Correspondence.

The Editors are not responsible for the opinions expressed by their Correspondents.

The Psychic Force.

To the Editor of the Scientific American:

In a letter which you admitted to your columns on September 30th, I expressed my surprise at the line of argument taken by Dr. Vander Weyde on the above subject; and the eminent scientist, in your last issue, pleads guilty of entire ignorance of the experiments which were made by Professor Crookes and his two co-laborers, and admits that he cannot explain the phenomena in question. Why, then, did he cry "jugglery," and deem that the discussion was ended?

Professor Crookes, the "reporter" whose "credulity" Dr. Vander Weyde speaks of, is a most eminent scientific investigator, and the editor of the *Quarterly Journal of Science*, published in London; and, if he be necessarily insane on some point, no one familiar with the technical literature of the present day will assert that his particular mania is stupidity on points of fact in physical research. In truth, the whole position of the learned doctor is a false one. It is every bit as foolish and as unscientific to cry "jugglery" as it is to cry "spiritualism" whenever a new phenomenon is presented for investigation.

But, if further proof of Dr. Vander Weyde's want of knowledge of the position of this matter were needed, it would be found in the strange way in which he mingles the psychic force theory and spiritualism together. He may apply his reprobation to spiritualism as much as he likes, and few people will object; but the psychic force is another matter altogether, and any destruction of that theory must be sufficient to convince those who, like myself, demand strict scientific proof, and are not in the least inclined to a superstitious belief in the powers of jugglery or of anything else.

To return to the main question, which Dr. Vander Weyde has not yet considered: Is it possible that a power can emanate from a man's will or mind, over and above the mere dynamic force of his muscles? Many of your readers, and probably Dr. Vander Weyde himself, are familiar with instances of men performing feats of muscular power when under great mental excitement, that the strength of their bodies could not possibly account for. Is not this a "psychic" or mental force? And are these questions "unscientific" or "superstitious," when everybody knows that all muscular action emanates from the will, and derives its quantity or intensity from that same will?

I am a mere inquirer after truth, and my name and address matter nothing to the world: but why do scientific men talk of popular ignorance on these subjects, and then answer questions by muttering "jugglery," "superstition," and the like? When the true explanations of many results that now puzzle us are given, we shall find that they are strictly in accordance with natural laws, and are not produced by disembodied souls revisiting the earth, nor by the inventive genius of a charlatan, in whose talents Dr. Vander Weyde seems to have a most credulous faith. B. D.

Jersey City.

Galvanic Experiments.

To the Editor of the Scientific American.

The interesting electrical experiment, described on page 203 of the SCIENTIFIC AMERICAN, reminds me of a series of galvanic experiments of a similar nature, which I made many years ago. As they have never been published, it may be useful to have them recorded in your widely read paper.

The house I occupied in Holland, in 1840, was situated a short distance from a river, to which, at high tide, the salt ocean water had access; but in which, at low tide, the fresh displaced the salt water. When the first mention was made about burying the plates of the galvanic battery in the earth, in order to procure a constant action, I conceived the idea of throwing a copper and a zinc plate into the river, each connected with a proper wire; and having conducted these wires to my house, and connected them with the galvanometer, a constant current was obtained which beautifully fluctuated in intensity, according to the degree of saltness of the water, but never became zero. When the copper plate was immersed in a fresh water well in the rear of the house, while the zinc plate remained in the sea water, so as to have a battery with two liquids and a porous cup (the earth) between, the current was almost as strong as when both plates were immersed in sea water, notwithstanding the plates were now several hundred feet apart; this proved practically, to me, that the earth offers little or no resistance to electric currents, a fact well established since the introduction of the electric telegraph.

