

of classifying the elements may be abandoned and recourse again had to Dumas' system of grouping the elements in natural families—of course, with modifications suggested by recent advances in chemistry.

In discussing the ion theory of Arrhenius, the author declares the idea of ion movements in fluids to be but a form of the kinetic hypothesis, advanced by Bernouilli about the middle of the last century; the ion playing the part of the gaseous molecule.

The attempt to cover so wide a range in so narrow a compass as Étard has chosen has, of course, necessitated an exceedingly terse mode of treatment. Although exception may be taken to some minor points, the author is evidently thoroughly abreast of the times, and has certainly succeeded in presenting the essential features of the numerous and varied themes he considers clearly and concisely.

FERDINAND G. WEICHMANN.

SCIENTIFIC JOURNALS.

AMERICAN CHEMICAL JOURNAL, JANUARY.

On the constitution of Phenoquinone: By C. LORING JACKSON and GEO. OENSLAGER. As a result of their work on the hemiacetals, compounds of the phenoquinone group, the authors suggest structural formulæ for phenoquinone and quinhedrone. They have determined the structure of the hemiacetals and base the present hypothesis on the great similarity between these substances and phenoquinone, the former being formed (theoretically) by the addition of two molecules of alcohol to quinone, and the latter by the addition of two molecules of phenol to quinone. They find the properties and reactions of the phenoquinone can be readily explained by this structure, and that in most cases the properties are those of the hemiacetals.

The Chemical Kinetics of Oxidation: By H. SCHLUNDT and R. B. WARDER. Warder reviews the work of a number of investigators on oxidation processes and discusses the results obtained by Schlundt, treating his curves mathematically, and drawing some general conclusions as to the theory of oxidation processes.

Composition of Ohio and Canadian Petroleums:

By C. F. MABERY. The author continues the report begun in the last number of this journal. He finds that both Ohio and Canadian petroleum contain small quantities of benzol, toluol and xylols. Both these oils resemble the Russian oil more closely than they do the Pennsylvania, and the Canadian oil has a smaller quantity of substances belonging to the methane series than the Ohio oil. The author refers to the various views as to the origin of petroleum and the difficulty of obtaining evidence on this point.

This number also contains reviews of the following books: *Chemical Analysis of Oils, Fats and Waxes*, R. Benedikt and S. Lewkowitsch; *Analytical Chemistry*, N. Menschutkin; *Solution and Electrolysis*, W. C. D. Whetham; *Grundriss der Elektrochemie*, H. Jahn; *Grundzüge der wissenschaftlichen Elektrochemie auf experimenteller Basis*, R. Lüpke; *Practical Proofs of Chemical Laws*, V. Cornish.

J. ELLIOTT GILPIN.

THE MONIST, JANUARY.

PROF. MACH, in the opening article (his inaugural lecture delivered on assuming the professorship of the History and Theory of Inductive Science in Vienna) discusses the part which chance, or rather *accident*, has played in invention and discovery. He considers the general relations of science to philosophy, gives practical examples of the devious ways by which knowledge has been accumulated, and formulates the conscious and unconscious methods employed by scientific discoverers in their search for truth.

In *Pathological Pleasures and Pains* Prof. Th. Ribot applies the pathological method of amplification, as furnished by disease, to the study of abnormal pleasures, with interesting results.

Dr. Carus gives an exhaustive study of *Chinese Philosophy*, accompanied by numerous tables, diagrams and ideographic characters. He has interspersed his discussions with sufficient history to make the science and philosophy of the Chinese intelligible, and to exhibit the causes on which their intellectual stagnancy rests. He has considered thoroughly the Chinese theory of permutations (a theory of philosophy which is mathematical in its character), their supposed employment of the binary system of numera-

tion, their cosmology, ontology, their ethics and religion.

In a long article Prof. August Weismann expounds and defends his new theory of *Germinal Selection*, a modification of Wilhelm Roux's idea of the principle of selection as applied to the *parts* of organisms—the struggle of the parts. Weismann reviews the *whole* status of the problem of the efficacy of natural selection, attacks the doctrines of internal formative laws and of internal motive forces in evolution, ascribing all impulse and guidance in the choice of variations to utility. Establishing the efficacy of selection by what he deems indisputable evidence, he contends, nevertheless, that natural selection does not explain a very important *crux* of evolution, viz, why the useful variations are always present. Something is wanting to the selection of *persons*, and that missing agency is supplied by *germinal* selection, which the author claims is the last consequence of the application of the principle of Malthus to living nature, and has its roots 'in the necessity of putting something else in the place of the Lamarckian principle,' which is declared to be inadequate. His treatment of the views of American inquirers on this point shows a higher appreciation of the strength of their position than we are accustomed to expect from European critics. In opposition thereto, however, he maintains—and here the whole burden of his objection rests—that since degeneration takes place in superfluous parts having only *passive* and not active functions, as in the chitinous parts of the skeleton of Arthropoda, therefore, it is certain that the cessation of functional action is not the efficient cause of degeneration. It is a curious and instructive circumstance that he grounds his arguments upon the same facts as his opponents, viz., on the facts of artificial selection. He repudiates the charge that his germ elements are modernized reproductions of Bonnet's preformations, and also argues for the simplicity of his theory of the constitution of the germinal substance as compared with that of Spencer. The mechanism of the selection and survival of the plus and minus determinants in Weismann's theory of the *germinal* battle for life is that of oscillations of the nutrient supply and of the *active* as well as passive assimilative powers of the struggling particles.

In the last article, *On the Nature of Mathematical Knowledge*, Prof. H. Schubert, of Hamburg, shows the varying degrees of certainty attainable in the different branches of mathematics as compared with each other and with the remaining sciences, and points out the leading features by which mathematical thought is distinguished from other rational processes.

Prof. Henry F. Osborn reviews the late Mr. Romanes's *Post-Darwinian Questions*. Other important works in science and philosophy also receive critical discussion.

SOCIETIES AND ACADEMIES.

BIOLOGICAL SOCIETY OF WASHINGTON. 253D
MEETING, SATURDAY, JANUARY 11.

GERRIT S. MILLER read by title a paper on the *Sub-genera of voles (Microtinae)*.

T. S. Palmer spoke on *Rabbit Drives in the West*, illustrating his remarks with lantern slides. He alluded to the great destruction caused by the introduction of rabbits into New Zealand and Australia, and the efforts to check their increase, and described the damage to fruit and other crops in California. The drives were undertaken with the object of reducing the numbers of the rabbits and the principal locality where they were held was in the San Joaquin valley. The method was practiced on a limited scale by the Indians as far back as 1839, but the first of the modern drives by whites took place at Pixley, Cal., in November, 1887. The principle of a drive was as follows: A corral or pen of some kind was built with wing fences leading from it for a long distance, like a funnel, and a multitude of people, who assemble in response to notices and advertisements form a line and drive the rabbits toward this trap. The line may be several miles in length and it is formed some distance from the pen. The rabbits which try to double on the line are killed with clubs, and when the others have been driven into the trap, gates are shut and all clubbed to death. The number destroyed in 208 drives, including under this head the 'shotgun hunts' of Colorado and Utah, was 459,000, the average per drive being about 2,200; the greatest number killed at any one time was in March, 1892, at Fresno, Cal.,