

COMPARATIVELY RECENT GEOLOGICAL CHANGES IN CALIFORNIA.

Professor Andrew C. Lawson, Ph.D., of the Department of Geology and Mineralogy of the University of California, is the author of a paper recently published in the Bulletin of the University on the Post-Pliocene Diastrophism of the Southern California Coast, and which is well calculated to enlist the interest of geologists in the comparatively recent changes which have taken place in that locality. As stated by the writer, "the recency of the record, the vastness of the events, the precision with which they may be established," all contribute to give the study high importance, as "nowhere is the record so legible, nowhere will greater discoveries reward the researches" of the geologist.

The conception of the general uplift of the coast is borne out by what is known of the topography and geological character of the chief river valleys, our illustration, furnished by Professor Lawson, representing the Pliocene delta of one of the most important of these valleys, the Santa Clara-San Benito. The total length of the depression, which contains the Bay of San Francisco, is about 150 miles, its breadth at the bottom varying from that of a head-water gorge to about 17 miles at the bay. The valley is occupied by a trenched and terraced Pliocene delta, its upper portion showing the delta in a great volume of approximately horizontal gravels. These gravels are exposed in a series of very remarkable cliffs, often over 1,000 feet high, which are "being developed by a vigorous sort of sculpture which yields the effects of a 'bad land' topography," as shown in the picture. "The trenching and terracing action of the streams, as they have by stages dissected the delta during the progress of the uplift, has left remnants of it in the form of isolated hills and plateaux in the middle of the valley. One of the highest of these lies just above the confluence of the Tres Pinos and the San Benito, between the two streams. This plateau shows magnificent cliff sections, particularly on the San Benito side, and the character of the ridge as a series of well bedded gravels from top to bottom is evident to the most casual glance. The bedding is either horizontal or is tilted to the eastward at angles up to perhaps 15°. The altitude of the summit of the gravel plateau was made the subject of careful measurement. By the use of the mercurial barometer the summit was found to be 929 feet above Tres Pinos station. The latter is given in the railway levels at 514 feet above sea level. The summit of the plateau is thus 1,443 feet above sea level. It is clear, from the character of the ground, that the summit of the plateau is not the original summit of the delta formation; much has been removed by erosion. Further up the valley, also, these same gravels are known to the writer to be several hundred feet higher than on the plateau near Tres Pinos. The summit and slopes of the plateau are distinctly terraced at various levels."

In conclusion, the author holds it as clearly established that a recent uplift of the continental margin has taken place from the Golden Gate to San Diego, the rise being from 800 to 1,500 feet, and the uplift probably extending far to the south and far to the north of these limits, the physiography of the country having thus been radically changed in the most recent geological times.

Pure Iron.

Professor Arnold recently produced, with the aid of aluminum, a sound ingot and bar containing 99.81 per cent of pure iron. So far no absolutely carbonless iron has been obtained commercially. An analysis of Professor Arnold's bar by Mr. R. A. Hadfield showed the following composition: Carbon, 0.07 per cent; silicon, 0.04 per cent; sulphur, 0.03 per cent; phosphorus, 1.015 per cent; iron, 99.81 per cent; total, 100.035 per cent. Its specific gravity was 7.863; limit of elasticity, 18 tons per square inch; breaking load, 23 tons per square

inch; elongation, measured on 2 inches, 49.25 per cent; reduction of area, 69.60 per cent; fracture, silky.

THE LATE NATHANIEL WHEELER.

The death of Mr. Nathaniel Wheeler brings to mind much that is of interest concerning the early history of the great industry which has since made the name of the American inventor famous, both in this country and abroad. The American sewing machine has found



NATHANIEL WHEELER.

its way to almost every country of the globe, whether civilized or uncivilized. It was a curious sight at the World's Fair to see the position that it occupied in almost every household in that little community of Javanese, who, by their quaint, retiring manners and attractive ways, won our sympathy and attention. The sewing machine was to be found on every piazza, and the fact of its almost constant operation did much to show the industry of these little people. The sewing machine as an American invention has attained more than a national reputation, and the fortunes that have been amassed by it have become world-famed. During the very early days of the SCIENTIFIC AMERICAN a quiet little man came to the office, bringing with him a model of a machine which was destined, in course of time, to make him and his partner famous. This machine was the prototype of the celebrated Wheeler & Wilson sewing machine, and it was first opened to public inspection in this office. The inventor and demonstrator was Mr. Wilson, whose name has for so many years been linked with Mr. Wheeler.