The most curious variation of the experiment, however, was when immersing two copper plates of equal size—one in the fresh well water, and the other in the ocean water; at high tide there was a strong current, as the salt water acted on the copper; at low tide there was no current at all, as both plates were in equal circumstances in fresh water. The degree of saltness of the river water was beautifully indicated by the deflection of the galvanometer, going from zero, for fresh water at low tide, to the maximum at high tide: by slow changes in the surface of the plates, however (principally in that exposed to the action of the salt water), the maximums did not correspond every day, as was to be expected.

This experiment gave rise to a series of interesting and instructive investigations on a smaller scale, which I can highly recommend to all who want to become acquainted with the electric action of different liquids on metals, and also of liquids on one another. All that is wanted is a sensitive galvanometer, and some plates of different metals, of an inch high and two inches long, each soldered to a bent piece of thin copper wire, and sunk vertically in the liquids to be tested. The most practical way to insure perfect contact is to dip the ends of the galvanometer wire, in two separate cups with mercury, and to place these in such position, next to the trough containing the liquid, that when immersing the plates, the ends of the wires, soldered to the same, also dip in the mercury cups; in this way, a current is established at once, and if one plate is substituted for another, the difference of galvanic action is at once not only perceived but measured to a certain degree. The change of direction of the current, by changing one plate or the liquid, is also very interesting to observe, while it constitutes the simplest way to find out what acids or solutions may be available with different metals to make new galvanic batteries. So, for instance, I found in this way, now thirty years ago, that a solution of caustic soda or potash could be used between plates of zinc and copper in place of diluted sulphuric acid, while, some ten or fifteen years ago, such a battery came in use among electro-platers.

I am, of course, aware of the more complete experiments, since made in this same direction, by eminent electricians; but as these results are recorded in such a way as to be only available for the scientific, and not for the practical, man, I simply wish, by my remarks, to put our practical mechanics, of a scientific turn of mind, on such a track as they, with their previous training, can explore with much better success than they would find in digging into the transactions of the learned societies found in our libraries, in which many important facts and valuable truths are, as it were, buried out of sight of those who are most interested in their knowledge, by reason of the practical results they could obtain from them. The investigation I recommend is most assuredly a new field to many, and has the great merit of being economical, and thus within reach of all who would rather spend their spare money in experiments than in tobacco or rum.

The only slightly expensive piece of apparatus required in these experiments, is the galvanometer, if it has to be bought; but I will, in a future number, give the manner in which I constructed one, more than forty years ago—a very delicate instrument of this kind, which cost me almost nothing. I have used it ever since, and have it still in my possession. It reminds me of Berzelius, the great Swedish chemist, who states that, having lost the agate pestle of his mortar, he took an agate button from his coat, fixed it to a handle, and found it so convenient that he used nothing else for the rest of his life; and most practical men, no doubt, have found how often an improvised arrangement, made to serve a temporary purpose, is found to fulfill all the requirements of a permanently useful tool.

P. H. VANDER WEYDE, M. D.

New York city.

Changing of Color in Fishes.

To the Editor of the Scientific American:

I have been waiting in vain for some naturalist to reply to the interesting "Query" of S. M. G. (in your issue of July 15th) why two roaches in his aquarium change color three or four times a day, while two others do not.

The details accompanying the story are too meager to be of much use, but, as a cause inevitably precedes an effect, so there must be reason for the phenomenon described, although it may require the critical observation and sagacity of an Agassiz to detect and comprehend it.

It has been observed that fishes and reptiles sometimes suddenly change complexion during periods of amorous excitement, also when alarmed or agitated with rage.

It is a well known fact that many individuals of the animal kingdom have the power of accommodating themselves to the shades of the localities inhabited.

In the higher orders of animal life, this metamorphosis takes place slowly. Animals and birds, indigenous to the frigid zone, where the surface of the earth is covered with a blanket of almost perpetual snow, are white, probably to enable them to more effectually conceal themselves. Many animals belonging to the temperate zone have the power of changing their coats to suit the season—from dark or variegated hues in summer to white in winter: those living in tropical climates, where perpetual verdure reigns, are gorgeous in color, like the *flora* of the same region.

