

**THE PREHOMINID LOCALITY OF RUDABÁNYA (NE HUNGARY)  
AND ITS NEIGHBOURHOOD  
A PALAEOGEOGRAPHIC RECONSTRUCTION**

by  
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A complex geomorphological, sedimentological and biological reconstruction of the closer and wider environments of the Early Pannonian prehomimid site of Rudabánya is outlined

Since 1967 fossil assemblages representing prehomimid finds from the earliest stage of man's origins have been recovered from Lower Pannonian lignitiferous clays overlying a metalliferous carbonate basement of Triassic age at the site of the Rudabánya iron ore mine, NE Hungary. In addition to two distinct types characteristic of the European region of prehomimization (*Rudapithecus hungaricus* KRETZOI and *Bodvapathecus altipalatus* KRETZOI), scores of specimens of *Phopithecus (Anapithecus) hernyáki* KRETZOI belonging to the group of relatives of the gibbons (M KRETZOI 1969, 1974, 1975) came to daylight.

Preliminary biostratigraphic, palaeobotanic, malacologic, ostracode and vertebrate studies enabled us to outline the chronologic position of the finds and the basical palaeoecologic conditions (M KRETZOI—E KROLOPP—H LŐRINCZ—I PÁLFALVY 1976). Nevertheless, the geomorphologic and integrate palaeogeographic patterns of the one-time habitat, which would be crucial for detecting the circumstances of adaptation as a prerequisite to hominization, have remained invariably unknown.

**Palaeogeography of the Borsod basin as the broader environment**

From the period immediately preceding the Pannonian sedimentation the Borsod basin was a well-individualized embayment open with a narrow gate towards the Great Plains sedimentary basin.

Facies analyses of the main types of sediments filling the Borsod basin and examination of their distribution enabled a tentative reconstruction of the palaeogeographic development of the area (L KORDOS 1975, 1979). By the end of the Miocene the basin frame serving as a recipient of the sediments of the Pannonian embayment was similar to the present-day pattern. In the northern part of the basin the Miocene grades with continuous, mostly fluvialite sedimentation to the Pannonian (Pliocene). In the Cserehát area the immediate pre-Pannonian period is characterized by a break in terrestrial to paludal sedimentation and/or a change in lithology. The boundary here is drawn on

the basis of the uppermost tuffaceous horizon (GY RADÓCZ 1969a) In the southern half of the Borsod basin the pre-Pannonian emergence led to interruption of marine-littoral sedimentation and to overall denudation processes This eroded surface was then invaded, through the Miskolc gate, by the waters of the Pannonian inland sea, depositing basal conglomerates in several points It is the processes begun that time and developed full scale in the Early Pannonian that are most valuable for prehistoric environmental reconstructions, for the land surface was the habitat of the prehistoric

In the study area three morphologically different Early Pannonian facies domains can be distinguished

- 1 land surfaces,
- 2 fluvial-swamp areas,
- 3 water-covered (lake) areas

Within the contiguous *terrestrial* arc of the Borsod basin eroded, subtropical peneplains were formed at 300 to 320 m a s l just before the advent of the Pannonian Most significant among the peneplain surfaces showing a rough morphology due to karstic processes and normal erosion were the

Aggtelek Karst group in the north and the Rudabánya and Szendrő ranges in the south The Borsod basin is bounded in the south by the flat karstic mass, partly hidden, of the Bukk (Fig 1), in the east, by the Miocene volcanic series of the Tokaj Mountains

The northern and western mountain borders and the depressions adjacent to them became recipients of the alluvium of rivers which were of southward orientation already in Miocene time, while the southern area received a marine, carbonaceous sedimentary sequence After the pre-Pannonian regression the northern and eastern parts of the study area were characterized by continued fluvial activities which expanded farther south The palaeogeography of the depression areas of this period is difficult to reconstruct, though the presence of a flat landscape traversed by rivers and streams and periodically flooded by them is very likely

This surface was that which would be invaded by the Early Pannonian inland sea It filled all the depressions, penetrated into the

