

IMPROVED FRUIT EVAPORATOR.

The annexed engraving represents a very simple and efficient fruit evaporator, recently patented by Mr. William H. Reed, of Cliffdale, Ill.

This apparatus consists of a reel adapted to receive in its double arms a series of fruit crates, the reel being supported on a shaft in a heating chamber, and rotated so as to bring the crates successively over the heater and to create a current of air which rapidly carries off the moisture from the fruit. The heating chamber is fitted with a ventilator at the top, and air inlets at the sides, about the shaft. The bottom of the furnace at the sides is filled in with fire resisting clay to carry the heat of the furnace directly up to the reel without great loss by radiation. There are air supply openings with dampers at the lower part of the heating chamber for supplying the amount of air required.

The chamber may be heated in various ways, either by a furnace, as shown in the engraving, or by means of a stove or by steam. The crates which fit into the radial arms are provided with wire gauze sides, so that the air has access to all sides of the fruit as it is carried around by the reel.

The capacity of this machine may be increased by extending the shaft and adding sections to the reel. In this case the sections are geared so that any one may be stopped or revolved without interfering with the others.

This evaporator is very rapid in its operation, and produces uniform evaporation without shifting the crates, and without special attention. The reel is revolved by suitable power or by hand.

Further information in regard to this invention may be obtained by addressing the inventor as above.

To Detect Alcohol in Oils.

To detect alcohol in oils, take a slim glass tube eight or ten inches in length, closed at one end, and as large as your finger. Put in an ounce or two of oil, paste a piece of paper on the outside of the glass, so that its lower edge will be even with the top of the oil, then add two or three times as much soft water, and shake well for a few moments. When it has settled, in an hour or so, the water will have absorbed the alcohol from the oil, which will show proportionately below the line first fixed.

HERRINGTON'S SYSTEM OF TRANSPORTATION AND DELIVERY.

A ready means of transporting articles for short distances is shown in the engraving. The device is more particularly designed for receiving and delivering parcels of goods, groceries, provisions, milk, etc., but it may be used to great advantage in manufactories and in many other places. The apparatus is so simple as to scarcely need description, consisting of a carrier, a wire or cable upon which the carrier runs, and a device at each end of the wire or cable for raising and lowering it to secure the elevation necessary to cause the carrier to run along the wire or cable. At each end of the cable there is a catch which retains the carrier at the end until the opposite end of the wire is lowered, when the wire becoming taut disengages the latch and releases the carrier. The article to be transported or delivered is suspended from the carrier and is moved along the wire by its own gravity.

In the present case the article being delivered is milk. The can is suspended from a hook on the carrier, and when the street end of the wire is raised by means of the cord running over the pulley on the post, the carrier moves forward toward the house end, where it is arrested by a rubber buffer and is retained by the spring catch before referred to.

Fig. 2 shows the arrangement of the pulley, carrier, catch, and buffer.

If the person at the house desires to operate the carrier, the method is the same as that already described.

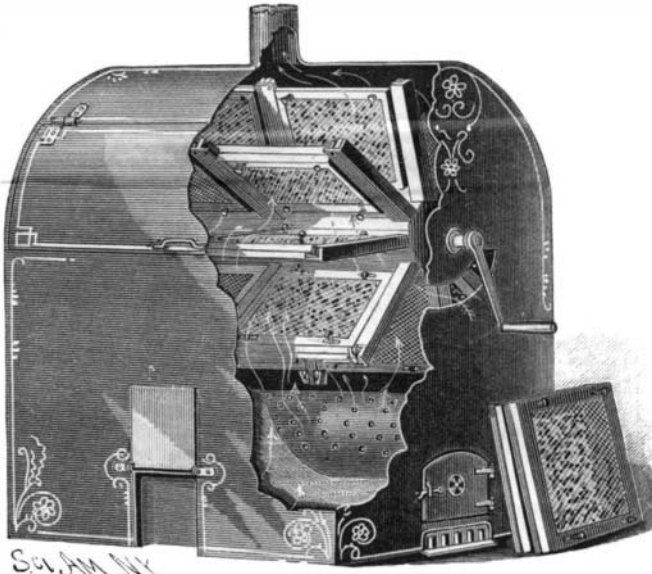
This device is very simple, easily constructed, and applicable to a great number of uses. It is capable of saving a great deal of labor, and may be profitably introduced in many places.

