

NEW SYSTEM OF VENTILATION.

All natural methods of ventilation, and all mechanical means relying upon the wind to operate them, must necessarily fail at times, as in a calm, or with but a slight movement of the external air, they lose their motive power and fail to operate, and these failures usually occur at the very time when an active ventilation is most needed.

Those who advocate the use of ordinary fan blowers for ventilation, do not seem to get the full idea of the subject of ventilation and do not realize that a positive and constant circulation must be obtained to secure a perfect ventilation. Such a circulation, it is claimed, cannot be realized except by a system in which an injection of fresh air into the room and an ejection of the heated foul air from the room may be secured, with the ability of operating both at the same time and by the same power. The use of the blower during the summer (only injecting fresh air into the rooms) may create a tolerable circulation when the weather will admit of opening the windows and doors to allow the heated foul air to escape; but when, as in cold weather, the blower can be used only to send in heated air, and the windows and doors cannot be opened as in summer, there will be an accumulation of heated foul air until the atmosphere becomes oppressive, and then, to get a circulation, the windows are usually thrown open, and a draught of cold air is allowed to enter, to the discomfort and often to the injury of many.

The ventilating system, represented in the accompanying engraving, overcomes all of these difficulties and presents a simple means of thorough ventilation. The motive power is a steam air compressor, which furnishes a comparatively small supply of compressed air to the nozzle, in which the degree of compression is automatically regulated, so that whether larger or smaller quantities of air pass the nozzle, it cannot exceed or fall below certain limits of pressure, which have been determined by careful experiments as most economical in their results. The air ejected from the nozzle, with some thirty or forty times its bulk of other air, is carried through proper channels to the rooms to be ventilated.

The nozzle, A, is provided with a valve, B, having an elongated tapering portion, *b*, and a stem, *a*, furnished with a spring, which is set or compressed to a given pressure. The valve is surrounded with a series of short radial ribs having grooves between them, which increase in depth toward the inner end of the valve. It will thus be seen that as the valve is pushed out by an increase of pressure, the volume of the escaping air jet is increased while its pressure remains the same.

In Fig. 3, C is the fresh air supply pipe which discharges through openings, *c c*, into the apartments of the building. Below a funnel, connected with the pipe, C, an injecting nozzle, A, is placed, and connected by a pipe, D, with a pressure air pump in the basement. The pipe, D, also extends to the ejector nozzle, A, in the ventilating shaft, E, at the top of the building, and the ventilating shaft communicates with registers in the ceilings of the different apartments. The air supplied by the direct acting air pressure pump being forced through the lower injecting nozzle, A, induces a flow of air from the air shaft into and through the pipe, C, to the apartments, and the ejecting nozzle, A, in the ventilating shaft, E, creates a strong upward draught, which draws the foul air from the apartments connected with the ventilating shaft. Fig. 3 shows the application of this system to the ventilation of steamships. For this service it is eminently adapted, as the air under pressure may be conveyed in small pipes, and the necessarily small, close apartments may not only be supplied with fresh air, but the foul air may be removed effectually. For steamships carrying cattle and perishable fruits, and to maintain a thorough circulation of air in the hold, it is especially adapted.

For the ventilation of public and private buildings, court houses, school houses, hospitals, public halls, hotels, banks, etc., and for any purpose requiring a complete circulation of air, this system seems very desirable. It has been indorsed by eminent engineers, and approved by many of our government officials.

The great advantages of this method are, that it is rendered entirely unnecessary to construct for ventilation wide air channels for the whole distance from the ventilating power to the place to be ventilated. This is absolutely necessary when fan wheels are used, or other contrivances propelling all the air used for ventilation, resulting in very little pressure and moderate velocity. By employing a very small amount of air, equal to two or three per cent of all of the air to be propelled, and giving it a high pressure and velocity, it may be conveyed in tubes of less than one tenth the diameter, thus reducing the size of the pipe from twenty inches to two inches.