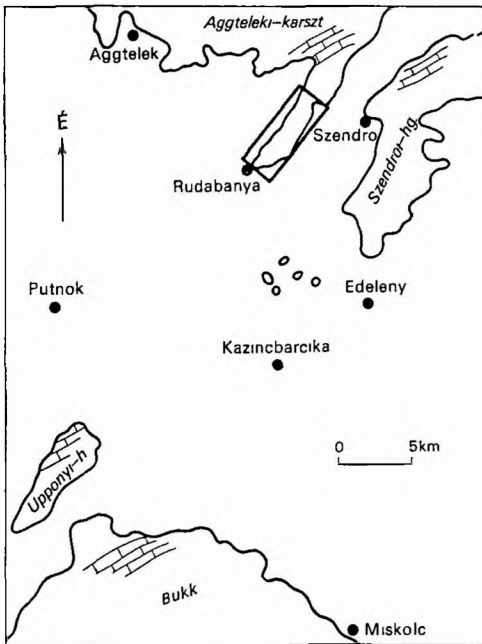


Fig 1 Connection of the Rudabánya range with the carbonate basement tracts of the Borsod basin with indication of the area of detailed geomorphological reconstruction

I ábra A Rudabányai-hegység kapcsolata a Borsodi-medence karbonátos alaphegységeivel, a részletes geomorfológiai rekonstrukcióval terület feltüntetésével

valleys of the peneplains and to their embayments and inundated the Szendrő area, the range of lowest altitude. It brought about a swampy inland archipelago. The greatest water depth seems to have occurred in the eastern and southern Cserehát and the Miskolc gate. The neighbourhood of the mountains (Aggtelek, Rudabánya) became a more or less contiguous land area which included hosts of swampy (later lignitiferous) basins with a diversity of sedimentary facies and morphology. Thus the Early Pannonian (Bódva Stage, the prehomind period) Borsod basin was an embayment of the Pannonian inland sea with an alternation of terrestrial surfaces with swamps and hemipelagic basins of extremely varied pattern.

In the basin area the Lower Pannonian lignitiferous variegated clay sequence (Bódva Stage) gradually developed into sandy-gravelly, cross-laminated sediments dated, for lack of index fossils, simply as a probable Upper Pannonian. What seems to be proved is that a direct water communication with the Great Plain basin through the Miskolc gate in the Late Pannonian did not exist anymore. Sediments transported by the ancient Hernád, a palaeostream with activities revived in Late Pannonian and particularly in Late Pliocene times, led to accumulation, in the northern half of the Borsod basin, of a very thick, unsorted pebble delta, the so-called Kosice pebble. Sediments from the source area of the palaeo-Sajó river of periodically renewed transportation activity on the Pannonian blanketed the western and north-western parts of the Borsod basin with sands and pebbles, producing the so-called Gómor pebble sheet.

In post-Pliocene and in Early Pleistocene time, after deposition of the pebble sheets, with development of the present-day river network, the alluvial blankets were removed by erosion and, parallel with this, the processes of karstification intensified. The rivers developed their terraced valleys in tectonically controlled directions, removing the Pannonian and Pliocene sediments from large areas.

### **Palaeogeography of the Rudabánya range as the immediate environment of the locality**

The Ruda-hegy area now extends over a length of 4.0 to 4.5 km and a width of 0.8 to 1.2 km, striking southwestwards from Rudabánya village to Alsótelekes.

Prior to mining activities, in its original state, it was a plateau of 300 to 330 m altitude divided into a western and an eastern range by the Bányavölgy valley in the south and the tributary valley of the Telekes rivulet in the north. Its highest peaks are the Villány-tető (337 m), the Cigányos (335 m) and the Galyagos (328 m). The Ruda-hegy area passes with a gentle slope to the stream valleys of 200–225 m valley-floor altitude. The geomorphological reconstruction of the immediate habitat of the prehominds of Rudabánya could be carried out in two steps, in the context of the Borsod basin. First the pre-Pannonian topography, with the Pannonian sediments peeled off, was reconstructed, and then the study of the basin-filling sediments enabled the reconstruction of the Early Pannonian environment.

