A New Safety Lamp.

Mr. Fleuss, the inventor of the diving helmet known by his name, and by means of which a man can take oxygen enough with him to remain under water more than an hour, has recently devised a new safety lamp based on the same principle. It is about twelve inches in height, and is composed of a stand, oxygen chamber, spirit tank, and cover. The oxygen chamber is spherical in shape, and is made of strong copper. It contains oxygen pumped in at a pressure of 260 pounds, and its outlet is a small pipe, furnished with an escape valve and regulator, opening close to the wick. Above the sphere is a little square tank containing methylated spirits for burning in the lamp, and upon it is closely screwed a socket holding the wick. Close to the wick is a thin iron rod, upon which is fastened, in the usual manner, a piece of lime. When the wick is lighted a stream of oxygen is turned upon it from the little pipe by means of the regulator and valve, and the flame is blown upon the block of lime, the light produced being of the most intense kind.

Over the lighted wick, the oxygen blowpipe, and the rod of lime a strong copper casing is screwed down, and the light is thrown through a bullseye in the side of this cover. The casing is dome-shaped, and is made with a double skin, the intervening space being filled with water. On the lower part of it is an outlet valve, by means of which the products of combustion are permitted to escape into the water between the skins of the case, and to find their way through it into the outer atmosphere, an escape valve on the top of the cover being the ultimate means of egress. The lamp is said to have borne all tests with most satisfactory results. It heats little, and is easily managed.

Deep-sea Soundings.

Captain George J. Belknap, commanding the United States steamer Alaska, reports to the Navy Department, under date Callao Bay, July 6, 1881. He gives detailed results of soundings in a run of 112 miles directly off shore. At a distance of 102 miles he found a depth of 3,368 fathoms, or nearly four statute miles, the deepest water yet found in the South Pacific, or in the eastern margins of both the North and South Pacific. Hoping to find a still deeper depression of the ocean bed he stood ten miles further to the westward, but only found 3,168 fathoms. In both casts the specimen cylinder brought up clay and greenish sand, and the bottom temperature of the deepest was about 34° Fah.

Grasshoppers in Turkey.

Turkey, it appears, is overrun with grasshoppers, and the government has been compelled to employ extraordinary measures to overcome the plague. A particularly voracious species has appeared in the Bodirum District (Smyrna), and the whole population is employed to combat the insects. At Angora all business was suspended for three days by order of the Governor-General, and all the inhabitants were ordered to march out into the fields to destroy the grasshoppers. Every inhabitant was compelled to deliver twenty oka (about fifty-six pounds) of dead grasshoppers to the officials. The swarms are said to emanate principally from Persia.

Remarkable Swarms of Dragon Flies.

In some parts of Germany dragon flies have been unusually numerous. At Kamenz, during the last days of May, enormous swarms of them, here and there in dense masses, and extending from five to ten miles in breadth, passed over the valley. The first swarm arrived about noon on May 30; its passage occupied two hours. In the evening a second swarm came from the direction of Weisswasser. The third swarm arrived on the morning of the 31st. Swarms of this description have not been observed since June, 1825. At Dresden the strange phenomenon was also observed.

Supposed New Species of Horse.

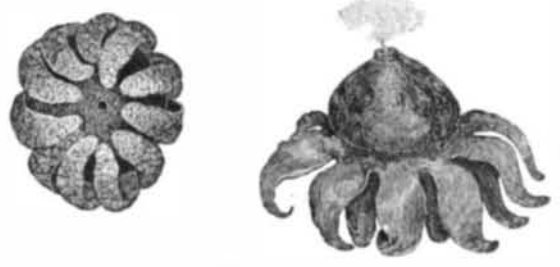
M. Poliakoff, the distinguished Russian naturalist, has examined a horse presented by Colonel Prejvalsky to the St. Petersburg Academy, and decides it to be a new species, which he has named Equus Prejwalskii. It appears that the new representative of the family of undivided-hoofed mammals is in some respects intermediate between the domestic horse and the wild ass, but it differs from the asinine genus in having four callosities, one on each leg. In the form of skull, absence of dorsal stripe, and other particulars, it resembles the domestic horse. This newly recorded animal is indigenous to the plains and deserts of Central Asia, and has not hitherto fallen under the dominion of man.

