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THE BROWN STONE QUARRIES OF CONNECTICUT.

most extensively worked, and the place gives a local name to the stone as "Portland stone."

A recent article in the Hartford Daily Times gives an array are quoted in this article. It appears from undoubted his-It lies in horizontal strata, usually with each stratum in the graved by a diamond. upper levels varying a trifle from the other in fineness of the sand. Occasionally there is found an intermixture of tine pebbles. Generally speaking, the deposit is not unlike that of silt upon a beach. In one of the three quarries now worked, several acres have been quarried to a depth of 200 supplied gratis to all readers who choose to send us their feet below the surface. As an experiment, some years ago, to decide for business reasons the probable depth of the sandstone, a diamond drill was started downward from the 200 acter or quality of the rock.

"The sandstone" says Prof. Rice, of Middletown, "was deposited in a long, narrow estuary, extending from New Haven nearly to the northern boundary of Massachusetts. The SUPPLEMENT records the complete history of these and No fossils have been found except trunks of trees and tracks. many other useful achievements; it presents in compact The latter are probably not tracks of birds, but of reptiles form the most recent papers by eminent writers in all the and amphibia." The latter opinion, it will be noted, is di-principal departments of general, technical, and theoretical rectly contrary to the popular belief in the "bird tracks," | science, embracing Biology, Geology, Mineralogy, Natural for which the Portland quarries are widely known. The History, Geography, Astronomy, Archæology, Chemistry, sandstone lies in horizontal strata, usually, and every few | Electricity, Mining, Mechanical Engineering, Technology, feet there is a well defined horizontal crack. On lifting a Agriculture, Horticulture, Domestic Economy, Biography, flat section of stone, the tracks are found on the surface of Medicine, etc. The array of authors is great; it includes the stone beneath, with corresponding projections of the almost every prominent name connected with science, such upper stone fitting into them. Professor Dana, in that as Huxley, Tyndall, Crookes, Maxwell, Siemens, Reynolds, model text book, "The Geological Story briefly Told," coin- A. M. Mayer, Bessemer, Tissandier, Dumas, Gladstone, cides with Professor Rice that the tracks are those of rep- Newberry, Remsen, Leeds, Mallet, Thompson, Hughes, tiles and amphibia. The late Edward Hitchcock, father of | Hopkins, Trowbridge, Ericsson, Copeland, Sellers, Eads. the present State Geologist of New Hampsbire, and a famous MacCord, Hammond, Loomis, and hundreds of others. writer on geological topics, was the first to assign to these Most of the papers contained in the SUPPLEMENT are illusfossil tracks in the Connecticut Valley sandstones their true trated, many of the drawings being to scale. significance in geology. His views were received with incredulity at first, but have since been adopted by the sci- size as SCIENTIFIC AMERICAN. The extensive range of its entific world.

splitting. The blast is generally of powder in a single hole PLEMENT have been preserved, thus enabling us to supply, -from 25 to 60 pounds of powder in a nine inch hole 15 or on call, any particular numbers that may be desired, at 10 20 feet deep. The object of this is to shatter the rock, so cents per copy. No periodical in the world offers so large that it may be easily broken into rubble for foundations. and varied a collection of scientific, technical, and useful When large and regular blocks are required, a chiseled cut papers, all of them readily available to the public at a low is made one or two inches wide and of varying depth, into price, as the SCIENTIFIC AMERICAN SUPPLEMENT. As bewhich wedges are driven with sledges, and the block slides fore stated, the new catalogue will be sent, free of charge, to off at the interception of a horizontal seam. Flood, the Cali- any desired address. Send for it to Munn & Co., 361 fornia millionaire, has given the Middlesex Quarry Company | Broadway, New York, office of the SCIENTIFIC AMERICAN. an order for the stone for the grand mansion he is to erect in San Francisco. It calls for 40,000 cubic feet of best quality, such as is used for monuments. This will make twentynearly \$2,000,000.

GAUGES FOR MECHANICAL WORK.

