GENERAL SCIENCE

Edison and Slosson Talked of Many Things

In a Number of Short Interviews, the Great Inventor Told The Great Popularizer His Opinions on Science at Work

OK T.A.E. With this *imprimatur* Thomas Alva Edison attested as authentic expression of his opinion a series of brief interviews with the late Dr. Edwin E. Slosson, who, during several years before his death in 1929, had frequent occasion to visit the eminent inventor-scientist. Since these conversations always had to be written, because of Mr. Edison's deafness, it was convenient for him to OK them with his initials. These memoranda are presented here, as intimate glimpses of one of the most unusual minds the world has ever known.

Power Makes Civilization

MODERN civilization is dependent for its expansion and continuance upon an adequate supply of power. Ever since the introduction of the steam engine the main support of industry has been fossil fuel, supplemented to some slight extent by waterwheels and windmills. But these underground stores of chemical energy are obviously limited and must ultimately be exhausted. Then we must develop other sources of energy, and also begin to grow our fuel, as we do our food, from year to year.

Ease of Life and War

DO YOU expect that science and invention will continue indefinitely making life easier for the majority of people, or is it likely that increase in population will, at some future date, be so rapid as to reduce the standard of living? The standard of living in countries not disturbed by war has been rising for years, where the people have not been exploited. In my opinion it will continue to rise for centuries in such countries.

What can be done to prevent war in the future? The numerous volumes of the Encyclopedia Britannica could be filled full of plans and suggestions on this subject, not one of which would be practicable. It seems as if the nature of man would need to be changed.

Food Factories and Gold

IN SOME kinds of production the factory may displace the farmer. I believe certain foods will be made synthetically from inorganic material cheaper than by natural processes. Sugar has already been made experimentally, but not commercially. The reported synthesis of gold from mercury by the electric current does not amount to much, even if true. The value of gold is mostly psychological. It is merely an instrument for exploitation.

It is said that certain metals, especially lead and tin, are likely to run short in the near future but I am not alarmed over that. As they rise in price more mines will be worked. Immense areas in Africa, South America, and Asia have never been prospected to any extent.

Better Motion Pictures

THE MOTION picture and the phonograph will be improved and become more important factors in daily life than at present. By increasing the size of the film the picture will be enlarged and therefore show more detail and better perspective. Possibly also a stereoscopic effect will be produced. Photography in natural colors would not be of much advantage. We may perhaps some day be able to view an event, such as a baseball game or a battle scene, from a great distance, but this could only be accomplished at great expense and we have no need for it.

Burning Coal Underground

OUR IRREPLACEABLE supplies of natural gas and petroleum have been too rapidly used up in many localities by wasteful methods of extraction and utilization. Coal also is being unduly diminished by the same recklessness. As coal becomes scarcer, unworkable seams will be utilized by burning them *in situ* with the production of carbon monoxide, which can be used in gas engines with great gain in efficiency and economy. This may also be found the best method of utilizing the bituminous shales, of which the United States has an abundance. Instead of mining the shale and then distilling off the oil from it, the bituminous portion can be burnt underground with a limited supply of air, and the carbon monoxide gas used on the spot, or piped away, to run internal combustion engines.

Power From Waves

THE WAVE POWER of the ocean may be utilized by means of tanks moored off shore and equipped with dynamos. The electrical current generated by the movements of the floating tanks would be conveyed to the shore by cables, and there used for running motors or stored in batteries.

The economical utilization of small, scattered, and variable movements such as those of the wind and waves depends upon the possibility of perfecting the storage battery so that it will be cheap, light, and lasting enough for universal use. I am confident this can be done and that storage batteries are sure to reach 90 per cent. efficiency and to have great capacity and long life.

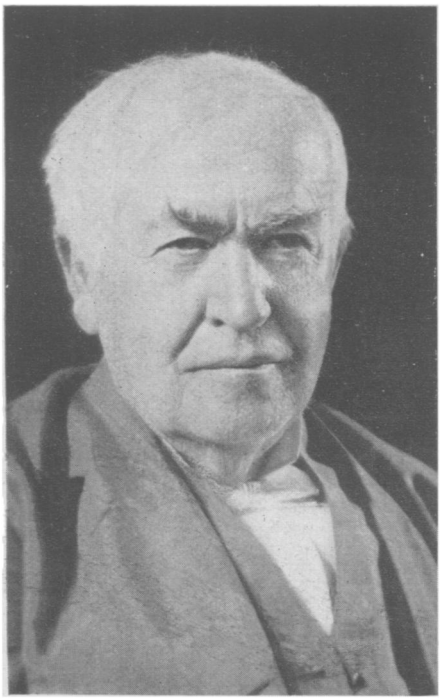
More Work for Farmers

INCREASED facilities for the transmission of power and the improvement of transportation tend toward centralization and will lead to the breakup of large cities and to the developing of rural and suburban life. Our cities are getting too congested. Mr. Ford is starting the decentralization of industry and others must follow.