EARTH STARS.

Among the curious and interesting things that one fond of rambling over the sand dunes of Coney Island will meet with are the earth stars.

Nothing can be more puzzling to one unacquainted with such matters than to find a star-like plate lying flat on the sand, or with its points curved, as in Fig. 1, and bearing on its center a more or less globular body. At first sight we

Fig. 1. Fig. 2.



EARTH STARS.

would take it to be almost anything else than a plant, yet it is a plant, and a very interesting one, belonging to the vast class of fungi. Most persons are quite familiar with its near relatives, the puffballs, which at first are round masses of a white puffy substance, and later a globular membrane filled with blackish dust, which passes out on the slightest touch in smoke-like puffs. Each puff of this dust is made up of millions of minute spores, which serve to multiply the plant, and serve the place of seeds.

The starry puffball in its early stage would readily escape notice or be taken for a small common puffball, and, like that, is attached to the earth. Unlike the common one, our starry puffball has a thick papery or leathery outer skin, which, at the proper stage of development, bursts in a somewhat regular manner and exposes the puffball portion, the star-like envelope remaining attached. We sometimes see oranges peeled for table decoration in a manner that reminds one of the earth stars.

The outer skin bursts with such force as to throw the plant several inches away from the place where it grew; hence it is rarely that they are found attached to the earth where they grew.

The central puffball gives off clouds of spores in the same manner as its larger relative. This portion sometimes sits directly upon the center of its starry shield, as in Fig. 2, or is raised above it upon one or more short stems. The genus is named *Geaster*, which means earth star. There are eleven species in Great Britain, and only about six recorded for this country. During the hot, dry weather the earth star closes up, as shown in Fig. 2, but after a rainfall or during a heavy fall of dew the star slowly expands, and assumes the position shown in Fig. 1.

A THREE HUNDRED DOLLAR TURTLE.

A magnificent living specimen of the so-called "leathery turtle," also "lyre turtle," and "trunk turtle," and *Sphargis coriacea* of the naturalists, was captured last week by Capt. Hines, of the fishing steamer Humphrey, while cruising for menhaden, some 125 miles off Absecom Light. When this turtle was first sighted it was fast asleep on the surface, evidently taking a sun bath.

After surrounding it with a "purse" net, a second and third net had to be used before the powerful reptile was securely entangled, so rapidly did he tear the nets asunder with his powerful fore and hind flippers. A crane was rigged on the deck of the steamer, by which means the turtle was carefully landed on the deck and brought to New York city to be sold—two amateur showmen of the market being the purchasers at $250, though Mr. Starr, of Bunnell's Museum, shortly afterward offered $300 for it. Under a canvas on the Fulton Market slip it reposes on a platform, where it is "bountifully fed on water melon rinds and butter-fish," as the showmen state.

This curious and very interesting animal is well worth seeing, as this one is the first living specimen that has been brought to New York since the one was captured off Long Island Sound, September 7, 1826. The one at the market will weigh in the neighborhood of 2,000 lb., and measures over 7 feet in length, is 43 inches broad, 3 feet thick, and the flippers are 47 inches in length, which, without doubt, ranks it as the largest living turtle ever brought to the Fulton or Washington market.

At the Berlin Fisheries Exhibition the United States Fish Commission exhibited in the collection of American turtles one of the finest specimens of the leathery turtle ever captured on our coast, and which was acknowledged to put Yankee-land ahead on the turtle question.

In color the skin or the shell of the leathery turtle is of a deep blue-black, and shining, reminding one of polished leather or black vulcanized rubber. About the throat are numerous mottlings of light blue spots. In place of the usual shield of horny plates that are to be found on all turtles, this variety is covered with innumerable small plates about the size of a ten-cent piece, which are situated under the leathery skin.

