

South American hog, scrambled up when it heard a noise, and ran to its trough, over which it stood looking expectantly at those who had disturbed it. The little sun bear was rolled up in a black ball in a corner of its cage, while the first sight of the grizzly in another apartment of the same cage showed it swaying noiselessly to and fro. The striped hyena was roaming about in its cage. A ridge of coarse hair arose along its back when it was disturbed, and it retired to the rear of the cage to glare at its visitors. It kept up a low but unceasing growl. It retains the wild instincts of its ancestors, and the keepers say that this low growl can be heard nearly all night. It howls a prediction of a storm several hours before the storm comes.

Savage hisses were heard from two black leopards before the visitors arrived at their cage. When a neighboring gas jet was lighted their glistening teeth and red gums came into view. Their upper lips were drawn back as they crouched on the floor, and their short ears were laid back until it seemed as if there was no room for any brains in their serpent-like skulls. They are the fiercest of all the beasts in the menagerie, and so wild that when they are changed to a new cage they will not eat for several days. A large spotted hyena was found growling in the dark, and twisting uneasily on its back with his clumsy feet in the air. He weighs 250 lb. He immediately got up, and retiring to the back of the cage, glared menacingly. A wildcat sprang to the rear of its cage when it was approached, and crouched as if for a spring. A moment afterward it sat up looking as innocent and unconcerned as a house cat after it has eaten a canary. It killed three of its brothers last summer. A jaguar glanced carelessly at the midnight party as they passed its cage, but otherwise affected to disregard them. Two lions, born in Central Park two years and a half ago, lifted their nozzles from their front paws, stretched out in front of them, and showed their fine large fronts, while they blinked lazily at a newly lighted gas jet. Showmen like lions, on the whole, much better than tigers, because they are not so treacherous; but they say that a bad lion is worse than a tiger. Before approaching within reach of a lion, a keeper always tries its disposition by coaxing words and by offers to pet it. If it holds down its head to be scratched, it is considered to be in a safe mood to handle. The rhinoceros sleeps with a hoarse snore, and resembles a huge over-fat hog as its body spreads out over the bottom of the cage. The one in Barnum's menagerie is said to weigh 7,900 lb. All of the framework of the wagon on which its cage rests is made of steel. It is said that it would be the most dangerous animal in the menagerie if it should escape in an angry mood. Though usually very sluggish, it is terribly quick in action when angry, and there is practically no limit to its strength.

The four or five baby elephants stood in a row, fastidiously selecting choice spears of hay with their restless trunks, while Emperor and his huge mates lay sprawled out on their sides, their upper sides being rounded up into formidable mounds of flesh. The effect of the light was to make several of them lurch backward and forward sideways, and finally sit up on their haunches in their clumsy, broken-jointed fashion. The sea lion sleeps on its platform and not in the water. The giraffe usually holds its long neck nearly erect, with its legs doubled under him like a horse.

Keepers in a menagerie divide their charges into six classes—hay animals, cat animals, monkeys, elephants, birds, and fishes. If a keeper of the cat animals is killed, or if he leaves his situation, the management look about for an experienced man to take his place. If they cannot find any, they promote one of the oldest and trustiest hay animal keepers to the vacant position. The cat animals comprise everything of a naturally savage nature, including the lions. The hay animals include deer, giraffes, and the like. In the elephant class are included rhinoceroses and hippopotami. It requires a particularly steady and trustworthy man to care for the "cats," which can never be handled or changed from cage to cage without precautions, no matter how tame they may seem to be.

NATURAL HISTORY NOTES.

