strength, for the square of the speed measures the force, and the force is proportional to the square of the current. If, then, such a contrivance takes the place of the balance of a pendulum clock, the clock will measure electric currents instead of time. To keep the indications true the maintaining power must be so contrived that the amplitude does not vary much, or the parts must be so arranged that the force is directly proportional to the displacement. Mr. Boys showed several ways of producing a controlling power. The first was a combination of solenoids, one passing through the other, and in which the force was proportional to the displacement. Being without iron it applies to the case of alternating currents. In another a small armature is mounted on the balance staff, and around it are the two poles of an electro-magnet which forms part of the circuit. In a third form which is unaffected by residual magnetism, two crescent-shaped pieces of iron, forming the sides of the balance, pass through two fixed solenoids. In all these cases the direction of the current does not matter.

The maintaining power may be an ordinary escapement driven in the usual way. It may also be independent of clockwork, an impulse being given to the balance electrically at each swing. A meter of this kind was shown, in which the controlling power depends on iron crescents and solenoids, and in which a portion of the main current is shunted through secondary solenoids when the balance is in its natural position, at which time a variation in the currents in the controlling solenoids has no effect in disturbing the period of oscillation. Such a meter is regulated by an adjustable weight if it goes too fast or slow. Being independent of gravity it will work equally well anywhere.

MECHANICAL INVENTIONS.

Mr. Henry R. Dulany, of Alexandria, La., has patented a suction device for elevating sand, or for elevating sugar, mortar, or similar substances from large vats, holes, or tanks. The invention consists principally of a large inverted bucket provided with a piston head, the vessel being provided at the top with suitable air-valves, the piston rod passing through the center of the top of the vessel, and being provided with notches adapted to engage with a spring-actuated clutch for holding the piston head when forced up by the material to be raised.

Mr. Eugenio Beovide, of Mineral de Catorce, Mexico, has patented an improved machine for cleaning and separating the fibers of leaves. The object of this invention is to provide a machine for removing the epidermis and filling cellular tissue from the fibers of such leaves as those of the *Agave americana*, or aloe, *Heniquen zechuquitta marquisia*, or *Coprosma*, and other plants growing in Mexico, Central and South America, which fibers are then used in the industries in the same manner as hemp and jute fibers, etc. The invention consists of a frame in which two or more rollers provided with yielding, rasping, and scraping knives, and with yielding, feeding, and pressing blades guided by suitable guide rings on the frame, are journaled above each other, and are surrounded by suitable casings, into the upper one of which the leaves are fed from an inclined table by adjustable feed rollers, and are drawn downward through the several receptacles by adjustable feed rollers journaled between each pair of rasping rollers. The rasping rollers revolve very rapidly and scrape all cellular matter from the fibers, this waste being thrown out through openings in the casings, and the cleaned fibers passing out between two rollers below the lowest rasping roller.

An improved buggy top, which is of simple construction, light, durable, folded and raised conveniently, has been patented by Mr. James H. Howe, of Conneaut, Ohio. The buggy top is formed of a single bow, to which front and rear sliding arms are pivoted at the ends of the bow, which arms are braced by hinged or jointed braces pivoted to the bow and to the sliding side arms, the braces having a short rod pivoted to them at the joint for operating them.

An improvement in beam calipers, with devices for automatically registering or indicating variations in the size of work to which they are applied, so that small differences in size can be readily detected, has been patented by Mr. George B. Webb, of Thomaston, Conn. In filing, grinding, or turning, the amount removed and to be removed can be quickly and exactly shown by means of this tool. The invention consists in a slide and indicating lever combined with one moving jaw of the calipers.

An improvement in spinning machines has been patented by Mr. Philip Townson, of Thompsonville, Conn. The object of this invention is to automatically change the speed of spindles when the bobbins are about two-thirds filled, and also to facilitate the stopping of the spindles when the fliers have been stopped.