This tubing may lead to the place to be ventilated, and there blow the air through the proper nozzle into the funnel-

An improvement in medicated belts has been patented by Messrs. William W. Vaughan and Joel J. Thom, of Brownsville, Mo. The object of this invention is to furnish a remedy and preventive of fever and ague. It consists in saturating hemp, jute, cotton, or other material, in rope form or otherwise, with tar, and inclosing it in a casing of cotton, linen, or the like, in the form of a belt, band, or strap, so that it may be conveniently secured around the body.

An improvement in combined washing and wringing machines, patented by Mr. Thomas J. Baldwin, of Pacific, Mo., consists of a box for receiving the clothes provided with a lid, which is secured by means of an eccentric bar and lever and rings, this box being supported between two standards and rotated by a crank, the shaft of which passes through one of the rollers of a clothes wringer, mounted on the frame of the machine, and provided with a lever for regulating the pressure. The box contains a number of wooden balls, which are thrown about during the revolutions of the box, and pound and wash the clothes.

An improved medicine spoon, invented by Mr. Barclay T.

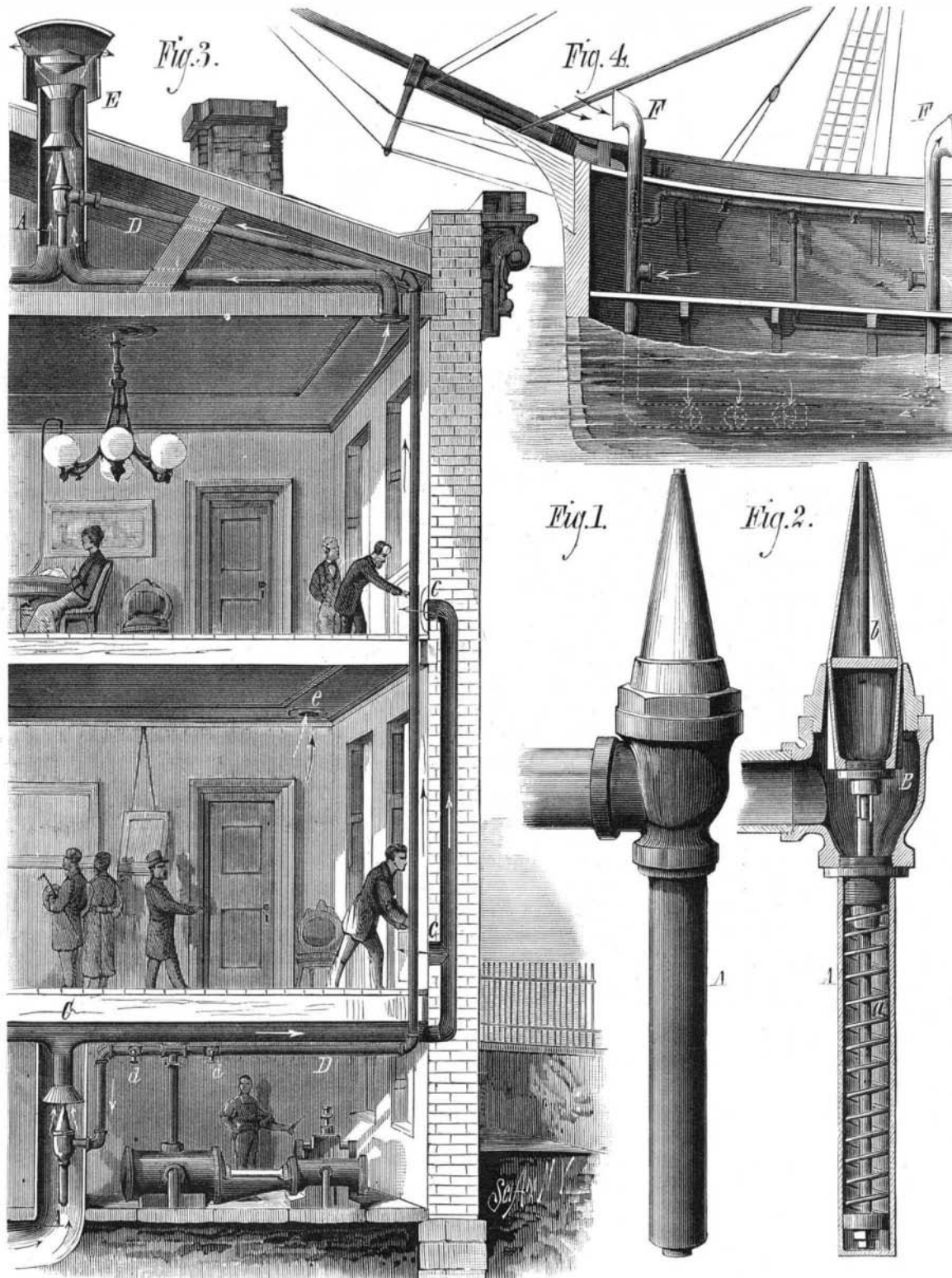
Trueblood, of Hadley, Ind., consists in a bowl provided with flanges, in combination with a cover fitting over the bowl and sliding under its flanges. With this spoon medicines can be easily and without waste administered to infants and others who resist their administration, and also to those who cannot be raised to an upright position.