Mr. G. H. Herrington, of Wichita, Kas., is the patentee of this invention.

To prevent mould on the top of glasses of jelly lay a lump of paraffine on the top of the hot jelly, letting it melt and spread over it. No brandy paper and no other covering is necessary. If preferred, the paraffine can be melted and poured over after the jelly is cold.

Arago's Little Joke.

One day at the Academy of Sciences they had a long and tiresome session. Arago thought he would go out and take the air. At the foot of the stairway there was a leather bowl, upon which the rays of the sun were hotly beating. Arago turned the bowl round, and, rushing up stairs, told the distinguished assemblage that he had just met with something that was very mysterious. "That leather bowl," he said, "at the foot of the stairway is cool upon the side which presents itself to the sun, but warm upon the other side." The scientists descended in a body and substantiated this assertion. They took the inclination of the sun, the hour, the minute, the second, and a vast array of other details. They made calculations, and several

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weeks afterward each of them presented a paper explaining the phenomenon, Arago himself taking care to send in his explanation with the rest. There is no knowing how far the discussion might have gone had it not been for the door-keeper, who, having seen Arago turn the bowl, and pitying the worthy gentlemen who were so much worried, cleared away the mystery.

Studies on Milk.

The author comes to the conclusion that human milk and cow's milk contain the identical albuminoids. Human milk contains, however, a smaller proportion of albuminoids, and especially of caseine. All the albuminoids held in solution in milk can be separated by dialysis (with chloroform water) from the undissolved caseine and from the butter. A part of the undissolved caseine forms the covers of the milk-

Poisonous Effects of Petroleum Smoke.

A curious instance of poisoning from the smoke of petroleum is reported in the *Neue Freie Presse* of Vienna. A workingman's wife brought to a local hospital a child eighteen months old who had been seized early in the morning with violent convulsions, and had subsequently become unconscious. She also stated that her husband, on awakening, had been taken with cramps, and had an uneasy sensation in his upper and lower extremities, accompanied by headache, from which she was also suffering. The singular color of the child and the results of careful examination led to the conclusion that there had been acute poisoning from smoke gases. It was then discovered that in the small and ill-ventilated bedroom occupied by the parties in question a petroleum lamp was used as a night lamp, the flame being reduced as much as possible. The wick had, however, been left projecting without the protection of a glass cylinder. In this way the flame of course emitted smoke. The father (himself a delicate man) was also found to exhibit symptoms of poisoning. By the exertions of the medical men in charge of the cases, both the father and the child have progressed so far toward recovery that their restoration to health is confidently expected.—*Lancet*.

Frogs.

A Louisville (Ky.) scientist, according to the *Electric World*, sings the praises of the frog, and incidentally refers to the part the humble batrachian has played in the development of electrical science: "Even in the benighted age in which Galvani lived it had been discovered that frogs' legs were good to eat. He had a pair of them hanging on a copper hook, and occasionally the wind would blow them against an iron railing, and they would jerk convulsively whenever contact was established. Galvani noticed it, and set his wits to find out the cause. Everybody knows the history, although it is a long one, and everybody knows that from that simple occurrence, and through the defunct frog's instrumentality, we have the telegraph monopoly, the telephone, with the wires crossed half the time and the other half something the matter with the transmitter, the electric light, which doesn't burn on cloudy nights, and many other blessings of life. The world owes all those things to the simple fact that a frog's hind legs are good to eat."

Tobacco Insecticide.

The *Repertoire de Pharmacie* quotes, upon the authority of Dr. Nessler, a recipe for an insecticide which is said to have a great reputation among German horticulturists. It consists of soft soap, 4 parts; extract of tobacco, 6 parts; amylic alcohol, 5 parts; methylic alcohol, 20 parts; water to make 1,000 parts. The extract of tobacco is made by boiling together equal parts of roll tobacco and water for half an hour, adding water to make up for what is evaporated.

The soft soap is first dissolved in the water with the aid of a gentle heat, and the other ingredients are then added. The mixture requires to be well stirred before it is used, and is applied by means of a brush or a garden syringe fitted with a small rose.