After his patents were obtained he was brought into communication with the subject of this sketch, a man already successful, and himself an inventor. Probably no more fortunate combination could have been made than when these two strong characters joined interests and determined to develop a mere mechanical idea into a commercial reality. Mr. Wheeler, by his energy, push, clear judgment, and business ability, in conjunction with his partner, whose mind was fertile with ideas, started their manufactory, which has grown and expanded until it has become an immense enterprise and one of the great sources of wealth to its native place, Bridgeport.

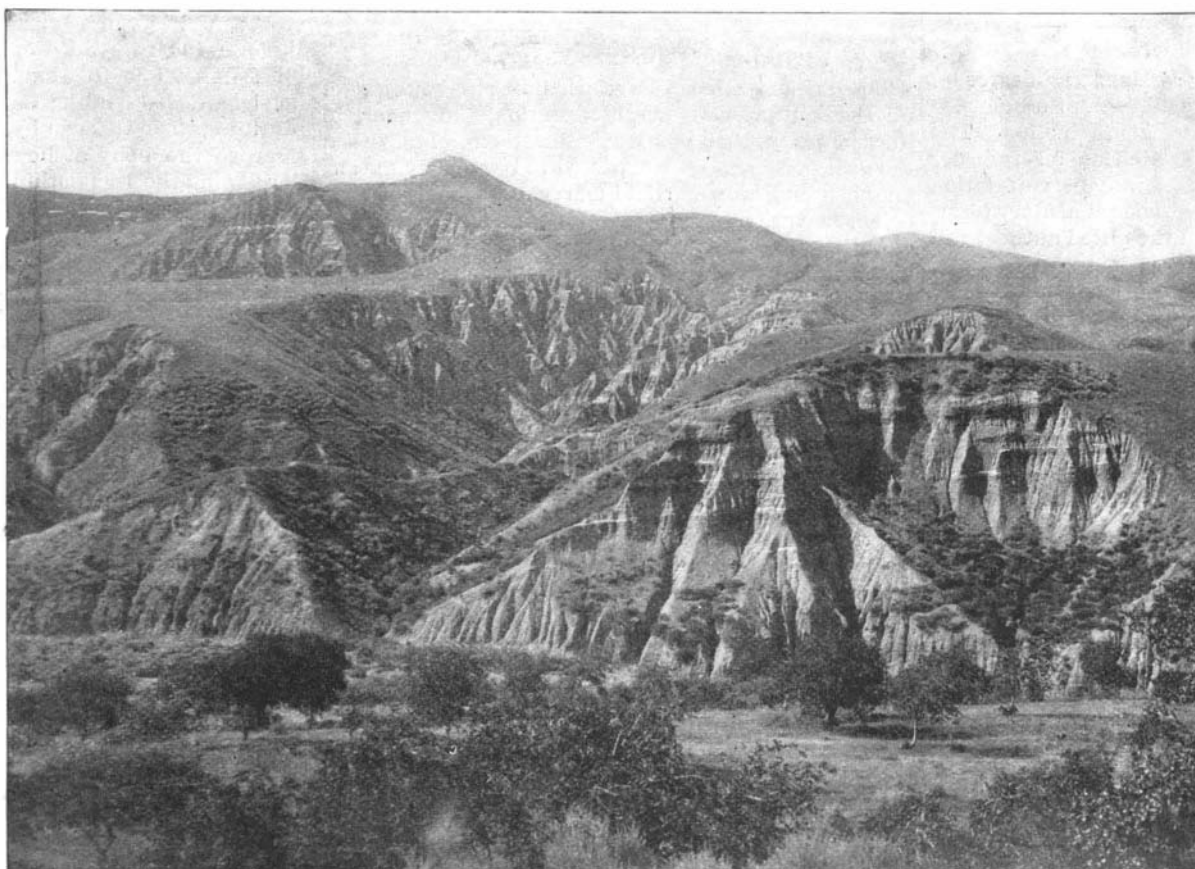
Nathaniel Wheeler was born in Watertown, Conn., September 7, 1820. His father was a carriage maker, and the son worked at the trade, making quite a reputation as a painter of taste and ingenuity in the decoration of carriages and the old fashioned sleighs, which were profusely decorated with stripes and ornaments. At the age of 21 he took the business on his own account, his father retiring to a farm, and conducted it about five years. At that time the manufacture of small metallic wares had become an important industry in Waterbury, and he decided to engage in it. Buckles, buttons, eyelets, were among the goods made, and beginning with tools for hand work only, he introduced machinery of various kinds. Among the articles he produced were the polished steel slides for ladies' belts, etc. He was among the first to make them in this country. The price was at first eight dollars a gross, but was reduced to twenty-five cents a gross through the improvements he made in machinery and methods of production. The firm of Warren & Woodruff were making similar goods in Watertown, and were also interested in a suspender factory. In 1848 this firm joined both of their interests with Mr. Wheeler's, under the name of Warren, Woodruff & Wheeler, Mr. Wheeler taking the full charge, and with such success that he was seeking other branches of work to add when he was by accident introduced to the sewing machine invention. From that time Mr.