As we descend the scale, we find the lower forms less capable of defending themselves; and for the purpose of self protection, as well as to aid them in obtaining food, they are endowed with the power to change color more speedily. For instance, the chameleon, many species of the lizard, also many insects, worms, fishes, etc.

It is a disputed question whether the power to change color is voluntary or involuntary; whether it is due to deliberate intention of the will (however rudimentary in the lower forms) or to arbitrary material causes over which the subject has no control; in short, whether it is a vestige of the infinite intelligence bestowed upon the humblest creature for its self preservation, or to chemical law, the only "omnipotent god" of the positivist.

I will relate a little incident, and leave it for the disciple of the Positive Philosophy to explain upon his hypothesis.

In indulging in my favorite recreation one day along the meadow bank of a familiar brook, I discovered, lying quietly on the light sandy bottom of a deep hole, a magnificent dark trout among several beautiful fellows of a lighter color.

"Waltonizing" while attempting to capture this "monarch of them all," I remembered a tributary half a mile away, flowing from a large cold spring, and winding its devious way through black and mucky soil, deep among tangled roots, underneath fallen logs and overhanging alder bushes, from which I had before taken "comrades wearing the same livery." I said to myself, "Aha! here is a stranger; this fellow is a new comer from the spring brook."

Those of lighter hue rose eagerly at the fly, and two or three of fair proportions were soon laid at my feet in the cool green grass; while those remaining, with the single exception of my "colored friend," grew shy and excited, and upon tempting them with a worm, they suddenly departed to divers secret hiding places.

The dark trout alone remained behind, and manifested, as indeed he had done all along, a remarkable indifference to what was going on. At last the bait was carried near his nose, when suddenly, as if agreeably surprised, he was all alert, his red fins quivered, he moved nervously from side to side with curious indecision, he made several short, sharp advances with open mouth in different directions, then quieted down as if disappointed. He seemed eager, yet acted very strangely. At last, with the hook fairly touching his nose, he struck quick and sharp, but the struggle was soon over.

Upon landing him, I found to my surprise both eyes gone. He was totally blind; the wounds had healed, showing that the mutilation was not recent He had evidently wandered from the dark recesses of the little brook above, down into the main stream, and was entirely unconscious of surrounding changes, and therefore, unlike his companions, *saw* no reason for exercising his powers of adaptation.

But I have spun out this yarn too long already, and conclude by saying, this little incident furnishes food for reflection; to my mind it is a very beautiful and conclusive demonstration of the dominant power of the will, even in its lowest and most rudimentary manifestations, over the physical organization.

"There is a natural body and there is a spiritual body," etc. A. R. M.

Facts about Butter.—How it is made at the East.

To the Editor of the Scientific American:

Our English word, butter, is derived from the Latin *butrum;* while this Latin word is of exceedingly doubtful origin, but has most probably come from the Greek language.

It is not known positively whether butter was ever made previous to the Christian era, but, in our translation of the Bible, the word "butter" frequently appears. In Genesis chap. XVIII., verse 8, we read: "And he took butter and the calf which he had dressed, and set it before them," etc. And in Deuteronomy, chap. XXXII. verse 14, the phrase "butter of kine" is made use of. Also, in the Book of Proverbs, chap. XXV, verse 33, we read: "Surely the churning of milk bringeth forth butter." The word appears also in other passages. But in all these cases, the word refers to something of a fluid nature, and whenever the word "butter" appears in the Bible it should read, according to most biblical critics, "thick milk" or "cream." The original Hebrew words *meetz heleb* (translated churning) signify to squeeze or press, and therefore the latter quotation above should read, "the pressing of the milker bringeth forth milk," and this agrees better with what follows in the same passage, "and the wringing of the nose bringeth forth blood."