### *The pre-Pannonian topography*

The detailed, contour line map of the pre-Pannonian surface could be plotted by using a great number of underground exploratory boreholes (Fig 2) In the course of this work the pre-Pannonian surface of the basement in the Pannonian-covered areas could be unambiguously determined In areas not covered with Pannonian sediment the reconstruction enabled us to study the present-day basement surface denuded in post-Miocene time Consequently, the pre-Pannonian geomorphological image of the Ruda-hegy in the sediment-covered area is true to reality, while on the higher-situated, bedrock surfaces it is highly speculative

The surface of the Ruda-hegy reduced to a peneplain before the end of the Miocene was dissected into four relatively high peaks of respectively 310, 320, 320 and 322 m altitude The difference in altitude between peak and saddle is not more than 40 m The 200 m contour line completely encircles the perimetry of the plateau Bounded from all sides by sharp tectonic lines, the plateau must have originally formed an inselberg of good contrast with its environment

In pre-Pannonian time the terrestrial morphogenesis was, in spite of the carbonate basement, primarily not karstic, but rather fluvial The single valley issuing from the Vilmos-mine area of the plateau (fossil vertebrate sites I and II) is one surrounded by topographic highs It extends through the northwestern margin of the Ruda-hegy into the basin area Before reaching its mouth it meets a short tributary on its left side The intramontane valley had got to the senile stage by the end of the Miocene, as its valley floor was split up into several subbasins It appears to have been formed and active in earlier Miocene times The bottom of the valley-depressions is covered by local, continental, coarse-detrital clay, the so-called "horse-flesh"

The eastern margin of the Ruda-hegy is dissected by minor embayments, of which the almost closed basin of the Andrásy III mine area with accumulation of Lower Pannonian sediments and fossil plant remains is most important An incision similar to a valley-head i.e. a narrow embayment, opens towards Andrásy mines I—II As far as the microform-generating processes are concerned, no information permitting a reconstruction is available Despite large-scale opencast mining operations, no exposure, suitable for micro-morphological evaluations could be found Research of such orientation is handicapped by the heavily weathered, fractured and postgenetically altered state of the bedrock

The lithology of the bedrock has not been crucial for the pre-Pannonian morphogenesis of the Ruda-hegy area The morphological forms permeate various lithological types without being affected in the least

Consequently, the Pannonian sediments of the Ruda-hegy were deposited in a main valley system dissected into subbasins within a peneplain developed in Miocene time

### *The Early Pannonian topography*

During the Early Pannonian invasion of the Borsod basin the Rudabánya range was surrounded by the waters of the Pannonian inland sea up to an altitude of 220—240 m The Ruda-hegy was separated from the rest of the range by the narrow basin of the Telekes valley which may have existed

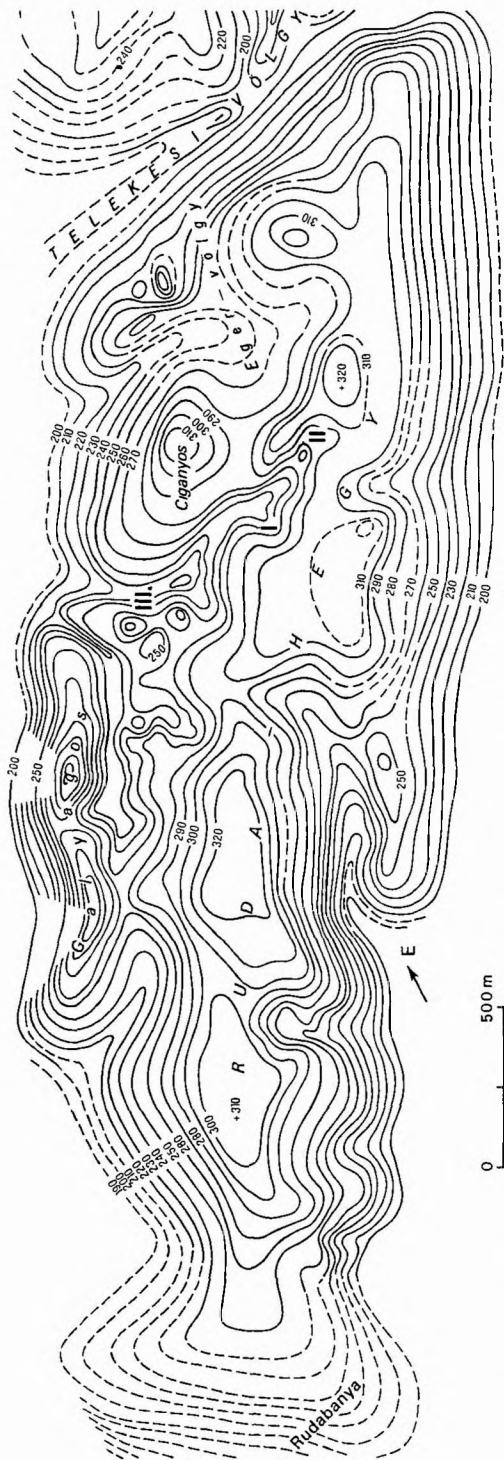


Fig 2 Pre-Pannoman geomorphological map of the Ruda-hegy area extending from Rudabánya to Alsótelekes villages, with indication of the vertebrate sampling sites (I, II, III)

