DR. C. H. O'DONOGHUE, reader in zoology at the University of Edinburgh, has been appointed professor of zoology at the University of Reading, England. He succeeds Professor F. J. Cole.

HAROLD L. MADISON, director of the Cleveland Museum of Natural History, Ohio, retired on April 1.

DR. RICHARD WEISSENBERG, formerly professor extraordinarius of anatomy at the University of Berlin and during 1937 visiting professor of cytology at the School of Medicine, Washington University, St. Louis, has been appointed a member of the Wistar Institute of Anatmoy and Biology, Philadelphia.

DR. HERMAN E. HAYWARD, professor of botany at the University of Chicago, has resigned, effective on March 16, to accept a post with the U. S. Regional Salinity Laboratory at Riverside, Calif.

DR. A. ASHLEY WEECH has been appointed director of the Normal Child Development Study of Columbia University, replacing Dr. Herbert B. Wilcox, who has become director of the New York Academy of Medicine. The appointment took effect on April 1.

M. H. V. VALLOIS, in charge of the anthropological laboratory for practical studies of the Ecole des Hautes Etudes, Paris, since 1937 and professor in the faculty of medicine of the University of Toulouse, has been appointed professor of prehistoric anthropology in the Institut de Paléontologie humaine of the University of Paris. M. Vallois is senior editor of *L'Anthropologie*.

A GRANT of $2,000 from Parke Davis and Company will provide for a year's research at the College of Medicine of Wayne University into the cause and treatment of peptic ulcer. Dr. David Sandweiss and Research Associate M. H. F. Friedman, members of the department of physiology, will be in direct charge of the work. Dr. T. L. Patterson will supervise the research. General investigations of peptic ulcer conducted during the past two years by the department of surgery will be continued in collaboration with the new work.

THE ninth Joseph Henry Lecture of the Philosophical Society of Washington, on "Recent Developments of Cosmic-Ray Investigation," was given by Dr. Thomas H. Johnson, of the Bartol Research Foundation, Swarthmore, Pa.

DR. H. T. DAVIS, professor of mathematics at Northwestern University, will give the academy address at the fifty-third annual meeting of the Iowa Academy of Science at Ames, on April 21. His subject will be "The Philosophy of Science."

PROFESSOR DETLEV W. BRONK, director of the Johnson Research Foundation and of the Institute of Neurology of the University of Pennsylvania, delivered the Louis Clark Vanuxem Lectures at Princeton University from March 20 to 23. The subjects of the several lectures were: "The Social and Biological Significance of the Nervous System," "The Sensory Outposts and Their Messages," "Physical and Chemical Determinants of Behavior Patterns" and "The Cellular Integration of the Organism."

DR. KAZYS PAKŠTAS, professor of geography at the University of Vytautas-the-Great, Kaunas, Lithuania, has been invited to lecture at the summer session of the University of California at Los Angeles from June 26 to August 10 on human and political geography in Central Europe. He plans to spend a year in the United States.

DISCUSSION

A MILITARY CLASSIFICATION FOR FOSSIL FRAGMENTS

PALEONTOLOGISTS have long been forced to use the binominal system in an unorthodox fashion in classifying fossils which are merely parts of an undiscovered, and possibly undiscoverable, organic whole. With increased activity in micropaleontology there come into prominence more and more groups in which zoological relationships may never be determined, so that, if the groups are to be studied at all, strictly artificial classifications *must* be employed.

How important this situation has become may be illustrated by the echinoderms, whose fragments in the form of both holothurian and echinoid spicules, echinoid spines, stelleroid and crinoid ossicles,[1] pedicellariae, fragments of Aristotle's lantern and other isolated plates are being more extensively studied every year. Naturally, if these and other fragments are to have correlative value they must first be classed as so many different bolts, nails or screws regardless of whether or not it can, at the moment, be demonstrated that they were made out of the same metal or in the same factory. But actually most of these groups we now classify as if they were biological units, and give them "generic" and "specific" names.

The infelicities due to the use of these non-biological "genera" also are serious in the more conventional fields of paleontology. Vertebrate paleontologists, for instance, have employed dual classifications long and commonly. Nine "families" and a host of "genera" have been established for fossil vertebrate tracks from the Triassic of the Connecticut River valley alone, and the

[1] R. C. Moore, *Bull. Geol. Soc. Amer.*, 49: 1918, 1938.