The upper shell, as will be seen by the illustration, is of a peculiar form, being composed of nine keel-like longitudinal ridges. The central and most prominent one, situated on the top of the back, is the highest. These dorsal ridges are all more or less scalloped, and are of a dirty bluish white. The front and hind flippers of this turtle are very stout and powerful and destitute of nails; in general form they are fin-like and capable of driving the animal through the water with great speed and force. The inside of the throat is lined with sharply tipped spines which point inwards, so that whatever enters has of necessity to be swallowed. The stout neck supports a large and massive head with strong and powerful jaws, the upper one being provided with notches, into which the sharp hook or beak of the lower jaw fits.

This turtle is undoubtedly an inhabitant of tropical waters, and is probably brought to our waters by the action of the Gulf Stream and other ocean currents.

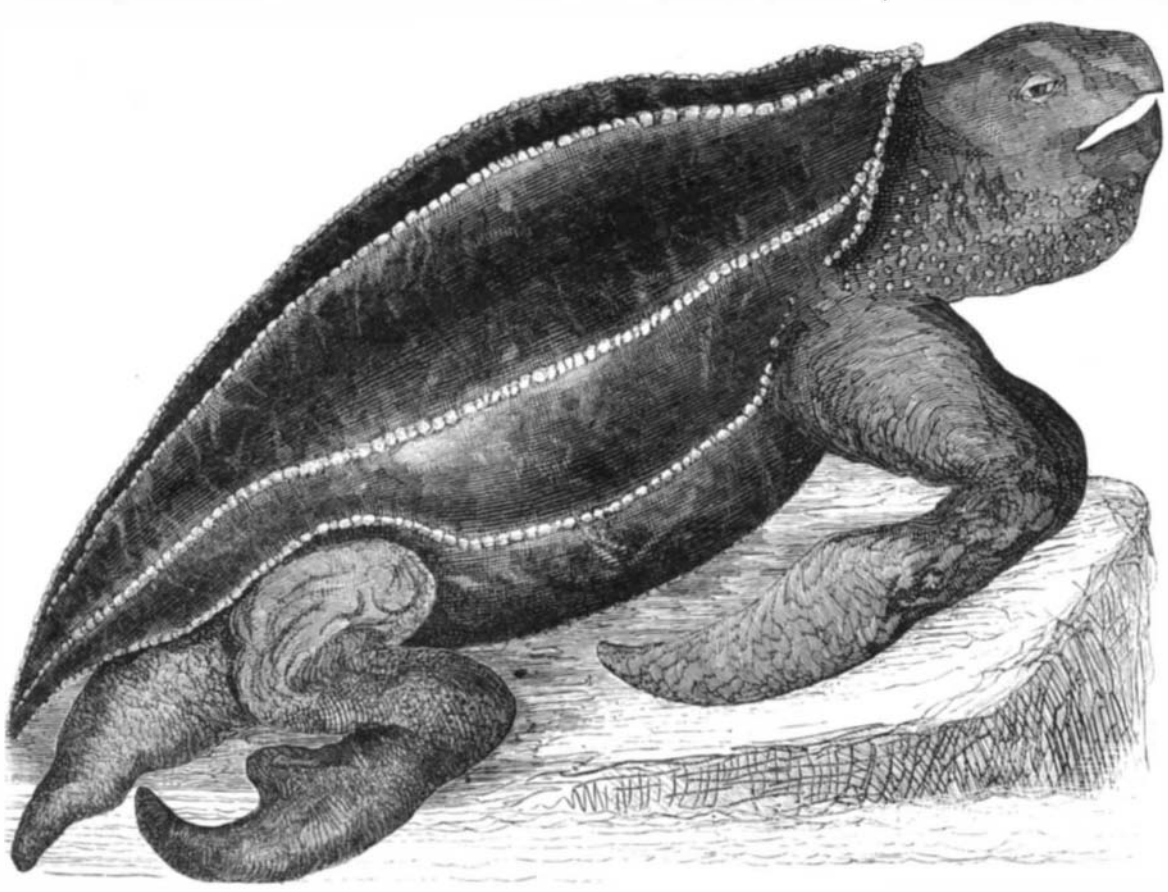
The immense size and weight of this turtle would render it a prize indeed to any lone and poorly-paid fisherman who might run across a specimen once in a while, were it not that the flesh is poisonous when eaten and produces severe sickness.

