

Glycerine has distinct antiseptic powers. It restrains the growth of most bacteria in dilutions of 35 per cent.; molds grow on the surface of bouillon containing 48 per cent.; no growth was observed above 50 per cent. Its germicidal properties are very feeble. It has practically no effect on spores, anthrax and tetanus being the spores tested. Tetanus, however, does not multiply in glycerinated lymph, nor in bouillon containing 60 per cent. of glycerine, the amount used by manufacturers in glycerinated virus.

It was found that the antiseptic and germicidal powers of glycerine varied somewhat with the kind of glycerine used, and also with the organisms tested. Cholera and plague were retarded by the presence of 21 per cent. to 24 per cent., while pus cocci grew in 31 per cent. and some molds grew on the surface in 48 per cent. Pus cocci are usually rendered sterile in 50 per cent. glycerine within five days, though they were kept alive as long as ten days in the ice-chest; they died more quickly at incubator temperature. In 80 per cent. and 90 per cent. glycerine *Staphylococcus pyogenes aureus* was kept alive in the ice-chest at 12° C., 41 days. Anthrax spores have been kept alive 247 days and the experiments are still going on. Tetanus spores were found viable in various percentages of glycerine after 135 days in the ice-chest.

The Reaction of Certain Water Bacteria with Dysentery-Immune Serum: D. H. BERGEY, University of Pennsylvania, Philadelphia.

A Mold Pathogenic to Lobsters: F. P. GORHAM, Brown University.

Complete Inhibition of the Cholera-Red Reaction by Impure Peptone. JAMES CARROLL, Army Medical Museum.

Demonstration of the Value of MacConkey's Medium for the Differentiation of B. coli from B. typhosus: N. MACL. HARRIS, Johns Hopkins University.

EDWIN O. JORDAN,
Secretary.

SCIENTIFIC BOOKS.

Ueber verschiedene Wege phylogenetischer Entwicklung. By O. JAEKEL. Jena, Gustav Fischer. 1902. 8vo. Pp. 60; 28 text-figures.

Der Neo-Lamarckismus und seine Beziehungen zum Darwinismus. By R. VON WETTSTEIN. Jena, Gustav Fischer. 1903. 8vo. Pp. 30.

The intensity which a few years ago characterized the struggle between the opposing camps of Neo-Lamarckism and Neo-Darwinism has, fortunately, largely subsided. Some new standpoints have arisen, notably those afforded by the doctrine of organic selection and by the rediscovery of the Mendelian law, and there has been a general tendency to inquire more thoroughly into the laws of variation and to seek for the factors concerned in that phenomenon.

The first of the two pamphlets which form the subject of this notice represents a phase of this tendency, and is of interest as exhibiting the views of a paleontologist who has had access to and has made admirable use of an exceptional abundance of material bearing upon the questions he discusses. In his opening pages Professor Jaekel combats the idea that if the paleontological record were complete it would furnish evidence of almost insensible transition from species to species, so that no 'good' species could exist for the paleontologist, and points out that an exhaustive search for confirmation of this idea, extending through the last three decades, has brought to light only three more or less acceptable cases, namely, those of the Steinheim *Planorbis* and of the Pannonian and Kossian *Paludinas*, none of which shows any more gradation than may be found in variable species of recent land snails.

The conclusion is reached, accordingly, that the distinctness of species was just as pronounced in the past as it is to-day, and that the idea of species has a definite morphological value. But this distinctness can not have been brought about by successive and promiscuous minglings of the germ plasm, by amphimixis; the rôle of this has rather been to annul in the course of generations extreme variations, and, granting the limitation of amphimixis to a group of forms by the action of migration, isolation or some other such factor, the result will have been the consolidation or concentration of certain characters, determined by the environment, and the formation of a species. A species, then, is 'a product of individual variation and limitation of crossing, and represents a local departure from the general tendency of development'; it is a fixation of one of the rapidly changing pictures produced during a general developmental progress.

What then are the factors which determine the general developmental tendency? Of these Professor Jaekel discusses three, namely, orthogenesis, epistasis and metagenesis, none of which is entirely unfamiliar, although the last two may not be recognizable under their new names. The factor of orthogenesis is essentially the orthogenesis of Eimer and the 'Vervollkommnungstrieb' of Nägeli, extended, however, so as to include progressive modifications of parts as well as of the entire organism, and to embrace as well retrogressive as progressive modification. As examples of its action there are cited the progressive modifications in the structure of the arms in the Melocrinidæ and Taxocrinidæ, the gradual migration of the anus in the Caryocrinidæ from the lower region of the theca to its upper margin, and the progressive complication of the septal lines in the Ammonitidæ.