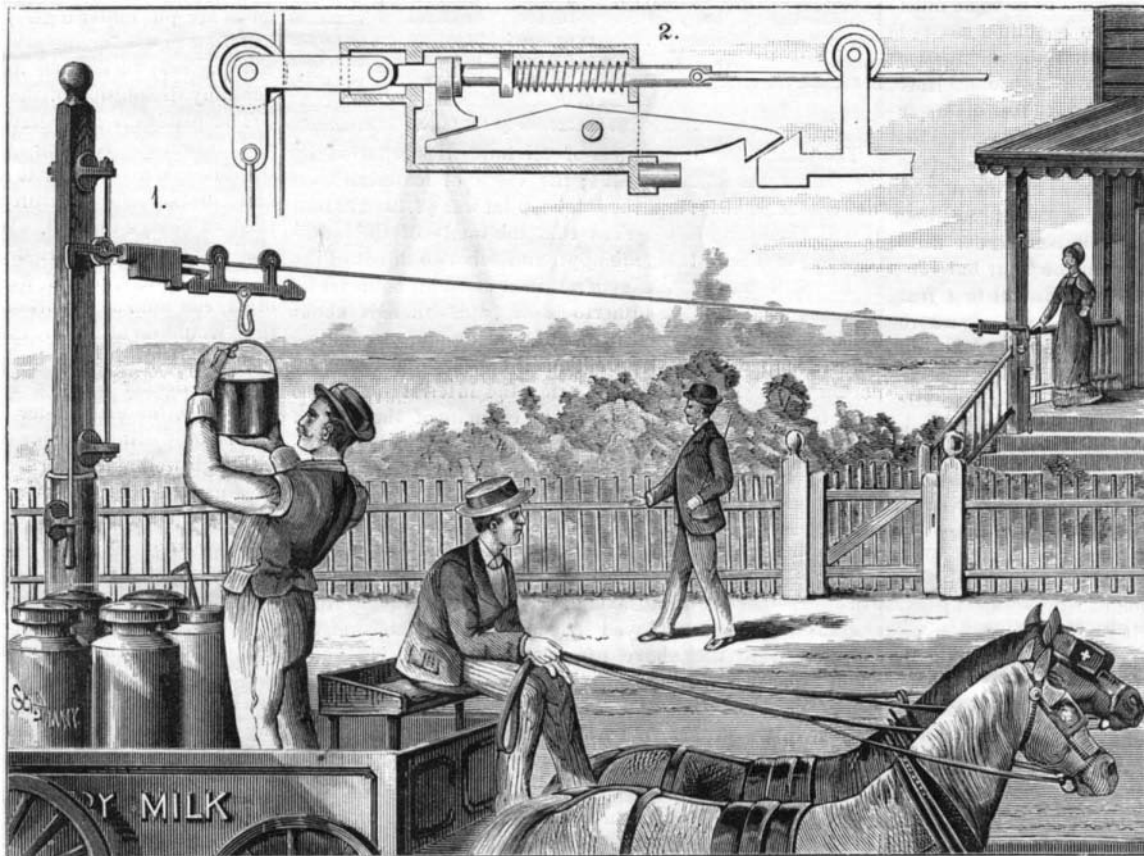
An American Example in Australia.

Frearson's Weekly, Adelaide, South Australia, gives several illustrations of railway viaducts, including the Kinzua viaduct on the Erie road, and in describing those on the Nairne line, Australia, says:

Many of our readers may not be aware that the viaducts on our Nairne line are modeled after the celebrated Kinzua viaduct. It is on the New York, Lake Erie, and Western Railroad, and is situated in the middle of McKean County, Pa., four miles from Alton, the present terminus of the Bradford branch of the Erie road, and crosses the Kinzua Creek at an elevation of 2,100 feet above sea level. It was Mr. O. W. Barnes, of New York, who two years ago

proposed to cross the valley by an immense viaduct. He was at that time chief engineer of the Bradford branch of the Erie, and was ably aided by his energetic assistant, Mr. Charles Pudsey. The length of this structure is 2,051 feet clear of the abutments, the height 301 feet from the bed of the stream to the base of rail.

It is asserted that the largest ivory factory in the world is at Centrebrook, Conn., where sometimes \$125,000 worth of ivory is bleaching

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globules, and is separated out in the cream; the other portion remains in the skim milk. The milk globules swell up if shaken with ether. The digestibility of any milk is inversely as the quantity of caseine which remains in the skim milk. Hence, Dr. Biedent's suggestion that only cream should be used for the earliest nourishment of young children brought up by hand is perfectly justified. The caseine of human milk, as well as of cow's milk, has always an acid reaction. In human milk there is only a small quantity of butter in a free state.—*H. Struve*.