Mr. Abraham Van Trump, of West Elkton, Ohio, has patented an improved pump. This invention relates to a pump which is more particularly intended to be attached to a water tank or box mounted on wheels, so as to be carried from place to place to obtain its supply of water. The invention consists in a novel arrangement of the cylinder, piston, valves, a hose, and a double screen, for guarding against the entrance of foreign substances into the pump cylinder.

Mr. Herbert W. Reed, of Ware, Mass., has patented an improvement in the class of so-called "monkey wrenches" whose sliding jaw is combined with a rack-bar and pawl, and also an adjusting nut to adapt it for rapid and close adjustment to the work.

A novel device for converting motion has been patented by Mr. Frank Elbing, of Algersdorf, Bohemia, Austria. This invention is for converting reciprocating rectilinear to continuous rotary motion, and is designed to overcome the dead centers of the usual crank mechanism without loss of motion or power. The invention consists in a shifting crank pin guided to move in a path eccentric to the crank axis.

An improved tool for bending railroad rails, patented by Mr. Robert Fagan, of Hazleton, Pa., consists of a bar of iron of suitable size carrying a screw at one end, the bar being adapted to be yoked to the rail in such manner that the portion of the bar beyond the yoke will form the short arm of a lever, the end through which the screw passes being the long arm of the lever. The end of the screw, when the device is attached to the rail, rests upon the rail for operating the lever and bending the rail.

An improvement in swivel racks for looms has been patented by Mr. Buckley Weston, of Paterson, N. J. This invention consists in the combination, with the rack-bar, swivel-shuttle, and pick-bar, of pins hung on wires attached to the rack-bar and provided with lugs designed to drop in recesses near the extremities of the pick-bar, the pins being actuated by springs, so that they engage in holes formed in the shuttle.

A saw filer, which secures the accurate gauging of the depth of the saw teeth, the equal action of the file on the saw teeth throughout the whole length of the file, the automatic feeding of the file, and its adjustment for any desired angle or pitch of teeth, has been patented by Mr. William H. Shutte, of Emporia, Kan. The invention consists of a sliding carriage carrying a spring-and-pawl-actuated bent arm that serves as a gauge for the depth of the saw teeth, and at the same time to support the file frame; an adjustable clamp is secured on the bent arm for the direct support of the file frame, and so constructed that the direction of the frame and file can be changed vertically.

A useful improvement in wagon gearing, whereby the king-bolt passing through the head-block and the axle can be dispensed with, has been patented by Messrs. Zephirin Dulmaine and George H. Poole, of Laramie City, Wyoming Ter. The invention consists in a short pintle passing through the end of the reach and fastened at the ends to plates or clips of the axle and the head-block, the head-block and bolster being also pivoted to each other by a short king-bolt secured to clips on the head-block and the bolster in a like manner.

Solvent for Gallic Acid.

Mr. Frederick Long says, in the *British Medical Journal*, that he has accidentally discovered a method of dissolving gallic acid. Having a short time since a case of hæmaturia, the result of uric-acid gravel, he chanced to prescribe a mixture containing half a drachm of gallic acid and a drachm and a half of citrate of potassium, and to his surprise he found he had a perfectly clear liquid, the gallic acid being completely dissolved. He has since made further experiments, and he finds that, with care, twenty grains of citrate will dissolve as much as fifteen grains of gallic acid in an ounce of water, and remain quite clear for any length of time. To be able to give gallic acid in perfect solution is a great advantage, as absorption must take place more rapidly when the salt is in solution than when simply suspended in mucilage. The citrate, being a very simple salt, can do no harm in any cases in which gallic acid is required.

Etching Film for Tracing with a Needle.

Mr. H. Trueman Wood, the secretary of the Society of Arts, sends the following to the *Photographic News*:

There are many purposes in photography for which an opaque film capable of being etched with a sharp point might be useful. Such a film can be obtained by use of the following formula: Negative collodion, one-half ounce; ether, 6 drachms; alcohol, 6 drachms; shellac, 30 grains; aurine, 2 grains; Judson's mauve dye, 30 drops; water, 30 drops.

