swered, and by his resourcefulness in experimental verification.

The theory seems less satisfactory in its application to the phenomena of gametic reproduction than to the processes of regeneration. Pushed to its logical extreme in its application to ontogenesis the process of individuation postulated by Child appears to be one of complete epigenesis and the organization which develops to be due exclusively to external factors. In order to meet the insuperable difficulties which would be raised against a consistent theory of epigenesis, Dr. Child assumes that as a result of the influence of external conditions through many generations and through the inheritance of the acquired modifications, reproductive cells or cell-masses have come to possess "a fundamental reaction system" which constitutes a basis of preformation and conditions their development and their reaction to external stimuli. In this way it is possible to understand why under similar external conditions the ontogenesis of different species varies so greatly. Moreover, the "fundamental reaction systems" may be further modified through their intra-individual environment.

In order to meet the difficulty of understanding how a "reaction system" involving primarily only quantitative dynamic differences determines specific qualitative differences which appear in ontogeny, Dr. Child is led to assume primary differences in the specific constitution of the protoplasm of different eggs or cell-masses. But, since "systems" suggest spatial localization and the "specific constitution of protoplasm" implies chemical differentiation, does it not seem as if the basis of individuality postulated by Dr. Child is essentially like that assumed in the hypotheses which Dr. Child repudiates? On the whole, however, Dr. Child's hypothesis of individuality appears to be the best supported and the most consistent mechanistic hypothesis which has been advanced.

As the product of the mature thought of an independent and resourceful investigator "Individuality in Organisms" will take a permanent place in biological literature.

H. V. NEAL

PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES

THE tenth number of Volume 2 of the *Proceedings of the National Academy of Sciences* contains the following articles:

Preliminary Results on the Color of Nebulæ: F. H. Seares, Mount Wilson Solar Observatory, Carnegie Institution of Washington. Photographs of a Messier 51, 94, 99 show that the nebular condensations have large negative color indices. The knots of nebulosity are bluer than the bluest of the neighboring stars. The spectral character of the outlying regions differs from that of the central nucleus. In the case of the planetary nebula N. G. C. 3242 no important differences of this sort are revealed.

The Action of Alkali in the Production of Lipolytically Active Protein: K. George Falk, Harriman Research Laboratory, Roosevelt Hospital, New York. The author discusses: Inactivation of the enzymes by acid, by alkali, by alcohols, by acetone, by salts and by heat; nature of the chemical changes involved in the inactivations; and activation of proteins by alkali.

The Excretion of Acids by Roots: A. R. Haas, Laboratory of Plant Physiology, Harvard University. The author finds that no acid other than carbonic was excreted from the roots of corn seedlings. Similar results were obtained for wheat seedlings.

Spectrographic Observations of Relative Motions in the Planetary Nebulæ: W. W. Campbell and J. H. Moore, Lick Observatory, University of California. Further observations indicating the probability of the hypothesis that the so-called ring nebulæ are in reality not ring forms, but ellipsoidal shells. Tentative conclusions are also drawn as to the probable masses of the nebulæ.

New Determinations of Permeability: S. C. Brooks, Laboratory of Plant Physiology, Harvard University. The determinations have been made by a new independent method and by improved older methods. The results agree in showing that living protoplasms are normally permeable to the salts studied, but salts of pure solutions may alter permeability, some causing an increase of permeability while

others cause a decrease, followed by an increase, of permeability. In a properly balanced solution the permeability remains normal. Cell walls may be semipermeable to an extent which renders them important in such experiments.

Point Sets and Cremona Groups. Part III.: Arthur A. Coble, Department of Mathematics, Johns Hopkins University. The group $G^2_{6,2}$ is used in the problem of determining the lines of a cubic surface. The determination differs from that of Klein.

The Interferences of Spectra both reversed and inverted: Carl Barus, Department of Physics, Brown University.

Sex Intergrades in a Species of Crustacea: Arthur M. Banta, Station for Experimental Evolution, Carnegie Institution of Washington. The author has collected a large amount of data on several species of Cladocera which is interesting because of the remarkable array of sex forms, the stock in general consisting of perhaps 40 per cent. normal males and about 8 per cent. normal females, the remainder being intergrades with *almost* every combination of sex characters.

Some Problems of Diophantine Approximation a Remarkable Trigonometrical Series: G. H. Hardy and J. E. Littlewood, Trinity College, Cambridge, England. A series is given which is never convergent or summable for any value of θ, and is accordingly not a Fourier's series. And further a function is found which does not possess a finite differential coefficient for any value of θ.

Steric Hindrance and the Existence of Odd Molecules (Free Radicals): Gilbert N. Lewis, Chemical Laboratory, University of California. It is contended that the hypothesis underlying the somewhat elusive phrase "steric hindrance" should not be introduced until phenomena are known which can not be so well explained in other ways. It is shown how the so-called free radical of organic chemistry may be explained independently of the hypothesis of steric hindrance.

Newton's Method in General Analysis: Albert A. Bennett, Department of Mathematics, Princeton University. An extension to general analyses of special algebraic work of H. B. Fine.

The Cobaltammines: William D. Harkins, R. E. Hall and W. A. Roberts, Kent Chemical Laboratory, University of Chicago. The authors have determined accurately the freezing-point lowerings caused by eight different cobaltammine salts, and have derived from the results the number of ions into which each salt dissociates. These are found to be in accordance with Werner's theory.

National Research Council: Report of the First Meeting of the Council. Reports of meetings of the Executive Committee. Organization of the Research Council (as at present constituted).

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THE AURIFEROUS GRAVELS OF THE SIERRA NEVADA

The origin and the natural distribution of the $300,000,000 of gold that has been mined from the Tertiary placer gravels of the Sierra Nevada of California is the subject of a report by Waldemar Lindgren, which has been published by the United States Geological Survey as Professional Paper 73.

The Geological Survey's studies of the Tertiary placer deposits of the California Sierra began in 1886 and were concluded about 15 years later. During this period 22 quadrangular areas were topographically mapped and 14 of these were studied in geologic detail and the results published by the survey in geologic folios. Professional Paper 73 includes the salient features of this earlier work, most of which was done by Mr. Lindgren himself. This report, thus comprehensive in geographic scope and minute in geologic detail, is believed to be the most complete and thorough description of a great placer-gold province ever published.

In the main the report is a detailed description of the entire area covered, including the gold placer gravels, but Mr. Lindgren's general account of the tremendous earth forces that built up the Sierra and of the processes