EINSTEIN CONSIDERS EDUCATION

When the Regents of the University of the State of New York conferred the honorary degree of doctor of science on Dr. Albert Einstein, now of Princeton University, at its seventy-second convocation on October 15 last, Dr. Einstein delivered an address modestly called "Some Thoughts Concerning Education." Excerpts from the English translation follow:

THE MOST important method of education always has consisted of that in which the pupil was urged to actual performance. This applies as well to the first attempts at writing of the primary boy as to the doctor's thesis on graduation from the university, or as to the mere memorizing of a poem, the writing of a composition, the interpretation and translation of a text, the solving of a mathematical problem, or the practice of physical sport.

"But behind every achievement exists the motivation which is at the foundation of it and which in turn is strengthened and nourished by the accomplishment of the undertaking. Here there are the greatest differences and they are of greatest importance to the educational value of the school. The same work may owe its origin to fear and compulsion, ambitious desire for authority and distinction, or loving interest in the object and a desire for truth and understanding, and thus to that divine curiosity which every healthy child possesses, but which so often early is weakened. The educational influence which is exercised upon the pupil by the accomplishment of one and the same work may be widely different, depending upon whether fear of hurt, egoistic passion or desire for pleasure and satisfaction are at the bottom of this work . . .

"To me the worst thing seems to be for a school principally to work with methods of fear, force, and artificial authority. Such treatment destroys the sound sentiments, the sincerity, and the self-confidence of the pupil. It produces the submissive subject.

"The second-named motive—ambition or, in milder terms, the aiming at recognition and consideration—lies firmly fixed in human nature. With absence of mental stimulus of this kind, human co-operation would be entirely impossible; the desire for the approval of one's fellowman certainly is one of the most important binding powers of society . . .

"The most important motive for work in the school and in life is the pleasure in work, pleasure in its result, and the knowledge of the value of the result to the community. In the awakening and strengthening of these psychological forces in the young man, I see the most important task given by the school. Such a psychological foundation alone leads to a joyous desire for the highest possessions of men—knowledge and artislike workmanship . . .

"Should language predominate or technical education in science? To this I answer: In my opinion all this is of secondary importance. If a young man has trained his muscles and physical endurance by gymnastics and walking, he will later be fitted for every physical work. This is also analogous to the training of the mind and the exercising of the mental and manual skill. Thus the wit was not wrong who defined education in this way: 'Education is that which remains, if one has forgotten everything he learned in school.' For this reason I am not at all anxious to take sides in the struggle between the followers of the classical philologic-historical education and the education more devoted to natural science."

USES OF CELLULOSE

CELLULOSE is one of the most important materials of research chemistry from the viewpoint of adding to the convenience, comfort, and length of life, according to Dr. Harrison E. Howe, editor of Industrial & Engineering Chemistry. On a lecture program before 1200 honor high school students, given recently at the American Museum of Natural History in celebration of the 109th Anniversary
Dr. Howe pointed out that there is no limit to the source of supply, since cellulose is one of "the building materials of nature."

Cellulose, which is the fundamental material of the structure of plants, comes from many sources, Dr. Howe stated. It may be fibrous material like cotton linters, or the woody material of spruce, or it may come from sugar cane, long leaf pine waste chips, cornstalks, or any one of many other sources.

Wood is one of the most useful of all our materials; it is the raw material for paper making, one of our highly important industries, and now it is being converted by the chemist into the most varied types of objects which bear no resemblance to the original material from which they are derived.

Wall and insulating boards made from cellulose, Dr. Howe said, have already replaced fifteen billion board feet of lumber. Veneers, of like source, make possible in many homes and other buildings paneling in rare wood types. New types of paper pulp now being developed will both relieve our dependence on foreign countries for sources of supply and will open up for development a large section of the southeastern United States. Cotton linters rank next in importance to spruce as a source of cellulose.

The first conversion problem of the chemist is to get the cellulose into solution, from which varied materials are made. "Duco," a finish developed by du Pont and widely used on automobiles, was cited as one of the first and most important cellulose products because it revolutionized the paint and varnish industry.

The plastics include shatterproof or "safety" glass, a cellulose acetate sheeting, put with adhesives between two sheets of plate glass. This glass, now required by law in some states for automobile windshields, has been an important contribution toward safer driving. Toiletware sets, toys, handbags, and scuffless heels are other uses.

Among the Fabrikoid or lacquered fabrics are book bindings, pointed out as especially interesting to students and collectors because it resists vermin attacks which have destroyed many important libraries. Commenting on the new upholstery materials in leather textures, and other types of cotton base coated with cellulose, giving the appearance of leather, Dr. Howe said that if leather were used for the purposes which these lacquered fabrics now serve, this country would have to keep fifty million head of cattle grazing. "Wooden sponges" (so called because the cellulose comes from wood) have the good qualities of natural sponges plus resistance to boiling.

In conclusion Dr. Howe emphasized to the students the future that lies in cellulose research because of its endless uses and universal application.

If it was wise, manly and patriotic for us to establish a free government, it is equally incumbent to attend to the necessary means of its preservation.—James Monroe.