A collodion thus treated gives a film which is perfectly non-actinic, and which allows the finest tracery to be executed upon it without any tearing or chipping whatever. The film is the result of a good many experiments, and was devised by a friend of the writer for the purpose of reproducing tracings made by a geometric chuck in the lathe. As a general rule, these patterns, which form the delight of so many amateur turners, are either traced with a pencil suitably held, or by a glass pen charged with aniline ink, the latter being the more recent device which has superseded the old pencil. They are, of course, also cut upon wood or metal with suitable tools. By the use of a plate coated with a film of the above described mixture, a steel point can be used. The glass plate is properly held in the chuck, and a steel point, which may be fitted with a spring, so as to prevent undue pressure or risk of breakage, is placed in the position usually occupied by the pencil. The pattern is thus traced in perfectly clear glass, and from the negative—if the term may be used—thus produced, prints can be taken on ordinary albumenized paper. As the film itself transmits practically no actinic light, the printing can be carried to any extent, and a perfectly black print produced. The film may also be etched upon with an ordinary etching needle, or even with a common needle, and prints produced from the plate thus obtained.

Another use of the formula is for the preparation of lantern diagrams. Any diagram can be rapidly traced upon a coated plate, and the diagram can then be thrown on the screen in the ordinary manner, appearing, of course, in bright lines on a black ground. A diagram of this sort is quite as effective as, if not more effective than the ordinary black lines on an illuminated ground, as was shown by the very vivid way in which a negative diagram, recently employed by Mr. Bolas at one of his Cantor lectures, shone out upon the screen. It would, of course, be easily possible to obtain a printing block by any of the ordinary methods from a plate etched in this manner.

The mixture requires some little care in its preparation, and especially as regards the addition of water. It is better to add the water gradually, coating the plate occasionally after each addition of a few drops. The formula might doubtless be susceptible of considerable modification; but the one given above has been proved to give the best results of any which have yet been tried.

The Petroleum Outlook.

The outlook given in our last two preceding reports, indicating that the highest production has probably been reached, receives confirmation from the data which we present our readers in the present number.

The Bradford and the Richburg fields are now defined, beyond any reasonable doubt, by a cordon of "dry holes." All the present drilling in outlying localities, notwithstanding it has been very extensive, has entirely failed to indicate any new field in the producing horizon within the line of the known fields. Operations continue to be active, but with all the activity in drilling, and with all the appliances of pumping and torpedoing, the figures for the month of January, compared with those of December, show the significant decline in the daily production of 4,079 barrels.

The Richburg field exhibits all those characteristics of impoverishment of rock and uncertainty of yield which we attributed to it several months ago, and on this account its decline may be expected to be much more rapid than is that of the Bradford field.

From all this condition which at present exists in the region we are of the opinion that the long expected decline has at last set in, and (always, of course, unless a new field is discovered) the production must from this time continue to decline, in spite of the unrestricted energy of the restless producers to enlarge it.

As to the effect of all this upon prices in the immediate future we are not so confident. There are some causes which seem to indicate stagnation for some time at least. Europe having taken advantage of the exceedingly low prices which prevailed last year on account of the excessive competition, has become pretty well stocked with the refined oil. In our own country this is also the case, but probably to a less extent. The busy season of the year has been closed, and we may reasonably look for diminished foreign demand for some months to come. The export of last year has been so far in excess of its predecessors that we can hardly look for an increased demand for the present year. Then, too, our stock of crude oil has grown so large as at times to be rather burdensome. It will, therefore, be seen that there is considerable margin for a decline in the production, without materially affecting the prices.

On the whole, however, we are inclined to the opinion that the continued persistent decline in crude for several months will have the effect of inspiring holders with great confidence for the future, and in the event of a continued ease in the money market we may look for a much better average of prices for this year than prevailed last year.

