"ISOSENSITIVITY" INSTEAD OF "ISOIMMUNITY"

RECENT progress in the discovery and elucidation of immunologic differences in human blood has been materially aided by the prompt acceptance of new terms which it has been necessary to introduce. Those who would learn of the complicated inter-relationships of the Rh types of human blood and their clinical implications have thus been spared the confusion which would accompany the mastery of several synonyms to designate each new phenomenon. It is with reluctance, therefore, that I propose the replacement of a term which has already gained considerable usage.

The word "isoimmunity" has been employed to denote the development in man of antibodies which act against the agglutinogens in the erythrocytes of another person as a result of previous contact with the antigenic substances in the red cells, either by repeated transfusions or by pregnancy. The prefix *iso-* has been accepted in this field to imply derivation from the same species. Immunologists have construed the word "immunity" to include any state in which antibodies have been developed as the result of exposure to antigens, regardless of whether the condition affords protection to the body or not. This represents an extension of the original meaning of the English word, which still carries with it, in non-technical language, the implication of protection, whereas "isoimmunity" is intended to apply to a state of vulnerability caused by the development of antibodies.

Experience in teaching medical students and physicians about isoimmunity has impressed me with the fact that this term is the source of much confusion because the false implication of protection still persists in the minds of some. I propose to substitute for "isoimmunity" the synonym "isosensitivity," and, for "isoimmunization," the term "isosensitization." The meaning of vulnerability is unmistakably conveyed to the clinician who is already familiar with the terms "sensitivity" and "sensitization" in the field of allergy and has no doubt about their significance to the patients.

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THE GULF HAMMOCK FORMATION IN FLORIDA

FOR a long time it has been an axiom of Florida geology that nowhere within the State is there exposed any formation older than the Ocala limestone. Now it seems that this axiom, like so many others, must be abandoned.

Until recently the Avon Park formation[1] which directly underlies the Ocala limestone, has been known only from core borings and well cuttings, excellent material for work on the microfauna but of little or no value in studying the larger fossils. A short time ago the writer was lucky enough to find a number of fairly extensive outcrops of this formation scattered throughout an area of four hundred square miles in southern Levy and northern Citrus counties. The correlation of the outcrops with the subsurface Avon Park is proven by their microfauna, by similarity of lithology and by stratigraphical position beneath a thin limestone bed replete with characteristic echinoids, which bed in turn is known to underlie the Ocala limestone in core holes on the flanks of the Ocala uplift.

By most workers in Florida geology the Avon Park formation has been put in the Claiborne group, although it has been rather generally felt that the evidence for Claibornian age was not complete. Lately the opinion that the formation ought to be reassigned to the upper Eocene or Jackson group has been gaining ground. Several of the recently found outcrops are rich in molluscs and echinoids. Although the study of this fauna will not be easy since the molluscs occur as moulds and calcite pseudomorphs and the echinoids are difficult to remove from the hard matrix, nevertheless it is reasonable to hope that with patient work this fauna may yet provide means for a final determination of the age of the Avon Park formation.

Since subsurface formation names cease to be valid when surface exposures have been found, the name Avon Park will have to be dropped. To take its place the writer proposes the name Gulf Hammock formation from the town of Gulf Hammock in Levy County where there are several good exposures.

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SCIENTIFIC BOOKS

AN OUTLINE OF POLITICO-GENETICS

The Dice of Destiny. An Introduction to Human Heredity and Racial Variation. By DAVID C. RIFE. Long's College Book Co., Columbus, Ohio, 1945. 163 pp. Price, $1.75.

THE calamity of the Second World War has awakened in many scientists a sense of social responsibility. It is this awakening, no doubt, that has prompted

[1] Paul L. Applin and Esther R. Applin, *Bull. Am. Assoc. Petrol. Geol.*, 28: p. 1686, 1944.

several geneticists to outline for popular consumption those aspects of their science which bear on man's social affairs. Among the books devoted to "politico-genetics," to use the author's apt phrase, the one under review is worthy of note. It is interestingly written, without cheap effects or exhibitionist wit, and with a simplicity and sincerity that will appeal to most readers. The parts of genetics that are not directly relevant to social problems are left severely alone, no matter how dear they may be to the hearts of specialists. For example, chromosomes are not mentioned. The core of the book is an account of what is known or conjectured about the inheritance of human traits and their modification by the environment. A good critical sense is displayed in the discussion of eugenical problems. The book concludes with chapters on "Race" and "Genes and Democracy." In the last named the author gives the reader a glimpse of his ideas on what the world of the future ought to be like.

The basic problem of politico-genetics is still the old nature-nurture puzzle. To be sure, we no longer divide human traits into sharply distinct categories of hereditary and environmental ones. Heredity determines the reactions of the organism to the environment. Yet, some genes produce the same character in all known conditions, while the expression of others is different in different environments. What we want to know is the amplitude of variation in the phenotype which a given genotype may develop in the environments actually available or potentially possible. The knowledge of human biology is, unfortunately, so incomplete that much scope is left for personal opinion of individual writers in this field. More than some, but less than other writers on politico-genetics, Professor Rife is inclined to regard heredity as being rigidly determinant. Heredity can hardly be taken to stand for "The Dice of Destiny" if its realization depends largely upon the environment which is in part controlled by human will. Although he quotes the data on the modifiability of the IQ, the author concludes that "heredity plays a major role in the determinations of how bright you are." Newman and his collaborators reached the conclusion, quoted by Rife, that "physical characteristics are the least affected by the environment, that intelligence is affected more, educational achievement still more, and personality and temperament the most of all." The role of heredity in the formation of the human personality is perhaps the central problem of the nature-nurture relationships. Observations and experiments show that heredity is very important in the determination of personality traits in domestic and wild animals. The author thinks that since "there is no reason to believe that man is a unique exception," it follows that "of the many components which enter into the determination of personality, it seems probable that some may be largely determined by heredity, and others by environment." Since races of animals frequently differ in personality traits, he believes that human races probably do so as well.

