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MAN-MADE MODIFICATIONS IN THE DISTRIBUTION OF FORESTS IN PETROSANI RAYON

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THE COMPOSITION AND UPPER LIMIT OF THE FORESTS

The General Character of Vegetation in Petrosani Rayon

In Petrosani Rayon there is a central European flora, with Arctic-alpine elements on the peaks of the adjoining mountains and Mediterranean infiltrations, in the sheltered places with suitable ecological conditions and where there is limestone.

Considering the physical geographic conditions of the rayon, this flora includes certain stages of vegetation. Specifically, in the lowest parts of the rayon, forests are strung out along the rivers. The forests of beech and conifers extend to the sides of the depression, while on the alpine peaks there are alpine meadows. This normal and natural staging of the vegetation can be better seen in the basin of the East Jiu where man-made action has been less extensive and, in all cases, not as strong as in the West Jiu basin.

In general the meadow of the Jiu rivers and the meadows of their larger tributaries, for example, Taia, particularly toward the confluence, are covered with alders which are fragmented today into groups which slowly give way to mountain willows. At the foot of the slopes, just in front of the marshes and in the swamps, peat bogs of rushes are forming, in which appear clumps of "bumbacarita" (Eriophorum), a type

of rush of northern origin with white puffs on the tips, and which is cropping up from the middle of the peat bogs to the spruce swamps.

Near the city of Petrosani, the alders are mixed in with willows and poplars in groups which dominate in the East Jiu area, while in the West Jiu area, on the other side of Cimpul lui Neag, they give way to German tamarisks (Myricaria).

Almost all of the tributaries of the 2 Jiu rivers are covered on their lower terraces by currant and raspberry bushes. The raspberry bushes have grown particularly well in the course of August (1952), yielding an abundant harvest. The harvesting has been organized by the state through forest districts orby private parties on the basis of authorisation given by the districts.

In reference to the forests, if in the East Jiu basin their distribution and staging is, as we have seen, in concordance with the natural conditions, in the West Jiu basin their division and staging and also their upper limit are discordant in relation to the natural conditions and have all been changed by the influence of man.

Thus in the East Jiu basin the forests begin with beech trees which are greatly fragmented today from Lonea as far as Livezeni where they continue in a mixed stage of transition, beech-spruce (predominantly beech) and spruce-beech (predominantly spruce), and they continue farther on with a stage of virgin spruce which gives way farther up to alpine meadows.

This situation can be observed not only on the map of the forests of Petrosani Rayon which we have included but in the phytogeographic profiles drawn on the Taia Valley, Voevod Brook, and Jiet (4, 5, and 6, Figure 1).

On Taia (4) the pure beeches extend to 750-825 m in altitude; the forests of beech with spruce 825-1,200 m; the forests of spruce with beech 1,200-1,425; the pure spruce forests 1,425-1,950 m.

On Voevod (5), the pure beech forests extend 775-875 m; the forests of beech with spruce 875-1,000 m; the spruce forests 1,000-1,600 m.

On Jiet (6), the pure beech forests extend 750-850 m; the forests of beech with spruce 850-1,125 m; the forests of spruce with beech 1,125-1,225 m; and the pure spruce forests 1,225-1,500 m.

The upper limit of the forests in the East Jiu basin therefore varies between 1,950 and 1,500 m which is, as at Jiet, the lowest in this basin.

In contrast to the situation in the East Jiu basin, the distribution and staging of the forests appears to be completely abnormal in the West Jiu basin; it is a mosaic of forest formations without a zonal staging in relation to the altitude, predominantly beech trees (75%) which in many cases terminate the forest towards the alpine clearings. For example, this is the case towards Oslea and in the Nedeuta valley (2), where, starting from Cimpul lui Neag, the trees are strung out as follows: pure beech 800-1,000 m; forests of beech with spruce

1,000-1,025 m; then again pure beech 1,025-1,600 - giving way to alpine clearings on [illegible] slopes [illegible] Uricani (3) where the pure beech forest begins on the northeast slope at 800 m and terminates at 1,050 m, giving way to alpine clearings respectively at 750 [illegible] and then in the alpine meadows, as almost pure beech, at 1,550 m on the southeast slope.

The causes of this specific distribution of the forests in the basin of the West Jiu and the causes of such a powerful lowering of the upper limit of the forests in this basin are, as we will see, exclusively of a man-made order.

