

examines the geography, the extent, the sedimentation, the structure and the evolution of the continental shelf. The section on the ocean-continent transition is useful and very well argued. The paper was clearly and completely up to date when it went into press.

Dewey's paper on the Geology of the southern termination of the Caledonides is again well and clearly written and presents a good case for the intersecting Caledonian and Variscan orogenic belts. The paper is accurate and is based on Dewey's own experience. He has incorporated into the paper the notion of tectonic zones and elements which was first developed in a small sub-committee of the Geological Society of London of which he and I both were members. This notion he has used adroitly and ably and as a result the paper is a blue-print for further Transatlantic correlations.

The other regional papers cannot be reviewed at length, but their general quality is high and as a background volume the book can be recommended to a general reader although not in all cases to specialists. The most obvious missing feature is the absence of a description of the North Atlantic Ocean as a whole, of its extent, topography, sedimentation and structure. Thus the margins, often well-elucidated, appear as fragments arranged round a conceptual hole with a few volcanic islands in it. The other general criticism of the book is that since it is arranged in individual papers it is a pity that it had to go through the mill of normal book publication. If these papers were published in a journal they would not have been behind the all too fast moving times as they appear at present.

MS received May 20, 1975.

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## **Tectonics of the Carpathian-Balkan Regions: Explanations to the Tectonic Map of the Carpathian-Balkan regions and their Foreland.**

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Edited by Michael Mahel  
*Geological Institute of Dionyz Stur,  
Bratislava, 450 p. 1974.  
150 (CCSR) Koruna (\$30.00).*

Reviewed by G. H. Eisbacher  
*Geological Survey of Canada  
100 West Pender Street  
Vancouver, B.C. V6B 1R8*

This book of facts complements nine 1:1,000,000 tectonic maps covering the fascinating region of the Eastern Alps, the Carpathians, the Balkan, and the Dinarides. It clearly documents the tectonic complexities and uses interesting ways to resolve them cartographically. Beyond this, the book contains detailed descriptions of the different orogenic strands and some 140 cross sections based on mapping, drilling and seismic explorations. The task of the editor, M. Mahel of Czechoslovakia, was a formidable one in that he had to incorporate tectonic concepts developed in 13 different national domains without abandoning the factual restraints imposed by the regional contributors. The data base for this work seems to be that of 1970, and western readers should be able to pursue their own special interest with the aid of numerous references scattered throughout. The work is timely as tectonic maps are being updated in adjacent regions as well, e.g., the recent 1:500,000 masterpiece covering Switzerland.

The most important concept used by Mahel and his co-workers is "time of folding", and particular emphasis is placed on the distinction between the Hercynian or older basement structures and structures created during the Alpine cycle of deformation. The breakdown of the Alpine orogeny into Palealpine (Cretaceous), Mesoalpine (Paleogene), and Neoalpine (Neogene) phases of deformation with outward migration of folding from an orogenic core zone to the foredeep is a useful frame of reference, particularly as it seems to hold for the

Western Alps as well. The intensity of the various "pulses", however, differs markedly from segment to segment and introduces a major cartographic problem. The important concept that lithology controls the tectonic style is well recognized. Mahel replaces the usual term "tectofacies" with the word "tectonogroups" and the painful soul-searching prior to the introduction of this term must have been similar to the one that preceded the struggle for "assemblages" and "belts" in the Phanerozoic orogens of Canada. The main tectonogroups are Pre-Mesozoic, Triassic, Jura-Cretaceous, Flysch and Molasse. Although quite meaningful in a broad sense the resulting local terminology still remains the headache of Alpine geology. Time-transgression and facies variations within tectonogroups are dealt with by further subdivisions (e.g., normal flysch, sandy flysch, cryptoflysch, calcareous flysch, Krasta flysch, conglomeratic carbonate flysch, heterogeneous flysch, wildflysch). Distinct tectonogroups generally form individual thrust units or nappes emplaced over stratigraphically younger tectonogroups.

With establishment of the time of folding and lithologic tectonogroups emphasis shifts to the "significant structural features" (e.g., thrust faults, normal faults), which separate the tectonic units. The compiler thus decides if major nappes in one area can be carried along strike or if they die out. From this kind of analysis it is clear that areas of complex facies patterns result in a complex mixing of tectonogroups, whereas uniform lithologic units may display equally simple tectonic styles along trend. In the Carpathians this is clearly demonstrated by the Krizna nappe.

The authors of the regional papers give many illustrations of changes in the time of deformation and structural style along the trend of the Alpine-Carpathian chains.

Although quality of documentation varies from section to section, the introductory chapter by Mahel helps the reader to place individual sections into a regional framework. Translation and editing are of the high standard that we have come to expect from Czechoslovakian productions. The volume suffers somewhat from the absence of an index and a simplified stratigraphic chart; they would have

helped to trace certain local units from one chapter to the next.

Future advances in the layout of Canadian tectonic maps could well be gained by the careful study of this case history; the reasonable price and the strong binding will make this work a widely used reference for many years to come.

MS received May 9, 1975.

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## Géologie, objet et méthodes

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Par J. Dercourt et J. Paquet,  
Dunod (Paris, Bruxelles, Montréal);  
date de droits d'auteur: Bordas, 1974.

Critique par Marcel Tiphane  
*Département de Géologie  
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Cet ouvrage peut être considéré comme la meilleure introduction aux Sciences de la Terre que nous ayons eue en français.

Il exige pour le comprendre une connaissance de la chimie, de la physique et de la mathématique que tout étudiant doit avoir eue au moment de débiter ses études en géologie. Avec ces prérequis et un esprit scientifique, l'étudiant peut progresser graduellement d'un chapitre à l'autre et absorber la grande quantité de matière que contient ce texte

Dans plusieurs cas, des explications supplémentaires doivent être ajoutées par la professeur, comme par exemple, dans le paragraphe sur "les formes géométriques des cristaux", les indices de Miller doivent être expliqués. Il en est de même pour certains diagrammes de l'évolution minéralogique.

Il va sans dire que les discussions portent surtout sur des exemples européens, mais fréquemment la comparaison est faite avec des exemples canadiens.

Un sujet semble à mon avis avoir été plus négligé: c'est la paléontologie. Sans développer ce sujet outre mesure, une discussion de certains concepts paléontologiques aurait été bienvenue avant sa discussion du principe d'identité paléontologique et de la signification des fossiles.

En somme, cet ouvrage est beaucoup plus qu'une simple vulgarisation scientifique de la géologie. Chaque sujet y est traité scientifiquement; les preuves et les exemples sont là pour démontrer les avancés. De plus ce texte n'est pas un recueil d'anciennes idées remaniées par les auteurs: il est au contraire une présentation moderne des nouveaux concepts utilisés dans l'enseignement des Sciences de la Terre.

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