That this profession has at last received official recognition is evidenced by the recent action of the council of the American Society of Agricultural Engineers. Authority has been granted for the formation of a division of consulting agricultural engineers, with membership requirements for the admission of men of high professional standing and a code of ethics. This group of consulting agricultural engineers proposes to cooperate with federal and state agricultural agencies and its members are devoting themselves particularly to commercial agriculture.

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A PROBABLE ORIGIN OF PETROLEUM

THE article in your issue of July 1 in regard to tests being made by Dr. Parker D. Trask on sea-bottom muds for the presence of oils is of interest to me, as I have for many years believed that oil shales and mineral oils were the result of deposition formed, not on the sea-bottoms, but on the bottoms and shallows of brine lakes. My reasons for this belief are as follows:

Oil fields are quite frequently found contiguous to salt deposits, and the water which succeeds the oil in most wells is salt water.

In some brine lakes, such as Great Salt Lake, Utah, there is a great deal of marine life, but of very small size. In Great Salt Lake there is an abundance of very small shrimp or crayfish, and in certain of the marshes on the lake shores these small creatures seem to die in large numbers, so much so that the marshes in places give off an almost unbearable odor, much similar to the smell of drying cod fish.

The natural presumption is that the bodies of these small creatures do not decompose in the ordinary way but become pickled in the brine and are more or less permanently preserved.

Where conditions have been favorable and a mud bed formed, having the preserved remains of this small marine life imbedded in them, this mud might very readily have been changed into beds of shale carrying a large percentage of oil. Petroleum may possibly be a distillation from such shale, and being fluid may have moved about over a considerable area.

Mud banks would normally form at the mouths of rivers flowing into the brine lakes and the rivers would be continuously carrying into the lakes large quantities of organic matter, which would be acted on by the brine and deposited with the mud.

Some forms of vegetable life seem to grow freely in water containing a very high percentage of salt. Such vegetable matter probably would not decompose in the ordinary way. It seems quite possible that the difference in the composition of mineral oils from different locations may be due to the different proportions of animal to vegetable matter in the original deposition.

I have not the slightest doubt but that if Dr. Trask will test some of the muds near Salt Lake City he will find them to be rich in oil. These marshes are of considerable extent in places, and the mud might prove to be a source of oil of some commercial importance.

While brine lakes are not very numerous at the present time, in earlier geological periods they seem to have been quite numerous, and in some cases of vast extent, as is clearly indicated by the very extensive salt deposits to be found in many parts of the world.

JOHN ROGER

QUOTATIONS

THE SURVIVAL OF THE FITTEST

IN the struggle for existence that life represents, the survival of the fittest appeals to many thinkers as the outstanding ideal. They argue that it makes for strength and progress in the race if the unfit—the weaklings and the degenerates—are eliminated through their inability to meet the strenuous conditions of rigorous living. Consequently not a few persons challenge many features of the modern program for public health and preventive medicine as well as allied social schemes for human comfort on the ground that these tend to counteract and discount the advantages that selection through inherent fitness is alleged to represent. As a recent writer has expressed it, by protecting us from our enemies, the bacteria and the viruses; by removing the sources of disease; by showing us how to avoid unfavorable conditions and to find favorable ones; in short, by bringing us and our environment into harmony, the "civilizers" are promoting the survival of the unfit; they are progressively filling the human race with the weak and the degenerate, who must hand on their weakness and degeneracy to their descendants.

Such arguments can not be lightly dismissed. The modern investigations in genetics have, indeed, shown that it is quite possible to produce a population composed of the congenitally defective—"the halt, the blind, the weak, the variously deformed and degenerate." The biologist of to-day refers these possibilities back to the transmission of defective "genes," the hereditary substance carriers that determine development. In a stimulating address before the National Tuberculosis Association at Indianapolis in May, Professor Jennings,[1] of the Johns Hopkins University,

[1] Jennings, H. S.: "Public Health Progress and Race Progress. Are They Incompatible?" SCIENCE 66: 45 (July 15) 1927.

sustained the thesis that defects in genes become as open to remedy as defects in nutrition. After all, the underlying problem is largely one of chemistry. The genes are chemical compounds. The consequences of a defective thyroid secretion are remedied by introducing synthetically produced thyroxin with the food. In principle it is clear, says Jennings, that defects in the store of chemicals given us by heredity may be supplied by other means; that undesirable things in the store of genes may be cancelled or corrected; that reactions among them which take an undesirable turn may be altered, set right. All these things, he adds, are seen to be mere matters of technic: one needs but to know how.

