of the impulse and ambition that has brought them their professional success. It was always a great pleasure to me to accompany him here and abroad to meetings of the Anatomical Association, where he invariably played a leading rôle. He almost always took part in every discussion; and in debate no one could surpass him when he was discussing his own specialty or other subjects where he was convinced that his opinions were correct. His early experience as a surgeon made him a consultant peculiarly valuable to the medical profession at large; he was alert to the practical significance of his anatomical work, and was always ready to give advice to those who sought it. As an anatomist, as an investigator in fields far removed from surgery, he never lost sight of the fact that the training of surgeons was one of his chief aims. The combination of a professional anatomist of highest standing, with a surgeon of rare skill is unique; in these days of high specialization, it is not likely to occur soon again.

Those of us who were Huntington's intimate friends will always regard him as highly for what he was, as for what he accomplished. His charm of manner, his humor, his deep loyalty to friendships, his masterful energy, his whole dominant personality we shall not forget. He was a rare man, a remarkable friend.

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IDEALS OF THE ENGINEER[1]

IN receiving this great honor, I do so with feelings of deep gratitude and not without a sense of humility, for I realize that the brain of the individual has its limits as a storehouse, and that with knowledge continually increasing, any one mind can take in only a small portion of the rapidly accumulating body of engineering information. In these days, intellectual specialization is absolutely necessary, and whatever I have been able to accomplish is the result of specialization and the cooperation of many individuals.

In order to be of use to society, the ideas of the engineer in every department, in transportation, communication, and architecture, must first be embodied in physical form, and because of this he has achieved such a mastery over material things that he is regarded as preeminently the exponent of a material age. The great utility and economy resulting from his activities are so sensational as to conceal from view the ideals which form the basis of his creative work.

If seeking the truth and applying the truth to the affairs of man is a spiritual thing, then the engineer must be absolved from the charge of materialism. He is an advocate for truth. His works must be tried in the inexorable court of Nature, where no errors are committed and no exceptions granted. The work of the engineer is dedicated to the use of mankind, and the pecuniary compensation which he himself obtains is slight compared with the great benefits received by society. He finds inspiration and reward in achievement, and his real compensation is the good which others derive from what he has done.

Let us consider briefly the ideals of the engineer and the nature of his functions in the light of modern theories of evolution.

We are told that man has come from a lowly origin, and that during ages of time incalculably long he has advanced to his present position at the head of the animal kingdom. It has been supposed that in man himself this evolutionary process is still at work, and that, therefore, in the course of the ages he will evolve into a superlative type, and then perhaps all will go well.

Inasmuch as this evolutionary process in man himself is said to have taken vast periods of time, it is not unreasonable to expect that further ages must elapse before salvation by this form of evolution could be achieved.

Such a view does not afford much comfort nor does it provide any basis for a practical program to guide us. Even speaking in terms of the life of a nation, such a process is too slow. We must reckon with man as he now is. Our problems must be solved by working upon him and through him, and can not wait for the arrival of the hypothetical superman. Indeed, it is stated by an eminent authority that there are no indications that future man will be more perfect in body than the most perfect individuals of the present, or than the most perfect men and women in the days of Phidias and Praxiteles. There seems to be no general agreement as to whether this process in man himself has actually ceased; but I believe it is safe to say, in any event, that it is too slow in its operation to afford a solution of any of the problems that now confront us.

But this is not all that evolution has to offer. For, even if this one pathway should be closed to further great progress during our age, we are assured by that eminent authority, Professor Edwin Grant Conklin,[2] that there are two others which are open to us.

The first of these to be considered is one which is preeminently under the control of the engineer. Conklin tells us that the evolution of man, the individual, is no longer limited to his body or mind;

[1] Address of John J. Carty upon receiving the John Fritz Gold Medal, February 15, 1928.

