but these observations throw little light on just what that connection really is.

LEONARD HASEMAN

DEPARTMENT OF ENTOMOLOGY,
UNIVERSITY OF MISSOURI

MALARIAL CRYPTOZOITES

THE recent attention which has been directed at the initial stages in the early schizogonic or asexual cycles of malarial parasites has revealed an inadequacy in terminology which it seems desirable now to correct. The stage which initiates this cycle is, of course, the sporozoite which is the end product of the sporogonous cycle in the mosquito. If the theory of Schaudinn were correct that sporozoites enter directly into erythrocytes and transform into trophozoites and schizonts the present terminology would be adequate. However, there is both direct and indirect evidence that this direct entry does not occur, but that development occurs elsewhere in the body before the erythrocytes are invaded. There is the choice of expanding our conceptions of the terms, trophozoite and schizont, to include any such stages in the life-cycle or of proposing a new term for the stages in question. We believe that the latter course is preferable, since the terms, trophozoite and schizont, have become so definitely associated with stages of the malarial parasites which live in erythrocytes.

For the first generation, exoerythrocytic stages of the parasite which develop from sporozoites we propose the name "cryptozoite." This term is chosen because (1) historically these stages remained hidden for a long time and (2) they are even now difficult to demonstrate. The zoological term "cryptozoic," referring to animals which inhabit dark, hidden places is already in use. We suggest that in the use of the new word care should be taken not to apply it specifically to any particular type of parasite falling within the above definition. Different types of cryptozoites might be described as uninucleate cryptozoites, multinucleate cryptozoites, cryptozoic schizonts, etc. Since, by definition, a cryptozoite is an exoerythrocytic stage of the parasite it should be emphasized that the converse is not necessarily true. In fact, it is definitely known that some exoerythrocytic stages arise from erythrocytic parasites. If further investigation should reveal that in some species of malarial parasites there is direct entry of the sporozoite into the erythrocyte it would suffice in describing the schizogonous cycle of such species to indicate that they lacked any cryptozoic stages. Moreover, if the cryptozoites of various species should prove to fall into various types, the procedure followed by Porter[1] in reference to exoerythrocytic stages might be adopted. He indicated that there are at least two types of exoerythrocytic stages, *elongatum*-type and *gallinaceum*-type, according to whether they resembled the predominating exoerythrocytic stages of these two species of *Plasmodium*. We realize that research will need to be done on each species of malarial parasite to determine in each case the length of life, the synchronism, the tissue affinities and the fate of cryptozoites.

C. G. HUFF
F. COULSTON
W. CANTRELL

UNIVERSITY OF CHICAGO

THE NEPHELINIZED PARAGNEISSES OF THE BANCROFT REGION, ONTARIO

A TOTAL of more than seven months was spent in the field in the Bancroft-Haliburton region of Ontario in 1941. A detailed geological and topographical map was prepared of the important area of nepheline-bearing rock to the immediate east of Bancroft village; the map is somewhat different from all previous maps of that area. Other areas were examined in varying detail. A great deal of thin section examination was carried out, and many analyses were made.

All the evidence gathered points to a parasedimentary origin for the nepheline-bearing rocks. They are interbanded conformably with a series of Grenville-type micaceous paragneisses and crystalline carbonate rocks. Delineation of the belt of rocks to the east of Bancroft indicates a fold, probably a syncline plunging east, and crossfolded north and south. The central and outer bands, enclosing the nepheline-rich gneisses, are composed dominantly of nepheline-poor and nepheline-free gneisses of great variety. Gradations in nepheline content both along and across the strike were noted. There is crystalline limestone of several degrees of purity around the limbs of the fold, and a good deal of it is to be classed as "flow marble."[1]

Several points indicate that the nepheline came into existence through a process analogous to granitization, differing only in the chemistry of the reactions. Osborne[2] believed that some nepheline rocks were replacements. Also, it is believed that the nephelinization is post-folding, since the flow marble contains fragments of all rocks except those containing nepheline,[1] and the zones richest in nepheline are in the shape of drag folds along the limbs of the major structure which suggest that structural openings localized intense nephelinization.

No evidence of the existence of a nepheline syenite magma was noted except in the case of certain of the nepheline pegmatites, many of which appear to be the result of regeneration of the nepheline of the paragneisses, and others of which may have been sec-

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[1] R. J. Porter, *Jour. Inf. Dis.*, 71: 14, 1942.