It is not until about the birth of Christ—probably before—that we have any definite mention of butter, as we understand the word. But it appears that at this time, and indeed for several centuries thereafter, that it was only used instead of oil, as an ointment or as a medicine. The ancient Burgundians were accustomed to besmear their hair with butter, and the ancient Christians of Egypt burned butter in their lamps at their altars instead of oil, a practice also accredited to the Abyssinians. Butter used to be allowed to be burned instead of oil in the Catholic churches during Christmas time, and this accounts for the name "butter tower" which we find at Rouen, in Nôtre Dame, and elsewhere. "In A.D. 1500, George d'Amboise, Archbishop of Rouen, finding the oil foul in his diocese during Lent, permitted the use of butter in the lamps, on condition that each person should pay six deniers for the indulgence, with which sum this tower was erected."

It is a very difficult matter to find out among what nation the practice of making butter originated. Some writers affirm that the ancient Scythians were acquainted with the art 400 years B.C.; and it appears also that the Ethiopians used the article as early as thirty years B.C., as also did the Indidians (inhabitants of India). Plutarch speaks of a visit, paid by a Lacedemonian lady, to Berenice, the wife of Deiotarus, and says that the one smelled so much of butter and the other of perfume, that neither of them could endure the other. But this must surely have been bad butter. Pliny says that the ancient Germans and Britons (barbarians in his time) made butter and used it as food, and ascribes the invention to these nations. And it is generally believed that the Greeks obtained their knowledge of butter from the Thracians or the Scythians, and the Romans from the Germans.

But whether the ancients knew how to make butter or not, it is quite certain that they did not know how to give it the firmness or consistency of the butter made at the present day. "With them it was poured out like oil; with us it is cut and spread." Their butter, too, must have been very inferior to ours in quality.

We are all well acquainted with our present mode of churning; other nations have some really funny ways of making butter.

In northern Africa, in Egypt, and Arabia, the cream is put into a goat's skin turned inside out, and pressed to and fro like kneading bread. And sometimes they place it on an inclined plane and let it roll to the bottom, and then replace it to run the same course. This method, it is said, produces

butter in a short time. Sometimes the skins are kneaded with the feet as observed by Dr. Chandler while traveling in Greece.

In Bengal they churn every morning that they may have fresh butter for breakfast. They simply stir the milk rapidly with a stick. In some parts of the East they make butter of the milk of the buffalo; but this is in every way inferior to that made from cow's milk. W. R. S.

Action of Hydrogen on Red Hot Oxide of Iron.

To the Editor of the Scientific American:

In a late number of the SCIENTIFIC AMERICAN, there appeared an article on "Boiler Explosions" over the signature of John Lynch, M.D., Professor in South Carolina University, which makes an erroneous statement of chemical facts.

The writer, in discussing boiler explosions, comes to the conclusion that they are caused by the chemical combination of hydrogen and oxygen gases. His error consists in confounding the action of free hydrogen when in contact with free oxygen, with the action of free hydrogen when in contact with combined oxygen.

I quote a few words for the purpose of explanation: "While the machinery is not in motion, or the steam not escaping freely, the hydrogen fills the upper portion of the boiler, and does not come in contact with the red hot iron or its oxide; but any cause which may produce an expansion or disturbance of the gas, so as to bring it into contact with the oxide of iron, heated to the same temperature as will decompose steam, the gases will immediately become chemically combined, producing a most intense heat ('the most intense heat that can be produced is caused by the combustion of hydrogen gas') and *causing an explosion;* at the same time the "oxide of iron will be reduced to its metallic state." I have italicized the words to which attention is directed. No explosion will take place from the combination of the free hydrogen with the combined oxygen of the oxide of iron, supposing for a moment that such an unheard of state of things, as the contact of free hydrogen with red hot oxide of iron in an ordinary boiler, should exist.

An explosion from the combination of hydrogen and oxygen results only when these mixed free gases are ignited by intense heat. When free dry hydrogen is passed over red hot oxide of iron or copper, there is no free gaseous oxygen to combine with the hydrogen, but oxygen in a solid combined state. This oxygen, the hydrogen abstracts from the iron quietly and without explosion, forming vapor of water, while metallic iron remains behind.

