

Human Capacity.

Is the human race endowed with talents, tastes and capacities so as to furnish to-day the requisite number to conduct the varied affairs of life and business, so that every department could be properly filled, and all be occupied?

In reply to this question, we may say that human nature is susceptible of varied culture, and that all the *faculties exist in all men* (except idiots), but the faculties are naturally developed by the incidents and circumstances which may act upon given tribes or classes of people; and if the question were asked, "Are all men now qualified to adapt themselves to the different economies of life?" we would say "NO." A great majority of mankind to-day is adapted to the commonest drudgeries only, because the majority of the race has not been cultivated so much in the faculties of philosophy, and

colonies on the false basis of hunting for precious metals, and their colonial civilization is faulty. The English have colonized for homes, farms, mechanism and trade, and their footsteps have been firm, and the results permanent and powerful. France cultivates ornaments and æsthetics, and we have a nation of fancy, style and decoration. The Scandinavians, by necessity, followed the sea, and they became navigators and the explorers of the world.

If we could find a country with the soil and climate adapted to the development of every useful trade, art, or occupation, doubtless the public would become classified so as to adapt a proper number of persons to each department of effort and achievement pertaining to all the phases of an excellent civilization. New England could not raise wheat, and Illinois lacks the water-power to be, like New England, a manufacturing region. The faculties become cultivated by practice, and practice is invited by

The Buffalo Pitts Traction Engine.

The season of special activity in traction engines is at hand. It seems likely from the many uses to which engines of this sort can be put in California that they will become an all-year resort for the large-scale California farmer, but at present their chief sphere is found in harvesting our great grain crops. The engraving on this page shows the Buffalo Pitts Traction straw-burning engine, as especially built for the California trade, conducted by Baker & Hamilton of this city and Sacramento. The engraving gives an excellent idea of the design of the machine, three-quarter view, as the photographer would say.

The Buffalo Pitts Traction engine has been in use for some time in California for pulling combined harvesters, plowing, etc., and the manufacturers in their circular make the fol-

It is near the junction of the St. Clair river with Lake Huron, and connects the towns of Port Sarnia, Ont., and Port Huron, Michigan. The railroad which runs through the tunnel is the connection of the Grand Trunk railway of Canada with its line in Michigan. The tunnel is 6000 feet long and the approaches are 1950 and 2500 feet respectively, making a total length of over two miles. The approaches have a grade of 105 feet to the mile, and a heavy locomotive is required to haul trains through the tunnel and up the grade of the approaches.

The locomotives are known as tank locomotives having no tender. There is a tank on each side of the boiler, and their capacity is 2000 gallons. There are five pair of driving wheels 50 inches in diameter. The wheel base is 18 feet 3 inches. The cylinders are 22 inches in diameter, having a stroke of 28 inches. The boiler is of steel $\frac{3}{8}$ of an inch thick, and is six feet two inches in diameter. There are 180 flues



BUFFALO PITTS TRACTION ENGINE.

ethics, and æsthetics, and mechanics, as it ought to have been; hence some nations are behind in arts, science and literature.

On the seacoasts we find men developed in reference to following the water, and seamanship is chiefly the result, and men have become almost amphibious. In other sections we find that the mechanical elements have been cultivated until the strength of the character finds its outlet in mechanism. We know of a town in Massachusetts where they nearly all tend toward the ministry and missionary work. Somebody has succeeded in that direction, and others have followed, until the strong current in that town is toward the ministry, as in other towns in the same State the current is toward navigation, especially the fisheries, and in others toward mechanism. In Kentucky there is a public sentiment that runs toward fine horses, and fine horses are the result. In other sections, not denying Kentucky her share, law, politics, statesmanship, public affairs seem to be the aspiration of the people, and in California and Colorado mining is the drift, and million airmen is the prayer, if not the song, of the people. The Spaniards have made most of their

necessity, and necessity is met or not met by opportunity, hence culture in diverse directions depends largely upon the wants of the people and the opportunities for such development. A hundred years from now this country may illustrate a harmonious division of talent and its adaptation to the different pursuits and attainments of life.—*Phrenological Journal.*

MECHANICAL IMPROVEMENTS.—A writer in an exchange says that the past two years have developed more improvements in mechanical devices than any 20 years preceding. During that time almost every branch of business has been more or less revolutionized by new mechanical appliances or new processes. It is a remarkable fact that it is more applicable to the American people than to any other nation that whenever any new device is brought out or any new process introduced, even before its utility is fairly demonstrated, in many cases hundreds and thousands are found ready to adopt it.

It will not do to run a cast iron fly wheel faster than 80 feet per second.

lowing claims for it: 1st, that it will pull any horse combined harvester built; 2d, that it will pull twelve 12 inch plows or more, according to condition of soil; 3d, that straw, wood or coal can be used for fuel, and full steam maintained with either kind of fuel; 4th, by reason of its large horse power and comparatively light weight is a perfect engine for road hauling.

The Largest Locomotive Ever Built.

A huge locomotive, the largest ever built in America and probably the heaviest ever built in the world, is now at the Baldwin Locomotive works in Philadelphia, and will be shipped next week to the St. Clair Tunnel company.

Four locomotives of the same kind have been built at the Baldwin Works for the company. Each is guaranteed to haul a load of 760 gross tons of cars and lading up a grade of 105 feet to the mile—equivalent to a train of 25 or 30 loaded freight cars. The St. Clair Tunnel company, for which the locomotives have been built, controls the line of railroad running through the tunnel under the St. Clair river.

2½ inches in diameter and 13 feet 6 inches long. The fire-box is 11 feet long and 3½ feet wide. The locomotive is too heavy for some of the bridges it will have to cross on the way, and the cab, tanks, side rods, and other parts will have to be taken off and shipped separately.

A GREAT ENGINEERING FEAT.—The greatest engineering feat in the history of the anthracite coal mining is about to begin. It is the commencement of what will be known as the Jeddo tunnel, which will be driven for the purpose of draining the flooded mines of Jeddo and Harleigh. It will be constructed from Butler valley, Pa., to the bottom of Ebervade mammoth vein, a distance of three miles through solid rock, to be eight feet square in the clear. The scheme of tunneling through the mountain first occurred to John Markle, who is to be president of the company, which will bear the title of Jeddo Tunnel Co., Limited. It will open an inexhaustible supply of coal and furnish employment for thousands of people for many years to come. It will also serve the double purpose of draining all the collieries in the valley.