Epistasis is a modified form of the process emphasized by Boas under the name of neotenia, a reversion of a phylum to a modified embryonic condition. Evidence for such a factor is found again among the crinoids, in the apparently reversionary peculiarities observable in certain groups, and also in the Saleniidæ and in the Agnostidæ among the

trilobites, whose small number of free body segments is regarded as due to an inhibition of development, rather than as an ancestral character. So too the transition of the Acanthodidæ of the Devonian period, with numerous dermal bones on the head and shoulder girdle and with acrodont teeth, to their Permian descendents which some paleontologists have regarded as true selachians, is advanced as a case much to the point, and the discovery of two Paleozoic cyclostomes which show, when compared with the more ancient *Palæospondylus*, a marked diminution of osseous material in the skeleton, leads to the supposition that this group of fishes may also have arisen as the result of epistasis. It must be confessed, however, that the morphologist who may have followed Professor Jaekel up to this point with interest, if not with absolute confidence, will draw a deep breath when he reads that the author is inclined to regard the entire group of the fishes as degenerated vertebrates, whose watery environment inhibited their normal development 'und die Formen namentlich in ihrer Atmung zur Stadien zurückführte, wie wir sie bei Crustaceen antreffen.'

Finally, under the factor of metakinesis there are found the results of what embryologists term cenogenetic modification, for the process is defined as a profound modification of a form in a manner impossible in the adult and only possible in a young stage in which the various organs are not yet histologically specialized and still possess more or less plasticity. Examples of the action of this force are again drawn from the crinoids, but these can not, within due limits, be detailed here. Among the echinoids the development of the irregular forms from the regular is regarded as the result of metakinesis, and the occurrence in the Trias of *Tiarechinus*, with more than two rows of interradian plates, is quoted among other examples of its action.

Such, in brief, are the ideas which Professor Jaekel advances in his pamphlet, which, it may be said, is a reprint from the 'Verhandlungen des V. Internationalen Zoologen-Congresses.' The ideas are not entirely novel, nor does their exposition free the mind of a

sense of something yet lacking for the complete solution of the question. It is not clear why epistasis and metakinesis may not well be regarded as particular cases of orthogenesis as Professor Jaekel defines that factor, and, if amphimixis have no place or part in the production of the orthogenetic progress, what is its source and maintenance? The paper, however, is full of interest, the ideas being clearly and forcibly expressed, and accompanied by a wealth of illustration drawn from sources unfamiliar to the majority of biologists.

The second paper, that of Professor von Wettstein, is a relapse into the old discussion, since it takes as its thesis the combined action of the Darwinian and Lamarckian factors in the origin of species. It can not be said, however, that the evidence adduced by the author from the botanical field in favor of Lamarckianism is more apt to carry conviction to the minds of Selectionists than much that has already been presented. The fact, for instance, that an asporogenous variety of yeast, produced by exposure to an abnormally high temperature, does not again become sporogenous when grown at a normal temperature, will not be regarded by Selectionists as proof of the Lamarckian position, since they recognize the inheritance of acquired characters, if so they may be called, in unicellular organisms. Nor will the gradual assumption of the peculiarities of Hungarian wheats by foreign varieties grown in that country prove to them a stumbling-block, since such changes may plausibly be explained as the results of the direct action of the environment upon the germ plasm and through it upon the somatic cells. The author, in fact, fails to take into account the fundamental idea of the Selectionist standpoint, namely, the isolation of the germ plasm, and, like many of his predecessors, assigns to the term 'acquired characters' a meaning very different from that which it possesses for a Selectionist.

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Municipal Engineering and Sanitation. By M. N. BAKER. New York, The Macmillan Company. 1902. 12mo. Pp. 317. \$1.25. In the Citizen's Library.

The phenomenal growth of cities which has been so characteristic a feature of the last two decades has brought us face to face with many new and important problems. It sometimes seems as if these problems were increasing faster than the abilities of our cities to solve them; but to students of sociology it is an encouraging sign of the times to note the interest which is being rapidly awakened in municipal affairs among local organizations such as boards of trade, village improvement societies, women's clubs, as well as among individuals. It leads one to hope that in the not distant future the '*age of the politician*' may be succeeded by the '*age of the good citizen*'. To all who are interested in municipal affairs, especially in those matters which relate to the control of the forces of nature, Mr. Baker's book on '*Municipal Engineering and Sanitation*' can be heartily recommended. It is a review of the whole field, and touches the vital points of many classes of activity. It describes the underlying principles of all, but does not pretend to give detailed information about any one. The subjects treated are grouped under five heads, as follows: 'Ways and Means of Communication'; 'Municipal Supplies'; 'Collection and Disposal of Wastes'; 'Protection of Life, Health and Property'; 'Administration, Finance and Public Policy.' The forty-three chapters of the book relate to streets and pavements, bridges, ferries, docks, telephones; water, ice, milk, markets, lighting and heating; sewerage, street-cleaning, garbage disposal, cemeteries; fire protection, smoke abatement, public baths, dwellings, parks; city charters, contracts, franchises, municipal ownership, taxation, uniform statistics, etc. These subjects are treated concisely, and a hasty reading of the book might lead one to think that they were treated too concisely, that the book was, in fact, a mere explanatory catalogue of unsolved municipal problems. This opinion would be far from the truth. Embellishments of rhetoric and extended illustrations are not to be found, but all the essential facts are there and where no facts are obtainable no attempt is made to conceal it by indulging in generalities. The book