Additional Water Supply for New York City.

The governor having approved of the new water supply bill, the additional works will be proceeded with as fast as possible. At present the city is supplied from Croton River and Lake, distant 40 miles from the city, by a masonry aqueduct 7 feet in diameter and about forty miles long. The daily delivery is 100,000,000 of gallons, equal to about 75 gallons for each inhabitant. The waste is enormous.

The new water commission will be asked to adopt the Quaker Dam plan, which is to build four and one-half miles below the present Croton Lake a massive dam to span the valley, rising to the height of some 200 feet.

This dam will be constructed of masonry on bed rock, near Quaker Bridge, and raise the water level in Croton Valley to 200 feet above tide, with a storage capacity of about 32,000,000,000 gallons. This will receive the entire drainage of 361 square miles of watershed, and the estimated cost is \$4,000,000. The reservoir will practically be a deep lake with an area of 3,657 acres. Added to the other sources of supply the storage capacity of the reservoirs would be about 46,000,000,000 gallons, and these would give very nearly 200,000,000 gallons per day for 230 days, independent of the natural flow of the Croton.

The line of the new aqueduct will measure 26½ miles to High Bridge. As far as practicable this will be built in tunnel, securing strength and avoiding expensive land damages. It will be circular, of brick, and the question is whether it shall be 12 or 15 feet in diameter. The latter will add 15 per cent to the cost, and yet increase the capacity nine-sixteenths.

The valleys will be crossed by masonry conduits, while siphons may be introduced for the Harlem River and Manhattan Valley. The water will be delivered into the reservoir at Central Park at an altitude of about 119 feet above tidewater, leaving the Quaker Bridge reservoir at an elevation of 142 feet, thus allowing 58 feet of storage water to be drawn from, provided the new Croton Lake was filled to its utmost capacity.

The preliminary estimates are \$4,000,000 for the storage reservoir, and \$10,000,000 to \$12,000,000 for the aqueduct. But these figures only include the delivery of water at High Bridge, and do not take into account the land damages or other injuries occasioned by the passage of an aqueduct with an internal diameter of 15 feet, nor the expenses occasioned by legal delays, etc.

The Electric Wonders of the Age.

Hon. S. S. Cox, in the annual address delivered before the Indiana Asbury University, at Greencastle, on the 19th ult. said:

"The electric monograph transmits messages in the original handwriting. The hektograph multiplies your epistles; the telephone enables people to make contracts through an orifice; but as there is no witness, photography comes in and records the shadow of the sound by curves in vowels and consonants!

"Electricity is an element elusive and subtle, yet it is stored in a box and imprisoned in a metal to be used at pleasure for portraiture, sound, light, or power. I have seen an organ in Berlin played by electricity, but this is simple compared with other experiments. Is it not a marvel that we can telegraph from a moving railroad car or the speeding steamship? A California photographer obtains six photographs in one leap of a clown in six different positions. He catches a horse on the gallop, a rabbit on a run, and a bird on the wing. By means of a wire a circular saw or a locomotive may be—nay, has been—run miles distant from its source of force. Electricity is born of the sun. It may be converted back to its source, so that when one talks by telephone he may see his distant colloquist. It is shrewdly believed that nerve power depends for increased strength on light. It will not be strange if the polyscope illuminates the animal organism, rendering the body transparent. The vast current of liquid force which we call electricity is condensed in boxes like desiccated meats, or spread over continents to convey intelligence. Man can never overdraw from this vast, bankruptless depository of nature.

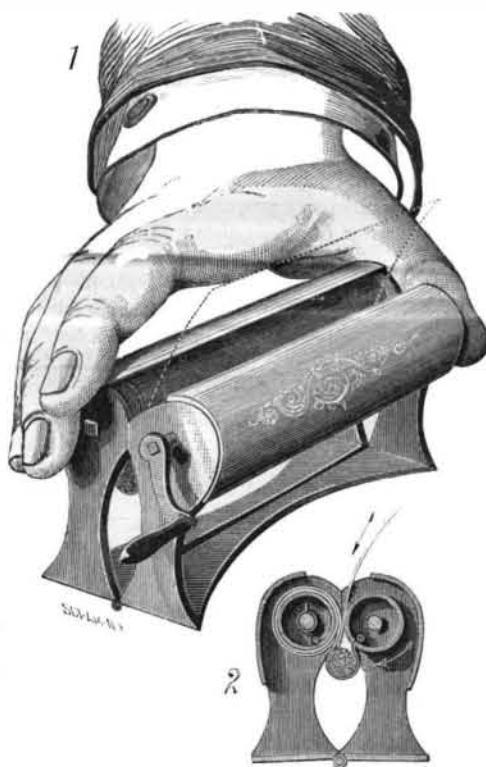
Products from Telegraph Batteries.