2 ábra A Rudabányától Alsótelekesig húzódó Ruda-hegy vonulatának pannon előtti geomorfológiai térképe, a gerinces lelőhelyek (I, II, III) feltüntetésével

already in Miocene time. The remaining part of the range, in turn, had a continuous terrestrial communication with the Galyaság area and the Aggtelek Karst.

In the littoral zone of the Pannonian inland sea a lignitiferous sequence was deposited which does not show any stratigraphic continuity with the lithologically similar sediments in the inner parts of the Ruda-hegy area, as indicated by sedimentological and geochemical results obtained in the laboratories of the Hungarian Geological Institute and by I. ELEK's coal-petrographic data (1979). Meteoric waters accumulated in the internal depressions and the subbasin remnants of the one-time valley produced swamp systems. The waters of the swamps seem to have had both surface and underground (karstic water) communication with one another, but each swamp was well-individualized from the viewpoint of sedimentation. The most significant Lower Pannonian lignitiferous paludal sedimentary sequence filled up to 260–290 m altitude, the subbasins of the internal valley system issuing from the Ruda-hegy. The swamp system of the Vilmos-bánya area is the only area of accumulation of prehuman finds in which three different subbasins can be singled out. Sites I and II were separated by a narrow ore-bearing basement ridge. Both were the highest points, valley-heads, of the valley system. Site III shows the sedimentary sequence of a large swamp that used to fill the deepest subbasin of the Vilmos-bánya valley.

According to sedimentological and coal-petrographic studies, the depressions during deposition of the Lower Pannonian lignitiferous clay sequence were continuously covered with water which produced a variety of swamp facies.

In Site I ("Mastodon wall") a sideritic-ankeritic bedrock is overlain by 1.6 m of allocthonous clays with barite concretions and detrital products of local terrestrial erosion. The lower member of the lignitiferous sequence formed in a deep swamp that belonged to the zone of medium water flow rate and was rich in both plant and vertebrate fossil remains. The two lignite beds formed during the basin's history were deposited in the inner zone of the shallow swamp and the low flow rate zone of the deep swamp. The about 3-m-thick lignitiferous sequence of Site I is followed by argillaceous-sandy sediments formed in a closed deep swamp of a high flow rate zone.

Site II ("Gibraltar") shows geological features similar to those of Site I, though sedimentological studies have convincingly shown the two subbasins to have been totally independent from each other.

Of the subbasins within the Ruda-hegy area it is Site III ("Big Wall") that contains the most complete Pannonian sequence. The valley basin is blanketed by 3 to 4 m of sideritic argillaceous detritus with quartz gravel streaks, the topmost part of which has been argillized owing to the permanent water coverage to which it was later exposed. The lignitiferous sequence of 8 to 10 m thickness contains eight carbonaceous layers. The lowermost layer pinches out in a feather-like pattern as one proceeds towards the basin's interior. Palaeogeographically, this means that the initial swamp must have been of small extension. With variation in water depth an alternation of lignites and clays evolved which filled the whole basin as the swamp expanded laterally to that extent. Deep- and shallow swamps with respectively low to fair water flow rates would alternate in the course of swamp development. Accumulation processes would lead to development of a deep swamp zone of

fair to high flow rate. At Site III, even *Brotia* appeared in several horizons, indicating that the fauna of the external Pannonian sea may have penetrated well into the Ruda-hegy basin. Situation and evolution of the swamp areas account for the mass accumulation of fossils and for the environmental reconstructions based thereon. At Rudabánya the ancient valley area of Vilmosbánya is the only place, where, as into a closed swamp depression, the animal corpses may have been drifted or carried in and accumulated in great concentrations.