Wheeler's business history is that of the Wheeler & Wilson Company, and for most of the time of the town and city of Bridgeport. Mr. Wheeler occupied a prominent place in the affairs of his city and State. He had large holdings of real estate in every section of the city, and was interested in some other manufacturing concerns. He was a director of the Consolidated Railroad, the Mountain Grove Cemetery Association, the City National Bank.

Mr. Wheeler was a representative from Bridgeport to the General State Assembly for four terms several years ago. He also represented his district in the State Senate two terms, and was one of the commissioners for the building of the State Capitol at Hartford. In his younger days he served several terms in the Common Council. He was a Park Commissioner for a long while. In 1876 he was appointed as a commissioner of the State of Connecticut for the World's Fair at Philadelphia.

Mr. Wheeler was twice married. His first wife, Miss Huldah Bradley, of Watertown, to whom he was married in 1842, died in 1857. There were four children by this marriage, two of whom are living—Samuel H., of Chicago, and Ellen B., the wife of Edward Harrall, of Fairfield, Conn. His second wife, who survives him, was Miss Mary E. Crissey, of New Canaan. By this marriage there were also four children, of whom two are alive and reside with their parents. They are Archer Crissey and William Bishop, twins, born in 1864. They have been associated with their father in the management of his private business and with the Fairfield Rubber Company.

Mr. Wheeler's inventions, as shown by the patent records, are as follows: In 1876, and again in 1878, he patented wood filling compounds now in general use. In 1876, with J. A. House, he patented a power transmitter



RECENT GEOLOGICAL ACTION, SANTA CLARA-SAN BENITO VALLEY, CAL.

clutch; in the same year, with Philo M. Beers, an improvement on a former invention of Beers' for polishing needle eyes. In 1878, a refrigerator. In 1883, a ventilating arrangement for railroad cars; also a system of heating and ventilating houses. In 1885, with Wilbur F. Dial, the eccentrically-centered loop taker; also the feed regulator for the No. 12 machine, two patents. In 1890, the barred hook used in the No. 2 machine, two patents for tension release, and one for combination of parts in the No. 9 machine. He also patented a design for cabinets.

We are indebted to the *Sewing Machine Times* for the engraving and for some of the data contained in the sketch.

COLUMBIA BICYCLES FOR 1894.

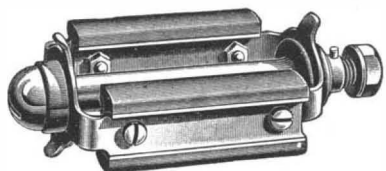
The Pope Manufacturing Company announce a number of new wheels for 1894, and we illustrate model



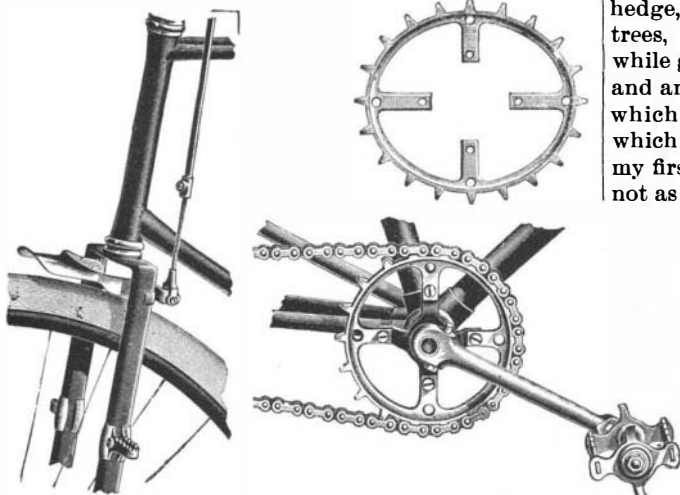
COLUMBIA BICYCLE, MODEL 34.

