King Snakes and Rattle Snakes.

An article was published in the 48th No. Scientific American, last volume, by S. Gillman, L. L. D., "on the venom of serpents."

Dr. Gillman, in that article, in referring to the fact, that after placing two speckled king snakes into a den of rattlesnakes, and the king snakes having destroyed in one night's time nearly all the rattlesnakes—after which he introduced the venom of a rattle snake into one of the king snakes—it having died immediately, comes to the conclusion, and says, "thus evincing that they (the small snakes) must have exercised some power besides physical force to overcome their fellow creatures."

My object in noticing this remark of Dr. Gillman, is to state that I believe the small snakes did not exercise any power besides physical force for the destruction of their fellow creatures, and my reason for thinking so. The principal reason I have for entertaining the opinion I do is this: some years since I witnessed a small speckled king snake overcome a rattlesnake of considerable size. In Tuscaloosa, Ala., I was employed with my father's hands in clearing a piece of new land in the spring, and I happened to pass a brush pile, when my attention was attracted by an uncommon noise and rattling of leaves. My first thought was, that a gray squirrel was in it, and that I would attempt to capture him; but on closer examination I discovered a small speckled king snake coiling himself round a rattlesnake from his neck to the large part of the body. It all seemed to be the work of a second. After seeing the little fellow secure his enemy, I tore away the brush pile, and with a stick took the snakes out. The rattlesnake was apparently dead, while his captor, from time to time, still continued to draw himself tighter around his enemy. After seeing what I have above related, I have no doubt but the Dr.'s king snakes overcome their fellow creatures with physical force. It is well known to us backwoods people that there are other snakes not poisonous that destroy the venomous ones: the small black snake, for instance, will do it. A circumstance of the kind was related to me by an eye-witness. "I observed," said he, "quite a small black snake moving forward apparently with a great deal of caution. He seemed to be smelling on the ground as though he were trying to track something, and thus he would elevate himself 12 or 18 inches, and seemed to be looking for some object. I concluded to remain perfectly still and see if I could find out what the little fellow was up to. I suppose he went on for some twenty yards in this cautious way, when his movements became so peculiar that I supposed he had descried his object, and upon observing closely I saw, about four feet in front of him, a rattlesnake of unusual size. The small snake seemed to select what I suppose seemed to him a favorable opportunity, and leaped upon his enemy, catching him just behind the head, and as quick as thought coiled himself around the larger one, and soon overcame him."

I am somewhat surprised that so close an investigator as Dr. Gillman, after residing, as he tells us, for three months in Arkansas, and having his attention drawn to snakes, should not have ascertained the fact that most of the venomless snakes look on poisonous ones as their enemies, and so destroy them, as related above. We "down South," were we disposed, could no doubt interest you with our snake stories. I once witnessed the catching of a rabbit by a snake about the size of my thumb—saw how the snake killed and swallowed it, and noticed particularly the principle upon which so small a snake was enabled to swallow so large a body. B. C.

Welding Steel on Shears' Blades.

The welding of steel upon iron is a very particular operation, and one which requires great experience and care to perform. An improvement in machinery for welding steel on the blades of shears, and finishing them, has just been made by Robert Dawson, of Huntingdon, Conn., who has taken measures to secure a patent for the same. The principal operating parts are two dies, one being of the form required for the back or outer side of the blade, and the other of the face or inner side of the same when finished. The former die is arranged in a sliding bed, the latter on a roll above it, the former receiving and forming a solid bearing for the whole of the iron part of the blade, and the latter having a flat face to rotate in contact with and press upon the steel, for welding it to the iron properly, both being caused to move together by gearing between the bed of the lower die, and the roll of the upper die.

Condensed Air as a Motive Agent.

B. R. Buckelew, of San Francisco, informs us by letter, that he is about to construct a boat to ply between that city and Marin city—twelve miles distant—which is to be propelled by rotary engines, supplied with condensed air at a high pressure, The condensed air for propulsion he intends to store up in large reservoirs, at each end of the ferry, and to store it up by wind, steam, and gunpowder force. From these reservoirs, the boat is to be supplied at the end of each trip by taking the compressed air into smaller reservoirs in the boat, from which it is supplied to the engines, like steam. He has also invented a regulator, to equalize the pressure of the air.