As shown by studies on the mollusc fauna (E. KROLOPP 1974 in M. KRETZOI et al 1974), the ratio of pulmonate and aquatic branchiate gastropods is the same, while the grey clays with fossil plant remains did not yield either bivalves or branchiate aquatic gastropods. This suggests the genetic environment of the carbonaceous bed to have been a stagnant, decaying organic mud, poor in oxygen. The mollusc fauna could be shown to include organisms favouring both riparian and mangrove and grassland vegetations. At Site III periodical refreshment of the stagnant water is suggested in several horizons, which is also indicated by forms like *Viviparus* and *Brotia escheri* recovered from sediments of the external Pannonian sea.

The ostracods examined from Sites I and II are all young specimens occurring in small stagnant water bodies. They may have originally lived in a non-swamp habitat, whence they could be washed by torrential rains into the swamp (K. DIEBEL—E. PIETRZENIUK 1974, in M. KRETZOI et al 1976). On the basis of vertebrate remains (M. KRETZOI 1974), the fauna represents two habitats, a nearwater forest of lush undergrowth on the one hand, and grassland-dotted forests, or, less frequently, open grasslands on the other. Insectivores and rodents requiring a dry ground and dwelling in underground holes and burrows are abundant. The finds seem not to have resulted from in situ accumulation of animal corpses, but to represent a taphocoenosis of skeletal elements deriving from nearby sources. Only the aquatic turtles suggest the in situ burial of integrate corpses.

According to macro- and microfloristic studies, it is the fossils from the Andrassy III mine area and from Sites I—IV that are predominantly swamp- or swamp- and mangrove-dwelling elements. The various habitats and life conditions produced a mosaic of vegetation ecologies not too large, but continually changing. I. PÁLFALVY (1976 in M. KRETZOI et al 1976) could identify, at Rudabánya, a wide ecological zonation with floating seaweed, large and rooted water-lilies, reeds, tussocks and clumps, and mangrove vegetations. The most external zone of the swamps associations was represented by an *Alnus*—*Taxodiaceae* bog forest. From the topographically more elevated, less frequently flooded riparian forest zone the representatives of deciduous forests have been recovered. Hilly and low upland topographies were characterized by arid grasslands interspersed with large groups of trees.

**S u m m a r i z i n g** the circumstances of prehuman accumulation at Rudabánya, let us conclude that the pre-Pannonian topography of the Ruda-hegy area of 300 to 320 m altitude, distinctly differentiated from its neighbourhood and dissected by internal valleys, was dotted with shallow and deep swamps. In swamps of low to fair flow rate, not only the local plant and animal remains were accumulated, but fossils of later origin introduced by rainwater transport from nearby sources, mainly the valley-heads and adjacent, relatively more elevated surfaces, as well. In the sediments under- and overlying

the swamp sediments all these fossils do not occur, so that the lithological and organic constituents of the fossiliferous localities agree in time with the biotope of the living organisms concerned

Sedimentological, analyses and ecological examination of both the fauna and the flora have shown the probable existence of contiguous mangrove and riparian forests in the swamp (basin) areas and of grasslands with isolated tree stands in the farther, hilly regions around them

A diversified habitat of rather rough topography, the contiguous Rudabánya range was separated only by a narrow, swampy valley from the large Aggtelek Karst that seems to have had higher altitude and a grassland vegetation

### *Later Pannonian topography*

Depressions in the Ruda-hegy area are filled with Miocene terrestrial sediments, followed by a lignitiferous clay sequence, grading into sandy and clayey sediments higher up the column. Already not only local clays, but also foreign rock grains (minerals) precipitate in the deep swamp sediments deposited at low and high flow rates. The overlying Pannonian sequence of rather obscure chronology (Upper Pannonian?) has completely levelled off Ruda-hegy's topography, thus camouflaging the pre-Pannonian depressions. The present-day relief is just slightly controlled by the pre-Pannonian topography, as the Pleistocene valleys are adjusted rather to the strike of the range

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## A RUDABÁNYAI PREHOMINIDA LELŐHELY ÉS KÖRNYEZETÉNEK ŐSFOLDRAJZI REKONSTRUKCIÓJA

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A rudabányai vasércbánya területéről, a triász alaphegységet fedő alsó-pannon lignites agyag rétegekből 1967 óta kerültek elő azok az ősmaradványegyüttesek, amelyek az ember származásának legkorábbi szakaszából származó prehomínida leleteket kísérik