34. This, while a new machine in many important points of design and construction, retains also the best features of their former light wheels. It weighs 30 pounds with or 29 pounds without brake. It is made for expert and intelligent riders, who take good care of their cycles, and if used as any finely constructed piece of mechanism should be, will give the highest satisfaction. It is furnished with Columbia single tube pneumatic tire, but Hartford double tube tire will be supplied, without additional charge, when desired.

We show in this connection the new front wheel



NEW PEDAL.



FRONT WHEEL BRAKE. SPROCKET WHEEL WITH DETACHABLE RIMS.

brake, which is used with this model. The newly designed forged spoon will be found strong and effective, while so acting on the tire as to reduce to a minimum any danger of wearing or cutting.

A novel feature of all models is the new front sprocket wheel, shown in illustration, the rim of which is easily and quickly detached without removing the pedal. By providing himself with one or more extra rims, either round or elliptical, and detachable chain links, any rider may effect a change of gear as required with little labor or delay.

A new pedal will also attract attention on account of a great saving in weight as well as additional neatness in appearance. These pedals are made in three widths, 3 1/4, 3 3/8, and 4 inches. The great elasticity of the

pneumatic tire admits of doing away with some of the rubber used in the old style pedal, making a saving in weight in this as well as in the frame.

Among other specialties announced for this year are the new Hartford double tube tire and the adoption of wood rims in some of the lighter wheels. The Columbia seamless tube is used in the construction of the frames. This is the strongest for its weight ever used by the Pope Company and the most uniform in gauge and tensile strength, as not only established by their own tests, but by those of the government testing department at Watertown, Mass.

The steady advance made by this company, the pioneer in the cycle industry in this country, is well known, and the great interest aroused on the subject of good roads is due to the persistent work of Col. A. A. Pope.

The reduction in price announced will be welcome in-

telligence to the great number interested in bicycling, and will cause these wheels to be used more widely than heretofore.

The forty-eight page catalogue issued by this company is profusely illustrated and beautifully printed. It will repay careful examination by any one interested in bicycling. All of the different wheels and parts are fully described. These catalogues may be had, free of charge, at any office or agency of the company, or will be mailed on receipt of four cents in stamps from their offices in Boston, New York, Chicago or Hartford.

The Humming Bird at Home.

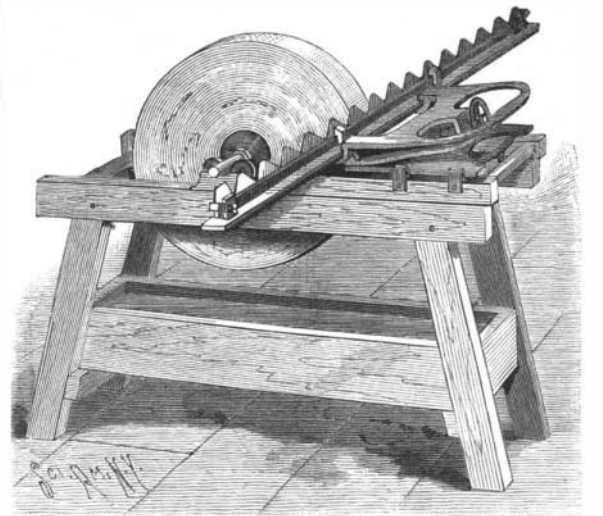
While spending the winter in California, I made my first acquaintance with Madam Hummingbird "at home." In the first place the location could not have been improved on. Just picture in your mind a lawn dotted with orange, lemon, fig, and palm trees, with here and there a giant century plant, or bunch of pampas grass and no end of flowers. While a cypress hedge, overshadowed by stately eucalyptus and pepper trees, separated the lawn from the street. One day while gathering oranges, I was startled by the rapid and angry darting of a humming bird near my face, which led me to look closely in that part of the tree, which resulted after a little search in the discovery of my first humming bird's nest. It was placed on a twig not as large as a lead pencil, on one of the lower limbs of the orange tree, and it was so covered with lichens the same color as the bark of the tree that it was difficult to find it again even after I knew about where it was. The nest is about the size of the burr oak acorn cup, built almost entirely of the feathery plumes of the pampas grass, covered with green lichens, and all held together, and to the limb, with something greatly resembling spider web. Within this "marvel of construction" were two semi-transparent eggs, almost too small to describe, and my efforts to use the blowpipe on them blew them all to smithereens.