The Peripatus.—In Mr. Moseley's recent work, "Notes by a Naturalist on the Challenger Expedition," the author gives the following description of the *Peripatus capensis* found at the Cape of Good Hope. This curious creature is believed to be a nearly related representative of the ancestor of all air-breathing arthropoda—i. e., of all insects, spiders, and myriapods. Before Mr. Moseley collected, examined, and dissected specimens at the Cape, nothing was known of its development. The animal has the appearance of a black caterpillar, the largest specimens being more than three inches in length, but the majority smaller. A pair of simple horn-like antennæ project from the head, which is provided with a single pair of small, simple eyes. Beneath the head is the mouth, provided with tumid lips, and within with a double pair of horny jaws. The animal has seventeen pairs of short conical feet, provided each with a pair of hooked claws. The skin is soft and flexible, and not provided with any chitinous rings. The animal breathes air by means of tracheal tubes, like those of insects. The sexes are distinct; the males are much smaller and fewer in number than the females. The animal is provided with large glands, which secrete a clear viscid fluid, that it has the power of ejecting from two papillæ, placed one on either side of the mouth. When touched or irritated the animal discharges this fluid with great force and rapidity, and in fine thread-like jets. These jets form a sort of network in front of the animal, looking like a spider's web with dew on it. The viscid substance (which is not irri-

tant when placed on the tongue) is exceedingly tenacious, like bird-lime, and when the author put some on a slip of glass some flies approaching it were at once caught and held fast. This slime is used not only as a means of offense, but to catch insects on which the animal feeds. The animals live in or under dead wood, are nocturnal in their habits, and their gait is exactly like that of a caterpillar.

That the *Peripatus* is a very ancient form is proved by its wide and very peculiar distribution. Species of the genus occur at the Cape of Good Hope, in Australia, in New Zealand, in Chili, in the Isthmus of Panama, and in West Indies. If its horny jaws were only larger, Mr. Moseley thinks they would no doubt be found fossil in strata as old as the old red sandstone at least.

The Hibernation of Swallows.—It was an old and popular superstition that swallows, late in autumn, hide themselves in holes in the earth, in marshes, or under water; and it also used to be asserted that great lumps or numbers of the birds were frequently fished up, fixed to one another by their claws and beaks, and that these when laid in a warm place quickly revived, although they before seemed dead. Curiously enough, Dr. Elliott Coues, in his work on "The Birds of the Colorado Valley," published by the government, revives this old question as to the hibernation of swallows. He does not indeed affirm his positive belief in their passing the winter, as alleged, buried in mud at the bottom of ponds and rivers, but he declares that the occurrence of this phenomenon rests on as good evidence as many other things which are accepted as facts in natural history, and that his mind, at any rate, is open to conviction. He says: "I see no reason why a swallow should not stay a while in the mud in a state of suspended animation, or greatly lowered degree of vital activity. The thing is physically and physiologically feasible, and is in strict analogy with observed phenomena in the cases of many other animals; and it is not more marvelous than catalepsy, trance, and several other conditions of life, the rationale of which is still obscure." In reviving this old question, which we supposed had for ever been set at rest long ago, Dr. Coues has done all in his power to furnish the means for its solution, in the shape of an elaborate bibliography of the subject, extending over nearly a dozen pages.

The Germination of Mushroom Spores.—It has been generally supposed, and in fact it is asserted in all works on the subject, that the spores of the common edible mushroom cannot be made to germinate until they have passed through the body of a horse or some other graminivorous animal. Mr. W. G. Smith, an eminent authority, denies this, however. He says, in the current number of the *Gardener's Chronicle*, that "it is a mistake to suppose that the mushroom spores will not germinate until they have passed through the stomach of a graminivorous animal, for I have several times seen the spores germinating upon clean glass. I first noticed the fact by accident, after I had left a number of freshly fallen spores under the microscope all night. On looking at the slide in the morning nearly every spore had germinated. But then the spores were perfectly fresh and alive. My observations lead me to think that spores very soon die in unsuitable dry air or when they fall upon any unsuitable matrix. Many other fungus spores will germinate upon glass, it being always remembered that for this purpose the spores must be perfectly fresh from the hymenium of the parent fungus. Fungus spores will grow freely upon damp blotting paper; they cannot be seen when upon this material, but they can be easily transferred (by mere contact) to a damp glass slide. Several dung-borne agarics (as they are often termed), including the mushroom, are not uncommon on the sea sands, in positions where graminivorous animals rarely disport themselves."

