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## SOME NOTES TO THE TERMS STANDARD, REGIONAL AND LOCAL STAGES

**Abstract:** The author draws an attention to not quite correct understanding of meaning of the chronostratigraphic units Standard, Regional and Local Stages. This sometimes leads to errors and misunderstandings in interpretation of the world stratigraphic literature.

**Резюме:** Автор обращает внимание на частое, не совсем правильное понимание значения хроностратиграфических единиц — стандартные, региональные и местные ярусы. Это приводит иногда к ошибкам и недоразумениям при интерпретации мировой стратиграфической литературы.

During last ten years, international team of authors succeeded in establishing not only generally used nomenclature of the Neogene stages for the regions of Europe, northern Africa and western Asia, but also in working out their palaeontological, radiometric and palaeomagnetic characteristics within the Regional Committee on Mediterranean Neogene Stratigraphy. This effort enables, for example, establishment and termination of the IGCP Project No. 25 "Stratigraphic Correlation Tethys-Paratethys Neogene" which solved time correlation of the Neogene on the territory between the Atlantic and the Indian Oceans.

In spite of these facts, meaning of the terms "*Standard, Global, Regional, Interregional* and *Local Stages*" is not clear to many specialists up to now. They use them optionally with the errors confusing a reader. Therefore, in the present paper I would like to explain how these terms are understood and applied by me at present. Majority of them have broad territorial and global meaning.

A. "*Standard Stage*" is, in my opinion, an equivalent of Global Stage. It is valid in a world-wide scale and understood as chronostratigraphic time span. At the same time, it must be borne in mind that a base section located in land with complete and continuous sedimentation for creation of "super-ideal" stratotype for Global Stage (Unit Stratotype) is found only rarely. But this defect is not important. In fact, general characterization of a certain age interval by means of all accessible palaeobiological, radiometric, palaeomagnetic, etc. methods should be carried out. Thus, in order to establish the Standard Global Stages, more perfect sections exactly correlable with each other (Boundary Stratotypes, Parastratotypes, Hypostratotypes) must be found and used. As each "Stage", also "Standard Global Stage" represents a section of time which has passed in the Earth's history. This aspect as well as permanent preservation of the chosen stage name are significant.

In accordance with the programme of the International Subcommittee on Stratigraphic Classification, the "Standard Global Stages" also for the world Neogene should be determined and approved within few years. In my opinion

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(in accordance with demands and proposals of many colleagues from all over the world), names of classic stages from Europe, originally from France and Italy (stage scale of the Mediterranean Neogene), should be approved as geochronological and chronostratigraphical units (Age = Stage). It makes no difference in what degree are type-sections on continent or at sea and ocean bottoms worked out at present.

B. "*Regional Stage*" (sometimes improperly used the term "*Interregional Stage*"). Regional Stages play an extremely important role in stratigraphy if they are correctly defined, characterized and correlable. They are evolutionarily more or less complete and palaeogeographically determined chronostratigraphic units spreading over the areas of thousands of sq. kilometres. They always express specificity of geological evolution of a certain region. Establishment of the Regional Stages has followed mainly from the fact that their palaeontological content totally differs from the neighbouring regions by bioprovincial or other evolutionary distinctions. Unfortunately, another reason was that the Standard Global Stages were not (in fact, have not been yet) satisfactorily and sufficiently defined and established what has excluded a possibility of uniform, world-wide nomenclature of the stages. Consequently, their existence and usage have been fully motivated, though not adequately valued in the Hedberg's Codex.

There are a lot of Regional Stages, for example, in the Neogene on all continents. Just Suchian, Totomian, Yunian, etc. in Japan, Opitican, Kapitean, etc. in New Zealand, Mohnian, Luisian, etc. in California have to be mentioned. In Europe, only in Paratethys region there are two stage scales (Western-Central and Eastern). Regardless their content specificity they should be understood also as time units.

Herein, an attention has to be paid to specificity and justifiability of such Regional Stages which though are generally used, do not correspond strictly with time meaning of the term "Stage" by their palaeontological denomination. The so-called "deep sea calcareous plankton stages", such as Genovesan, Sorolian stages, etc., or "Mammal Stages" in North America: Blancean, Hemphillian, etc., "Mammalian Stages" denominated in Europe as Ruscinian, Turolian, etc. can serve as the examples. In the similar way, the term "Stages" is very often used also for denomination of expressive lithological units in some regions. Though in their material content they express time which has passed since their establishment, they do not represent explicitly chronostratigraphic terms. Therefore, they should not be denominated as "Stages", but rather as e.g. "members" or "zones", in accordance with nomenclature of the litho- or biostratigraphic units.

There are no doubts that the Regional Stages as chronostratigraphic units are necessary, useful and they form a basis for establishment of the Standard Global Stages. Therefore, the first-rate task is to characterize much more perfectly the Regional Stages which have not been worked out yet in the complex way by the aid of all accessible methods of stratigraphy.

C. "*Local Stage*". In spite of the fact that the Regional Stages have very broad territorial range, in some publications they are still referred to as "*Local Stages*". Such term should practically no longer exist in geological nomenclature.

It is evident that there are small, limited territories, isolated basins with the

age of their filling which cannot be precisely determined. They are often denoted in literature by some special chronostratigraphic term (XY Local Stage)! Would not it been more correct to use only lithostratigraphic denotation in such cases (e. g. XY Formation)? Many errors and misunderstandings would be prevented in such way.

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