### *A Borsodi-medence, mint a tágabb környezet ősfoldrajza*

A Borsodi-medence a pannon uledékképződést közvetlenül megelőző időszakról kezdődően jól körülhatárolható, az Alföld felé szűk kapuval nyitott oblozet volt. Az alsó-pannonban erre a térszínre nyomul be a Miskolci-kapun keresztül a Pannon-beltő vize, több ponton alapkonglomerátumot rakva le. A prehomínidák környezetrekonstrukciójakor az ekkor bekövetkezett, s az alsó-pannonban kiterjedt folyamatok a legjelentősebbek, miután e térszín jelentette életerüket.

A Borsodi-medencében az alsó-pannon folyamán három, morfológiailag eltérő fáciesterületet lehetett megkülönböztetni

- 1 szárazulatok,
- 2 folyóvízi—mocsaras területek,
- 3 vízzel borított tavi területek

A Borsodi-medence zárt *szárazföldi* ívén belül a pannont megelőzően ma 300—320 m-en elterülő, denudálódott, meleg—mérsékelt oví (szubtrópusi) tonkfelszínek alakultak ki. A karsztos folyamatokkal és normális erózióval egyenletlenné vált tonkfelszínek közül északon legjelentősebb az Aggteleki-karszt csoportja, délebbre a Rudabányai-vonulat és a Szendrői-hegység. A Borsodi-medencét délről a Bukk lapos, részben fedett karsztos tomege határolja (1 ábra). Keletről a medencét a Tokaji-hegység miocén vulkáni sorozata zárta.

A hegységek peremét, ill a sullyedékterületeket már a miocénben is északról délre irányuló *folyóvizek* uledéke töltötte fel északon és nyugaton, míg délen tengeri széntelepés rétegsor képződött. A pannont megelőző regressziót követően északon és keleten a folyóvízi tevékenység valószínűleg tovább tartott, kiterjedt délebbre is. E periódus sullyedékterületeinek ősfoldrajzi képét nehéz rekonstruálni, valószínű, hogy lapos, folyóvizekkel átjárt, időszakosan elöntött vidék volt.

Erre a felszínre nyomult be az alsó-pannon *beltó* vize, amely kitöltötte az összes sullyedékterületet, benyomult a penepilének völgyeibe, oblozeteibe, elfedte a legalacsonyabb helyzetű Szendrői-hegységet Szigetekre tagolódott mocsaras beltavi rendszert hozott létre. A legnagyobb vízmélység valószínűleg a Cserehát keleti és déli területén, valamint a Miskolci-kapuban volt. A hegységek környéke (Aggtelek, Rudabánya) kisméretű, többé-kevésbé zárt, mocsaras (későbbi lignittelepes) medencékkel tagolt területté változott, igen sokrétű uledékfáciessel és morfológiával. Az alsó-pannon (Bódvai-emelet, a prehomindák időszaka) idején tehát a Borsodi-medence a Pannon-tó oblozete volt, szárazföldi karsztos és medencékre tagolt mocsári—nyíltvízi területek változásával.

### *A Rudabányai-vonulat, mint szűkebb környezet ősfoldrajza*

A Ruda-hegy vonulata ma 4,0—4,5 km hosszúságban és 0,8—1,2 km szélességben húzódik ÉK—DNy-i csapással Rudabányától Alsótelekesig. A bányaművelést megelőző, eredeti állapotában 300—330 m t sz f magasságú volt.

A *pannon előtti felszín* részletes szintvonalas térképét a nagyszámú bányabeli kutatófúrás felhasználásával lehetett megszerkeszteni, amelynek lehetőségét a Rudabányai Ércbányák geológusai teremtették meg (2 ábra). Ennek során a pannon uledékekkel fedett területeken az alaphegység prepannon felszínét egyértelműen meg lehetett határozni. A pannon uledékekkel nem fedett területen a rekonstrukció során a miocén után már denudálódott, mai alaphegységi felszín lehetett tanulmányozni.