Before taking the nest, I visited Madam Hummingbird several times, and nearly always found her at home. She never left the nest but a few minutes at a time.—*Frank Ford, Mag. of Nat. Sci.*

AN IMPROVED SICKLE GRINDER.

This is a device which may be attached to the frame of an ordinary grindstone, to support the sickle in the proper position against the stone in grinding, preserving each section of the sickle uniformly true from heel to top. The improvement has been patented by Mr. Thomas Gordon, of South Bend, Wyoming. The base plate of the adjusting frame slides in guide cleats secured upon the beams of the grindstone frame, and on the base plate is a bed adjustably connected with the plate by means of a set screw serving

as a pivot and another set screw in a segmental slot, the slot having at one side a scale to indicate how far to the right or left the bed is to be moved to give the proper beveled settings to different sized sections of the sickles. Pivotaly connected with the bed is an adjusting frame having an outer handle section and opposite extensions in which are slideways adapted to receive a sickle-carrying bar, for holding in position the sickle to be ground. Near each end of the carrying bar is a post with pivoted yokes

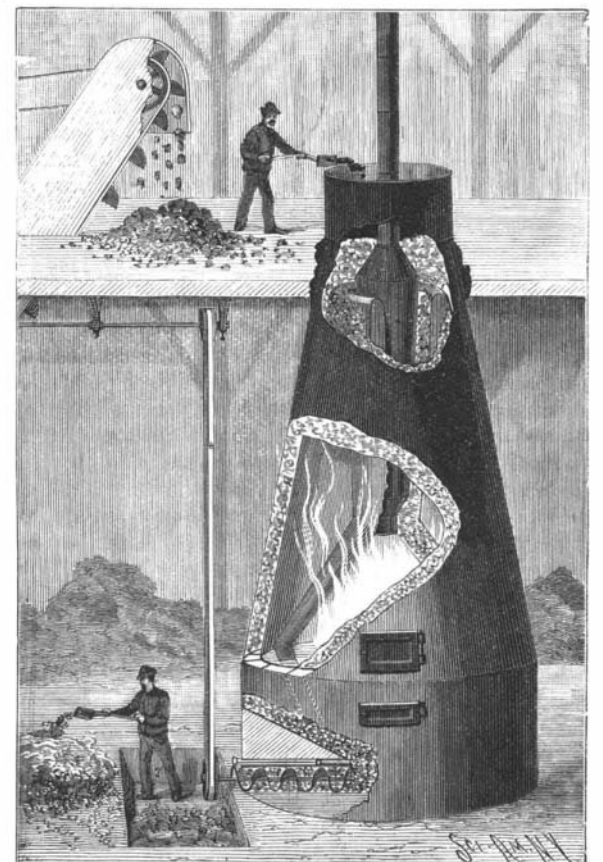


GORDON'S SICKLE GRINDER.

adapted to be clamped in any position they may be set, while intermediate posts are adapted to support the sickle bar to prevent its springing away from the stone during the process of grinding. The base is kept fed to the grindstone by a spring connected with a bracket, and the carrying bar may be manipulated by a shaft on whose outer end is a hand wheel, its inner end carrying a pinion meshing with teeth on the under face of the bar, the latter being carried either to the right or left by turning the hand wheel, it being designed that one revolution of the shaft shall carry the sickle to the right or left the length of one section. Instead of operating the sickle-carrying bar by means of this shaft, it is in many cases slid by hand either to the right or left. In use the stone is maintained perfectly square across its full face, the sickle sections passing over and across the entire face surface of the stone. The machine may also be adapted to the uses of an ordinary grindstone. Further information relative to this invention may be obtained of Mr. J. G. Pratte, Cheyenne, Wyoming.

AN EFFICIENT AND CONTINUOUS DRIER.

This improved drier, patented by Mr. William Harmon, of Bartow, Fla., is designed to save all the heat, the material to be dried being fed directly over the fire, while large quantities may be continuously treated, the material being carried down through the drier by gravity. Within the shell is a grate, beneath which is an ashpit, secured to a horizontal partition, suitable doors and air inlet apertures being provided, and within the conical part of the exterior shell is an interior concentric shell forming an outer annular space for the passage of part of the material to be dried, the lower end of this space being adapted to be closed by a series



HARMON'S DRIER.