[1] F. Chayes, *Bull. Geol. Soc. Amer.*, LIII, 1942.

[2] F. F. Osborne, *Amer. Jour. Sci.*, XX, 1933.

ondary magmas, perhaps fluxed by CO_2 released by reactions of granitic or syenitic juices on limestone. Most of the nepheline pegmatites appear to be replacements to more or less degree.

The visible granite is definitely post-nepheline in age, but apparently has caused a large amount of albitization. Quartz-bearing dike rocks cut the nepheline rocks.

The authors contend that the limestone-syntexis theory is at fault mainly in mechanics; however, the chemical reactions embodied may apply under the present theory. The exact composition of the sediments prior to nephelinization is not understood, but they appear to have been impure limey rocks. Calcite is present in all the rocks examined and is perhaps least in those richest in nepheline. The solutions causing the alteration may have been normal granitic or syenitic liquors rich in Na_2SiO_3, and probably contained Al_2O_3 and Fe_2O_3. The source of the solutions is also indeterminate; they may have come from an earlier unexposed granitic or syenitic body, or may have been related to the visible intrusions that manifested themselves at first merely by exhalations, and later by actual near-surface intrusion and caused the albitization of the rocks formed by their first action.

Comparison is made of the Bancroft area with other areas in the major belt of alkaline rocks and serves only to strengthen the thesis of origin.

W. K. GUMMER[3]
S. V. BURR[4]

SCIENTIFIC BOOKS

PETROLEUM REFINING

Chemical Refining of Petroleum. By VLADIMER A. KALICHEVSKY and BERT ALLEN STAGNER. Revised edition. 550 pp. New York: Reinhold Publishing Corporation. 1942. $7.50.

THIS is a thorough revision of the authors' valuable text and reference book, the first edition of which appeared in 1933. In the revised edition the text material has been expanded from 352 to 416 pages, the supplementary list of U. S. patents on petroleum refining occupies 79 pages and includes only patents not discussed in the text and not listed in the first edition, in which the list of patents on the subject covered only 25 pages and included foreign patents. In the revision no material change has been made in the conversion and other tables given in the first edition, but a 12-page glossary of terms has been omitted from the revised edition. The indices include an index of patent numbers and an author's index, as well as the subject index which covers both the text and the supplementary list of patents.

While there have been only a few changes in the general arrangement of the text, it has been almost completely rewritten and much new material introduced. Chapter I, on the composition of petroleum, discusses the classes of compounds and the principal products. A brief section on analysis of petroleum hydrocarbons mentions the use of new chemico-physical methods and refers to recent researches which fix the composition in terms of the characteristic radicals rather than by attempting to isolate individual compounds. This is followed by a long chapter (75 pages) on treatment with sulfuric acid, containing new material on polymerization of unsaturated compounds, cold acid treatment of cracked naphthas, low temperature treatment and octane rating, and distillation after treatment. Other sections of this Chapter II have been rewritten and somewhat enlarged. At the end is a bibliography of 265 references on acid treatment. These bibliographies at the end of each chapter constitute a favorable feature of the book.

Chapter III discusses acid sludge and its disposal, recovery and concentration of sulfuric acid; and contains a new section on removal of hydrogen sulfide from cracked gases and its use in manufacture of sulfuric acid. In Chapter IV, on treatment with alkaline reagents, new material, particularly on the extraction of mercaptans, has been introduced. Both of these chapters have been largely rewritten.

Chapter V covers sweetening operations and elimination of elemental sulfur, which made up Chapter IV of the first edition, as well as the reduction of total sulfur in light distillates, which was the subject-matter of Chapter VII in the previous edition. As an introduction to these subjects the laboratory analysis of oils for various sulfur compounds, and tests for corrosiveness in oil are discussed in some detail. In the discussion of sweetening operations the oxidation of mercaptans by elemental sulfur, by oxygen or air, and by alkali hypochlorite is followed by new material on the extraction of mercaptans. The sodium plumbite ("doctor solution") treatment has been well elucidated; consideration of recent researches on the subject and of sweetening before acid treatment or before distillation is included. Sweetening by means of lead sulfide, other sulfides, copper salts and hypochlorite have shown little development and the text therefore follows largely the material given in the first edition. New sections on extraction of mercaptans by increasing the solvent power of caustic alkali solutions and

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[3] Geologist and petrographer, Aluminum Company of Canada, Ltd., Arvida, Quebec.

[4] Geologist, Aluminum Company of Canada, Ltd., Arvida, Quebec.