growth. At least at the concentrations used, sodium 2, 4, 5 trichlorophenate, 8-hydroxy quinoline sulfate and sodium ortho-phenyl phenate produced variable fungistatic action. No doubt proper adjustment of concentrations would give more definite results.

These results thus indicate that the use of various bacteriostatic and fungistatic organic chemicals offer a means of separating bacteria and fungi in pathological organism isolation work.

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ARUBA ISLAND

EDUCATION IN ARGENTINA

HAVING just returned to the United States after two years spent in Argentina, I can not refrain from passing along a few comments concerning certain changes which are taking place in education there.

Since the revolution of June 3 (1943), the Military Government in the field of education has carried on such policies as attacks upon progressive education and measures against foreigners, repressions in the form of new interventors in the various districts and institutions of higher learning, and affirmative measures emphasizing nationalism, Catholic instruction and totalitarianism in the university field.

In the universities all the deanships have been filled by the appointment of temporary administrators usually of totalitarian sympathy and of clerical stripe. The internal struggle for power within the military clique has resulted in a reshuffling of the ministerial posts and several men have occupied the position of Minister of Justice and Public Instruction. Each change in the position brings about the resignation of each of the interventors assigned to Argentina's six universities. This year, two weeks before the opening of the school year, only one of the six institutions of higher learning had any resemblance to a functional administration.

It may be important to keep scientists informed regarding the situation since under present conditions great caution must be used before further efforts are made by either institutions or individuals to contribute to the betterment of education or scientific research in Argentina. Until there is again freedom of assemblage, freedom of speech and freedom of the press, the opportunities for assisting the educational programs of the country by grants for research, libraries or exchange fellowships are greatly diminished.

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SCIENTIFIC BOOKS

CHROMOSOMES AND PHYLOGENY

Contributions to the Genetics, Taxonomy and Ecology of Drosophila pseudoobscura and its Relatives. By TH. DOBZHANSKY and CARL EPLING. Carnegie Institution of Washington Publication 554. Washington, D. C., 183 pp., 4 plates. Price, $2.25 (paper), $2.75 (bound in cloth).

WHEN T. H. Morgan's studies on *Drosophila melanogaster* led to a revolutionary development of the field of genetics, many taxonomists, paleontologists and other naturalists remained sceptical as to the significance of this work. A study of the mutations of a semi-domestic animal in milk bottles, they insisted, might well clear up the mechanics of inheritance and still leave us in the dark on the course of evolution in natural populations. This criticism was well taken, and students of *Drosophila* have turned in recent years with ever-increasing frequency to the outdoor study of wild *Drosophilae*.

Dobzhansky's ten-year work on the *Drosophila pseudoobscura* group finds its culmination in the present publication. A taxonomist by training and an outdoor naturalist by inclination, Dobzhansky was particularly well fitted to engage in research that covers the genetics, taxonomy and ecology of *Drosophila*. In the taxonomic section he shows convincingly, in joint authorship with Epling, that the so-called races *pseudoobscura* A and B have all the biological characteristics of good species. In spite of the minuteness of the external differences race B is raised to specific rank under the name *D. persimilis*, an action that will be applauded by all biologists to whom the species is more than a receptacle of morphologically similar specimens. The two species *pseudoobscura* and *persimilis*, together with *miranda*, are the only American representatives of the otherwise Palearctic *obscura* group.

The ecological section contains the first thorough account of a wild species of *Drosophila* considerably more detailed and informative than the preliminary descriptions of earlier authors. Particular attention is paid to the factors that affect the population structure, such as food preference, daily cruising radius, population density, daily and seasonal cycles and so forth.

The main body of the book is devoted to a study of the geographical distribution of the various gene arrangements in *pseudoobscura* and *persimilis*. The study of the giant salivary gland chromosomes of the *Drosophila* larvae makes it possible to determine where the chromosomal breaks took place and in what sequence the inversions must have occurred that have

led from the ancestral gene arrangement to the present configuration. The gene arrangements are a morphological character which has two unique advantages over the conventional characters used by the taxonomist. First, the actual genetic basis is studied and not merely a phenotype, and second, the phylogenetic history of each arrangement can be established beyond reasonable doubt.

