

## SIR JOHN EVANS.

BY MARCUS BENJAMIN, PH.D.

The distinguished scientist who will succeed Sir Joseph Lister as president of the British Association for the Advancement of Science has long been favorably known in this country for his studies in archaeology, geology and numismatics, and the following brief sketch of his career will be of interest to those who know him only as the one who has been chosen to preside over the meeting of the British Association to be held in Toronto next week.

John Evans is a son of the late Rev. Dr. A. B. Evans, who for many years was head master of Market Bosworth Grammar School in Leicestershire, England, and was born in 1823. He received his education under his father's direction, during which time he developed an interest in scientific studies. These, however, have been for the main part his recreation and pleasure, while the chief occupation of his life has been that of a paper manufacturer, in which he has been successful, and he was for some time the president of the Paper Makers' Association.

His first important book was one devoted to numismatics, and his "Coins of the Ancient Britons," published in 1864, gained for him the Allier d'Plantersche prize from the French Academy. Among his best known archaeological works are the "Ancient Stone Implements, Weapons and Ornaments of Great Britain," which he published in 1872, and of which a French translation appeared in 1875. Also his "Ancient Bronze Implements, Weapons and Ornaments of Great Britain and Ireland," which was published in London in 1881 and in Paris in 1882.

Dr. Evans has also written papers on "Flint Implements in the Drift," and other archaeological papers for the "Archæologia," and he is a contributor to the Numismatic Chronicle, of which he is one of the editors.

The honorary degree of D.C.L. has been conferred upon him by Oxford, and that of LL.D. by Dublin, and that of Sc.D. by Cambridge. More recently he has been made a knight commander of the Bath. His own associates have honored him conspicuously, for, in 1875-76, he was made president of the Geological Society; in 1878-79, of the Anthropological Institute; in 1875-97, of the Numismatic Society; and in 1885-91, of the Society of Antiquarians. In consequence of the latter office he is an ex-officio trustee of the British Museum. He has long been a member of the Royal Society and is now one of its vice-presidents and its treasurer. Of many foreign learned societies he is also an honorary member, and is a correspondent of the French Institute in the Academie des Inscriptions.

Sir John Evans has his home at Nash Mills, Hemel Hempstead, and his neighbors have testified to their appreciation of him by electing him a justice of the peace and deputy lieutenant for the county of Hertfordshire, where he also served as high sheriff in 1881-82. He is chairman of quarter sessions for the St. Albans division of Herts, and also vice-chairman of the Hertfordshire County Council.

The knowledge and experience of Sir John Evans fully demonstrate the wisdom of selecting him to preside over the meeting of the British Association, and we hope that the splendid welcome that he will receive from his American confrères will fully compensate him for his visit to the new world.

**English versus American Locomotives in Japan.**

It is very interesting to note the discussions which go on in the Japanese journals on the relative merits of English and American machinery and manufactures. The great development of railways in Japan has naturally led to the discussion of the relative merits of English and American locomotives. In a recent issue of the Chuo Shimbun the editor reproduces the arguments advanced by the advocates of each class of engine. The speaker in favor of the English engines appeals to actual experience, and expresses the opinion that, judged from that point of view, there is no need for discussion. He points out that when Viscount Inonye was at the head of the railway bureau, he resolved to make a trial of American locomotives, and in 1891 two were imported. The result of the experiment was thoroughly unsatisfactory, for within a year they were useless. He then enters into a long account of their defects, which, if at all correct, shows that they were deficient both in design and workmanship. After Viscount Inonye's retirement, his successor, Mr. Matsumoto, who had received part of his education in the