Daily average production of the Bradford field, 56,000 barrels; decrease in January, 5,000 barrels. Daily average production of the Allegheny field, 12,039 barrels; increase in January, 1,300 barrels. Decrease average daily production in the northern field, 3,700 barrels; decrease average daily production in the southern field, 379 barrels; total decrease average daily production (whole field), 4,079 barrels. —*Stowell's Petroleum Reporter.*

THE skins of certain sharks are used in jewelry for sleeve buttons and the like, and when dried and cured take a polish almost equal to that of stone, and greatly resemble the fossil coral *porites*. The vertebræ of the shark are always in demand for canes. The opening filled with marrow during life is now fitted with a steel or iron rod. The side openings are filled with mother-of-pearl, and when polished the cane is decidedly ornamental. In India, in 1880, $300,000 worth of shark fins were shipped to China for food. In the islands of the Pacific the fish is in great demand for its teeth, which are manufactured into weapons of various kinds, ranging from spears to swords and daggers. The teeth are all serrated or saw-edged, and make terrible wounds. The base of the tooth is bored with some small instrument, and forty to fifty of them are tied or lashed to a hardwood sword, forming the edge. The hilt is alo protected by crosspieces armed in the same way. So effective are these weapons that the natives of these islands wear an armor made of rope especially to protect themselves from the shark's teeth.—*Sea World.*

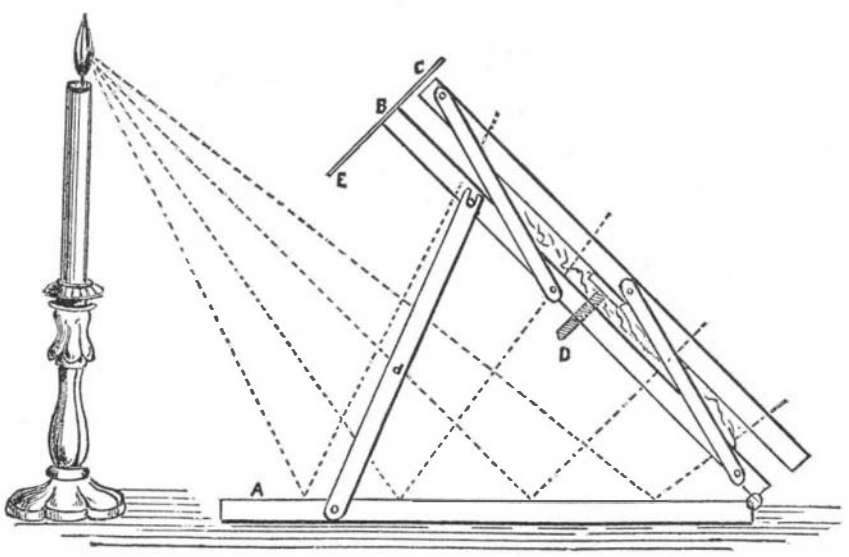
AN amateur was chaffering about the price of a table service in Dresden china. "But it is much too dear! There is not a single piece in it which has not been mended." The dealer has his answer pat. "My dear sir," he says, "why, that is the very thing that makes the set valuable. This is the table service that Bonaparte broke when he kicked over the preliminaries at Leoben!" The amateur, a little taken aback by this thrust, says: "Are you perfectly sure of that?" "Certainly I am. Would you like the same service without its being mended? I have that also."

Convention of Mining Engineers.