Farming for three months and loafing for nine months is wrong. Something is needed that will make farmers producers during the nine months of comparative idleness. Then we will not hear so much complaining about freight rates.

Traffic and Large Cities

WHAT is going to be done about traffic congestion and parking of automobiles in cities? Cities like New York will be compelled to pass laws providing that after a certain future date no increase of manufacturing establishments shall be allowed beyond specified territorial limits; for instance,



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on the east of New York City, below the Harlem River. Congested retail trading centers will have to spread out or lose money.

For increased transportation facilities in large cities should we look to subways, viaducts, elevated sidewalks, or some other device? Much deeper rock tunnels, subways, in which no complications of construction are met with. Also the building of high speed boats and using the river, with bus distribution may be practicable. Boats holding several hundred persons and traveling twenty-five to thirty miles an hour.

Wind Power from Balloons

WIND POWER may be made available most efficiently, it seems to me, by captive balloons, equipped with fans and dynamo. These balloons can be allowed to rise to a high altitude and will be sure to find in some stratum of the atmosphere a suitable wind blowing at any time. In case of storms the balloons could be pulled to earth. Probably the raising and lowering to find the most favorable layer can be done automatically. The electricity generated by the dynamo aloft would traverse the three guy ropes and feed storage batteries on the ground. The power for pulling down the balloons would of course come from this source, and the hydrogen necessary for inflating the gas bags would be made by passing the current through water, with oxygen as a by-product.

Surprise of the Phonograph

THE PHONOGRAPH has, rather to my surprise, developed more as a musical instrument than a talking machine. When I invented the phonograph, July 18, 1877, I thought more of its use in business for taking dictation than for the production of music and the promotion of dancing. I still think that it will in time compete with printed books. But the musical possibilities of the phonograph are still unrealized. It is my ambition before I die to make a complete and perfect record of Beethoven's Ninth Symphony rendered by an orchestra of 75 pieces.

Revolution Through Science

THE NEW instrumentalities for the rapid and universal diffusion of knowledge are revolutionizing political and financial conditions of the past. The world is now in a state of transition. It has been a peasant and peon world exploited by monarchs, militarists, traders, religionists, and financiers, but the motion picture, the telephone, the newspapers and the schools are changing things rapidly. The day of the scientific research engineer and the economist is approaching. The exploiter will not have the easy time as of old. His ethics will be improved.

Substitutes For Oil

TO PROVIDE fuel to replace the vanishing oil and the diminishing coal, the world will have to resort increasingly to such vegetation as can be most quickly produced in large quantities at slight expense, like dried sugar cane, rapidly growing trees, etc. Any such woody material will yield, on dry distillation, tar and oils similar to petroleum, and all starchy and sugary substances will also give fuel alcohol by fermentation.

Of course there are many other possibilities of power production, but there will be needed some chemical discoveries to make them effective. However, I do not doubt that they will be made eventually.

Earth Heat and Desert Power

THERE IS in the interior of the earth an inexhaustible supply of heat, and we can at least make use of such as

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serves to produce hot springs by boring shafts to a depth that will be hot enough to furnish steam under sufficient pressure for engines.

When coal becomes much more expensive sun engines will be invented that will make the arid deserts a source of wealth to the world instead of wasted areas as they have been hitherto. Wherever there are depressed areas near oceans as in Sahara, Dead Sea, and Death Valley, the sea water may be run into them, turning turbines on its way. The rapid evaporation from such immense areas under an unclouded sun would keep a constant difference of level. Salt would be a by-product of the process, as well as other and more valuable elements contained in sea water, such as iodine, bromine, and potassium.

Advice to Young Men

WHAT ADVICE would you give to a young man seeking an education that will fit him for engineering, invention, or applied science of some sort? Young men do not take advice.

What reforms would you advise in common customs of (1) diet, (2) clothing, (3) sleeping? Eat only enough to keep one's weight constant. Wear loose clothing and thus avoid pinching the fine blood channels. For dreamless sleep try five hours instead of eight.