Toward the alpine peaks, the forests of Petrosani Rayon terminate in a natural manner or artificially (through the destructive intervention of man). They do so either indirectly — through a transition phase, the subalpine stage, or juniper trees and juniper thickets — or directly, when the same natural phase of transition is missing in the natural conditions or has been deforested so as to increase the alpine pastures. This deforestation very often has been made with justification toward the upper limits of the forests for the same reason.

The alpine meadows which are used as pastures have different cereals (Poa, Agrostis, Luzula, etc) and are overrun with sea-reed (Nardus stricata) which is not eaten by animals.

In the area of the cheese dairies and in the places tramped down by the sheep and fertilised by their dung heaps, there grows a rich, ruderal, and nitrificated flora which is formed of mountain stevia, nettles, sheep's "Laptuc," etc.

On the plains and in the small depressions of this area there extend in patches dried tundras formed of such lichens as Thamnolia, Cetraria, etc and moist tundras formed of mosses (Sphagnum, Hypnum, and Polytrichum) as well as heathberries.

Beginning from the years 1948-1949, the juniper trees were removed from small areas. Removal by burning, as was frequently done by the peasants, has yielded senseless results, The soil is burned and then washed by waters or covered by moss.

The following work has been praised as technical action to maintain or increase the productivity of the alpine pastures: destruction of anthills, picking up rocks and loose wood, destruction of injurious plants by repeated mowing or by digging up the roots, fertilization of the soil with nitric fertilizers and potash which are spread by an airplane after the Soviet example, and even the sowing of cereals more nutritive for animals.

After this short report on the general character of the vegetation in Petrosani Rayon, we will not endeavor to go into any more detail about the situation of the forests. We will however endeavor to discover the way in which man-made influences have been manifested in the distribution of the forests of this rayon and to note the ensuing modifications resulting from these influences.

In the course of the report we will make use of the map of the forests of Petrosani Rayon which we made on a scale of 1:100,000 by a reduction of the 19 maps in a production series which in 1950 had been raised to a scale of 1:20,000. Of this series 11 maps show the forests of the large forest unit of the

Petrosani basin (found in the Petrosani forest district) and 8 maps show the forests of the large forest unit (found in the Lupeni forest district).

For each of the respective districts there exists a map on a scale of 1:100,000 of the distribution of the forests which are printed in a uniform green color. This map, very schematic in spite of the fact that it is not very exact, does not give the composition of the forests in their dominant components.

On the other hand the map on a scale of 1:20,000 in 19 large sheets gives this composition in great detail, with the components being indicated in % and having many types of forests according to the dominance of their components.

We have copied all of these maps just as we found them and we have reduced the types of trees to only a few more characteristic ones. We recopied the maps on a 1:20,000 scale and united them. We indicated on the new map by particular colors the types reduced by us to 14 [sic]: (1) forests of beech (100%) or pure beech groves; (2) forests of birch (100%); (3) forests of spruce (100%) or pure spruce groves; (4) forests of beech mixed with birch; (5) forests of beech with spruce in equal proportions (50%); (6) forests of birch with spruce in equal proportions (50%); (7) forests dominated by beech (over 50%) with birch; (8) forests dominated by beech (over 50%) with spruce and pine or fir trees; (9) forests dominated by birch (over 50%) with beech; (10) forests dominated by birch (over 50%) with spruce; (11) forests dominated by spruce (over 50%) with beech; (12) forests dominated by spruce (over 50%) with birch; and (13) forests dominated by spruce

(over 50%). On the map drawn by us on 4 sheets reduced from 19, other elements have also been indicated: (14) forests in regeneration; (15) the protection perimeters of the alpine meadows; (16) enclaves (meadows, pastures, commons, cultivated areas, and degraded terrains); and (17) alpine meadows.

Since this simplified map is still very detailed and difficult to handle, we have simplified the trees much more in another map on a scale of 1:100,000, restricting them to the following: forests of beech or pure stands of beech; forests of beech (dominant) with spruce; forests of spruce and beech in equal proportions; forests of spruce (dominant) with beech; forests of spruce or pure stands of spruce; and alpine meadows.

This new map, devoid of elements which can be dispensed with for a geographic study of the whole, takes account in the legend of the natural progression of the trees by altitude and is more expressive and more easily handled.