The food of the leathery turtle consists of the larger and coarser varieties of marine plants, such as the gulf weed and laminarias. The shells of these turtles have often been used for small boats, as well as drinking troughs for domestic animals and bathtubs for children.

The habit of the leathery turtle is much the same as that of the green turtle, logger-head, and hawk's-bill turtles. When sleeping or resting it floats on the surface. When feeding it is capable of remaining under water a long time before rising to the surface for a fresh supply of air.

A large specimen, which was captured in Massachusetts Bay, in 1824, when asleep and basking, was sold for $200 to the New England Museum.

The largest specimen ever exhibited in this country was one that measured over 10 feet; this was lost at the burning of Barnum's (old) Museum. This one was captured off Sandy Hook, in 1816, which, including stuffing, setting-up, etc., cost Peale, the founder of the American Museum, afterwards Barnum's, $400. The first recorded specimen taken on our coast was in 1811. From 1811 to present date, some thirty specimens have been caught, most of them having been secured by the Smithsonian Institution, so that an animal of such uncertain occurrence must be considered very rare. The leathery turtle, like all other deep-sea turtles, never visits the shore except during the breeding



LEATHERY TURTLE.—*Sphargis coriacea*

season to deposit its eggs. Ancient mythology is responsible for the legend that Mercury first acquired the idea of the form of the lute or lyre from the general appearance of this turtle; the ridges along the back being suggestive of the strings, and the broad hind feet representing the foot of the instrument. The French name for this turtle is *luth* (a lute).

NATURAL HISTORY NOTES.

Interesting Case of Commensalism.—Dr. Möbius, in his recent work on the fauna of the Mauritius Islands, gives a description of two crabs of most extraordinary habits. Both belong to the family polydectinæ, the species of which have their front claws armed with large teeth. Latreilie, who first named the crab *Polydectes cupulifer*, remarked that a gummy substance was always to be found at the ends of the claws of this species, and Dana described the animal as having always something spongy in its hands. Dr. Möbius has discovered the remarkable fact that these things held in the two claws of the crab are in reality living sea-anemones. These anemones are attached to the immovable joint of each claw, while the teeth of the movable joint of the claw are kept buried deep into the flesh of the sea-anemones, and thus hold them fast, although each anemone can easily be pulled away from its position with the forceps in specimens preserved in spirits. The mouth of the sea-anemone is always turned away from the crab. The same curious combination exists in the case of another species of the same family, but of a different genus, *Melia tessellata*, which also inhabits Mauritius. Professor Möbius gives the following account of the matter: "I collected about fifty male and female specimens of *Melia tessellata;* all of these held in each claw an *Actinia prehensa*. The recurved hooks of the inner margins of the claw joints of the crab are particularly well adapted to hold the actinias fast. I never succeeded in dragging the living actinias out without injuring them. If I left the fragments of them when pulled out lying in the vessel in which the *Melia* was the crab collected them again in his clutch in a short time. If I cut the actinias in pieces with the scissors I found them all again in the claws of the crab after a few hours. It is very probable that the actinias aid the crab in catching its prey by means of their thread-like cells, and that the actinias, on the other hand, gain by being carried from place to place by the crab, and are thus brought into contact with more animals which can serve as food to them than they would if stationary. This is a very interesting case of commensalism."