Of the 12,350¢ spent during the year 1881-82 upon the 127,166 galvanic cells in use, 2,727¢, or about 22 per cent, were recovered by the sale of the battery residues, consisting of copper, zinc, and lead salts. It has been customary to sell these products by auction twice a year. The Government does not guarantee any fixed percentage of metal in these salts, but the amount varies very slightly. The normal cell of the German telegraph offices is a modified Daniell cell of a simple and cheap kind. The zinc electrode is formed of a ring, hanging down from the edge of a glass vessel to half its depth. On the bottom lies a rectangular plate of lead, to which a vertical stout iron wire, incased in sheet lead, is soldered, making the other electrode.

The glass is filled with sulphate of zinc solution, and a few crystals of sulphate of copper are from time to time dropped into the liquid. Of these materials the zinc ring is of course most subject to deterioration. Thus we find that the above mentioned 127,166 cells required nearly 80,000 new zinc rings, against 7,300 lead sheets and 910 lead plates. The sulphate of copper forms the largest item in the annual expenditure, amounting to 8,000¢. During the four years which the table comprises, from 1878 to 1882, the number of cells had increased by nearly 20,000.

NEW CIGARETTE MACHINE.

The engraving below represents a new cigarette machine, invented by Dr. E. Casgrain, of Quebec, Canada, and patented by him in the United States, Canada, England, France, Spain and Cuba, and Germany. It consists of 2 cylinders joined by a band, journaled in frames binged to each other, one of which is provided with a crank handle, and the other furnished with an internal tension spring. To-



SIMPLE CIGARETTE MACHINE.

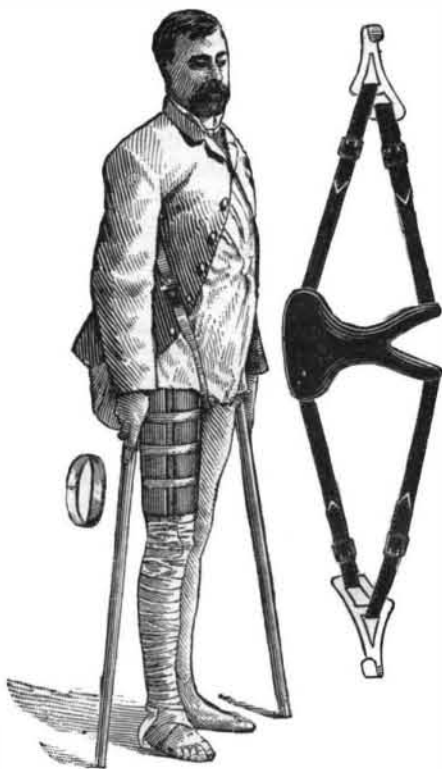
bacco and paper are placed on the band, the machine is closed, a turn of the crank handle enrolls the tobacco, and the cigarette is made.

The machine works perfectly and easily and is very well designed and arranged. An inexperienced hand may make over 100 cigarettes an hour with it. It is a great improvement in inventions of the kind, working very rapidly, and it is withal cheap and practical.

M. M. Gaynor & Fitzgerald, of New Haven, Conn., are sole manufacturers for the proprietor.

A NEW CRUTCH.

Doctor James R. Taylor, of New York city, while reading a paper before the American Medical Association, at its recent meeting at Cleveland, on "Fractures of the Long



TAYLOR'S IMPROVED CRUTCH.

Bones," exhibited a novel device of his own invention, for use in combination with the ordinary crutches used by convalescents from fractures of the leg, or other cause of lameness of the lower extremities.

The invention consists of a neat little saddle, which is well shown in the accompanying engraving, and it is so arranged that it can be worn without inconvenience inside of the clothing. Attached to it are a pair of small adjustable suspenders, the free ends of which terminate in steel books for fitting upon the tops of the crutches.