Of course, the correction of defects attributable to hereditary weaknesses does not necessarily abolish the latter. However thoroughly the natural effects of his "poor constitution" may be offset and his own life made more satisfactory alike to himself and to society, the defective individual continues to be a potential producer of the unfit. Shall he therefore be prevented from surviving? Not infrequently physical shortcomings go hand in hand with conspicuous mental capacities. The artist is by no means always an athlete. Shall the progress of the race be safeguarded by preventing the application of scientific ingenuity whereby the hereditarily weak may secure the enjoyment of a full, useful, happy, long life? To such queries Jennings has offered a cogent reply. The mere survival of a genetically defective individual does nothing to increase the degeneracy of later generations—provided he does not propagate. Not survival alone, but also propagation, Jennings rightly adds, is required for the perpetuation of defective genes. Without propagation, survival is harmless, so far as race deterioration is concerned.

The implications of these statements are fairly obvious. In their relation to the modern activities in the field of public health and social betterment they place burdens of responsibility where they have been only lightly considered heretofore. The public health worker, Jennings remarks, must become genetically minded, eugenically minded. If by his activities he promotes, in the congenitally defective, propagation as well as survival, his work does indeed tend toward a measure of racial degeneration. The control of the instincts that lead to propagation is a formidable problem. The subject is one that can not be thrust aside merely because it calls for considerable delicacy in presentation and, as yet, undevised tact in its furtherance. In any event the control of our environments will not be summarily abandoned. We still know too little about the details of heredity to assume that protective and defensive actions or selective control of the environment are inevitably threatening to human welfare in the long run. We may properly watch for defective genes and stop the propagation of their bearers; but, as Jennings concludes, the proposal to abandon control of the environment—the cessation of the process of adjusting ourselves to the conditions—is not a serious contribution to the practice of life. —*The Journal of the American Medical Association.*

SCIENTIFIC BOOKS

Catalogue of the Birds of the Americas and the Adjacent Islands in Field Museum of Natural History. Part V. Tyrannidae. By CHARLES E. HELLMAYR. Field Museum, Chicago, April 11, 1927. Pp. 517.

THE admirable synonymic and bibliographic catalogue of birds of the Western Hemisphere should be known to all zoologists. Begun years ago by Charles B. Cory, and continued after his death by C. E. Hellmayr, it stands as a model worthy of imitation by others than ornithologists. What a splendid thing it would be if in the course of time the whole fauna and flora of the Americas could be catalogued in this fashion! It is of course true that in many groups the genera and species are still so imperfectly known that no reasonably complete presentation of the fauna is possible. Yet there are other organisms than birds which could very well be listed in such a manner as to illustrate principles of geographical distribution, and give us a fairly adequate idea of the leading facts. Such, for instance, are the butterflies. Looking through the bird volumes, noticing the distribution of the species and subspecies, one is continually reminded of parallel facts in relation to the butterflies. If these latter could be listed in a similar fashion, and the two series compared, it is certain that interesting biological generalizations would emerge. A list of the terrestrial molluscs would be no less instructive. The method of the catalogue is to give the full synonymy and bibliography of each genus, species and subspecies, citing type localities, and giving the range as exactly as possible. In footnotes are added many critical comments, including brief diagnoses of subspecies, and often of genera.

To the general naturalist, special interest attaches to those birds which are peculiar to islands off the American coast. Several such are included among the Tyrannidae. The genus *Nesotriccus* (*N. ridgwayi* Townsend) is confined to the small Cocos Island, off the Gulf of Panama. It is however related to *Eribates* (*E. magnirostris* Gould), a genus only found in the Galapagos Islands. The scarlet or vermilion flycatchers (*Pyrocephalus*), well known on the mainland, are represented by two subspecies