

# ON THE DISTRIBUTION OF NYMPHAL EPHEMEROPTERA

J. D. AGNEW

I REFER to the paper by D. A. Hughes (*S. Afr. J. Sci.*, Nov. 1965, pp. 397-403). The author in his concluding remarks (on the distribution of nymphs of two species of Ephemeroptera) postulates that "the macro-habitat is a function of the microhabitat." This appears to be the case for the one environmental variable, namely light, studied experimentally by Hughes but I feel it is heuristically misleading to generalize — other important determinants of distribution, for example temperature, are not "micro-distributed" and therefore cannot fall within the scope of Hughes' postulate, thus reducing it to rather limited validity.

In the discussion to the paper Noble speculates that "it would be particularly interesting to see why *Baetis harrisoni* is found predominantly on top of stones and *Tricorythus discolor* underneath them." I would suggest the following explanation: both species are algal grazers with partial niche overlap (that is, both occupying the same habitat but different microhabitats, and both competing for the same food supply which is concentrated on the upper surfaces of the stones — the area receiving light). During the day *B. harrisoni* is on top and *T. discolor* underneath, for the reasons expounded by Hughes. At night, *T. discolor* moves up to feed and *B. harrisoni* vacates its position to enter the organic drift. In this way competition between the two species for a common food supply is minimized, or at least reduced — an elegant (but as yet unproven) demonstration of Klopfer's<sup>1</sup> assertion that "in a heterogeneous environment two specialized species can more efficiently utilize the resources of that environment

than a single less specialized species." In this connexion Klopfer also says "It has become a routine exercise for ecologists to demonstrate that sympatric species do not share the same foods. Where the same items are consumed interspecific differences are presumed to exist in the sizes of the objects taken or in the time of the day when feeding occurs." Perhaps both differences play a part in the case under discussion.

It should be remembered that most if not all results in the literature are based on daytime sampling which probably presents an incomplete picture of the micro-distribution of riverine faunas.

Work by Müller<sup>2</sup> in Germany has shown that Baetidae there (*B. rhodani* and *B. vernus*) have a very distinct circadian rhythm of movement — numbers in the organic drift at night are between 27 and 83 times as great as during the day. The rhythm is apparently geared to light intensity. *B. harrisoni* is not nearly as stenecous as *T. discolor* and can be found in large numbers on gravelly bottoms and in vegetation in the current. This gives some support to my scheme above which is suggested in the hope that it will lead to further investigations.

## REFERENCES

1. KLOPFER, P. H. (1962): *Behavioural Aspects of Ecology*. Prentice-Hall, New Jersey.
2. MÜLLER, K. (1963): Tag-Nachtrhythmus von Baetidenlarven in der Organischen Drift. *Naturwissenschaften* 5 (161), 1-3.

UNIVERSITY COLLEGE OF ZULULAND,  
KWA-DLANGEZWA,  
NATAL.

(Submitted for publication 22 February, 1966.)

# SOUTH AFRICAN JOURNAL OF SCIENCE



## SUID-AFRIKAANSE TYDSKRIF VIR WETENSKAP

Published by The South African Association for  
the Advancement of Science  
P.O. BOX 6894, Johannesburg

Uitgegeë deur Die Suid-Afrikaanse Genootskap  
vir die Bevordering van die Wetenskap  
POSBUS 6894, Johannesburg

Vol./Deel 63

MARCH 1967

MAART

No. 3

### Contents - Inhoud

POLYNESIAN ORIGINS AND THE KONTIKI EXPE- DITION .....	73	A QUANTITATIVE ANALYSIS OF THE ROCK ART FROM A SAMPLE AREA IN THE WESTERN CAPE	100
<i>Dr M. D. W. Jeffreys</i>		<i>T. M. O'C. Maggs</i>	
NOTES AND NEWS — OOR IETS EN ALLES .....	77	SECTION G — A SKETCH OF ITS ORIGIN AND AIMS	105
SEROLOGICAL TESTS IN AMOEBIASIS CLINICAL APPLICATIONS .....	78	A PROFILE OF THE EERSTE RIVER, SOUTH WEST CAPE .....	107
<i>Prof. R. Elsdon-Dew</i>		<i>J. D. Seddon</i>	
BOTANICAL EXPLORATION IN BASUTOLAND.....	81	ON THE DISTRIBUTION OF NYMPHAL EPHEMEROP- TERA .....	111X
LETTER TO THE EDITORS — AAN DIE REDAKSIE DERIVATION OF LIMPOPO .....	83	<i>J. D. Agnew</i>	
<i>A. H. Smith</i>		AN UNUSUAL STONE OBJECT .....	112
A LOGARITHMIC DIAGRAM FOR THE APPROXIMATE LOCATION OF ROOTS OF AN ALGEBRAIC EQUA- TION .....	84	<i>Dr D. J. Esterhuysen</i>	
<i>R. M. Walker</i>		REVIEWS	
ESTIMATION OF PARAMETERS IN SYSTEMS DEFINED BY DIFFERENTIAL EQUATIONS .....	91	ZOOLOGY .....	114
<i>Dr R. P. King</i>		MATHEMATICS .....	115
BONE WEATHERING AND THE PROBLEM OF BONE PSEUDO-TOOLS .....	97	PHYSICS AND MATHEMATICS .....	116
<i>Dr C. K. Brain</i>		PHYSICS .....	116
		CHEMISTRY .....	119
		OCEANOGRAPHY .....	120
		THE SKY IN APRIL .....	120

Free to Members  
Kosteloos aan Lede

Price 60 cents Prys  
Registered at the G.P.O. as a newspaper

R7 per annum (post free)  
R7 per jaar (pos vry)