A Rival of the Shellac-producing Insect.—The *Colonies and India* states that an American explorer has recently discovered in the little known district of Yucatan, bordering on British Honduras, a valuable insect, possessing properties which ought to make it a rival of the cochineal and shellac-producing insects. This is the *Nean*, or *Nin*, a species of *Coccus*, which feeds on the mango tree and similar plants, and exists in enormous quantities in Central America. It is of considerable size, of a yellowish brown color, and emits a peculiar oily odor, containing as it does a large quantity of fatty oil, or rather grease. This grease is used by the natives for various purposes, being highly prized as a medicinal oil for external application, and it is also employed for mixing paints. It can be made to change its condition very considerably by different processes. When exposed to great heat the lighter oils evaporate, leaving a tough, flexible mass, resembling half softened wax, but unaffected by heat or cold, and which may be used as a lacquer or varnish. When burnt this material produces a thick semi-fluid mass, somewhat resembling a solution of India rubber, which after a few days becomes hard and solid. As a cement this substance will be invaluable, and it might also be used for waterproofing purposes.

Electrical Eels.—According to the *Popular Science Review*, M. Fritsch, after an examination of a fresh specimen of *Gymnotus electricus*, concludes that this fish is allied to the siluroids rather than to the eels, and hence the term "electrical eel," by which it has hitherto been popularly known, is a misnomer. He founds this opinion especially upon the structure of the brain, which has the olfactory tubercles small and the cerebellum very large, as in the siluroids; whereas in the true eels these parts present exactly the opposite character. Further, in the *Gymnotus*, as in the siluroids, the maxillaries are rudimentary, and the margin of the up-

per jaw is formed by the intermaxillaries; in the murænoids, on the contrary, the maxillaries form part of this margin and bear teeth. The structure of the opercula constitutes another agreement with the siluroids. From consideration of these and other characters M. Fritsch is inclined to place the *Gymnotus* close to the malapterini, which also include an electrical species.

The Ivory Nut Palm.—A writer in a recent number of *Science Gossip* states that in 1843 Mr. William Purdie was dispatched to New Granada to collect plants for the Royal Gardens, Kew. He was specially instructed to find a few special plants, one of which was the ivory nut palm. In his account of this Mr. Purdie says: "In a journey of 600 miles, from Santa Martha to Ocana, in New Granada, at the village of Semana, seventeen leagues from hence, and near the great river Magdalena, I entered the mountains, and saw for the first time the ivory nut palm (*Phytelaphus macrocarpa*), called *Tagua* by the natives. The habit of this palm is to have little or no stem, what there is is decumbent; it is not a robust tree. Old plants have from fifteen to twenty primate leaves, which when fully grown measure nearly twenty feet in length, of a delicate green color, very graceful, and similar to those of the date palm. The male and female flowers are borne on separate plants. The male flowers are produced generally in six clusters from the bases of the leaves and on short footstalks. The clusters are compact and form a nearly globose head, which, on account of the style-like projections resembling the rigid hair of a negro, is not inaptly called *Cabeza del negro* (negro's head). These heads lie close to the ground, each cluster containing four or five seeds. The seed contains at first a clear insipid liquid, which afterward becomes milky and sweet, and ultimately hardens and becomes the "vegetable ivory" of commerce. Each of these nuts is about the size of a green walnut, and is covered with a yellow, sweet, oily pulp, which is collected and sold under the name of *Pepo del Tagua*. A spoonful of the latter with a little sugar and water makes the celebrated *Chiche de Tagua*, said to be the most delicious beverage of the country.

The stem of the male plant is larger and more erect than that of the female, and the singularity of its inflorescence is only equaled by its beauty. The fragrance is most powerful and delicious, exceeding that of any other plant, and so diffusible that the air for many yards becomes alive with myriads of insects. Mr. Purdie states that he had to carry some of these blossoms twelve miles, and though he killed a number of the annoying insects that followed him, yet the next day a great many still hovered about the flowers, having come all the way from the woods where the latter grew.