Compressed air has been employed, and still is, to propel a locomotive up an inclined plane, near Paris, and an engine has been worked for a long time in a coal mine, as described in Vol. 4, Scientific American, near Glasgow, by compressed air. We have also seen accounts of a carriage having been propelled through the streets of Paris by compressed air, contained in a portable strong metal vessel. It is our opinion that condensed air never can be used with economy in the propulsion of engines. First of all, it has to be condensed by an engine, either a water-wheel or a wind-mill, and owing to its great bulk, it would require immense magazines in which to store it up.

The Water Wheel Challenge.

Our readers will remember that we presented on page 402, Vol. 9, Scientific American, a challenge for the manufacturers of water wheels to compete with that of Mr. Vandewater. Since then we have received quite a number of communications on the subject. One correspondent, A. B., of Susquehanna, Pa., says that a good plan for those who wish to try their water wheels, would be to exhibit a working model twelve inches in diameter, under sixteen inches head, driving an archimedean screw, the wheel which drives the whole water up nearest to the horizontal head to receive the prize. He suggests that the trials take place in the Crystal Palace Arcade, and every candidate to pay an entrance fee of $50 to form a prize. He is ready to be put down for that sum.—Another correspondent, J. H., of N. H., makes the same suggestions as the above with regard to the size of the wheels, but with respect to testing their power, he recommends the friction brake.

Water Wheel Challenge.

The "Water Wheel Challenge" on page 402, last volume, Scientific American, may lead to some fine sparring. I have now in my mill a water wheel entirely constructed of wrought iron. The wheel is twenty-three feet two inches in diameter, and three feet ten inches wide. The bottom of the forebay is on a level with the upper edge of the wheel, and the water is let on the wheel with a curved pitch back shute. To grind and dress three bushels of wheat per hour, I draw a gate three feet by three-quarters of an inch, under a six-inch head; which makes, if my calculation is correct, about two and seven-tenths horse power. I see, in a note by the American editor of *Weisbach's Mechanics*, in Vol. 2, page 194, that "three excellent over-shot flouring-mill wheels with all the modern improvements," required one and a-half horse power to grind and dress one bushel of wheat per hour, which would be four and a-half horse power for three bushels. I think Mr. Vandewater had better not be too hasty to bet. It is not patented, and I therefore have no interest in the matter, further than the gratification of having the best wheel, if it should prove so. "Necessity," here again, has been "the mother of invention." The wheel is a curiosity.

A. W.

Middleton, Pa.

Remarkable Spring.

S. N. Caralho, an artist, in a communication to the San Francisco *Herald*, describes a wonderful spring which he discovered on a journey from the great Salt Lake to Los Angelos. He says:—

"We followed up the stream of the cottonwood springs, on the 30th of May last, for about three miles, when the road turned a little to the right: as I was anxious to see the head of the stream, and from the appearance of the surrounding country, I judged it to be very near. Parley Pratt, several other gentlemen, and myself, continued up the stream, and after a ride of half a mile we came to a large spring, 35 feet wide and 40 long, surrounded by acacias in full bloom. We approached through an opening, and found it to contain the clearest and most delicious water I ever tasted; the bottom appeared to be not more than two feet from the surface, and to consist of white sand. Parley Pratt prepared himself for a bathe, and soon his body divided the crystal waters. While I was considering whether I should go in, I heard Mr. Pratt calling to me that it was impossible to sink, the water was so buoyant. I hardly believed it, and to be able to speak certainly, I also undressed and jumped in. What was my delight and astonishment to find that all my efforts to sink were futile. I raised my body out of the water, and suddenly lowered myself, but I bounced upwards as if I had struck a springing board; I walked about the water up to my arm-pits, just the same as if I had been walking on dry land. The water, instead of being about two feet deep, was over fifteen—the length of the longest testpole we had along. It is positively impossible for a man to sink over his head in it; the sand on the banks is very fine and white; the temperature of the water is 58° Fahr. I can form no idea as to the cause of this singular phenomena. Great Salt Lake also possesses this quality, but this water is perfectly sweet. In the absence of any other name, I have called it the *Buoyant Spring*. I have never heard it spoken of as possessing this quality, and should like some of the *savans* to explain the cause of buoyancy."

If the spring discharges a large volume of water, the great pressure from beneath will uphold those who bathe in it and prevent them from sinking.

