TECTONIC GRASS ROOTS

by

A. Berthelsen and H.J. Zwart

On the eve of the "scientific soul-searching" which will take place in Zurich, Switzerland at the IUGS Symposium devoted to the planning of a new international Inter-Union program on geodynamics (see Editorial, EPISODES 1978, No. 3), the Chairman and Secretary of the IUGS Commission on Tectonics present a whimsical reply to the question "Whither the 'other' Commission?" EPISODES runs their "tectonofanciful profile" in the spirit of the festive season.

THE ADVENTURES OF TEC TONY

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Tec Tony is of mixed descent
His eyes are blue
As William Smith's
His artfull nose resembles Suess'
His skill as Napper could suggest
Swiss ancestry; his short-termed movements
Still remind his mother of a
German Stille Nacht.

When young and eager, he contracted
A strange Wegenerian disease
But cured by strong fixistic fever
He remained aground
Apart from short but pleasant trips
In various submarines
Studying the gravity
Of tectongenious theory.

He climbed the peaks and tapped the shields
He sneaked through windows,
Dug for roots, and
Jumped from Horsts to Grabens
And what he saw he
Classified anew
Referring to an ortho — or a
Paradoxical view.

Though warned oft times by Holmes and Hess
Tec stubbornly refrained
From reading what he called
The yellow global press
Imagine his surprise one day
When in the middle of a cat-nappe
A spokesman from the Global Syndicate
Came by to offer him protection!

"You'd better join the Syndicate"
His voice subducted Tec
Who felt the pistol in his belly
And lost his classic wit,
Tec saw the quaking finger
On the trigger, and he groaned
For who would wish to be convectioned
To the mantle jelly zone?

He knew the global challengers
Had been collecting data but
Were now in need of further funds
To transform their spreading margin
"What could he do?" he asked himself,
Perhaps become their partner,
And try to change the threat to a
Converging bargain?

The impact of plate tectonics on classic tectonics is consciously exaggerated in "The Adventures of Tec Tony", yet the cartoon acts as a lighthearted illustration of the sort of problems confronting the IUGS Commission on Tectonics. The cartoon was drawn before the September issue of EPISODES, with its leading articles on geodynamics, reached us, but this has not changed the facts presented. As underlined by C.L. Drake (U.S.A.) and H. Illies (F.R.G.) in EPISODES, the work conducted under the Upper Mantle Project (1959-1969) and the Geodynamics Project (1969-1979) has raised as many tectonic problems on the continents as it has solved in the sea. Plans, therefore, for a

new Inter-Union project, concentrating on the lithosphere, are to be welcomed.

But what then should the role of the IUGS Commission on Tectonics be? Does it not become superfluous? We do not think so, nor, apparently, do the IUGS officials. There is need for both interdisciplinary and disciplinary approaches, and in our opinion, "geological tectonics" must be prepared to respond to future demands.

Every success has its drawbacks, and one of the greatest challenges to tectonicians today is the enormous

popularity of tectonics. Even the classically trained tectonicians who accept the arguments and need for plate tectonics sometimes feel that model-making has become too fashionable at the expense of the hardworking "foot-slugging" geologists.

Faced with this situation, the Commission on Tectonics initially decided to concentrate on two fields: the tectonics of the Precambrian shield areas, and microstructures. Both topics are of fundamental importance to students of on-shore tectonics because they deal with basic problems like "how did the first continental architecture come into being?" and "which deformation mechanisms exist in natural rocks?", "how is this reflected in rock fabrics?" and "what is the relation to large scale structures?"

In both of these fields, important new studies are being performed by groups of scientists and by independent schools, and a wealth of information is stored in the accumulating literature, ready to be filtered critically and incorporated in a new approach. But coordination and communication of the results are needed, and it is this work that we feel must be the job of the Commission of Tectonics — to support and cultivate what grows from the grass roots, so that it ripens properly for the "International Harvester" machines steered by "Inter-Union drivers".

To return to the Commission's two areas of concentration, a Sub-commission has been charged with the task of preparing an Atlas of Precambrian Structural Type Regions. A blueprint of the atlas should be ready for the International Geological Congress being held in Paris in 1980. It will contain examples of regions that are well exposed and thoroughly studied structurally, covering a wide spectrum of type regions. Contributions to the atlas are welcomed by the Sub-commission and correspondence on this should be addressed through the Secretary of the Commission,

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Asger Berthelsen, born in Denmark in 1928, has been Professor of Geology at Copenhagen University, Denmark since 1966. Prior to that he lectured at Aarhus University in Denmark (1961-66) and worked for the Geological Survey of Greenland (until 1961). His area of specialization is structural geology and tectonics of Precambrian shields, younger mountain belts and glacial deposits. Dr. Berthelsen is currently Chairman of the IUGS Commission on Tectonics.

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A Sub-commission on Microstructures is being formed, aimed at bringing various groups of workers in this field together. This area of study is important because it relates two vital processes active during orogeny — deformation and metamorphism, which together are responsible for the ultimate rock fabric. In order to understand such major structures as nappes, mylonite zones and rocks which have been buried deeply in subduction zones, one must know the structural and metamorphic history of these rocks. This can only be done through a detailed study of small scale structures and microstructures, which will provide a direct feedback from field studies to sophisticated laboratory work, including the use of experimental deformation rigs and the electron microscope. Fundamental research in this field, accompanied by experiment rock deformation, may enable us to further characterize the solid flow of rock masses in tectonic belts, and to understand the mechanism by which rocks deform under a great variety of pressures and temperatures. In addition, the crystallographic rock fabric may tell us something about the deformation paths and conditions.

As for the immediate future, the Commission is carrying on its activities with enthusiasm. A field trip to West Greenland is planned in 1979 for a working group on Precambrian tectonics. Another Bureau meeting (the last was held in 1977) is scheduled in conjunction with the IGCP meeting being held in Kiev, U.S.S.R. in September of 1979. The Sub-commission on Precambrian tectonics is planning a workshop meeting for the spring of 1980 in Copenhagen, Denmark. It may well be that by 1980 and the International Geological Congress, we shall all be in a better position to determine whether Tec Tony managed to keep the skin on his nose, or not.

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