When the suspenders are adjusted to fit the patient, the books reach up to about two inches below the axillæ, the ends alone coming out under the arms and outside of the clothing.

These ends are the only parts of the device which are visible.

The saddle is well padded to fit the perineum, and is of such form that the patient rests upon it without discomfort when sitting on a chair. Its temporary removal is also nicely provided for, and when the wearer places the crutches in the suspender books for the purpose of walking, the weight of his body is carried entirely upon the saddle, without the crutches reaching up to the axillæ, so that no discomfort is experienced even in taking long walks.

The apparatus was received very favorably, and cordially applauded by the large body of surgeons present at the above meeting.

This apparatus has been thoroughly tested by Doctor Taylor on quite a number of his own patients, both male and female, with great satisfaction to both the patient and the doctor.

The Air of Houses.

There is much confusion in the minds of some people, says the *Building News* (London), with respect to the dryness or dampness of houses. An airtight room is more or less damp, though people are generally apt to think it otherwise if there is no draught, and all the air is carefully shut out. As a general rule, we invariably find the most draughty house is the driest, as it will be generally found to be the healthiest, if not the most comfortable, in cold weather. But the air of a room, as that for an invalid, may become too dry; it may be overheated by a stove, which would become injurious to the patient. In certain cases vaporizers are now employed to give the air of the sick chamber its healthful proportion of moisture.

Mr. G. J. Symons, in a paper on meteorology, has remarked that the subject of the hygrometry of the sick room was unknown two generations ago. If, in addition to temperature, the quantity of moisture in a sick room were indicated by the hygrometer, a great deal more might be done for the invalid's comfort. It is just as easy to regulate the hygrometric condition of the sick room as its temperature, and, in many respiratory complaints, the former is even of greater importance than the latter. The hotter the air is the more water can it contain, and this condition does not appear to be apprehended by those who dwell in such rooms, or provide the means of heating and ventilating them.

Prof. Tyndall found that the moisture in the air of an ordinary room absorbs 50 to 70 times as much of the radiant heat as the air does. Moisture is the regulator and conservator of the heat, and in due quantity acts like a blanket, by protecting us from a too sudden cooling or heating. The question is one, we think, worthy more attention by the sanitary builder than has been given to it. Complaints are loud against certain hot air furnaces, as they overheat the air and render it unfit for breathing; they tend to scorch and dry the air, and to this extent they are unhealthy.

Hydrophobia.

For some time M. Pasteur, the French investigator, has been experimenting with a view of discovering whether the fatal infection of rabies can be disarmed of its power by inoculation. It is said that he now possesses four dogs which are proof against the infection, whatever may be the method of inoculation used or the virulence of the matter, while other dogs inoculated with the same virus invariably perish. The experimenter raises the question whether these four animals owe their impunity to spontaneous recovery from a mild attack, which may have escaped observation, or whether they are naturally refractory to the disease. One of the three dogs which he inoculated in 1881 survived, and though twice inoculated in 1882, he did not become rabid. The importance of finding a remedy for all forms of hydrophobia is magnified by two facts brought to light by the researches of M. Bert. One of these is that even if the saliva of a mad dog does not communicate rabies it may prove fatal by producing serious local injuries—in other words, the secretions of rabid animals have poisonous properties over and above the special rabic virus. The second fact is that it does not follow because a dog which has bitten any person does not die, that the animal is free from rabies. These conclusions will add to the terrors of the disease. But there is some consolation in learning from M. Bert that the mere salivas of rabid dogs do not always communicate the deadly virus, and apparently never communicate it unless they contain the mucus from the respiratory organs, which seems to be the fatal portion of the saliva.

Origin of Yellow Fever.

A report has been received at the State Department, at Washington, containing the results of observations and experiments made by Dr. Freize, a Brazilian physician, who believes that he has discovered the cause of yellow fever in a microscopic parasite found in the blood of yellow fever patients. Experiments made by injecting this infected blood into the veins of rabbits and guinea pigs proved its virulence by producing death, the blood of the inoculated animal showing the same characteristics as that from the original yellow fever victim. The doctor's experiments seem to prove, also, that these parasitic germs of death survive in the soil where the subject of the fever is buried, and from thence may again contaminate living organisms, which would appear to favor cremation rather than burial in the case of yellow fever victims.