The annual meeting of the American Institute of Mining Engineers began in Washington, Feb. 21, Mr. William Metcalf, of Pittsburg, in the chair. The opening address was delivered by Gen. Sherman, and the address of welcome by Major J. W. Powell, chairman of the local committee of arrangements. At the second morning session, papers were read by E. F. Loiseau, of Philadelphia, upon the "Process for Making Artificial Fuel from Anthracite and Bituminous Coal Dust, and the Applicability of the Process to the Utilization and Solidification of the Slacking Lignites of the West;" by W. H. Adams, upon "Coal in Northern Mexico;" by J. C. F. Randolph, of New York, upon the "New Mill for the Batopilas Mining Company;" by Henry M. Hour, upon "Comparative Efficiency of Fans and Positive Blowers," and by C. Henry Roney, of Philadelphia, upon a new ore pulverizer. In the evening, papers were read and addresses made by Gen. Meigs, Capt. Lyle, of the Springfield Arsenal, Charles MacDonald, and others on the subject of organizing systematic tests of iron and steel, the speakers generally favoring the appointment of a commission by Congress to take charge of and continue experiments with the metal-testing machine at Watertown Arsenal. During the next day's session papers were read by Prof. H. S. Monroe, of New York, upon "First Aid to the Injured;" by N. S. Keith, of New York city, upon "Electrical Apparatus and the Processes of the Mining and Metallurgical Engineer;" by Prof. Silliman, of New Haven, upon "Some Newly Discovered Mineral Regions of Southern New Mexico," and by George W. Maynard, of New York, upon "Late Developments in the Siemens Direct Process."

THE SKIAGRAPH.

A is a looking-glass laid flat upon the table; B and C are wooden frames, each holding a square of plain glass. The flower to be drawn is laid between the glasses, which can be kept at any distance apart by means of the parallel links on each side, and the screws at D. A piece of paper is laid upon the upper glass, and, by the light of a candle reflected from the mirror, the shadow of the flower is projected through the paper, and its outline can be easily traced. The paper can then be removed, and the shading and coloring copied from the object, which is held in the same position between the glasses. A skillful draughtsman may despise such aid, but it has been found useful for drawings aiming rather at correctness of shape and size than at artistic effect. The shadows will, of course, be very slightly larger than the object. The machine might also be useful to designers of Christmas cards, or floral patterns of any kind. It can easily be made with a common looking-glass and two picture frames, and a few pieces of brass wire. A cardboard screen should be placed at E to prevent the light from falling directly upon either side of the paper. Everything must have a Greek name nowadays, so we call it the skiagraph. —*Knowledge.*



THE SKIAGRAPH.

Cutaneous Eruptions Caused by the Use of Certain Medicines.

Anspitz, in his valuable "System der Hautkrankheiten," gives the following list of eruptions liable to follow the use of certain remedies. It will be a useful table for reference:

Quinine.—(*a*) Scarlatinous erythema, (*b*) morbillous papular erythema, (*c*) hæmorrhagia and purpura, (*d*) wheals, œdema, pruritus.

Cinchona, Belladonna, Strychnine, and Stramonium.—Manifestations like papulæ sudorales.

Digitalis.—Erythema after a few days' use.

Aconite.—Vesicular exanthema.

Santonine.—Vesicles, wheals.

Rhus Venenata and Toxicodendron.—Vesicular eruption.

Opium and Morphine.—Erythema, papular eruption, with much desquamation and pruritus.

Pilocarpin (?).—Augmentation of the perspiration.

Phosphorus.—Purpura.

Phosphoric Acid.—Builous eruption.

Mercury (internally).—Erythema, eczema.

Arsenic.—Erythema and papules, eczema.

Carbolic Acid.—Erythema, vesicles, or wheals.

Salicylic Acid.—Purpura, vesicles with laryngeal catarrh, wheals.

Chloral Hydrate.—Erythema (well colored), pruritus, desquamation, purpura and petechiæ, eczema with crust and scab.

Balsam Copaiba, Cubebs, Turpentine.—Vesicles, erythema, eczema.

Cod Liver Oil.—Acne.

Iodide of Potash.—Papules, vesicles and bullæ, pustules and ecthyma, eczema, ecchymoses, and purpura.

Bromide of Potassium.—Papules and pustules, deep tubercles and ecchymoses, vesicles, ulcers.—*Virginia Medical Monthly.*

Mr. Lawson's Boiler Experiments.

