents of a similar process. They weep the same kind of briny fluid, in exactly the same way, though from widely different causes. Imagination is at times sufficient to excite the nervous system into the production of tears, without external aid or reflex. Writers and readers of good fiction weep over it alike, and the actor loses himself so entirely in the exigences of dramatic art that he sheds real tears and the audience shed tears with him. Of a truth, the man who never weeps has a hard heart, and the quality of his intellect may also be questioned.

Emotion, then, affection, grief, anxiety, incite to tears, not pain or discomfort. The pangs of maternity are tearless, though the influence of ether or chloroform may cause some emotional dream that results in weeping. In the earlier days of surgery patients might scream and utter such pitiful cries as to sicken the bystanders, might even faint with pain, yet there were seldom any tears. These, being pure waves of emotion and a relief to the heart, are almost powerless to mitigate pain. Perhaps one who weeps from pain does so from unconscious though selfish pity—in other words, from emotion.

For the tearful, change of scene, mental diversion, and out-door life are the best remedies. The author quoted objects to alcohol as fearfully injurious. It disturbs and unbalances the nervous system, keeps up a maudlin and pitiful sentimentality, and sustains the evil. Alcohol is the mother of sorrow. An opiate, however, prescribed at night, soothes and controls and really disciplines rebellious nerve centers. Sleep cures tears. And so does time, the restorer. Persons subjected to many and repeated griefs forget how to weep, and the old as compared to the young are almost tearless. Tears have their value in the life of humanity, not as tears but as signs. They show that grief centers are being relieved of their sensibility, and that the nervous organization is learning how to bear up against sorrow.

Poisonous Metals in Preserved Foods.

The fact that the amount of lead in the tin coating of vessels for preserved foods, and that in the solder with which they are united, have been limited by law in Germany to 1 per cent and 10 per cent respectively, has caused the adoption of vessels closed without a soldered joint, a rubber ring being substituted instead. The author having observed that preserved foods contained in vessels of this description, which appeared unexceptionable, were often contaminated with lead, has examined into the cause of its presence, and finds it to be due to the rubber ring employed.

The following examples are chosen from among the figures quoted by him: (1) India rubber rings made in Paris and used by a large German firm, (*a*) average weight of ring, 0·5 grm.; ash 66·6 per cent, consisting almost wholly of red lead; no antimony sulphide was present. (*b*) An experiment was made by exposing a rubber ring to water under pressure at a temperature of 110° to 112° C. for thirty minutes; at the end of this time the ring was found to be softened and 0·0286 grm. red lead (misprinted Mn_3O_4 in original) was suspended in the water, which contained no lead in solution. (*c*) Another ring was similarly treated in the presence of 0·5 kilo. of asparagus. The solution gave an immediate precipitate of lead sulphate on the addition of sulphuric acid; the quantity of lead in solution corresponded to 60 per cent of the total amount in the ring. (2) India rubber rings taken from tins of Australian meat from a large English firm had the same composition as those mentioned under (1). (3) Red rubber rings from Vienna contained 63 per cent of ash, the bulk of which was red lead. (4) Red rubber rings from a German factory gave similar results, save that a little antimony sulphide was present. (5) Numerous analyses of rings from other German firms gave similar figures.

In view of these facts the author is interesting himself in the manufacture and use of rings of a less poisonous character.—*W. Reuss, Chem. Zeit.; Analyst.*

American Salt.

The total production of salt in the United States for the year 1891 was 10,229,691 barrels, valued at $5,872,186. The importations were about 800,000 barrels, chiefly from England.

The finest salt is made by the vacuum pan process. About four-tenths of the American production are due to Michigan, four-tenths to New York, not quite one-tenth to Kansas, and the remainder to Ohio, West Virginia, Louisiana, California, Utah, Nevada, Texas. Perhaps the most wonderful deposit of salt in this country is at Petite Anse, La., where, at a depth of sixteen to twenty-five feet below the surface, a deposit of salt over 1,000 ft. thick is found. This salt is of remarkable purity.