A Ruda-hegy miocén vége előtti, már penepilénné denudálódott felszíne négy, háromszáz méternél magasabb kiemelkedésre tagolódott, amelynek csúcsai jelenleg 310, 320, 320 és 322 m t sz f magasságban vannak. A platók között, a csúcs és a hágó szintkülönbsége a 40 m-t nem haladja meg. A 200 m-es szintvonal a Ruda-hegy peremét teljesen körül fogja. A sziget-hegy eredetileg minden oldalról éles szerkezeti vonalakkal határolt, így jól elkülönült környezetétől.

A prepannon szárazföldi felszínfejlődés a karbonátos aljzat ellenére elsősorban nem karsztos, hanem folyóvízi. A platóról egyetlen, a Vilmos-bánya területén induló (I és II sz. őseríncses lelőhely), magaslatokkal korulvett völgy húzódik, amelyik a Ruda-hegy ÉNy-i peremén kifut a medenceterületre. A torkolat előtt rövid bal oldali mellékágat is magába foglal. A hegyközi völgy a miocén végére már szenilis állapotba jutott, miután volgytalpa több rész-medencére bomlott. Kialakulása, működése a miocén korábbi időszakára tehető. A völgyi sullyedékek alját helyi, szárazföldi durva tormelékcs agyag, az ún. „lőhús” borítja. A Ruda-hegy keleti pereme oblozetekkel tagolt.

A Borsodi-medence *alsó-pannon elöntése* során a Rudabányai-vonulatot kb. 220—240 m t sz f magasságig korulvette a Pannon-beltó vize.

A partszegélyi területen a Pannon-beltóban lignites agyagsorozat rakódott le, amely nem mutat rétegtani folyamatosságot a Ruda-hegy belső, hasonló kifejlődésű uledékeivel, mint azt a MÁFI laboratóriumában végzett uledékföldtani, geokémiai és ELEK I (1979) szénközöttani vizsgálati adatai is jelzik. A belső mélyedéseket, mint kisebb oblozeteket, valamint a részmedencékre tagolódott egykori völgyet kitöltő csapadékvíz láprendszereket hozott létre.

A lápok víze valószínűleg felszíni és felszín alatti (karsztvíz) kapcsolatban állt egymással, de uledékképződés szempontjából elkulonultak. A legjelentősebb lignites alsó-pannon lápi uledéksor a Ruda-hegyről induló belső volgyrendszer medencéit töltötte ki 260—290 m t. sz. f. magasságig. A Vilmos-bánya e lárrendszer a prehomínida leletek egyetlen felhalmozódási helye, amely három, egymástól elkulonuló medencére bomlik. Az I. sz. és a II. sz. lelőhelyet keskeny érces alaphegységi gát választotta el egymástól. Mindkettő a volgyrendszer legmagasabb pontja, volgyfője volt. A III. sz. lelőhely a Vilmos-bánya volgyének legmélyebb medencéjét kitöltő nagyméretű lár uledéksorozata.

Az uledékföldtani és szénkőzettani vizsgálatok szerint az alsó-pannon lignites agyagsorozat képződése idején a mélyedésekben mindvégig vízborítás volt, változatos lápi kifejlődéssel.

**O s s z e f o g l a l v a** a rudabányai prehomínidák felhalmozódásának körülményeit, megállapíthatjuk, hogy a Ruda-hegy pannon előtti, környezetétől elkulonult, belső volgyekkel tagolt 300—320 m mai t. sz. f. magasságú térszínét mély- és sekélylápok sorozata tarkította. A gyenge és közepes vízáramlású lápokban nemcsak a helyben tenyésző növények és állatok maradványai halmozódtak fel, hanem főleg a volgyfőkben a környező magasabb térszínekről bemosott, behordott későbbi fossziliák is. A lápi uledékek fekejét és fedőjét adó uledékekben mindezek a maradványok nem fordulnak elő, így a lelőhelyek uledékes és szerves alkotóinak összetétele időben megegyezik az élőlények biotópjával.

Az uledékföldtani, növény- és állattani ökológiai elemzések alapján valószínűsíthető, hogy a lápok (medencék) környékén zárt lár- és lügeterdő, a távolabbi dombsági területeken facsoportokat is tartalmazó nyílt terület volt.

A tagolt és változatos élőhelyű, zárt rudabányai vonulat csak keskeny mocsaras volgyvel volt elválasztva a nagykiterjedésű, magasabb helyzetű, valószínűleg nyílt vegetációjú Aggteleki-karszttól.