United States, and who has therefore a great leaning for things American, imported in January, 1894, four American locomotives, which, however, fared no better than their predecessors. From the very outset repairs and alterations were required, and after a year or two the whole four were virtually condemned. After this experience the railway bureau decided that the English engine was the better; and recently, when an order was given for eighteen locomotives, it was stipulated that they must be of English make. The writer in favor of the American locomotives expresses the opinion that it is a mistake to judge so hastily on the subject, as the engines hitherto imported by Japan from the States were not of the best kind. He says that there are other and better makers of locomotives in the States, and that it is absurd to suppose that the Americans cannot make good engines. Even Japan is beginning to develop that ability, and America is not new to the work as Japan is, as she has been at it for years. Above all, she can turn out much cheaper locomotives than England can, there being a difference of as much as one-third of the price in favor of the American engine. This means, of course, that, if the American locomotive lasts seven years against the English locomotive's ten, the advantage is still on the side of the former. He makes the rather

gent expression of public opinion which is taking place on these matters is certain in the end to lead to efficiency and public convenience.—Engineering.

**Guides to Gears.**

To have the wheel you ride properly geared is so very important that two points must always be borne in mind when buying machines. One is that the novice, even though he may be strong and muscular, cannot use as high a gear as the man who has had long practice in pedaling, for not only will the particular muscles called into requisition in riding require to be developed, but the novice has not the knack of exerting his powers to the best advantage. The other point is that gears which were suitable on a machine built several years ago are not, as a rule, high enough on a thoroughly up-to-date machine, since the latter is lighter, easier to propel, and faster than the former. For this reason it will be found that experienced riders have slightly raised the gear every season for years past; and the fact that they can now use, with perfect comfort, a considerably higher gear than they could a few years ago they attribute partly to practice and partly to improvements in the manufacture of machines.

It is very difficult to lay down definite rules for the guidance of others in deciding on the best height of gearing, as the most suitable gear depends on so many conditions. The first and perhaps the most important question is the character of the rider's muscles. If he is strong, but slow in his movements, he will certainly need a high gear. If he is weak, but quick, he will need a low gear. But the character of the machine he is riding also has to be taken into account. With a heavy machine fitted with full roadster tires, the gear must not be as high as with a light one equipped with racing tires, and with 6 inch cranks it must not be as high as with 6½ inch. Another very important consideration is the nature of the roads to be ridden over. In a level country, blessed with good roads, a much higher gear can be ridden than in a hilly country; and, again, if the rider only goes out when the roads are dry, higher gear can be ridden than if he goes out at all times, no matter whether roads be dry or muddy.