The Census of 1891 in Canada.

According to the Canadian Census Department the population of Canada, by provinces, is as follows:

		Percentage of Inc.
Nova Scotia	450,523	2 25
New Brunswick	321,294	0·02
P. E. Island	100,088	0·18
Quebec	1,588,856	9·53
Ontario	2,112,989	9·95
Manitoba	154,442	148·06
Assiniboia, Alberta, Saskatchewan	67,554	164 76
British Columbia	92,767	87·56
Unorganized	32,168	4·00
Total	4,829,411	11·66

THE TEN LARGEST CITIES.

		Inc. p. c.
Montreal	216,650	39·5
Toronto	181,220	88·4
Quebec	63,090	1·0
Hamilton	48,980	36·2
Ottawa	44,154	41·0
St. John	39,179	5·2
Halifax	38,556	6·8
London	31,877	21·7
Winnipeg	25,642	221·1
Kingston	19,264	36·7

There are 47 cities, their population varying from 216,650 at Montreal to 5,042 in Port Hope; 45 towns having from 4,940 (at Collingwood) to 3,061 (at Walkerton); 91 villages, headed by Picton, N. S., with 2,999, and Georgetown at the foot with 1,509.

The Trust Fallacy.

Trusts are not a creation of modern times by any means. They have existed at least from the beginning of the present century, or, rather, they have attempted to exist during the period named, but, as a rule, signally failed. A partisan writer, in an article that recently appeared in one of the largest and most influential newspapers in the country, attempted to show that trusts were a good thing for the public. At the outset he argued that trusts could by no means injure the small manufacturers, for the reason that they could dispose of their plants and become shareholders in the trust. He therefore claimed to be puzzled to understand why it was that the people protest so vigorously against such combinations of capital. He further argued that the consumer was really benefited by the formation of a trust, and upon this point it is interesting to dwell, for the simple reason that it has never been made clear to the general public why the average trust reduces prices upon the production it has cornered, immediately upon its formation. In completing a great trust all of the stronger manufacturers are invited to join; then the weaker ones are given an opportunity to sacrifice their property or to be driven out of business. Self-preservation is the first law of nature, and it is the most natural thing in the world for these smaller manufacturers to fight back. The trust is all-powerful, with millions at its back, and in order to silence the weaker enemy's guns, prices are put at a figure below the cost of production, and the smaller manufacturers go to the wall. During the battle there is no question but what the public profit largely, or could profit largely, if it took advantage of existing prices, and bought up all the products in sight. That is just what the public does not do, however, and when the trust has crushed all opposition out of sight, up go prices and the consumer finally pays back into the treasury of the trust the money it has expended in crushing those who dared to oppose it. There is really no argument that can be adduced favorable to a trust. A trust is an entirely different thing than a combination of capital. It is the coming together of all the powerful wings of a certain industry, to crush out the weak, and monopolize certain productions in order that it may fix prices as it pleases. The proposition trusts are formed in order to benefit the consumer is so ludicrous that it is scarcely worth considering. The writer endeavored to make a point to the effect that a trust was not a profitable thing after all, by stating that Standard Oil paid but 6 per cent dividend. Now the fact of the matter is that in recent years the Standard Oil trust has paid not less than 10 per cent, and last year paid 12 per cent dividends upon the capital invested.—*Stoves and Hardware Reporter.*

Cork Pavement.

A new material for paving is now being introduced into London. It is composed of granulated cork and bitumen pressed into blocks, which are laid like bricks or wood paving. The special advantage of the material lies in its elasticity. When used for pavement it gives a soft tread which is exceedingly pleasant, recalling the feel of a carpet. In roadways it furnishes a splendid foothold for horses, and at the same time almost abolishes the noise which is such an unpleasant feature of city traffic. A short piece of pavement is to be seen in Liverpool Street, E. C.; while the outlet to Pickford's yard in Gresham Street is laid with this material. It yet remains to be seen how it will bear the ordinary traffic of a London street, but there is evidence to show that in Australia short pieces of roadway have given good results.