In June last Mr. D. T. Lawson succeeded in exploding a steam boiler of practical dimensions and containing a working amount of water by steam pressure. The experiment was described and illustrated in the SCIENTIFIC AMERICAN issues of July 9 and December 24, 1881. He has now constructed two boilers of the same type and dimensions, one of them containing his patent device for the prevention of explosions, and the other an exact duplicate of the one he exploded last summer. The one containing the patent device has been erected at Munhall's Farm, near Pittsburg, Pa., on the site of the former experiment, and on the 17th of February a new series of experiments was commenced; but on account of the imperfection of some of the attachments they have been interrupted for a few days to perfect the arrangements and also to procure steam gauges of standard accuracy. A commission has been appointed by the Secretary of the Treasury, consisting of United States boiler inspectors, who will be present to report the results to their chief.

Duration of Wire-Cable Bridges in France.

Engineer Bernadeau has recently published an interesting note on the preservation and duration of wire bridges in France, from which the Hanover *Wochenblatt* culls the following points of interest:

From 1870 to 1879 M. Bernadeau had oversight of six suspension bridges in the Department of Lot-et-Garonne, in France. These bridges were built in 1833 to 1845. He was required to undertake a careful examination of each bridge every year. His experience gained in this manner showed that in every form of construction there are always some points which cannot be accurately tested, and hence a possible accident could with difficulty be foreseen. There were, however, some signs or indications which pointed to imperfections. For example, if reddish spots appear on the surface of the cable in places that may become wet, one may be certain that the core or heart of the cable is rusted. These reliable observations were made on three bridges, and the cables had to be renewed in consequence. The rust had attacked nearly the whole cable, and the single wires had become so friable that it excited surprise that these bridges held together at all. At one bridge in Couthures, only 15 out of the 180 wires forming each cable were in good condition; all the rest broke like glass. These bridges had been built 32, 34, and 39 years respectively. Two bridges at Castelmoron and Caimont fell under the trial load because of the cable breaking in moist places which could not be examined. They had lasted for 25 and 28 years. The bridges at Maurin and Rayne fell during May and June, 1881, under the usual test load, after being in use 30 years. The cables of the Marmande bridge had to be renewed after 30 years' service.

From the foregoing we may conclude that the iron wire cables of suspension bridges become rusted in 30 years, so that they no longer offer sufficient security and must be replaced by others. The renewal of cables of three bridges, those of Couthures, Raissannes, and Tonneins, was accomplished in the following manner: Each of these bridges had four or five wire cables on each side, to which the suspension rods of the roadway are fastened. First, one of the cables was loosened and the strands separated, all the rusted wires cut away and taken out of the cable. The other wires were lengthened by drawing and beating with wooden hammers to remove adhering particles, then wound on spools. Strands were next formed from a definite number of wires and dipped in boiling linseed oil. The cable is made in the usual manner from strands prepared in this manner. Whatever wires are lacking are supplied by new ones, and the reconstructed cables put up again. In this way the cables can be renewed without interruption of the street traffic, only no heavy loads can be allowed to cross, nor two teams at one time. Each bridge was tested, after being renewed, by loading it for twenty-four hours with a load of 200 kilos per square meter (40 pounds per square foot) of the road-bed.

SOUNDING-BOARD TRANSMITTER.—If a sound is produced at a certain distance from the sounding-board (*? table d'harmonie*) of a piano, it is known that this board, as well as the strings which are in unison with the sound produced, or with one of its harmonics, enter into vibration. The author finds, on applying a microphone to such a board, that the sound transmitted in a circuit containing a telephone is considerably strengthened without any alteration either in its distinctness or in its quality, and upon this principle he has constructed a very sensitive transmitter.—*M. Bourbouze.*

The Cricket's Chirp and the Temperature.

The rate of the cricket's chirp varies with the temperature, becoming faster as the latter rises. Recently a writer in the Salem (Mass.) *Gazette* gave the following rule for estimating the temperature of the air by the number of chirps made by crickets per minute: "Take seventy-two as the number of strokes per minute at 60° temperature, and for every four strokes more add 1°; for every four strokes less deduct the same." In a letter to the *Popular Science Monthly*, Margarette W. Brook gives an account of observations she made with a view to testing this rule on twelve evenings, from September 30 to October 17. Her column of temperatures, as computed by the rate of vibration, shows a close agreement with that of temperatures recorded by the thermometer.—*Nature*

Boracic Acid as an Antiseptic in Skin Affections.