A Locomotive Dicotyledon.—So far as has been generally known hitherto the power of voluntary locomotion of plants from place to place is confined to members of the lower orders of cryptogams, namely, algæ and fungi; but an interesting case of voluntary motion among dicotyledonous plants, in a species of *Loranthus*, has been discovered by Dr. G. Watt, of the Educational Department, Bengal Lower Provinces. It is only while the seed is germinating that the motion takes place, but the mode of traveling is very peculiar and quite different from that of any other known plant. The plant is a native of Bengal, and like all other members of the genus is parasitical, growing upon a few evergreen trees, particularly upon some species of *Memecylon*. The fruit, like that of its relative, the mistletoe, and nearly all other members of the order, consists of a mass of very viscid pulp surrounding a single seed, and on separating from the parent plant adheres to whatever it may chance to fall upon, and after a time begins to germinate. It is only during the first stage of germination that the motion to be described takes place, and it is evident that the power of being able to move about is to enable the plant to find a suitable place to grow upon. The radicle at first grows out, and when it has attained a length of about an inch it develops upon its extremity a flattened disk, and then curves about until the disk is applied to any object that is near at hand. If the spot upon which the disk fastens is suitable for further development of the plant, germination continues, and no locomotion takes place; but if, on the contrary, the spot should not be favorable, the germinating embryo has the power of changing its position. This is accomplished by the adhesive radicle raising the seed and advancing it to another spot; or, to make the process plainer, the disk at the end of the radicle adheres very tightly to whatever it is applied; the radicle itself straightens and tears the viscid berry away from whatever it has adhered to, and raises it in the air. The radicle then again curves and carries the berry to another spot, where it again adheres. The disk then releases itself, and by the curving about of the radicle is advanced to another spot, where it again fixes itself. Dr. Watt says he has seen this repeated several times, so that to a certain extent the young embryo, still within the seed, moves about. It seems to select certain places in preference to others, particularly the leaves, which in the *Memecylon* are evergreen and very dense. The berries on falling are almost certain to alight on the leaves, and, although many germinate thereon, they have been frequently observed to move off the leaves on to the stems, and finally fasten there.

The Origin of the Cat.—St. George Mivart, in his recent work on the cat, says that the early history of the domestic cat is uncertain. It is not the common cat of zoology which is the wild or native cat, an animal that existed abundantly in the forests in the time of Julius Cæsar and was seen in Wales within the last twenty years. It appears to have come down to us from the Eyptians, being mentioned, Mr. Mivart informs us, in inscriptions as early as 1684 B.C., and being, as well known, an object of religious worship and the venerated inmate of certain temples. It was an emblem of the sun to the Egyptians, and, according to Herodotus, the death of a cat from natural causes was followed by the ceremony of shaving the eyebrows in token of mourning. From Egypt it must have been introduced into Greece, though Professor Rolleston, in his article on cats in Humphry and Turner's *Journal of Anatomy*, considers that the cat of the ancients was the *Mustela fotna*, the "beech" or "stone" marten. It was not a domestic animal among the Hebrews, though it was known to them, as we read in the apocryphal book of Baruch, who lived, it is supposed, in the reign of Jehoiakim, about 600 B.C., that "upon their bodies and heads sit bats, swallows, and birds, and the *cats* also." In regard to the pedigree of the cat, Mr. Mivart traces it from unknown insectivora-like animals, which produced, among other forms, *Arctocyon*. From this, as a root, the carnivorous branch divided into cynoid and arctoid branches—the former developing into the typical *Canidæ;* the latter, after giving off other branches, leading to the *Ursidæ*, and, through *Proclurus*, to the *Viverridæ*, *Hyænidæ*, *Cryptoproctidæ*, and *Felidæ*.

Dr. Andrew Clark on Alcohol.