We are of the opinion that if we could work in this way for all the rayons in the People's Republic of Rumania, we could obtain for the first time a sufficiently detailed map of the forests of Rumania at a scale of 1:100,000. This would be true even if from time to time, despite our control of the terrain, the forests should be cut down rapidly thus changing the situation from year to year.

In any case it would be an incomparably better map than the one made by D. A. Sburlan and I. G. Tanasache in 1930 on a scale of 1:800,000. The latter is the only one which we have on hand today. The proposed map would be a better

approximation of the actual situation than the map of the state forests of 1904 on a scale of 1:100,000.

In the studies which we have made in Petrosani Rayon we have tried to coordinate the information received from the forest districts and to complete it with our own observations.

Considerations of the Forests of the East Jiu Basin

As can also be seen from the adjoining map, the trees in the vicinity of the villages and around the city of Petrosani are for the most part defective. This is because of abusive pasturing and dereliction of the forests.

The former forestry exploitation of the Society of Petrosani and Lonea were made not only for pit props but also for firewood and charcoal. As a consequence of the removal of spruce wood from the mixed forests, the % of beech has increased in these woods.

The forest elements which make up the woods of this basin are, in decreasing proportion, beech (60%) and spruce (34%). The dominant element therefore is the beech. The beech has gradually taken the place of the conifers, sometimes constituting the upper limit of the forests (as at Polatistea) and being found over heights of 1,500 m.

The spruce grows spontaneously in some valleys, but is widely scattered even beginning at times at an altitude of 800 m. At an altitude of 1,000 m it forms a significant % of the woods and beginning at 1,300 m it forms pure stands.

Other species such as the fir tree, the maple, and the ash appear widely spread out in some valleys at 800-1,300 .

The pine and the locust trees are found on some degraded terrains in plantings made 20-30 years ago, at heights of 700-800 m.

Man-Made Modifications in the Production Units (Series) of the East Jiu

In Series I (between the Jiu rivers) the 30-year old woods are formed of pure though very fragmented beech stands into which seemingly artificially created birches have entered temporarily.

In Series II (Jigoreasa) the dominant trees in the woods are the beech stands (88%), which extend to 900-1,300 m and which constitute the upper limit of the forests toward Mount Jigorul Mare.

In Series III (Jupineasa-Valea Rosie) the woods consist of pure beech, then beech with scattered spruce, with which is made a transition to the alpine stage. In a wood lot toward the alpine pasture, however, there exists a mixed wood of spruce-beech type, but with the spruce dominant.

In Series IV (Valea Popii), as we have shown on the map and in profile 4, the staging of the forests is as far from normal as possible: beeches (750-825 m), beeches with spruce (825-1,200 m), spruces with beech (1,200-1,425 m), pure spruces which reach 1,950 m toward Surianu in the Taia Valley but most of the time occurring around 1,550 m, giving way to the alpine stage. Only in the middle of the unit is there found a large wood lot of pure beeches and in the intermediary zone beeches with spruce, which we point out as a natural regeneration through

beech as a result of the rapid cutting of the forests.

In Series V (Ausel) the situation is the same as in Series IV, with the difference that here the upper limit of the forests descends much lower (toward 1,500).

In Series VI (Rascoala) the beeches have almost been destroyed because of unregulated exploitation in the past.

In Series VII (Voevodul) the situation of the staging of the woods is normal (see profile 5): beeches (775-875) as far as the other side of Patrului brook, a tributary of the Voevod; beeches with spruce (875-1,000), pure spruces 1,000-1,600 m, where they give way to alpine .e

Normal also is the staging of the woods in Series VIII (Loliai-Cimpa) and especially normal in Series IX (Jiet) (see profile 6 of Jiet) where the woods are arranged thus: beech (750-850 m); beech with spruce (850-1,125); spruce with beech (1,125-1,225); and pure spruce (1,225-1,500), at which point the alpine meadows start and terminate on Paring Peak (2,529 m). The situation is the same in Series X (Maleia-Igvor). However in all of these series the beeches are very greatly fragmented in a sufficiently large range in the area of the human settlements which are strung out along the Jiu, but in Series X (Maleia-Igvor), the forest has had to yield ground to agriculture, especially on the wider (mountain) backs, in all depressions, and on all ridges with gentler slopes, being preserved only on the abrupt and sharp ridges. As a differentiation of this from the following series, Series XI (Polatistea) presents remarkable deviations in the sense that the beeches are those which terminate the forest at the alpine

clearings, although their upper limit is much lower (below Gropu Peak, which is 1,475 m).