An improvement in pressing irons, patented by Elvira A. Russell, of Minneapolis, Minn., is adapted to be placed over a lamp burner like a chimney, and, while serving the same purpose, be heated by the flame of the lamp. It consists in making the iron of the general form of a conical lamp chimney, having one of its exterior sides flattened to form an ironing surface, an extension at the smaller end on the flattened side to serve as a point for the iron, and at the large end a round portion to fit over the burner and hold the iron on the lamp top.

Mr. William H. Huston, of Chauncey, Ill., has patented a guard for doors or windows, formed of a number of sections composed of vertical and horizontal iron or steel bars, these sections hanging on L-shaped hooks in the casing of the door, in such a manner that no section can be removed unless the uppermost section is first removed.

Mr. George W. Ellis, of Philadelphia, Pa., has patented an improvement in the class of trusses for reducing hernia, in which the pad is attached to a slotted bar whose head is held in a clamp that allows adjustment of the pad in various positions.

Mr. William Wilmington, of Toledo, Ohio, has patented an improvement in chill moulds for casting car wheels, the object of which is to facilitate the moulding of car wheels and provide a suitable arrangement for the gas to escape, at the least cost, and



GREEN'S SYSTEM OF VENTILATION.

without materially impairing the strength and durability of that class of car wheel chills that have in their construction an annular groove in the face of the flange portion of the chill to receive sand, or its equivalent, preparatory to casting the wheel. The reason for filling the groove with sand is to prolong the cooling of the outer portion of the flange of the wheel cast therein, thereby preventing the fracturing of the flange of the wheel which is incident to its rapid cooling and contraction.

Further information regarding this system of ventilating may be obtained from the D. C. Green Ventilating Company, 88 Liberty street, New York city.

MISCELLANEOUS INVENTIONS

Mr. Elisha Depue, of Silvara, Pa., has patented an improved tool for upsetting tires, carriage braces, and stays, iron rods, and other forgings. It is simple in construction, inexpensive, convenient, and effective.

Mr. Richard A. Kipling, of Roselle, N. J., has patented an electric lamp with carbons crossed so that they can be fed, by simple contrivances, directly against each other, point to point, in such a manner that the luminous arc will be formed around the carbon points where they meet, and shall cast no shadow below them.

Mr. Casper Marti, of New Albin, Iowa, has invented an improved trap for catching rats and other animals, which is simple in construction and convenient and effective. It is capable of catching the animal without leaving any trace or scent to frighten others that may come after him.