Great Railroad Bridge—Maine Mechanics Association.

Messrs. Editors.—I noticed in a recent number of the Scientific American an article concerning a "Great Railway Bridge" over the Illinois River, at La Salle. It speaks of it as being fully equal to any structure of the kind in America.

The Grand Trunk Railway Company have commenced a bridge across the St. Lawrence, at Montreal, for the passage of the trains of the Atlantic and St. Lawrence, and the St. Lawrence and Atlantic Railway, which for size and strength will exceed anything of the kind in the world. It is to be nearly three miles in length, crossing the river at an angle.

It is to be constructed of iron materials at an estimated cost of about five millions of dollars. The parts are fitted in England, and a part of them have already arrived at this port, and been transported over the road to Montreal.

This vast structure is under the Superintendence of Robert Stephenson, and it is expected will be finished in about two years. It is to be at an elevation sufficient for the largest ships to pass under at all times.

The Managers of the Maine Charitable Mechanic Association are busily employed in making preparations for the coming Fair. They have erected a new building two stories high, and 120 feet in length, immediately in front of, and connected with the City Hall. This new building is to connect at the other end, by means of a bridge thrown across the street, with another large hall, all three of which they hope to see well filled with contributions from all parts of the country. The managers will spare no pains or expense to make everything convenient for such as shall send the productions of their skill and labor for exhibition. Yours, G. L. Bailey.

Portland Me., Sept. 8th, 1854.

To Mechanics—The Scientific American.

There is much zealous truth in the annexed extract, taken from the Granville (Ohio) *Journal*:

"The question is often propounded—'Why have we so few really scientific artizans and mechanics amongst us compared with the number of those who follow these pursuits?' The answer is at hand: It is the neglect of those who are engaged in mechanical avocations to thoroughly acquaint themselves with the scientific details of their business. They are too apt to be content with following the rules which were taught them during their apprenticeship without investigating the principles upon which they are based, or in working after the models and instructions of others, who being more prudential and wise have made themselves familiar with the scientific principles of their employment.

The mechanic or artizan can with no more propriety expect to excel in his particular sphere without hard study and deep and close reflection, than the physician or lawyer to arrive at eminence in his profession without similar application. If we wish to arrive at distinction in any of the avocations of life, we must avail ourselves of the observation and experience of others as well as that of our own. This is the grand secret of success in arriving at perfection in any thing, and we wish it were more fully appreciated by our fellow mechanics. If apprentices to the mechanic arts would but spend the money they squander for 'yellow covered' romances, song books, and such worthless trash, which but poison their minds, corrupt their morals, and unfit them for the duties of life, for good scientific papers and books, and use the time they idle away evenings on the streets and around places that should never be frequented by them, in the perusal of these periodicals and books, they would find, when out of their apprenticeship, that they would be better workmen, more respected, and much better qualified to fill the various spheres in which they may be called to act; and if our master-mechanics and journeymen would take greater pride in storing their minds with scientific truths, and keeping themselves well posted in all the advances and improvements in the mechanic arts, they would be more capable of imparting instruction to those working under them and rendering greater satisfaction to their employers, as well as elevate their calling.

We have neither time nor space to pursue this subject further at present—but would once more recommend the Scientific American to all those who are anxious to become better acquainted with mechanical science, as one of the best, if not the best medium for that purpose published in our country."

We thank the editor of the *Journal* for his favorable opinion of the Scientific American.

Coal—New Sources—Consumption.

Amongst the items of information contained in the latest arrivals from the United States is one of considerable importance relative to coals to be procured in the Pacific and Eastern Oceans. It is found in Australia, and is soon to be abundant in Calcutta, obtained from the Burdwan mines. The *Alta California* has learned from Captain Adams, the bearer of the despatches from Commodore Perry, concerning the treaty with Japan, that "a coal depot will be established at Simoda, for the convenience of steamers, running from California to China, and the *Japanese agree to supply whatever quantity of coal* may be required." If we are to believe that coal can be obtained abundantly in Japan as it is already said to be obtained in Vancouver's Island, we may anticipate a great diminution of expense in navigating the Eastern Ocean and the Pacific by steam, and some relaxation in the excessive demand which has within a few years arisen for English coal.—[London Economist.