[2] "The Direction of Human Evolution," Edwin Grant Conklin.

but by adding to his own powers the forces of nature, man has entered upon a new path of progress. The differentiations of various members of a colony of ants or bees, he tells us, are limited to their bodies and are fixed and irreversible. But in human society, differentiations are no longer confined to the bodies of individuals, but have become as it were extra-corporeal. And by his control over nature, man has taken into his evolution the whole of his environment. Although he is not as strong as the elephant, nor as deft as the spider, nor as swift as the antelope, nor as powerful in the water as the whale, nor in the air as the eagle; yet by his control of the forces of nature outside of his body, he can excel all animals in strength and delicacy of movement, and in speed and power, on land, in water, and in air.

The true object of engineering is not to create machines to which men will be bound by the chains of necessity, or mechanisms to which they will become slaves. The mission of the engineer is to obtain such a mastery in the application of the laws of nature that man will be liberated and that the forces of the universe will be employed in his service. According to Conklin, this new path of progress is in all respects the most important which has ever been discovered by organisms, and no one can foresee the end of this process of annexing to our own powers the illimitable forces of the universe.

Concerning the other pathway of evolution, he tells us that progress in intellectual evolution, no less than in physical, lies in the direction of increasing specialization and cooperation. But this progress, he says, is no longer taking place within the individual, but in the specialization and cooperation of many individuals. The intellectual evolution of the individual may have come to an end; but whether or not this is true, it is certain that the intellectual evolution of groups of individuals is only at the beginning. In social evolution—the evolution of human society—Conklin says a new path of progress has been found, the end of which no one can foresee.

Progress along this pathway, also, is vitally dependent upon the work of the engineer, for the perfection of all forms of communications and transportation is essential in order that this new super-organism, human society, shall achieve its destiny.

Emphasizing the importance of this, Trotter,[3] another distinguished writer on evolution, tells us that the capacity for free intercommunication between individuals of the species has meant so much in the evolution of man, and will certainly come in the future to mean so incalculably more, that it can not be regarded as anything less than a master element in the shaping of his destiny.

The use of the spoken word to convey ideas distinguishes man from all other created things. It is the function of the engineer to provide for the extension of the spoken word by means of electrical systems of intercommunication which will serve to connect the nervous system of each unit of society with all of the others thus providing an indispensable element in the structure of that inconceivably great and powerful organism which it is believed will be the ultimate outcome of the marvelous evolution which society is to undergo.

There is one element and only one, which stands in the way of the realization of this inspiring vision. That is man himself for he is the unit or cell out of which the new organism is to be evolved. In the individual animal organism, the units or cells are physically joined to each other; but in the social organism, the units are individuals, not physically joined but free to move about at will. The connection between these separate and mobile units is accomplished by communications, which convey information, ideas, and impulses from one mind to another. Whether these communications shall be employed in peaceful, constructive cooperation, or whether they shall be used to engender conflict and confusion, depends upon man himself.

Already, the applications of science to human affairs have far outrun the ability of man to use them wisely. The engineer has provided agencies of incalculable value in time of peace, but they are also endowed with prodigious powers of destruction which can be loosed in time of war. Unless we solve the problem encountered in man himself, the outlook is dark indeed, and it may even be questioned whether our civilization will endure.

Human behavior presents the most important and the most formidable problem of all the ages. Its solution can be achieved only by profound and prolonged researches, which shall bring to bear upon every phase of the subject all of the resources of science.

While, in such a consideration as this, it would be folly to ignore the claims of religion and philosophy, it would be a grave error to conclude that, in order to avoid disaster, we must restrict progress in the application of science to material things. On the contrary, we must accelerate progress in all the sciences, for the knowledge thus gained will be required in preparing the individual man to function as a sane and peaceful unit in the ultimate social organism.

Scientific research in our universities and elsewhere,

[3] "Instincts of the Herd in Peace and War," W. Trotter.

conducted solely for the increase of knowledge, should receive more adequate financial support, so that it may be prosecuted with ever-increasing vigor. If this is done, I believe that in the fulness of time, by further scientific discoveries, the physical development of man will be improved, that many diseases will be entirely eliminated, and that immunity to the others will be achieved, and that feeble-bodiedness and feeble-mindedness will disappear. Thus will be removed some of the greatest barriers to social progress.

In the great plan of evolution, the part assigned to the engineer calls for the highest exercise of his creative faculties, for he is to direct the evolution of man's extra-corporeal powers, providing him with more numerous and still more powerful additions to his feeble bodily equipment.