Mr. William Osmond, of New York city, has patented an improved device for attachment to the tops of fences, especially in back yards, to prevent cats from crossing or walking upon them, and thus prevent annoyance from the collection of cats by night in the yards.

ONE OF NATURE'S GLUTTONS.

BY DANIEL C. BEARD.

It was one sultry day last summer that I sent a messenger boy down on Fulton street to secure me a model for a picture I was to paint. After a short time the boy returned, bringing with him a most peculiar individual.

A pair of bright gem-like eyes and a blunt nose, together with a broad, tightly-closed mouth, made up a countenance not easily to be forgotten; and his odd shaped head rested closely upon the shoulders. Add to this a pair of short arms terminating in hands of but four fingers each and disproportionately long legs, to which were attached very broad feet, and you have before you a picture of my model.

A musician by birth and occupation, he belongs to the genus *Rana*, known to naturalists as the *Rana pipens*, but to the schoolboy as the bullfrog! The particular batrachian whose portrait adorns this sheet is quite a favorite, in spite of his previous bad character. Although a tyrant and cannibal, he now numbers among his personal friends many well known artists and noted engravers, who gladly drop their brush, pencil, or graver for the pleasure of seeing the frog devour some crab, bag, or insect that has been captured for him. An old fish globe has been brought into requisition, and through its transparent wall the green prisoner now stares at me as I write. The frog had fasted in this crystal prison for over three weeks before it occurred to me that he might be hungry. To make amends for my neglect I spent almost half a day chasing blue-bottle flies around the room with but indifferent success. However, I captured twenty-

all of which he swallowed tail foremost, keeping up a lively kicking and scratching with fore and hind feet to prevent his prey from curling up and biting. Enough water is always kept in the globe to keep its inmate moist, but too shallow for a mouse to drown in. The wily batrachian is well aware of this fact, for it is not until nothing but the head and fore feet of the mouse protrude from between his jaws that he bends his head down, holding it and the mouse under water until the latter is suffocated before it is finally gulped down. Partly to make a more even fight and partly as an experiment to see what the frog would do under the circumstances, a little over a month ago, before putting in a large male mouse, we emptied all the water from the globe. Then ensued a chase; round and round went the mouse, trying in vain to scale the glassy walls, but never missing an opportunity to give the frog a savage nip with its sharp teeth. Round and round plunged the batrachian after him. Once he caught the mouse by the tail, whereupon the mouse turned and mounted the slimy back of his enemy and bit him severely; but quicker than thought the powerful hind leg of the frog swept the mouse from his back and dashed it violently against the side of the globe.