In an ordinary steam boiler no free oxygen can, under any circumstances, be produced from the decomposition of the water or steam, and there is good authority for stating that no free hydrogen can be so produced. Consequently, no explosion can take place from the ignition of the mixed gases.

I agree with the writer that "the engineer should study thoroughly not only machinery but also chemistry, at least so far as it relates to those bodies which he is obliged to use."

But this study should not embrace any erroneous chemical theories unsupported by chemical facts; but should include especially the tensile strength of iron under the varying conditions of thickness and temperature, and the immense power capable of being developed by the generation of steam in a confined space.

The intelligent engineer should not be long in learning the fact (though Heaven save him from the personal experience so necessary in other matters) that, when a boiler explodes, it is because the shell of iron without is not strong enough to withstand the pressure of steam within.

West Farms, N. Y. JOHN F. GESNER.

Testing Boilers by Hydrostatic Pressure.

To the Editor of the Scientific American:

In your paper of September 2d, you published a letter from me in which I questioned the possibility of testing a steam boiler properly in the manner stated in the testimony of Inspector John K. Mathews. In your issue of September 30th, I find an answer, to my communication, signed by that gentleman, in which he explains how, by having a man at the safety valve, men stationed at the blow cocks, and men at the main valves of the engine, with the men, as sworn to, at the hydrant valve, and, I suppose, properly agreed signals, such a feat is possible. For so much of the communication I am thankful; the rest proves nothing except that Mr. Mathews is unable to discuss a simple question without showing his contempt for the witnesses of coroners' inquests (among which are some of the ablest and truest men in the country); no doubt he dislikes the whole institution, and particularly its characteristic prying into people's actions.

"That knaves and fools will exist with the human race" (to use his own words) is evident; and as long as men, innocent of overalls and too large to get through a manhole, take the oath and fee of inspectors, and certify to a thorough inspection of steam boilers, there is no danger of either the one or the other running out.

But, Mr. Editor, the question under consideration is a serious one, for on its decision depend the lives of the people. It is certainly very convenient to fill a boiler by a hydrant; and it would be more so to call this a thorough test. Yet the man must be very selfish and devoid of all regard to the sacred obligation of an oath who would not spend ten minutes to attach a pump and really and truly test the boiler under hydrostatic pressure. I am not willing to admit that men, at all the possible outlets of a boiler, could save the same from strain and injury; for water has no practical elasticity, and even lightning would not be quick enough to save the boiler from overstrain. But there is, fortunately, one security. Boilers, when subjected to hydrostatic pressure, gradually change their form, and assume the one which holds the largest amount of water. A barrel nearly approaching a cylinder will become a perfect one under *maximum* test; all stays are gradually brought to their true tension, and, if one should be too short, it will (being unable to stand the whole pressure of several hundred inches) be torn off; plates not properly cut and caulked will be strained and leak, and the whole boiler will assume the shape, appearance, and duty as though it was under the same pressure of steam, with this exception, that the solid pressure of water on a cold boiler is more severe.

The object of the law is manifest, and is intended to show what the condition of the boiler is under this test. For this purpose it is to be examined carefully outside while under pressure, and inside when the pressure is relieved. That this can be done thoroughly in the manner sworn to as having been done on the *Westfield*, I deny.

Unless Mr. Mathews will add to our information, and condescend to treat correspondents of the SCIENTIFIC AMERICAN as gentlemen, and not as fools and knaves, I cannot further recognize him. JOSEPH A. MILLER.

Boston, Mass.

Treatment of Colorado Ores.

To the Editor of the Scientific American:

I am much pleased to have, by means of my article upon this subject, drawn forth Mr. Church's letter in your issue of October 7th. I do not consider myself competent to judge of the correctness of the position taken by this gentleman; but I am glad to find that, by having the accounts at the mine, in which I am interested, kept in a systematic manner, and by contributing these details to Professor Hague, I have done something toward enabling Mr. Church to prove, as he believes, the correctness of his theory.