The ideals of the engineer will not be realized until man has achieved his destiny in that social organism which is foreshadowed "with its million-minded knowledge and power, to which no barrier will be insurmountable, no gulf impassable, and no task too great."

JOHN J. CARTY

AMERICAN TELEPHONE AND TELEGRAPH CO.

SCIENTIFIC EVENTS

CONFERENCE OF LAKE ERIE BIOLOGISTS

SINCE the initiation of active field investigations in Lake Erie by the U. S. Bureau of Fisheries in the summer of 1927, it has become evident that several investigators and research institutions are already interested in biological research in these waters and that others are either planning to undertake such studies or are in a favorable position to do so.

To stimulate interest in Lake Erie and to center attention upon fisheries conservation, the commissioner of fisheries called a conference of the various biologists working independently or as members of the staffs of research institutions and universities with the hope of effecting closer coordination of the work and to prevent duplication of effort. Dr. Francis H. Herrick, of Western Reserve University, offered the facilities for the meeting, and the conference, therefore, was held in Cleveland on February 6.

The New York Conservation Department was represented by Alexander McDonald, commissioner, and Dr. Emmeline Moore; Dr. R. H. Pegrum represented the Buffalo Society of Natural Sciences; N. R. Buller, Fisheries Commissioner of Pennsylvania, was present; Dr. R. C. Osburn, of Ohio State University; E. L. Wickliff, W. M. Tidd, and M. K. Young, of the Ohio Division of Fish and Game, and Dr. R. V. Bangham, of Wooster College, Wooster, Ohio, also were present. A number of the faculty of Western Reserve University attended, including Dr. Herrick and Dr. J. Paul Visscher. The Ohio State Department of Health was represented by Messrs. B. F. Hatch and Paul Mason; G. F. Simmons represented the Cleveland Museum of Natural History. Michigan was represented by C. L. Hubbs, curator of fishes of the State University, and the Province of Ontario by W. J. K. Harkness and J. L. Hart, of the University of Toronto. Besides Commissioner Henry O'Malley, who presided at the conference, the Bureau of Fisheries was represented by Lewis Radcliffe, Elmer Higgins, Dr. John Van Oosten, Stillman Wright and E. J. McClure. In addition to these official delegates a number of commercial fishermen and fish merchants evidenced their interest in the solution of fishery problems in Lake Erie by attending the conference and entering into the discussions.

After an address of welcome by Dr. Herrick, Mr. O'Malley took the chair and the following program was taken up:

1. Conservation in Lake Erie and the need for cooperative investigation, Henry O'Malley.
2. The condition of the Great Lakes fisheries, Lewis Radcliffe.
3. Review of the present state of knowledge concerning the biology of Lake Erie, Dr. R. C. Osburn.
4. Biological problems in Lake Erie, Dr. C. J. Fish (read by Dr. R. H. Pegrum).
5. Survey of research programs and research facilities:
   a. State of New York, Mr. McDonald and Dr. Moore.
   b. Buffalo Museum of Natural Sciences, Dr. Pegrum.
   c. State of Pennsylvania, N. R. Buller.
   d. State of Ohio, Dr. R. C. Osburn.
   e. Western Reserve University, Dr. J. Paul Visscher.
   f. University of Toronto, W. J. K. Harkness.
   g. University of Michigan, Carl L. Hubbs.
   h. U. S. Bureau of Fisheries, Dr. John Van Oosten.
   i. Other agencies:
      1. Cleveland Museum of Natural History, G. F. Simmons.
      2. Ohio State Board of Health, B. F. Hatch.

The fisheries situation in Lake Erie and the need for further investigations were discussed freely by various members of the conference. In surveying the research programs and research facilities of the various organizations it was apparent that the States of New York and Ohio are contemplating further investigations in Lake Erie on an extensive scale during the coming year. Included in the program of the State of New York is the employment of personnel from several cooperative institutions, such as Cornell University, Syracuse University, Rensselaer Polytechnic Institute and the Buffalo Museum of Natural Sciences. At the western end of the lake the Ohio Division of