

## Chapter 47

# Eastern European Planation Surfaces

The planation surfaces of the United Kingdom and Western Europe continue into Eastern Europe. A brief summary of the main areas are as follows.

### The Russian Platform

The Russian Platform is a large broad area that stretches from Eastern Europe to the Ural Mountains. Part of it is in Europe and part in western Asia, but it will be discussed in this chapter since it is described together in *The Geomorphology of Europe*.<sup>1</sup> Planation surfaces are widespread in the uplands. As in other areas, the number and age of these planation surfaces are debated.

### The Carpathian Mountains

The Carpathian Mountains arc around the Hungarian Plain (Pannonian Basin) which stretches from northeast Austria to Romania. They are divided into the Western, Eastern, and Southern Carpathians. The mountains are also divided into an inner and outer Carpathian range.

Planation surfaces are quite common in the Carpathian Mountains (Figure 47.1).<sup>2,3</sup> A general description of them are given by Demek:

The relief of the Carpathians has developed mainly during the Neogene [late Cenozoic]. Locally in the inner Carpathians, Palaeogene [early Cenozoic] or even Mesozoic landforms, such as planation surfaces, have survived. Extensive late Mesozoic-early Tertiary planation surfaces on the crystalline and metamorphic rocks are preserved in the Slovakian Ore Mountains. Later block movements have dislocated the Tertiary planation surfaces, leaving a legacy of fragmentary flat-topped relief forms situation at different altitudes and deeply incised valleys on the sides of the block ranges.<sup>4</sup>

There are also numerous pediments at lower altitudes, often in valleys (see Part XIV). The planation surfaces are similar to what Ollier and Pain describes all over the world:

We can distinguish four sets of processes:

- 1 process that cause folds and other structures;
- 2 processes that make planation surfaces;
- 3 processes that cause uplift of a plain to form a plateau...;
- 4 erosional processes that dissect a plateau into mountains...<sup>5</sup>

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<sup>1</sup> Aseev, A.A., N.V. Bashenina, and E.A. Rubina, 1984. Russian Platform. In, Embleton, C. (editor), *Geomorphology of Europe*, John Wiley & Sons, New York, NY, pp. 78–91.

<sup>2</sup> Ollier C. and C. Pain, 2000. *The Origin of Mountains*, Routledge, London, U.K., pp. 86–91.

<sup>3</sup> Lacika, J., 1997. Neogene palaeosurfaces in the volcanic area of Central Slovakia. In, Widdowson, M. (editor), *Palaeosurfaces: Recognition, Reconstruction and Palaeoenvironmental Interpretation*, Geological Society of London Special Publication No. 120, The Geological Society of London, London, U.K., pp. 203–219.

<sup>4</sup> Demek, J., Carpathian Mountains. In, Embleton, C. (editor), *Geomorphology of Europe*, John Wiley & Sons, New York, NY, p. 356.

<sup>5</sup> Ollier and Pain, Ref. 2, pp. 3–4.



Figure 47.1. A horse atop of the Krasna mountain range in Ukrainian Zakarpattia Oblast, Central Carpathian Mountains (Wikipedia). Notice the general rolling nature of the mountaintops.

### **Poland/Czech Republic**

Planation surfaces are found in the southern upland of Poland and the Bohemian Massif of the Czech Republic.<sup>6,7</sup> (The Carpathian Mountains extend up into southeast Poland.) Pediments are also common at lower levels. The Sudetes Mountains and foothills in southwest Poland, part of the Bohemian Massif, have planation surfaces with inselbergs that are claimed to have formed by massive weathering.<sup>8,9</sup> Their number and origin are debated. The weathering hypothesis for the origin of planation surfaces suffers from many problems (see chapter 51).

### **The Balkan Peninsula**

The Balkan Peninsula is east of Adriatic Sea and south of the Carpathian Mountains. A number of planation surfaces have been recognized in the Dinaric Alps, just northeast of the

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<sup>6</sup> Demek, J., 1984. Bohemian Massif. In, Embleton, C. (editor), *Geomorphology of Europe*, John Wiley & Sons, New York, NY, pp. 216–224.

<sup>7</sup> Demek, J., 1984. Silesian and South Polish uplands. In, Embleton, C. (editor), *Geomorphology of Europe*, John Wiley & Sons, New York, NY, pp. 224–230.

<sup>8</sup> Migon, P., 1997. Tertiary etchsurfaces in the Sudetes Mountains, SW Poland: a contribution to the pre-Quaternary morphology of Central Europe. In, Widdowson, M. (editor), *Palaeosurfaces: Recognition, Reconstruction and Palaeoenvironmental Interpretation*, Geological Society of London Special Publication No. 120, The Geological Society of London, London, U.K., pp. 187–202.

<sup>9</sup> Migon, P., 1999. Inherited landscapes of the Sudetic Foreland (SW Poland) and implications for reconstruction uplift and erosional histories of upland terrains in Central Europe. In, Smith, B.J., W.B. Whalley, and P.A. Warke (editors), *Uplift, Erosion and Stability: Perspectives on Long-Term Landscape Development*, Geological Society of London Special Publication No. 162, The Geological Society, London, U.K., pp. 93–107.

Adriatic Sea.<sup>10,11</sup> The Balkan Mountains in northern Bulgaria possess late Cenozoic planation surfaces and pediments.<sup>12</sup>

### **The Caucasus Mountains**

The summits of the Caucasus Mountains, which lie between the Black and Caspian Seas, are beveled and accordant,<sup>13</sup> but no flat surfaces survive, suggesting the planation surface was completely eroded during uplift, similar to the Alps' Gipfflur (see Chapter 46). However, well-preserved gravel capped planation surfaces, probably pediments, are common in the foothills of the Caucasus Mountains.<sup>14</sup>

### **Turkey and Around the Black Sea**

Summit remnants of planation surfaces are widespread in Turkey.<sup>15</sup> There are three planation surfaces on the Stavropol Plateau east of the Black Sea.

Many of the planation surfaces have been given different claimed ages, but this information probably has been superseded. The Crimean Peninsula in the northern Black Sea and the surrounding northern portion of the Black Sea have numerous planation surfaces.<sup>16</sup> Their description is the same as those in the rest of the world. The surface on the Crimean Peninsula is almost flat and bevels the rocks below them. Later, the planation surface was uplifted and dissected.

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<sup>10</sup> Demek, J., I. Gams, and I. Vaptsarov, 1984. Balkan Peninsula. In, Embleton, C. (editor), *Geomorphology of Europe*, John Wiley & Sons, New York, NY, pp. 374–386.

<sup>11</sup> King, L.C., 1967. *The Morphology of the Earth—A Study and Synthesis of World Scenery*, Hafner Publishing Company, New York, NY, pp. 518–520.

<sup>12</sup> Aseev, A.A., N.S. Blagovolin, and L.R. Serebryannyi, 1984. Exogenic landforms of Europe. In, Embleton, C. (editor), *Geomorphology of Europe*, John Wiley & Sons, New York, NY, p. 34.

<sup>13</sup> Ollier and Pain, Ref. 2, pp. 91–93.

<sup>14</sup> Dumitrashko, N.S., 1984. Caucasian Mountains and Armenian Highlands. In, Embleton, C. (editor), *Geomorphology of Europe*, John Wiley & Sons, New York, NY, pp. 393–403.

<sup>15</sup> King, Ref. 11, pp. 517–518.

<sup>16</sup> Blagovolin, N.S., 1984. Northern Black Sea lowlands and Crimea. In, Embleton, C. (editor), *Geomorphology of Europe*, John Wiley & Sons, New York, NY, pp. 387–391.