For one, however, I hope Mr. Church will not include me among the number of mine owners who have "systematically resisted all efforts to ascertain the truth." For some years I have sought, by having weekly returns of all costs and results, by having assays constantly made of the ores, and by all other means in my power, to ascertain "the truth;" and all facts I have gleaned have, in one way and another, been placed before those interested, with the desire that others might throw still more light upon the subject than I was able to.

Long since I came to the conclusion that concentration was the remedy, but how shall we effectively concentrate? I think the gold ores of Colorado will average not far from thirty dollars per tun. The smelter will pay us a much better proportionate price for an ore worth $150 than one worth $100 per tun. How can we concentrate to a value of $150 per tun? THOS. J. LEE.

Boston, Mass.

Ignition by Superheated Steam.

To the Editor of the Scientific American:

An accident occurred here recently to a Low steam automatic heating arrangement, whereby a valuable building and some lives were placed in great peril. The heating arrangement has attached to it a regulator which admits water to supply the loss by evaporation, connected to the boiler by two pipes, one at the top and one at the bottom. The bottom pipe became closed by rust, preventing the water from entering the boiler, while, at the same time, the glass gage indicated water at the usual hight. The consequence was the boiler became empty, and nearly white hot, creating superheated steam, which set fire to the felting or covering around the pipes. This was discovered just in time to prevent serious damage.

I would suggest that parties having these heaters should have the pipes that lead to the boiler taken off and examined, as that is the only way the evil can be detected; and then place a draw off cock on the same.

Canton, Ohio. G. W. D.

Liquid Measuring Can.

In this invention, an ordinary sheet metal can has a large vertical tube, and a smaller one, placed beside the large one, extending from the bottom or below the bottom to the top. A float in the larger one is intended to rest on the liquid and is partly suspended, by a cord passing up over pulleys, down the side of the can, around a pulley, and back over pulleys and down into a smaller tube to a weight suspended by it. One of the pulleys carries a notched disk, which will be turned the distance between two notches by the falling of the float when a given quantity of fluid is drawn, say a pint, the parts being accurately adjusted therefor. A pawl, resting on the edge of the disk and dropping into the notches as each one comes under it, shows when the given quantity has been drawn. The disk is held always in the right position, when the drawing begins, to be turned forward just one measure between the notches before the pawl drops. A three way cock for drawing from the large measuring tube has a branch leading from the bottom of the can, for allowlowing the liquid to flow into the tube through said cock when the flow from the tube is stopped; but when opened to draw therefrom, the cock is turned against the passage so as to shut off the flow therefrom. The disk may be notched to indicate any measures preferred, and it may be arranged on any approved part of the can. The weight need not necessarily be arranged in a tube, but is so preferred. Mr. Christopher Martin Bridges, of Leon, Iowa, is the inventor of this improvement.

THERE is perhaps no time at which we are disposed to think so highly of a friend as when we find him standing higher than we expected in the esteem of others.

[Special Correspondence of the Scientific American.]

THE CERULEAN PLEASONTON'S SUNSHINE PATENT.

Washington, D. C.

The cerulean Pleasonton (Gen. A. J., of Philadelphia, not the Hon. Boutwell Grant, Ex-Commissioner, nor even a brother) has just been successful in receiving a patent for his blue light vegetable and animal stimulator, fructifier, and panacea. Not an unpleasant entertainment, on the evening of our national extended-eagle anniversary, are those blue lights that shoot upward so zealously, and then suddenly vanish without even a tail to tell their story. The discussion, of the scientific and unscientific features of the blue light process. belongs to some other column of your paper, but you may be pleased to note the breadth of the inventor's views and the modesty of his expectations, as appear in the "breadth" of his original claim, which reads, we are informed, very nearly as follows: "I claim the use of the combined natural light of the sun in combination with the transmitted blue or electric light of the sky, to the growth of the animal kingdom of nature, to the growth of fruits, vines, flowers, plants, vegetables, etc, and to the cure of diseases in men and animals."

