

the opportunity for advancement, the graver the dangers of abuse. In savage races youth is passed in two or three years. Women bear children at 18 or 14 and are old and wrinkled at 30.

Length of adolescence is also due to blood. Unmixed races like the Jews and Germans hasten through adolescence, the period of change, and settle into race habits and customs. But in America where blood is much mixed, adolescence is prolonged, and the ferment of youth—the ability to be moulded by the influence of principles—is continued long into adult life. In this fact lies the great hope of the future of our race.

Cossov, a Russian scientist has, by the comparison of hundreds of thousands of cases, proved that the best time to bear children is, for the woman, 25 to 35 years of age and for the man, 30 to 40. Children born long before that time are not likely to reach the full maturity of their powers. Children born long after that time, while not in danger themselves, are likely to produce immature offspring. Exceptional race changes are likely to occur on the male side of the house. Boys surprise us continually by their innovations; by their development of the remote and unlike; girls seldom show gaps between what they are and what their parents were.

The law of latency is noted but unexplained by science. It consists in the unexpected breaking out of tendencies which immediately become factors in civilization. All great geniuses illustrate this law. By means of the educational forces they set going, they influence the life of the race.

But after all accidents and all artificial agencies have had due consideration, science comes to this conclusion: An ounce of good heredity is worth a ton of education, so far as race betterment is concerned; provided that by education we mean, what is usually meant—mere intellectual power or cleverness.

But the education which reconstructs the lines of the moral life—which makes right living a habit—this tells for good—this is in short the material of which heredity is made. It is plain therefore. It is first of all to transmit the life which is confided to us. No greater menace to our civilization can be found than in those tendencies which tamper with the foundations of life. Alas for the feeling which has come to regard marriage as a doubtful blessing!

It is next our duty to transmit the stream of life purer and holier than we received it. All the tendencies that purify and enoble are summed up in the word love. Only when guided by this power do we know that we are working in consonance with the Author of our being.

"He prayeth best who loveth best,
All things both great and small.
For the great God loveth us,
He made, and loveth all."

After a life devoted to microscopic investigation of tendencies that affect the future well-being of the race, I am glad to say that, in spite of the dark aspects here and there, I am no pessimist. My hope of the future places me in the sunlight of a cheerful optimism. The world is growing better.

SCIENTIFIC DATA.

OGDEN, Aug. 23.—This morning a small party of men left Ogden over the Southern Pacific for California after a stay of four weeks in the vicinity of Ogden. Few people here know them or know what they have been doing the last month. They were, however, distinguished men in their line and their work during their stay will add much to scientific data. The party consisted of Professors Marks, Wlog, and Hoskin of Leland Stanford University, and they have been at Ogden to make tests at the Power company's plant to ascertain particularly the loss of power by friction of the waters at different pressures.

Professor Marks is a civil engineer and a recognized authority on hydraulics. He was at one time engaged by the government in superintending the dredging of the Mississippi and Missouri rivers. Professor Wlog is also a civil engineer, but his specialty is bridge building. Both he and professor Marks were graduated from Cornell and were for a time connected with the University of Wisconsin. Prof. L. M. Hoskins is a teacher of hydraulics and mathematics and stands high in his profession.

The gentlemen finished up their work Saturday; and yesterday spent the day in Salt Lake. They were entertained by members of the University club and friends in the city. In the afternoon it is understood that they went to Saltair and took a bath in the Lake.

The work of the California men has been successful. Their work has consisted of experiments alone and the deductions will now be made. When this is done the data will be given out and used in the construction of other power plants. The plant here is the largest in the world and the data is therefore very valuable.

The Ogden plant consists of a long pipe that carries water from the bottom of the dam that is to create the great reservoir down to the power house where by use of machines the energy of the water is transformed by machines into electrical energy. The pipe which is usually eight miles long is constructed of wood bound with steel, and is six feet in diameter. It is laid as nearly as possible on the hydraulic grade so that the friction of moving will just be overcome by the force of falling. When the end of the canyon is reached steel pipe is used, and this increases in thickness from slightly over one-fourth of an inch to one and three-fourths. Just before reaching the power house the great six-foot pipe divides into two branches, one of which runs on each side of the house. These empty into cylindrical receivers, eight feet in diameter and from each of these five pipes up out of the ground and pass through the walls into the building.

The pipe from the receiver is about two and one-fourth feet in diameter and after entering the building are reduced to one and one-fourth feet to increase the velocity of the water they carry. Three valves are here found, a great hand valve, a butterfly valve and an automatic valve. These are for use in shutting off the water and regulating it.

The pipe makes a curve after the last valve is passed forming an arc excentric with a fifty-eight inch wheel that is placed just above it. The surface of the wheel is formed into buckets somewhat like the cogs on a cog wheel and these are so shaped as to receive the greatest amount of energy from the water as it spurts from the six nozzles below. These nozzles are rectangular holes about three square inches to each in the curved steel pipe. The water rushes from these and its force against the buckets drives the wheel at a tremendous rate. The shaft which fits in self-oiling babbit metal bearings passes out from the iron box in which the machine is encased and to it is fastened a great armature which whirling between electromagnets generates an electric current of 1000 horse power. The plant is constructed for ten machines though only five have been put in—two on one side and three on the other.

The work of the California professors has been to determine the loss of power by friction when the water is moving at different velocities through the pipe. There were two series of experiments, one on the wooden pipe and the other on the iron pipe, which is under a pressure of from forty to two hundred pounds to the square inch. Several pipes of mercury were put in at different points and the water turned on this relieved the pressure and the mercury would fall. The measurement of the different heights when the different amounts of water are being used was very delicate work, if of any value, and as this had to be repeated at different parts of the line extended work was necessary.

The experiments have shown that the power plant at Ogden is a great enterprise and comes up to the expectations that have been placed on it. Scientific men, especially those interested in hydraulics will look for the calculations and description of experiments.

THE UTAH EXHIBIT.

Judge John W. Judd has just returned from Tennessee whither he went July 16th in connection with Mr. George D. Pyper as commissioners of the Utah exhibit at the Tennessee Semi-Centennial Exhibition.

A News reporter called upon him and remarked that he looked well. "Then I deceive my looks?" was the judge's response. "The fact is, I am just recovering from an attack of malaria. Tennessee is a great state, and I am proud of it as my native home, but it cannot compare with Utah for climate, especially during the summer months. No sea-board country can. Why, I feel like a new man since I reached these valleys, and my complete recovery is only a matter of a few days."

"The readers of the News will doubtless be interested in what you can tell them of your recent labors in connection with the Exposition" suggested the reporter.

"They may well be," said Judge Judd, and his face lighted up with interest. "But the fact is one must visit this splendid exhibition to get anything like an adequate idea of its grandeur and immensity. It is without doubt the most extensive exhibit