In a lecture delivered before the Franklin Institute a short the spindle, and were belted to run in opposite directions. time ago and recently published, Mr. George M. Bond Between them was a sliding friction clutch that by a very spoke of the modern accuracy in the work of the machinist slight movement of a lever could be made to engage with as compared with former crudity. James Watt, in a letter | either cone, as desired. The arrangement suggested the to a friend, claimed that he had attained remarkable ac- possibility of an improvement in screw cutting lathes by curacy in boring a cylinder of a steam engine and fitting its constructing the lathe head in a similar manner, and dispiston so closely that "the thickness of a half crown could pensing with the overhead clutch, which requires so long a not be introduced between them." Standard gauges are now : lever that the time used up in shipping interferes with accumade that show errors of one one-hundred-thousandth of an racy of work. The details are not completed as yet, but the superintend inch, and work is exacted to one fifty-thousandth of an inch. ent, who is a skillful mechanic, is confident that much is to Such accurate work is not, however, generally necessary, except in the construction of gauges; but these standard be gained in the way of positive and instautaneous reversing gauges are the means provided for keeping within proper, by having the clutch directly under the operator's hand. useful, and practicable bounds in the production of thou-A REMARKABLE STRAIGHT EDGE. sands of pieces of the same size and shape in which often-Some notice was made in the SCIENTIFIC AMERICAN of times a certain amount of variation is allowed both plus and minus. A certain amount of looseness must be allowed, March 29, 1884, of a trio of remarkable straight edges made for instance, in the fit of journals and bearings, the amount by the Pratt & Whitney Company, Hartford, Conn., which to be determined according to the length and size of the are each 12 feet long and wonderfully exact. These straight journal: but this variation should be referred to some par- edges are castings of iron, forming a chord and a segment of a circle, the extreme radius in the center, from the chord or ticular gauge as a standard. This allowance of difference is necessary in the fittings straight line to the highest point of the curve, being 20 inches, of bearings and journals, as, if made with the extreme ac- the depth gradually tapering on a curve. The width on the curacy of gauge work, the surfaces would cohere and face is about 21/2 inches, making a face 21/2 inches by 12 feet. speedily destroy each other. This is seen in the construc- Between the chord and the curve the casting is a honeycomb tion of end measure pieces as gauges; where two are pressed of diagonal braces. Recently some remarkable tests have together by their ends they will cohere even in a vacuum. been made with these straight edges, one of them being a In the perfect fit of plug and ring gauges where the plug is test of flexure. The straight edge was placed on a true and inserted in the ring, both being of hardened steel and both' perfectly clean planer bed, with a slip of tissue paper under

at the same temperature, it is necessary to keep the plug Probably the most extensive quarries of red free stone or moving, or the easy sliding fit will change to a driving fit. "brown stone" in the world are on the Connecticut River at In fact, there is no room for one to expand and not the Middletown and at Portland, on opposite sides of the river, other. A plug gauge of three-quarters of an inch diameter, fifteen miles below Hartford, the capital of the State. The but which is three-ten-thousandths of an inch smaller than Portland quarries on the east side of the river have been the ring, is a loose fit which can be tested by feeling; and if the plug and ring are clean and of the same temperature, the plug will drop through the ring.

In order to make standard gauges within the limit of acof facts concerning these celebrated quarries, some of which curacy necessary for interchangeability, to fulfill the requirements of modern shop practice, line measure is the torical evidence that these quarries were worked in 1645, best standard for practical reference. This measurement is 239 years ago, as there is an ordinance alluding to them at by means of engraved lines on a ruled steel bar, the tests that time. The deposit of brown sandstone at Portland being made by the microscope. For this purpose a hardcovers an area of 200 acres, and is practically inexhaustible. ened steel bar is used, the subdivisions being ruled or en-

OUR NEW SUPPLEMENT CATALOGUE.

A new catalogue of valuable papers contained in the Sci-ENTIFIC AMERICAN SUPPLEMENT is now ready, and will be names

This catalogue exemplifies the astonishing progress that is now being made in the various branches of science and the foot level. It was driven 312 feet, making 512 feet in all, arts. Not quite ten years have elapsed since the publication and without reaching the bottom of the depositl A core of the SUPPLEMENT was begun; yet within this brief period that was taken out showed no material change in the char- many important discoveries have appeared and many great works have been undertaken or completed. Among them the Telephone, the Electric Light, the Panama Canal, the Brooklyn Bridge, the St. Gothard Tunnel, are conspicuous.

The new catalogue occupies 24 large quarto pages, same 'subjects will be understood when we state that it includes over The stone is removed by blasting and by drilling and 5,000 titles. Stereotype plates of all the issues of the SUP-

.... A SUGGESTED LATHE IMPROVEMENT.

The ordinary back-geared engine lathe of the machine shop five schooner loads. It is shipped to Newark, N. J., there is not a special tool, it being used generally for turning, bordressed, boxed, and sent to New York, to be shipped for a ing, and screw cutting, and frequently for drilling and four months' voyage around Cape Horn. The freight is \$7 chucking. There are, however, special lathes, as boring per ton, and Flood pays, therefore, \$28,000 extra over the lathes, pulley lathes, and others. It is proposed to add to cost of putting up a similar building in New York. It is the list of special tools for the machine shop a screw cutting estimated that the bill for stone, when set in the walls of his lathe of a pattern somewhat different from the ordinary residence, will amount to \$200,000, but this is a small amount back-geared lathe. In constructing a special machine refor the mere shell of the house, whose total cost will be cently, ou which the principal rotating spindle had to be re-

versed in motion instantly and frequently, the superintendent introduced a supplemental spindle carrying two step cones with their small ends contiguous. These turned freely on

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