The frequently advanced argument that because psychic traits in animals are rather rigidly determined by heredity they are so determined in man deserves careful consideration. The analogy may be good, but arguments from analogy do not prove anything. The variability found in a living species is governed by natural selection according to the demands of the adaptation of the organism to its environment. Now, adaptation may be attained either through a reaction norm that responds to variations in the environment by evolving optimal phenotypes, or else through genotypic specialization for the particular environment in which the species normally lives. Which of these methods of adaptation is resorted to depends upon the inherent properties of the species, as well as upon the degree of stability, or changeability, of the environment. The greater the variety of conditions to which the organism is called upon to respond, the more versatile must be the reaction norm.

Man is a unique product of evolution in that he, far more than any other species, has escaped from the bondage of the physical and the biological into the social environment. Furthermore, human social environments are notable not only for their extreme complexity but also for the rapid changes to which immediate adjustment is demanded. Adjustment occurs chiefly in the psychic realm. The more advanced the social organization the less important are the physical characteristics. Because the changes in the human environment are not only rapid but diverse and manifold, genetic fixation of personality traits is decidedly undesirable. The survival, much more the success, of an individual in most human societies depends upon his ability rapidly to evolve behavior patterns which fit him to the kaleidoscope of circumstances he encounters. He must submit to some, rebel against others, and escape from still other situations. Individuals who display a fixity of response suffer under most forms of human society. An animal becomes adapted to its environment by evolving certain physical or behavioral traits; the adaptation of man consists chiefly in developing his inventiveness.

If social conditions should remain stable for many generations, genetic types adapted to different forms of social organization, and to different stations within a given society, might eventually arise. Such stability

does not obtain, however, and our western civilization is particularly noted for rapid transformations. When empires fall, or when ruling classes are overthrown, woe befalls their members unless they change their behavior speedily. A consistent genetic trend may, therefore, be expected in the evolution of human psychic traits, namely, that genotypes will be selected which permit more and more plasticity, and less and less fixity, in personality characteristics. The end result of this trend will be that the genotypic differences in personality traits will become quite unimportant compared to their phenotypic plasticity. This should not be construed to mean that mankind tends to become genetically uniform; the trend is not toward genotypic uniformity but toward phenotypic plasticity. Natural selection favors above all else the ability to become rapidly adjusted to circumstances which change not only from day to day but, in a modern society, from minute to minute. Genetic differences may be retained, provided that they permit themselves to be eclipsed by the phenotypic plasticity. Whether or not this trend has already run its full course must be settled by investigation and not by speculation. All that we can be reasonably sure of is that the evolutionary pattern of the human species is so different from those of the higher animals (not to speak of the lower ones) that judgments by analogy with respect to the psychic traits have little value. It may be that the non-pathological hereditary differences in behavior found among men are merely the uneroded remnants of genotypic specializations that were moulded by natural selection to fit the conditions of ages long past. Genotypes now emerging will perhaps predispose every individual to respond to every challenge that his environment may offer as a social rather than a solitary being.

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COSMIC RAYS

What Are Cosmic Rays? Revised and enlarged American edition. By PIERRE AUGER. Translated from the French by Maurice M. Shapiro. vii + 128 pp. 22 plates. Chicago: University of Chicago Press. 1945. $2.00.

THIS book, as stated in the translator's preface, is written "primarily for the reader who lacks a technical knowledge of physics, but who wants to keep in touch with current developments in science." It represents a revised and extended presentation of a book entitled "Rayons Cosmiques," published by the Presses Universitaires de France, Paris, 1941.

The first chapter, "Story of Discovery," introduces briefly the fundamental concepts associated with ionization and allied phenomena, together with their measurement, and leads up to the problem of an extra-terrestrial radiation. The second chapter, "The Heroic Epoch," traces the main steps which have been concerned with unravelling the general nature of the cosmic radiation. The third chapter, "Showers, Pairs, Bursts, Stars," enters into greater detail concerning the phenomena covered in its title. The fourth chapter, "Time Takes Its Toll of Cosmic Rays," discusses in further detail the nature of the particles which are associated with cosmic ray phenomena and the energies encountered in these particles. The last chapter, "The Sky's the Limit," deals further with cosmic-ray energies, particularly in relation to the evidence provided by "extensive showers," and further discussion is given of the extra-terrestrial origin of the primary cosmic ray particles and of the origin of the particles formed in the atmosphere, together with the interrelationships of the various particles.

While the book is written in elementary style, very easy of comprehension by a person with a limited knowledge of physics, it will not be so readily understood by the layman, to whom such expressions as "field," "electron volt energies," etc., represent an unfamiliar language. The style is vivacious and entertaining. Naturally, there are lacunae. In a small book of 128 pages one can hardly expect an approach to completeness of citation of the various experiments and ideas which have played a part in our present understanding of cosmic rays.

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