"genus" *Cladodus* includes a type of tooth demonstrated to have occurred in as many as seven families of three distinct orders of sharks. The study of fossil plants is also complicated by nomenclatorial difficulties. For instance, the Pennsylvanian genus *Calamites*, whose living representatives obviously grew as botanical entities, is in fragmentary form, catalogued under no less than a dozen "generic" names! Such a situation, annoying enough to the paleobotanist, is confusion confounded to scientists in related fields.

Thus, all divisions of paleontology have their own specific problems of dual classification. The difficulty, however, is a *general* one, and at least some of the problems might be lessened if merely the incubus of the terms "genus" and "species" could be removed. A satisfactory basis for a utilitarian classification, divorced from these terms, is found in the classical divisions of the Roman Army. The *Ordo militaris*,[2] or "Military Classification," with its approximate classificatory equivalents in the Linnaean, or typical binominal system, follows:

Linnaean	*Ordo militaris*		
Class	Exercitus	—plural	Exercitus
Order	Legio	— "	Legiones
Family	Cohors	— "	Cohortes
Genus	Manipulus	— "	Manipuli
Species	Centuria	— "	Centuriae
Individual	Miles	— "	Milites

Since most attempts to devise, for fossils, designations which are assembled as numbers or as formulae have met with little success, there is retained, for the military classification, a binominal scheme of nomenclature with simple Latin and Greek descriptive terms.

The most important terms of the *Ordo militaris* are the equivalents of the genus and species of the biological classification, *i.e.*, *manipulus* and *centuria*. Their substitution for the old terms may seem a little strange at first, but certainly *manipulus* is easier to use than "artificial" or "form" genus, and it involves no contradiction nor misuse of words. The military system is by no means a panacea to cure all nomenclatorial ills, but its use will at least be unambiguous to the extent that its terms themselves reveal that the writer is dealing with fossils which can be grouped under the same name because of their architectural similarities, and not necessarily because of any real or implied "blood relationships."

Under the "military system" not only the neglected fossil fragments, but also the entities, of which the fragments are only a part, would have a better chance of becoming completely understood. The fact, however, that an entire fossil becomes known and is described under a new name in nowise would throw into synonymy the *Ordo militaris* designations for the possibly many different *manipuli* and *centuriae* fragments which made up the whole. The "military system" terms, if applied in conformity to the ordinary rules of nomenclatorial procedure, would continue to have (special) taxonomic standing, and stratigraphic significance. Furthermore, the fossil fragments themselves, in all cases so much more numerous than complete organic remains, having been christened, would have a far better chance of achieving the paleontological importance which they richly deserve.

[2] *Jour. Geol.*, 46: 7, 975–984, 1938.

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REVISION OF DENTAL SYMBOLS

THE symbols employed by anatomists and vertebrate paleontologists in designating the teeth of mammals is in need of revision. Confusion arises from using the same characters for two different purposes. The same characters are employed in one sense to designate the number of teeth in the dental formula and in another sense to designate the position of teeth in the dental series.

The dental formula is fully established and apparently encounters no objections beyond those of the typist and compositor. When, however, symbols employed in the dental formula to designate the number of teeth in a series are used to designate the position of an individual tooth, confusion arises. For example, a paper recently came to my desk in which a generic description ran thus: "Dentition $\frac{I3}{3}$ $\frac{C1}{1}$ $\frac{P4}{4}$ $\frac{M2.}{2}$ $\underline{P4}$ has metacone, etc." In the one instance $\underline{P4}$ indicates that there are four teeth in the premolar series; in the other instance it indicates that the fourth tooth of the premolar series is under discussion. This is common practise, grown up in vertebrate paleontology as a short cut in description.

The form of the symbol used to designate the individual tooth ($\underline{P4}$) is troublesome to the typist and to the compositor. This is true also of the dental formula but that appears as a rule only once in the paper whereas the symbols for individual teeth may run through pages of description and discussion. They will be found at the beginning of sentences and at their end, sometimes at both. This common use renders the symbol a continued source of trouble to the typist because of the need of shifting, and a source of expense to the printer because the symbol can not be set up by machines and must be set up by hand.

Various modifications of the tooth symbol have been suggested. The most satisfactory solution appears to be that of eliminating the dash used as a dividing line in the symbol and bringing the number down on the