Propagation of Rock Fish.—(*Roccus lineatus*.)

A notable achievement in fish culture is reported by the *Baltimore Sun*, namely, the successful hatching of several hundred rock fish or striped bass, as they are more commonly known in this market. The credit is due to Major T. B. Ferguson, of the United States Fish Commission, who thinks it one of the most important gains of fish culture, since the rock fish is good at all seasons and is one of our leading sources of sea food. Hitherto the spawning time of this fish has not been known. The young rock fish now at Druid Hill Park hatching house are the produce of three ripe rock fish taken May 6th at Dr. Capehart's fishing shore, "Avoca," on Albemarle Sound, N. C., near the mouth of the Roanoke river. From these three fish nearly two bushels of eggs, estimated at three millions, were taken and impregnated, but the proper preparation had not been made for their treatment, and the result was not as prolific as could have been desired. Indeed, although the fish commissioners have been long bent on finding out the habits of the striped bass, the capture of these ripe fish was a surprise. They were taken and spawned by Wm. Hamlen, of Baltimore, who resides on Federal Hill, and has been in the employment of the Maryland Fish Commission for several years. Mr. Hamlen was fortunate also in hatching the first smelt, under Major Ferguson, in the Raritan river, and last season he was successful in securing herring eggs, from which 500,000 fish were hatched at Avoca, on Albemarle Sound, and brought to Washington and Baltimore for distribution.

The striped bass hatching was in connection with United States fish hatching work under the superintendence of Major Ferguson, who has thus been instrumental in achieving success first with smelt, then with herring, and now with the striped bass. The eggs of the ripe rock fish are green, opaque, and smaller than the eggs of shad. After impregnation they become fifty per cent larger than shad eggs, and their specific gravity is lighter. They are almost perfectly transparent, and have only a small speck. They have a large umbilical sac, a quarter of an inch long, and almost invisible. In water at the temperature of which shad eggs will hatch in four or five days, rock fish eggs will hatch in thirty-six or forty-eight hours.

The Obelisk.

Mr. Dixon has partially gained his suit against the underwriters for the salvage of the Cleopatra and the obelisk when cast away off the Spanish coast, and *Iron* says the result gives general satisfaction. It is also satisfactory to find that the "Needle" itself has been successfully coated with an insulating solution which it is hoped will protect it for many years from the action of the sulphurous acid that the sea coal fires of the metropolis discharge into the atmosphere to the detriment of most descriptions of stone. The monolith had been greatly injured on the surface from exposure to atmospheric influence in Egypt, especially since it was

thrown down; and it also, owing to the disorganized condition of its exterior, received further injury during its transit to this country. The effect of the silicious wash, we are told, has surpassed expectation, and is only to be compared to the restoration of an old painting. The obelisk first received a thorough cleaning, it was then coated with the solution, and now appears as if just chiseled from the rock, showing its original colors, the quartz and feldspar glittering in the sunlight. The intaglio also comes out much more distinctly than before.

The Metric System.

During the last Congress much evidence was collected with reference to the compulsory adoption of the metric system in this country. Among the papers was the following able report by the Quartermaster General:

"In reply to the reference of the resolution of the House of Representatives, in regard to the objections which may exist to making the use of the metric system of weights and measures obligatory, first, in all government transactions, and second, in all transactions between individuals, and the length of preliminary notice desirable before such metric law goes into operation in the United States, I have the honor to say that if the law makes the use of the metric system obligatory in all government transactions it can be adopted by officers of the Quartermaster's Department as soon as notified by general orders.

"Such an order can be distributed to every military post within the space of one month from the time of its publication, and, if the telegraph be used, within one week.