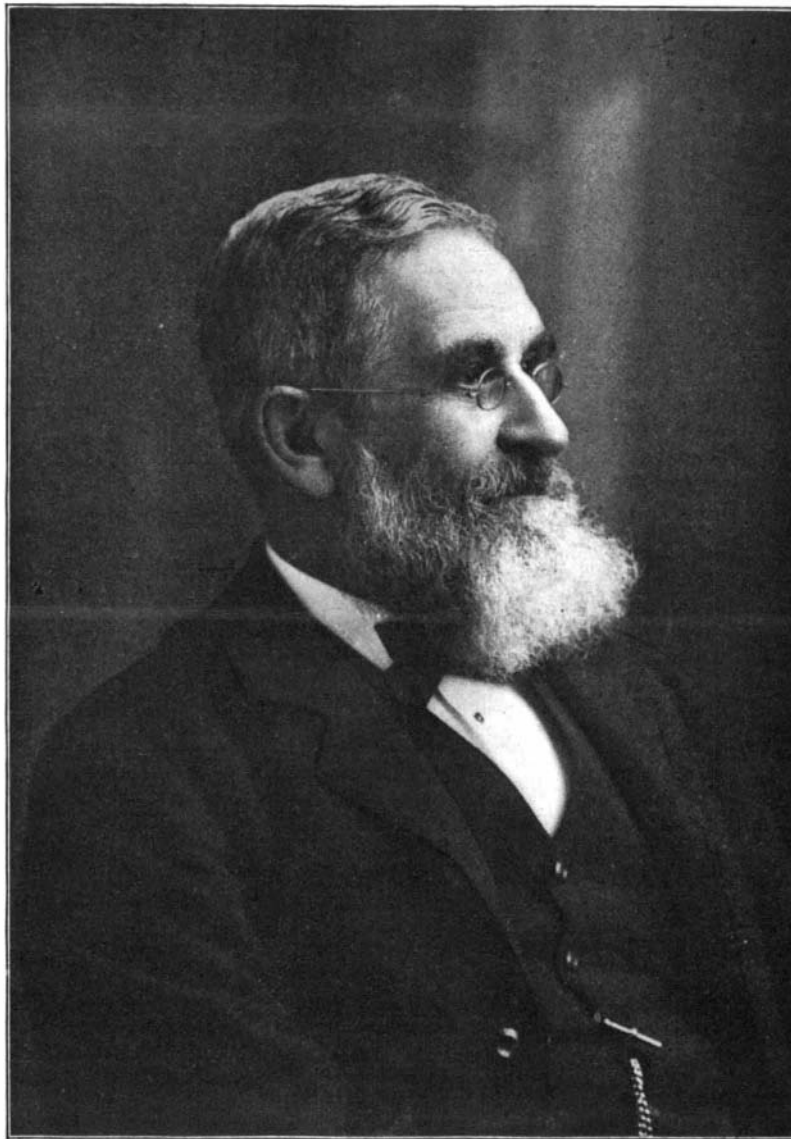
While it is not the intention of this article to recommend to the average cyclist a very high gear, yet it cannot be denied that many riders fall into the error of having their machines geared too low. Although low gearing requires less pressure on the pedals, it necessitates moving the feet round faster, and thus in reality adds to the amount of work which has to be performed by the energy which the rider expends. In any case, the machine and its load have to be propelled, but with a low gear the rider's feet and legs have to be raised a greater number of times. Of course, the low gear has the advantage up hill or against a wind; but at other times the rapid movement of the legs is apt to become exhausting, besides which, it makes ankle action very difficult, if not impossible, and increases the liability of the rider to lose his pedals, and danger in regaining them. Far more riders complain that the gears they use are too low rather than too high. As to

back pedaling, no doubt that a low gear is, on the whole, the best for holding a machine back going down hill. But even here the advantage is not always on the side of the low gear, for the pedals may go round so fast that the rider can do nothing with them. What any experienced rider eventually learns to believe in is a moderately high gear and a good brake.

The average woman's wheel should be geared some half dozen inches or more lower than that of the average man; but in each individual case the precise gear which will be most suitable can only be determined by a careful weighing of all the points which have been mentioned above.—The Wheel.

**Coloring Marble and Similar Stones.**

A newly discovered process for treating marble or other similar stones in order to give them any colored shade, veins or spots, says the Chicago Tribune, consists in leaving these stones in one or more baths composed of a solution of alcohol and one or more colors of aniline or other coloring materials. The coloring materials are fixed by leaving the colored stones in a bath of oil or any other fat substance, or by applying upon the stones layers of the same stuff. The absorption of the organic coloring materials and of the fat substances by the stone may be accelerated by heating or boiling the bath which contains the stuff to be treated.



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astonishing statement that materials and labor are cheaper in America than in England. Probably he is nearer the truth when he says that the British manufacturer is a stiffbacked person. He has been at the top of the manufacturing tree for such a long time that he fails to observe the changes going on below. He will not concede anything to a customer or make any effort to suit the latter's convenience. But the American is looking for custom, and will spare no pains to reduce his prices or accommodate a client in any other manner. In conclusion, he adds that the proof that the Japanese government understands these things is that it has recently ordered eighteen locomotives from Rogers, and they are to be examined and passed by Mr. Crawford, an American engineer formerly in Japan. We believe that Mr. Crawford was the first engineer of the Hokkaido Railway, and introduced cheap methods of construction, which, however, were not followed. On this subject we may note that the question of state versus private railways is at present being much discussed from all points of view. The general conclusion seems to be that all railways ought to be built and superintended by the government but worked by the people, as experience in Japan shows that official lines are managed with a degree of officialdom to which the public has a right to object, and private lines are built on principles so commercial as to be distinctly dangerous. The intelli-