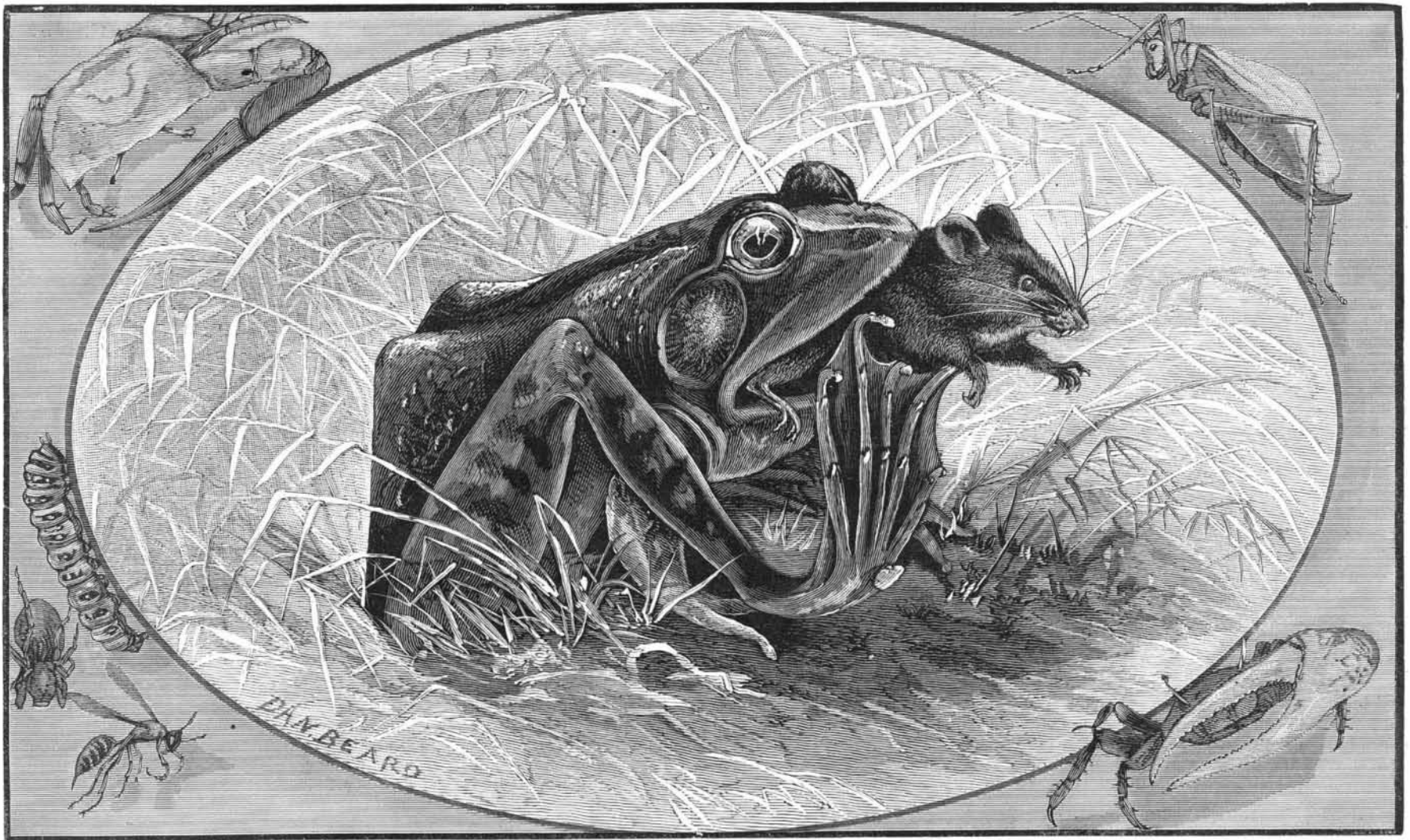
The battle had commenced and lasted about five minutes, when by a lucky snap the frog got the mouse by the hind quarters; the little mammal buried his sharp teeth in the frog's nose. Then again did the mill-pond croaker exhibit an intelligence and activity which I had always been led to believe these creatures never possessed. He kicked with his hind legs and pawed with his fore legs with such vigor that

ted from the central organ to the muscle with the utmost rapidity, but the contraction of the muscle is just so much and no more than the designed effect demands for its accomplishment. This is what we mean by *responsiveness*.

Endurance is the capacity of repetition of the same act, the reiterated discharge of the same amount of nerve force to produce equal muscular contractions for an indefinite period. It is the "staying power" which the tissues must acquire in order to do their best work. It also means the learning and adoption of the line of least muscular force to perform a given task. This is slowly acquired, but when once known, allows of the performance of apparently most onerous tasks with little effort.

Strength is the third, and, beyond a certain moderate amount, least important end of athletic training, although it is often put first. The utmost strength that it is possible for any one to acquire is strictly limited by conditions of age, height, weight, and structure beyond the individual's control; nor is it at all necessary to develop the strength of muscles to their utmost in order to reach their utmost physical perfection. Quite the reverse, indeed, is the case.

To develop these three qualities of tissue wholly different methods of physical culture are required. They do not go hand in hand. The country lout with big muscles that can throw an ox has, as a rule, little endurance and less responsiveness. All army surgeons know how soon these big strong fellows will break down. The circus clown, agile as a cat, is often physically weak, and with no more endurance than an ordinary mortal.