Dr. George Thin, of London, emphasizes strongly the advantage of using some preparation of boracic acid to overcome the offensive odor of the feet, and gives instances in which this treatment has been thoroughly successful. In some cases he recommends the wearing of stockings and cork soles saturated with the acid. In others he prescribes an ointment, or rather a kind of glycerine cream, made as follows: A solution of boric acid is incorporated with a fatty basis of white wax and almond oil, which produce a soft, homogeneous mixture, free from the irritating crystalline plates of the crystal that are apt to separate from vaseline. He finds that this is also a very useful remedial agent for inflamed feet, as after long walking tours, and in such eczemas as are produced by the irritation of dyed underclothing.

Health of Workmen in Chrome Works.

The manager of the single establishment in Russia for the manufacture of chrome reports a curious disease among his men. He says:

"The workmen suffer from the action upon the nose of the dust of bichromate of potash, and the disease manifests itself thus:

"A little hole is formed on the partition of the nose (dividing the two nostrils), and increases gradually until the partition entirely disappears, with the exception of the lower part of it, so that to a superficial observer there is nothing the matter with the nose except perhaps a little outward depression. It must be remarked that as soon as the partition is gone the process seems to stop there, and neither the lungs, air tubes, nor throat is in the least affected. Its influence is very different with different individuals. Some workmen after having been employed for ten years at the works remain unaffected, while with others the hole in the nose begins to be formed after one month's work. A general inspection of all the men at the works not long ago proved that more than fifty per cent of them had diseased noses. When the disease sets in first, the man feels tickling in the nose; a week or so after it bleeds, and in a few days more there is no uncomfortable feeling of any sort, and thus the hole is formed almost without any pain."

There are, it is said, six works of the kind in the world—three in Glasgow, Scotland, one in Russia, one in Austria, and one in this country. It would be interesting to know whether the same trouble has ever been noticed outside of Russia.

The Colorado Desert.

Mr. Joseph F. James, who spent some four weeks in traveling over the Colorado Desert, in California, gives rather an unpromising account of it in an article communicated by him to the *Popular Science Monthly.*

The desert occupies almost the whole of the large county of San Diego. It is some 150 miles long and 50 miles wide, and the Southern Pacific Railroad runs through its center. At about sixty miles from Los Angeles the railroad encounters a very heavy grade, 100 to 110 feet to the mile, and it continues for twenty-two miles. At the summit, known as San Gorgonio Pass, begins the descent into the desert, and every mile brings you to a more desolate country. At Whitewater Station, twenty miles from the summit, the desert begins in earnest. First a few flowers enliven the scene. Large *Œnotheræ*, three or four inches in diameter, grow on small stalks five or six inches in height. Large plants of *Abronia maritima*, with clusters of brilliant purple flowers, spread over the ground. A little *Gilia* (*G. lemmoni*), with white corolla and yellow center, adds its beauty to the scene; and the only shrub, *Larrea mexicana*, or "creosote plant," with yellow flowers and sticky leaves and branches, reminds you of the forests you have left behind.

During the seven miles to the next station, Seven Palms, the vegetation gradually thins out. Progressing beyond this the flowers disappear, and the *Cacti* predominate; and further on these are replaced by the stunted "grease wood." Finally, even the latter vanishes, and when Dos Palmas is reached we come to a country where there is absolutely nothing in the shape of vegetation. Every one knows how a well-kept field looks when it has been plowed and harrowed and cultivated until not a stick nor stone nor weed shows itself above ground. In order to form a picture of this part of the Colorado Desert, imagine a field such as this extending for miles and miles, level as a floor, with no signs of life visible, and no indications of man's presence save the rail-