"The objections thereto which at once occur to me are:

"1. It will very considerably increase the labor of computation, for, in practice, all sellers to the United States will make their deliveries in accordance with the English measures now in general use, and the officers, using the ordinary scales for weight, and the yard, foot, and inch, and bushel, gallon, quart, and pint for measures, will first ascertain the quantities and sizes in the present weights and measures, and then, by the use of tables to be distributed, will reduce them to metric quantities in their statement of their vouchers, receipts, and accounts, which will, it appears to me, be a perfectly useless labor.

"2. This reduction, involving additional calculations and transfers from one set of units to another, unfamiliar, and much less convenient, will infallibly be the source of many mistakes, to the loss of the disbursing officer of the Treasury, or of the person who sells supplies to the United States.

"3. It will be necessary, in order to make the operation of such a law really successful, to throw away all the hay scales and other platform scales whose beams are now divided according to the American standard of units of weight, and all the rules and measures divided according to the yard, foot, and inch, and all the weights, pounds, ounces, or grains, of avoirdupois, troy, and apothecaries' weight, and to purchase, distribute, and substitute new scales and new weights according to the metric system. These changes will be expensive. The trouble and labor I do not speak of, as such labor will, in case of the passage of a law, simply be the duty of all officers and employes of the United States.

"4. If the metric system is made obligatory in government transactions and not in transactions between individuals, then continual confusion and misunderstanding will be caused by the use of one standard by the government and another by the people. All packages are put up by merchants, manufacturers, and producers in accordance with the actual legal standards, pounds, ounces, grains, yards, feet, inches. The transactions of the United States, large as they are, are insignificant compared with those of private trade. Manufacturers and consumers and the people will not change their customs at the call of the officers of the United States.

"In regard to making the metric system obligatory in transactions between individuals:

"I do not believe that this is within the power of Congress. It will be looked upon by the people as an arbitrary and unjust interference with their private business and individual rights, and I do not think they will submit to it. It will inflict, if it can be enforced, a great loss upon many, especially upon manufacturers and mechanics whose shops are filled with costly tools, standard gauges, dies, and machines, all constructed upon the basis of the foot and inch.

"Every geared lathe in the United States depends upon a screw of a certain number of threads to the inch, and all the screws it produces are gauged in pitch and diameter by the inch.

"The meter is not commensurate with the inch, foot, or yard; all reductions are approximate only. The law of July 27, 1866, makes the use of the metric system permissive, legal, but not obligatory, and establishes for the reduction of meters to inches, and the reverse, the ratio of one meter to thirty-nine and thirty-seven hundredths inches, which is not absolutely correct. To alter all this machinery, to change all these machines, gauges, dies, screws, and other parts of engines, will be the work of years—will cost millions of dollars.

"The metric system is not a convenient one for common use. Its measures are not of convenient length. The yard, half the stature of a man, is of convenient length to handle, to use, to apply. It, and the goods measured by it, can be halved, quartered, subdivided into eighths, sixteenths, thirty-seconds, sixty-fourths, etc.; or it can be with equal facility divided into tenths, hundredths, thousandths. Half a meter is no dimension: half a centimeter is an unknown quantity; but half a yard, half a foot, half an inch, half a bushel, one fourth of a bushel, of a quart, of a pint, etc., are recognized. If half a liter, of a deciliter, or a quarter, eighth, or sixteenth of these quantities is provided for, then the metric decimal system is abandoned at once.

"In calculation the metric system applies admirably to money and accounts of money; but even here the government has been obliged to abandon for the convenience of the people the true, strict, decimal system, and to coin half a dollar, half an eagle, the quarter of a dollar, etc.

"In the use of weights and measures, however, there are not so great advantages in the decimal system. The unit is too large, and the numbers produced and used in the calcu-

millionth of the Paris quadrant, is not what it professes to be and was enacted to be) cannot be found in the French metric system.

"1. The unit of length: The meter is 3 280890 + feet, or 39 37070 + inches.

"2. The unit of area: The are is 119 60332 + square yards.

