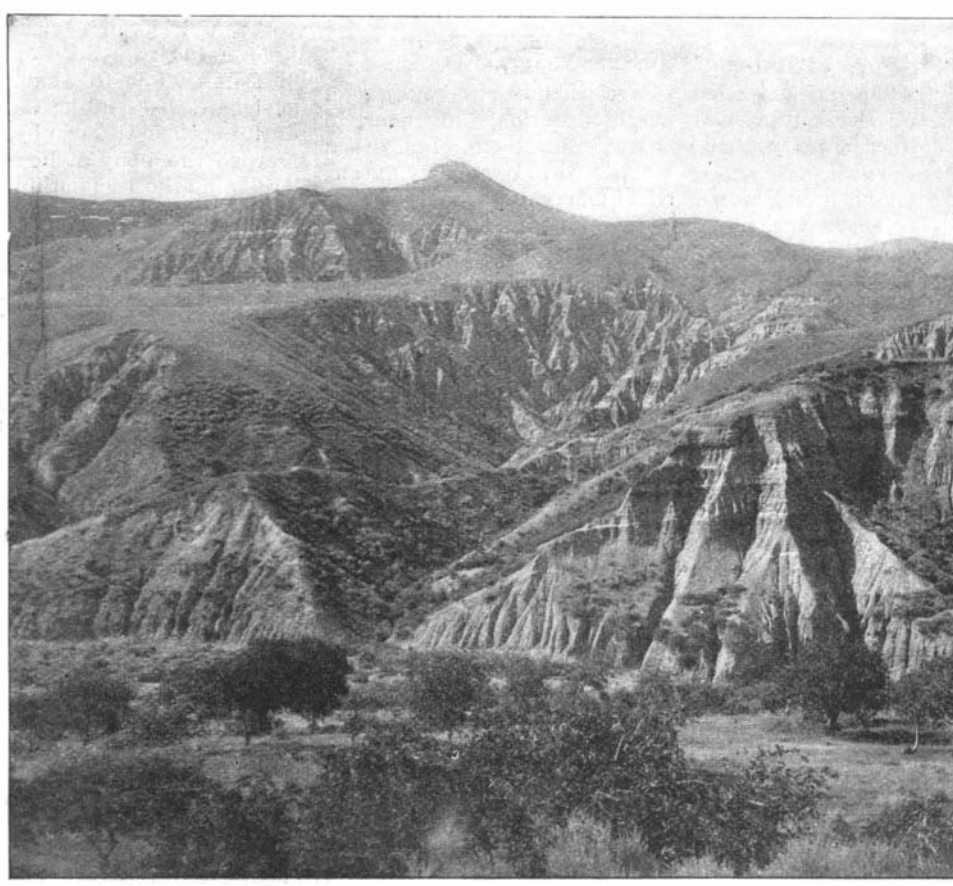
COMPARATIVELY RECENT GEOLOGICAL CHANGES IN CALIFORNIA.

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 headwater 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.



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

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 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.

NATHANIEL 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 genera use. In 1876, with J. A. House, he patented a power transmitter