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SCIENCE IN DAILY LIFE

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The American Library Association has asked me to write something about the importance of the physical sciences for one of their forthcoming pamphelts on "Reading With A Purpose". This is what I said:

Ignorance of the laws of nature oxcuses no one. We have to live in accordance with them if we are to live at all, and the more we know of them the better we can live. The unprecedented oxpansion of civilization in the last two centuries, the immense increase in wealth and tho general diffusion of the comforts and conveniences of life, must be credited chiefly to applied science, and especially to the physical sciences, since the biological, psychological and social sciences have not yet developed to a point where they exert so powerful an influence upon mankind.

It is interesting and important to learn about things far away and long ago, such for instance as the habits of the auks of the Arctic or life in Egypt in the time of the Pharoah Tut-Ankh-Amen, but after all we can live, and even be happy, in complete ignorance of these things. But we cannot carry on our work for a day without making some use of the laws of the physical sciences whether we are conscious of them or not.

Fortunately we are forced to learn a lot about them in our infancy, long before we go to school. It is pounded into our brains by hard knocks. We have to acquire a practical knowledge ofthe law of gravitation in childhood before we are able to walk, and we learn a good deal about chemistry by the experimental method of putting everything into our mouths and so testing it by taste and smell, which are the two senses that distinguish substances by their chemical constitution.

So every grown person, though he may never have been to school, gains through his daily life and occupation a considerable knowledge of the physical sciences. He gets, for instance, a certain familiarity with the physical principles of machinery and with the chemical properties of metals and foods. But the knowledge so accidentally acquired is fragmentary and often fallacious. The information that he has so picked up is not connected, and he cannot apply it to new problems. Such a man knows more than he knows he knows, but he is not able to make full use of it because he has never connected his facts or generalized his ideas. In short, such a casual collection of fragmentary facts is not science, but merely the raw material for science. What such a man needs is to road some simple systematic work on the physical sciences,

and he will then find that the practical points he has picked up will fall into their proper places in the general laws, and that these laws will extend his vision and throw new light on all that he sees and does ever after. To study physics and chemistry is like giving sight to a blind man. It opens to him a new world of undreamed-of-beauty, meaning and possibilities.

But simply because these physical sciences are so fundamental and essential they are apt to be overlooked and neglected in the acquirement of culture. When tourists visit a Gothic cathedral many of them see nothing but the frescoes and gargoyles, and give no thought to the architectural principlos of its structure, yet the esthetic effect of the edifice is due largely to the way the structural principles are revealed in its pillars, buttresses and arches. One who fails to get that misses, not only the meaning, but much of the beauty of the building. So, too, one who, for lack of acquaintance with the physical sciences, does not see the inner meaning of the acts and processes of daily life, not only is hampered in their control, but loses the enjoyment of their significance.

CHEMISTS BELIEVE FUTURE FUEL PROBLEMS CAN BE MET

When there is one motor car to every four persons in the United States, which is now estimated as the saturation point in motor-mad America, and oil wells stop producing, what will America do for "gas". This problem wrinkled the brows of scientists gathered in Philadelphia for the seventy-second meeting of the American Chemical Society, and many schemes were suggested for keeping the wolf from the garage door.

"The United States had 100,000 motor cars twenty years ago, and today she has nearly 20,000,000," Dr. A. C. Fieldner, chief chemist of the Pittsburgh department of the U. S. Bureau of Mines explained. "The United States owns five sixths of all the motor cars and trucks in the world, anduses 80 per cent. of all the motor fuel. Nearly all of this motor fuel is gasoline made from petroleum, and the petroleum supply in the United States is definitely limited."

The engines of motor cars, Dr. Fieldner said, are very inefficient users of fuel. The mileage could be almost doubled if engines of greater gas compression were used with anti-knock gasoline, and the supply of petroleum could be made to last some years longer.

The oil wells of proven acreage in the United States are estimated to contain a billion barrels of readily available petroleum, and this supply would last only until 1936, Dr. Fieldner explained, at the present rate of consumption by inefficient engines. It is believed that more than five times as much oil or about 26 billion barrels may still be gotten out of the wells when ordinary pumping is finished. In addition to this, oil shale deposits, soft coal and lignite can supply about 700 billion barrels more when needed, according to the estimates of experts. This would make a total oil reserve of 734 billion barrles, which sounds enormous, but only about 4 per cent. of it comes from crude oil which is readily available and from which all the gasoline of commerce is made.

Gasoline used to be distilled from crude oil, but as the demand leaped with the growth of the motor car other means were used to swell the amount. A process called