Geological Map of Asia and Europe (1: 5,000,000)

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I recently acquired a Geological Map of Asia and Europe (1: 5,000,000), in 9 sheets, and I found it so impressive that I would like to write some words about it. The map is immense in size, just like the Eurasian continent itself. A large wall of at least 3 m wide and 2.4 m high is needed to display it. The continent of Eurasia is the largest of the world. It occupies about 36% of the total land area of the globe. It is a mosaic of many large and small tectonic blocks, welded by younger orogenic belts. To achieve a complete coverage of geological features of the entire continent in a single map is evidently a very difficult task. The production of this map is indeed most admirable.

The map is compiled by a team of 17 members led by Prof. Li Tingdong of the Chinese Academy of Geological Sciences. In the accompanied brochure of 33-page explanatory notes, the authors explain how the map project was initiated, compiled and set to the final production. In all stages of their compilation, they have paid extreme attention to meet the highest technical requirements and accuracy for geological contents. They have achieved this goal.

The authors followed the standard procedure of preparation for a geological map. The map legend includes (1) stratigraphy, (2) igneous rocks, (3) genetic types of the quaternary deposits (marine, lacustrine, loess, glacial, etc.), and (4) offshore isobaths. The igneous rocks include (a) plutonic rocks with standard color designation for different rock types and chronological symbols, (b) hypabyssal intrusive rocks, and (c) Pliocene-to-recent and pre-Plio-

cene volcanic rocks. Because the Eurasian continent contains an immense spectrum of geological features, not all of them can be expressed in a single map. However, the key elements, such as rock type distribution, principal tectonic/structural trends, major drainage systems, and other geomorphic features are well demonstrated.

The map covers an area from 25°W to near 170°W (longitude), and from 10°S to the vicinity of the Arctic (latitude). The choice of projection and land mass distribution are evidently very crucial in the map-making. In the end, the team has chosen equal-area oblique zenithal projection, with density of the graticule $\lambda = \phi = 5^\circ$. The projection centre is set at 85°E and 40°N (in the Tarim Basin of NW China) and the central meridian at longitude 85°E. This design minimizes distortion in area and maintains the proportion of areas of various regions. The angular distortion for China is small with a maximum of 2° or so.

Before the publication of this map, an old Geological Map of Asia (1: 5M, in Chinese), published in 1975 by the Cartography Publishing House, Beijing, has been the most useful map that I have used for my research work. The present map inherits all the strong points, and is entirely in English. Furthermore, it extends its coverage beyond the Ural Mountains to the whole Europe. The continuation of geological features across all national boundaries has an enormous advantage over individual national map sheets.

This is the first geological map of Eurasia compiled by China or any other countries. The map involves 49 Asian and 44 European countries or regions. A good map must integrate scientific content and artistic expression. The present map has met all the cartographic requirements for a high-standard map of this scale. The detailed procedure of map preparation is fully explained in the Explanatory Notes, and I am amazed by the highly sophisticated techniques the team has employed. When I compare it with the old map of Asia, plenty of new geological information up to 1994 is added to it. The new information came not only from published late-edition maps, but also from their own research effort by the team members.

I admire this map. If I have any suggestions to make, that would be the follows: (1) add the national boundary lines (in half-tone or grey); that would greatly facilitate the search of a particular area, (2) distinguish different classes of faults with sense of movement (normal, reverse, strike-slip, and undetermined), at least for the major faults, like the Altyn Tagh and the Irtysh, (3) incorporate available offshore and subsurface data in geological interpretation. I recognize that adding national boundaries for small European countries is not practical, but a boundary for Mongolia or China would be most useful.

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With the quality and the modest price, I highly recommend this map to all libraries and individual research workers.

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