"3. The unit of liquid measure: The liter is 0 26418635 + gallon, or 1 0567454 + quart, or 2 1134908 + pints.

"4. The unit of space: The stere is 1 308764 + cubic yard, or 35 386636 + cubic feet.

"5. The unit of weight is: The gramme = 15 43234874 + grains troy.

"6. The unit of roads is: The kilometer = 1,000 meters = 0 62138 + mile.

"7. The unit of land measure for farms and city lots is: The hectare = 2 47114 + acres.

"8. The commercial unit of weight is: The kilogramme = 1,000 grammes = 2 20462125 + pounds avoirdupois.

"What will our farmers, citizens, merchants, tradesmen, and mechanics do with these figures? And will they submit to being obliged to reduce acres, feet, inches, pounds, and ounces by multiplying or dividing by the above figures? "I think that to make the French metric system obligatory between individuals in this country will be an impolitic and arbitrary interference with the rights, interests, and habits and customs of the people."

Self-Reliance.

There is no one element in a man's character that contributes more to his success in life, wisely says the *United States Economist*, than confidence or self-reliance in his own ability. A faint-hearted man is unstable, and will never excel. Faith in the endeavor to will and to execute is as important in a successful business career as is the keystone to the arch. A man possessed of a bold, daring, and resolute will may be modest in revealing his powers, but will be determined in performing what he conceives to be right. To men with this never-dying faith there is no such word as defeat, and when obstacles present themselves in their path, it only results in their putting forth a greater effort to accomplish their purpose.

Toil, trial, disaster, gloom, and danger may environ and threaten to overthrow the most cherished plans, yet over and above all hindrances a heroic soul will triumph and win fame and honor. The discouragements that would retard the irresolute only discover the weak places to the brave, and, strengthening these, they renew the conflict with increased vigor. Timidity creates cowards and never wins success. It is a strong and abiding faith in one's own ability to perform that overcomes difficulties that others thought could not be surmounted.

In all the pursuits of life we find that those who achieve honor and distinction are strong and self-reliant in their own powers, exercise faith in their own ability, and carry out plans conceived in their own brain. Morse had faith in telegraphic wires, and Field in submarine cables, and to-day, in consequence thereof, the lightning is harnessed to convey the news of the world in every part of the habitable globe within the compass of a few hours. Two young men in 1862 commenced a banking business in Wall street in a small office. They had faith in their own ability and also that of the United States to pay its great war debt. To-day they are the leading bankers in government securities on this continent, their daily sales running into the millions, and their name and credit take high rank in all the financial centers of the world. Not many years ago Edison occupied an humble position as a telegraph operator; to-day his name and fame are world-wide as associated with some of the grandest discoveries of ancient or modern times. Astor, Stewart, and Vanderbilt furnish examples in the large fortunes

