The UNIVERSITY *of* WESTERN ONTARIO

Department of Earth Sciences • Faculty of Science

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Professor Jozef Kazmierczak
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Dear Prof. Kazmierczak

Re: Review of doctoral thesis presented by Dagmara Chmielarz, and titled "Faunal Dynamics of monograptid graptolites in the Late Silurian of northeastern Poland".

The thesis is overall, attractive and well presented, and reasonably well written; her English is quite good, especially her vocabulary, but there are many minor faults in such things as word endings, word tenses, use of articles, etc. I would strongly suggest that before she publishes the thesis, she should first submit it to someone whose first language is English.

The thesis is a considerable and important addition to the Silurian graptolite faunal studies of northeastern Poland and continues in the tradition of, particularly, professors Urbanek, Teller, and Kozłowska. Dagmara's introduction of many geochemical analyses is noteworthy, and they contribute to the understanding of the environments in which graptolites lived and flourished. Finally, it is quite clear that she is familiar with, and researched the literature for her chapter topics, especially on the main focus of her study, the Gorstian-Ludfordian boundary and the so-called "*leintwardinensis* Event".

I will now turn to a critique of her thesis (in no particular order):

1 While it is clear that she researched background literature, and cited that extensively, I'm left with the feeling that she has not thought about global extensions. For example, it appears that she assumes that the ranges of species in her borehole are generally the same globally. Two examples: *Linograptus posthumus* appears in the *kozlowski* Zone in her borehole; it appears as though she thinks that is true everywhere, not acknowledging the fact that it already occurs in the *progenitor-nilssoni* Zone outside of Poland. Another example: she discusses the level of *Bohemograptus* proliferation in the Ludfordian, yet doesn't note their abundance in the Lower Gorstian level in regions such as Arctic Canada or Australia.
2 Extinction of "specialized" species; e.g. cucullograptids and others: the question then is "what is specialized?" To say that over specialization led to the demise of those groups, is like invoking

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the old argument for the extinction of the sabretooth cat and the Irish "elk". If the development of, especially, the metatheca was a hindrance, why would the graptolites continue on that path?

3 Biostratigraphic boundaries, especially the *ludensis* Z. which is said to be a partial range zone. This designation is totally unnecessary since the first occurrence of *N. nilssoni* automatically establishes the base of that zone.

4 *C. ludensis* in the Ludlow: This is very peculiar, since elsewhere in the world, such as Australia, Arctic Canada, Czech Republic, Central Asia, it is restricted to the uppermost Homerian; i.e., there is no overlap. This is worthy of discussion. Is she really sure of her identification?

5 Taxonomy: I agree with her identifications, but find her descriptions and discussions a bit short and stilted. Secondly, I was disappointed that every taxon was illustrated by only one, or at most, two photos. I would like to have seen several or more images to get a feel for the morphological variations, especially of those species that were represented by a large number of specimens. This is particularly true of the *P. dubius* group. One other thing, when publishing this study, Dagmara will definitely have to include the original type designation in the synonymy list; e.g., *M. priodon* requires the insertion of Bronn's, 1835, etc. publication.

6 Geochemistry: This study produces a large geochemical amount of data, some new, and Dagmara has made some attempt to use those analyses in making environmental interpretations. My feeling is that while a very good start, she could have gone (much) farther in integrating lithology, biostratigraphic ranges of species, species abundance, oxic/anoxic levels, organic Carbon levels, and sealevel fluctuations in a single diagram. Needless to say, this may be complicated, but it is worth a try, especially since this is the first comprehensive geochemical study in this region.

7 The "*leintwardinensis* Event": In view of the evidence presented by Dagmara, it could be considered a "toss up" as to which interpretation is correct, especially when looking at the lack of a large δ13C excursion at that level in her borehole. Elsewhere, as in nearby countries such as the Baltic countries, Ukraine, and Czech Republic there are unusually large positive excursions from that part of the stratigraphic column, and these have bolstered the belief in an "event". Would Dagmara like to venture an opinion of on the lack of anomaly in the Gołdap well?

In conclusion, although there are weaknesses in the work, some of which I have pointed out, and some of which are easily corrected, I am favourably inclined. I'm sure that when the published version of the thesis appears, it will be a fine contribution. I wish her well.

Sincerely

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