The term "combined natural" is good, being both scientific and complimentary to his solar majesty; and the discovery of the new dynamics of the sky in transmitting light deserves of itself a patent, with a seven years' extension thrown in. The examiner, in his treatment of the case, well observes that the applicant cannot properly claim the use of the unchanging forces of nature, and such a monopoly could not be granted. He can only claim new and useful devices for applying and controlling the powers of nature. The patent granted contains two clauses of claims, one for the method of utilizing the solar rays, another for the construction of buildings for the above purpose. The method consists solely, as far as we can discern, in combining the sunlight with the blue light by transmitting the solar rays through alternate portions of clear glass, and blue, purple, or violet colored glass, and the construction of the conservatory consists in making the roof and sides of such alternate portions of glass. What will the scientific men, who for many years have experimented in the most elaborate and thorough manner to ascertain the chemical effects of the constituent colored solar rays on vegetable life, say to this patent? In a published paper read before the Philadelphia Agricultural Society, Mr. Pleasonton says:

"If" (a brief but sensible preface, that word if), "by the combination of sunlight and blue light from the sky, you can mature quadrupeds in twelve months with no greater supply of food than would be used for an immature animal in the same period, you can scarcely conceive of the immeasurable value of this discovery to an agricultural people. You would no longer have to wait five years for the maturity of a colt; and all your animals could be produced in the greatest abundance and variety. In regard to the human family, its influence would be wide spread—you could not only in the temperate regions produce the early maturity of the tropics, but you could invigorate the constitutions of invalids, and develop in the young, a generation, physically and intellectually, which might become a marvel to mankind. Architects would be required to so arrange the introduction of these mixed rays of light into our houses, that the occupants might derive the greatest benefit from their influence. Mankind will then not only be able to live fast, but they can live well and also live long."

Mr. Pleasonton's faith in blue light is such that the address referred to is printed on blue paper, "to relieve," as he says, "the eyes of the reader from the great glare from white paper;" and he expresses the hope of seeing "this colored paper introduced for all books and periodicals.' The effect of blue light on the human brain should be his next theme.

‡

The Approaching Solar Eclipse.

An eclipse of the sun will occur, on the eleventh of next December, which will be visible as a total one in India, Ceylon and Australia. Preparations are being made to observe the astronomical event in a manner worthy of its great scientific importance. The British men of science are already commencing energetic action to make the most of the occasion. The Astronomer Royal is superintending the adaptation of instruments already in his possession for use in his chosen locality in India. The President of the Royal Society has arranged to have instruments of the newest and most approved kind sent to Australia. The President of the Scientific Association at the recent meeting stirred up the members to vigorous action in order to gain all possible knowledge from the solar phenomenon. The Royal Society of New South Wales is organizing an expedition to Cape Sidmouth to observe the event, and it is expected that a staff of observers from England, will take possession of a fitting position in Ceylon. Government is to be petitioned for the means, which it will not fail to grant, and much enthusiasm and interest prevail among the British men of science, who are determined to utilize the solar ecclipse to add largely to the knowledge of solar physics. We are sure that our American astronomers, who earned great distinction by their observations during the last two solar eclipses, will not be behind the European co-workers in doing all that can be done to aid the cause.

MILK STATISTICS.—Sixteen quarts of pure milk are required to make one pound of butter, and 10 quarts to make one pound of cheese. When butter is 40 cents per pound, and cheese 11 cents: one pound of butter equals in value 16 quarts of milk and returns 2½ cents per quart to the dairyman. But one pound of cheese from 10 quarts of milk only gives him 1$\frac{1}{10}$ cents per quart for the milk.