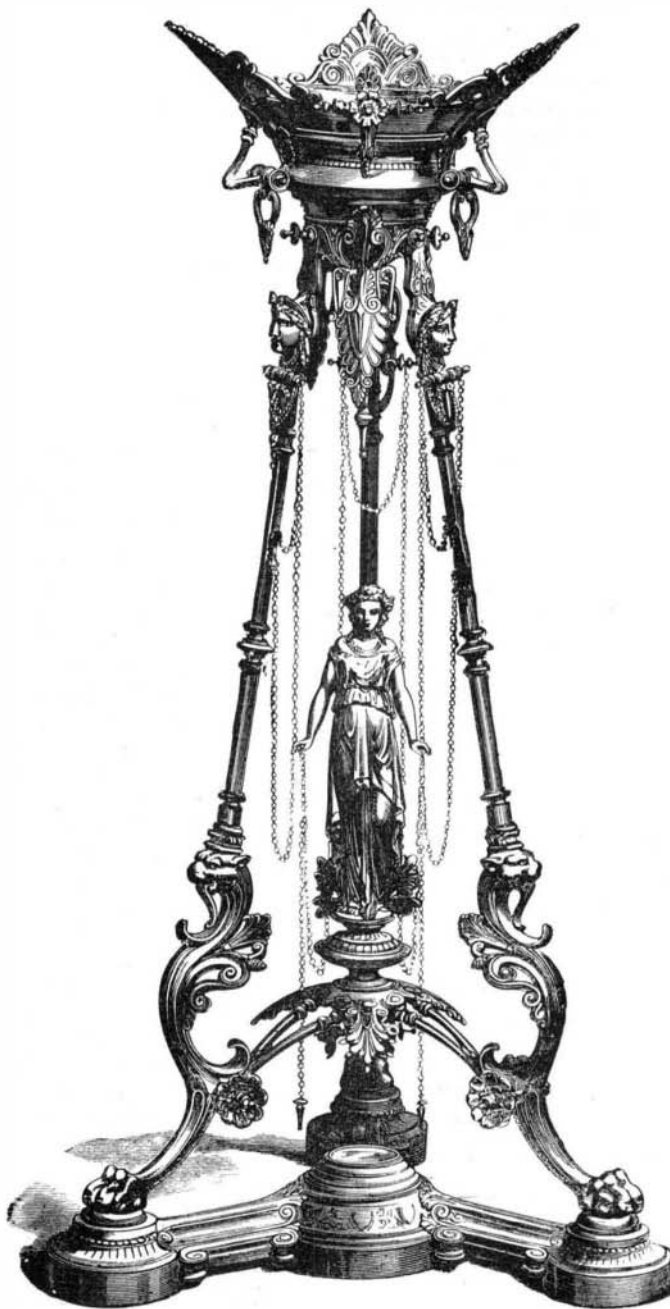
they created as to what well-directed energy and determination can accomplish in business pursuits, while the eventful life of the late Judge Packer is another striking illustration of the high position that can be attained by reliance and perseverance in the individual man, backed by a liberal endowment of common sense. In the ever-widening paths of commerce and the ever-increasing monetary circles there open up before the young men of the nation rare opportunities to win wealth and fortune. In agricultural, mining, industrial, and mercantile pursuits like avenues to attain distinction are presented. But fortune will not come by chance nor distinction by hazard; both must be won by strong, heroic endeavor. Backbone is vital in the achievement of lofty aims, and nerve and grit are essential requisites in the battle of life. A man, to triumph, must have faith in his enterprise and reliance in his ability.

FLOWER STAND.*

The engraving on this page represents an elegant bronze flower stand designed and manufactured by Mr. M. Semey, of Paris, France. A base like the lower portion of the stand is also used as the base for a candelabrum.

The judicious use made of the antique in this composition gives it interest.

* *The Workshop*: Wilmer & Rogers News Company, agents, 31 Beekman street, New York city.



BRONZE FLOWER STAND.

lations of the engineers are tedious to write and are beyond the limits of ready apprehension.

"The ciphers and figures 0 00000073 convey no idea to a mind trained in the English and American system, and yet such combinations are common in French works of science and mechanics.

"The true scientific natural basis of the metric system has been abandoned. The meter was intended and enacted to be the ten millionth of the quadrant of the terrestrial meridian of Paris. In the progress of geodesy and science, it is ascertained that the standard meter bears no (exact) relation to that quadrant, and, though it is probably very nearly the ten millionth of the quadrant of the meridian in which New York lies, it is not probable that it is the ten-millionth of either of the three other quadrants of that meridian, or of any quadrant of any other meridian.

"The fact is, that the meter is quite as arbitrary and unscientific a standard as the foot, or yard. It is of less convenient length than either of them, and its compulsory adoption would derange the titles and records of every farm and of every city and village lot in the United States; would put every merchant, farmer, manufacturer, and mechanic to an unnecessary expense and trouble, and all, it seems to me, for the sake of indulging a fancy only, and a baseless fancy, of closet philosophers and mathematicians for a scientific basis of measures and weights which (as the meter is not a ten