The mapping of the fifteen known gene arrangements on the third chromosome of *pseudoobscura* and of the seven of *persimilis,* together with a determination of their frequency (in per cent.) throughout the range of the two species allows many interesting conclusions. The theoretically ancestral arrangement *Hypothetical* has not yet been found. Why it should have been replaced by the younger arrangements is an unsolved puzzle. The arrangement *Standard* is the only one that is found jointly in both species, indicating that it was present before *pseudoobscura* and *persimilis* split into two species. Some of the arrangements are apparently very recent since they are still quite localized. The ratio of homozygotes and heterozygotes is so close to the calculated one that random mating and equal viability of the gene arrangements must be expected.

In the final section Epling attempts to correlate the present distribution of the gene arrangements (particularly those with discontinuous ranges) with the geological and climatic history of western North America. He suggests that many of the arrangements are very old and "were in existence during Miocene times or perhaps earlier." This, as it seems to me, highly unlikely conclusion is a striking illustration of the contradictory nature of many of the *D. pseudoobscura* data. On one hand, there is a comparatively high rate of active migration as well as of passive dispersal; on the other hand, there is an almost unbelievable localization of populations as indicated by genetic differences between populations less than a mile apart. On one hand, there are clinal changes of frequency in the *Klamath, Standard, Arrowhead* and *Pikes Peak* arrangements, which seem to parallel closely climatic changes. On the other hand, some arrangements are equally at home in such contrasting climatic provinces as the interior of British Columbia, the mountains along Death Valley and the plains of Texas. I can not escape the feeling that a joker is hidden somewhere in this deck of cards. Perhaps this discrepancy can be explained by assuming an even greater selective significance of small genetic differences than was previously realized. This would counterbalance the swamping that undoubtedly must take place continuously. A study of the endemic Drosophilidae of the oceanic Hawaiian Islands might shed some light on the passive dispersal facilities of this family. Finally, the absence of the *Santa Cruz* arrangement from the most arid section of the southwestern deserts, as well as the seasonal fluctuation of the gene arrangements in at least two localities in California indicate that some inversions may have different selective values in different environments. To be sure, as Dobzhansky himself points out (*Genetics,* 28: 179, 1943), it is not the inversions themselves that produce these effects, but rather the genes that are variously associated with them at each locality. The possible role of a position effect of such breaks should not be overlooked. Perhaps the reduction of crossing over permits the development of stabilized gene complexes with very specific properties.

This work has all the earmarks of one of the classics of the field of genetics. It is rich in fact and rich in thought-provoking discussions. It is pioneering in its employment of new methods and exemplary in its coordination of the three fields of genetics, taxonomy and systematics.

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SYNTHETIC RUBBER

Synthetic Resins and Rubbers. By PAUL O. POWERS. New York: John Wiley and Sons, Inc. 296 pages. $3.00.

EVER since the Japanese invaded Malaya, every one has been aware that the source of supply of natural rubber was cut off from us. It is also a well-known fact that colossal strides have been made by technologists to fabricate various types of synthetic rubber out of raw materials available in this country. A book, therefore, which discusses the chemistry of synthetic rubbers is timely.

As the title indicates, the subject of this book is both resins and rubbers. Rubber, synthetic or natural, is but one of a large class of organic compounds. Other products which likewise fall into this category are plastics, synthetic resins, adhesives, coating compositions, paints, varnishes and lacquers and synthetic fibers. One fundamental property which all these materials possess is that they are very large and complex organic molecules. It follows that, since these materials are fundamentally related, their uses are also often interchangeable. For example, natural rubber has been used as an adhesive, as a fiber, as a coating composition and as a molding compound. Conversely, certain resinous materials may be used as rubbery materials and as fibers.

Under appropriate conditions, a great many simple organic compounds can be transformed into derivatives whose molecular weight varies from 500 to 500,000 and perhaps even much higher. Compared to