BULLFROG DISGORING A MOUSE.

five of them, and one vicious hornet that had strayed in through the open window. All these were successively swallowed by the frog in a most business like manner. A pink fleshy tongue would shoot out and in an instant the insect aimed at would disappear. When he came to the hornet the frog appeared to think his food was rather highly seasoned, for he winked his eyes several times, if that term can be applied to the act of sinking his eyes down in his head and then popping them up again.

Next day he ate fifteen large flies, two big lively katydids, and two full grown fiddler crabs, life-sized drawings of which may be seen upon the border to the accompanying illustration. He had for dessert the same day a dragon fly and an ichneumon fly. I have since tried him with raw meat, but he could not be persuaded to touch it until a piece cut to represent some insect with long legs was put upon a straw and dangled in front of his nose; this he instantly snapped up.

Insects, crustaceans, mollusks, and small animals, anything with life and not too large to be taken into the capacious mouth of this animal, are greedily devoured, even its own tadpoles and young frogs form a palatable viand for the parent. Once I took a dead mouse and, holding it in the globe, jumped it around to give it the appearance of life. Without hesitation it was seized and speedily swallowed by the frog before he discovered that he had been swindled by a corpse. He then opened his mouth and with his fore feet deliberately pulled out the obnoxious mouse in a manner that set the spectators off in roars of laughter. Since then he has devoured many live mice with apparent relish,

the rodent had very few opportunities of biting. Once the mouse's teeth fastened upon the hind foot of the frog, causing him to turn two or three complete somersaults in his efforts to free himself. The mouse was so large that it was no easy task for the *Rana pipens* to swallow him. Slowly but surely, however, he disappeared, until nothing but the head was visible. There being no water in the globe the frog could not drown him, so he did the next best thing—choked him to death by squeezing his neck until the poor rodent's bead-like eyes stuck out from its head, and life was extinct.

Scientific Gymnastics.

Exercise, to be beneficial in the highest sense, should be for itself alone; it must not be work in any sense; it should pursue its own objects, and no other; it should be made a pleasure and not a labor; it should be utterly divorced from ulterior notions of economizing expended powers; and this should never more firmly be insisted on than in the case of those abnormal creatures who say they take no pleasure except in useful work.

The theory of scientific gymnastics is directed to bring about three qualities in the tissues. 1. Responsiveness; 2. Endurance; 3. Strength. The first of these is displayed in suppleness or agility. The muscle is well under the control of the will; it responds at once, with promptness and to the required extent. The quick blow of the prize fighter, the exactly graded and lightning-like motion of the swordsman, are examples. Not only is the nervous message transmit-

Moreover, all three of these qualities are to be imparted to all the muscles of the body, in proportion to their uses, so that a symmetrical development may be secured. The blacksmith, with his mighty right arm, but who is "blown" in a foot race of a hundred yards, and the ballet dancer, with her legs like Diana's and her arms like stems, are familiar examples of the absence of symmetry.—*Medical and Surgical Reporter*.

The Benzoate of Sodium in Consumption and Diphtheria.

The inhalation of the benzoate of sodium in phthisis continues to attract attention in Germany. Prof. Rokitansky, of Innsprück, was the first to advocate it, and Dr. Winternitz and others who had visited his clinic report upon it very favorably. They aver that nearly all cases improve upon it, at least at first. This result is categorically denied by many other observers.

Its success as an agent in diphtheria is attested by Dr. Letzerich, of Berlin. The pseudo-membrane is dusted with powdered benzoate, applied through a glass tube or quill, two or three times a day. Older children may use a gargle of one part to twenty. The temperature and pulse together decline under this treatment. The pseudo-membrane contracts and becomes thinner and more transparent.

It is estimated, by those in position to know, that more miles of railroad will be built during 1880 in this country than during any year before. About 9,000 miles of new road are already under contract.