Dr. Andrew Clark lately delivered an evening address on alcohol, in the Great Portland Street School-rooms, London, to a crowde and deeply interested audience. He said he purposed offering a few informal remarks upon the influence of alcoholic drinks upon health, upon work, upon disease, and upon the succeeding generation. This question of alcohol was of the first importance to us as a nation and as individuals, and hence a great responsibility rested upon those who professed to speak upon it with authority. He ventured to say that he knew something about this question. For twenty-five years he had been physician to one of the largest hospitals in this country (the London Hospital), and there, as elsewhere, it had been a part of his business in life to ascertain the influence which alcoholic drinks exercised upon health, and he had with deep interest and attention striven to get at the truth of the matter. In the first place let him distinctly say that alcohol was a poison, as were also strychnine, arsenic, and opium; but in certain small doses strychnine, arsenic, and opium were useful in special circumstances, and in very minute doses alcohol could also be used without any obvious prejudicial effect upon health. He was not going to discuss what these minute doses were, save to say that they were very minute. A perfect state of health (and it was rarely to be found) could not be benefited by alcohol in any degree, and in nine times out of ten it was injured by it. He said this not as a total abstainer, though he earnestly hoped that all the rising generation would be. Instead of the ideal state of health which might be enjoyed save for the nature of our surroundings, the sins of our parents, and our own sins, there was a sort of secondary health possessed by most of us, and what did alcohol do for this?

He had two answers to give—that this sort of health bore apparently with alcohol better than the other, and sometimes seemed as if benefited by it; and this was exactly the sort of health that formed the great debating ground of different people with respect to the use of alcohol. Secondly, there were some nervous people always ailing, yet never ill, for whom he had a profound sympathy, who seemed to derive great comfort from alcohol, and to these he had sometimes said, "Take a little beer or wine, but take great care never to go beyond the minute dose." He did not defend this, but simply stated it to show what he thought. As to the influence of alcohol upon work, Dr. Clark went on to encourage his hearers to try the experiment of total abstinence, and observe the result in regard to work. Let them, however, try it fairly, and not allow themselves to be deterred from it by the evil prognostications of friends. He was certain that if this experiment were tried each individual present would come to the conclusion that alcohol was not a helper of work, but, on the contrary, a hinderer.

Now as to the effect of alcohol upon disease. He went through the wards of his hospital to-day and asked himself how many cases there were due to natural and unavoidable causes and how many to drink, and he came, after careful thought, to the conclusion that seven out of ten owed their ill-health to alcohol. He did not say that these were excessive drinkers or drunkards—in fact, it was not the drunkards who suffered most from alcohol, but the moderate drinkers who exceeded the physiological quantity. The drunkard very often was an abstainer for months together after a period of intemperance, but the moderate drinker went steadily to work undermining his constitution, and preparing himself for premature decay and death. He had no means of finding out how many victims alcohol claimed each year, but certainly more than three-fourths of the disorders of fashionable life arose from the drug of which he was speaking. Finally, Dr. Clark dwelt upon the heredity of the alcoholic taint, and closed by saying that sometimes when he thought of all this conglomeration of evils he was disposed to rush to the opposite extreme—to give up his profession, to give up everything, and to enter upon a holy crusade, preaching to all men everywhere to beware of this enemy of the race.

Pulque.

BY E. E. RIOPEL, M.D.

Pulque is the national drink of the Mexicans. It is produced by the fermentation of the maguey or *Agave americana*. This plant has been considered diuretic and antisyphilitic. There is no authentic record as to who first made pulque or neutli. Many are the traditions extant among the Mexicans concerning its first manufacturer. It seems, however, to be the more general belief that it was Xochitl, daughter of a nobleman called Papantezin, who lived in the time of Tapancaltzin, eighth king of the Toltecs. From time immemorial pulque has been considered to contain medicinal virtues in a very high degree as well as all the other products of the maguey, and at one time the maguey was even said to hold a spiritual life and was held in reverence. To-day pulque is esteemed by the ignorant classes as having a variety of curative powers, and physicians use it for its alcoholic and nutritive properties. It is held as a stimulant, tonic, and antispasmodic. They recommend it to the infirm, weak, anæmic, and nursing mothers.

ITS COMPOSITION.

It is obtained by fermenting the juice expressed from the central portion of the maguey plant. After expressing the juice between rollers, or, as was formerly done by means of suction, it is carried to the vats for fermentation. These vats consist of raw ox-hides loosely suspended in a strong wooden frame, with the hair on the outside. These hide-made vessels contain the cryptococcus or ferment, which is a residuum of the former fermentations. After a few hours fermentation is fully established and the pulque is drawn off, always leaving a residuum in the vessel for the next fermentation. The liquid obtained from the maguey plant has a density varying from 1·029 to 1·042, and contains in 100 parts 9·553 of sugar, 0·540 of gum and soluble albumen, 0·726 salts, and 89·181 of water, holding in solution resinous matter, fats, albuminoids, starch, dextrine, and glucose.

According to Don Jose Ramos, its salts contain potash, soda, and lime in moderate proportions, and magnesia and alumina as chlorides, carbonates, sulphates, and silicates; hence the great value in which it must have been held in former times and in which it ought to be held at the present day.

From the composition of the juice of the maguey one may have an idea of the therapeutic effects of the pulque, allowing for the change which these constituents may undergo through fermentation. Pulque has no definite proportion of alcohol, for one may readily see from the way it is manufactured that it cannot have any definite standard. It, however, contains a very small proportion of fusel oil and carbonic acid in large quantities. Considering that its manufacture is not based upon any standard of purity, or even with ordinary care, its density cannot be given with any certainty, though it varies from 0·9943 to 1·0200 ("La Esquela de Medicina"). To-day it is attracting the attention of the medical fraternity because of the evil effects upon the liver caused by its excessive use among the lower classes, not, however, in the light of pulque as a compound, but because of the evil effects of the alcohol which it contains. It is, therefore, proposed to adopt some other form of manufacture that a much lower percentage of alcohol may enter into its composition, according to a fixed standard, and thus avoid the evils of alcoholism.—*Therapeutic Gazette.*

Action of Coffee and Sugar on the Stomach.

In a paper presented to the Société de Biologie (*Rev. Méd.*) M. Leven states that coffee, so far, as is often supposed, from accelerating the digestive process of the stomach, rather tends to impede this. When thirty grammes of coffee, diluted in one hundred and fifty of water, is given to a dog, which is killed five hours and a half afterward, the stomach is found pale, its mucous surface being anæmic, and the vessels of its external membrane contracted. The whole organ exhibits a marked appearance of anæmia. Coffee thus determining anæmia of the mucous membrane, preventing rather than favoring vascular congestion, and opposing rather than facilitating the secretion of gastric juice, how comes it that the sense of comfort is procured for so many people who are accustomed to take coffee after a meal? A repast, in fact, produces, in those whose digestion is torpid, a heaviness of the intellectual faculties and embarrassment of the power of thinking; and these effects, and the disturbance of the head, are promptly dissipated by the stimulant effect which the coffee produces on the nervous centers, as shown by experiments with caseïn. Coffee and tea, when taken in excess, are a frequent cause of dyspepsia, for the anæmic condition of the mucous membrane being periodically renewed, a permanent state of congestion is at last produced, which constitutes dyspepsia. Sugar, which with many doctors has a bad reputation, is an excellent aliment which assists digestion, and should not be proscribed in dyspepsia. By experiment, digestion of meat is found to take place much more completely when sugar is added. Coffee exerts both a local and general action, operating locally by means of its tannin, by diminishing the caliber of the vessels, but acting on the general economy by exciting the nervous centers and the muscular system. It renders digestion slower, and is only of good effect by relieving the feeling of torpor after meals. Its injurious action on digestion may be corrected by adding sugar so as to counterbalance its effects on the mucous membrane. This adding sugar to coffee is not only a pleasant practice, but one contributing to digestion.

Nitro-Benzol in Oil of Bitter Almonds.

The oil is mixed with a little alcohol, a solution of pure potash, and a few drops of ferric chloride. The mixture is allowed to stand for some hours, shaken, and distilled, avoiding with great care bumping or spirting, and the direct action of the flame upon any part of the oil. A portion of the distillate, dehydrated, is heated in a test tube with a few fragments of pure potash. If the oil was pure the mixture