Consideration of the Forests of the West Jiu Basin

The woods of the west Jiu basin are of spruce, of spruce with beech and then almost pure beech with small percentages of white fir, maple, ash, and particularly birch and willow trees. Today the beeches are dominant (75%). The woods do not have a natural staging but rather have been divided into a very variegated mosaic resulting from man-made modifications. In many cases it is not the spruces which terminate the forest toward the alpine bareness but rather beeches (because of the removal of the conifers). Around the peaks, on the high mountains, and especially around the exploited felling areas, regenerated or unregenerated, abusive pasturing practice dating back a long time has caused great injuries to the forest. The unregulated cutting effected under the bourgeois landowner regime and the great conflagrations here which have burned extensive surfaces of the forests have thus caused great damage to the forest massif of the West Jiu basin.

Besides the forests cut from 1880 on, from which some have been regenerated in a natural way into spruce and even more into beech, many portions are still unregenerated, burnt or dried because of the fires.

With small exceptions, all of the cuttings have been effaced, both for the spruce and the beech. For the extraction of spruce wood and the wood of several other valuable elements (maple, ash, etc), replanting of these trees is necessary. The increase of the % of spruce is imposed as much as possible because

the mines in this basin annually consume a great quantity of pit props (from conifers) without a possibility of reducing this consumption which without doubt will increase.

In view of the physical geographic conditions here, favorable to the development of conifers, the excessive proportion of beech which we have verified here in the West Jiu basin appears unnatural. The fact is explained if we assume that the conifers were cut out without restraint not only in order to satisfy the large requirements for pit props but also in order to meet the needs of the people for construction wood. The population is numerous in this basin but the regeneration of the forests, which in the past has been abandoned almost exclusively to nature, had been done only for beech, the other elements being unexploited.

Another contributing factor in the almost total reduction in some production units of the % of conifers has been the constant struggle waged by the inhabitants to control the limits of the alpine clearings, destroying by grazing and fires on extensive surfaces the stands of pure or mixed conifers which were situated below the natural limit of these clearings. For this reason in many parts and particularly toward the mouth of the basin the alpine clearing has descended below its normal altitude, even reaching at some points 1,000 m, as for example right near Uricani.

With few exceptions, the beech ascends here as far as the alpine clearing, and even as far as 1,500 m, with the forest vegetation breaking off abruptly without the usual transition through the subalpine stage of juniper trees and juniper thickets.

Wasting of the forests began long ago in the West Jiu basin, especially at the time when the population began to multiply. At that time the people had extended the terrain from the vicinity of their homes by deforestation at the margins of the forests, thus creating near their homes pastures which in some cases also included small portions of the forests. Similarly, pastures and meadows were also created in time even in the interior of the forests.

After the opening of the Lupeni coal mines (1878-1880), when the coniferous material necessary for the extraction of the coal began to be sought, there also began the exploitation of the forest. This in itself promoted the buying and selling of the forested areas which had been extensively exploited and spoiled. The former owners did not concern themselves very seriously with the reformation of the ruined woods or the regeneration of the exploited forests. They sought only to get as much profit in as short a time as possible. Therefore, due to the negligence of the bourgeois landowner regime, the proportion of conifers dropped greatly, their place being gradually taken by the beech while the remaining conifers existed only as mixed elements in certain production units.

In most production units of the West Jiu basin regeneration was completely left to the vagaries of chance. This regeneration was through beech mixed with new species and was valueless. Thus, it came about that the conifers which were the dominant elements, at about 50%, dropped to 21%, while the beech in turn attained an average of 78% in the whole West Jiu basin.

The productivity of the woods has dropped below normal over significant areas, because of the unregulated exploitation of the past, and because of the lack of improvements and the almost complete negligence of regeneration, so that today the wasted and degraded woods represent 22% of the entire forest area.

The forest elements which make up the woods are in descending proportion: beech (78%), spruce (20%), fir (1%, which also includes the pine), and various foliage trees (1%, which includes maple, ash, birch, locust, etc).

The dominant element is beech which has gradually occupied the place of the conifers because of the continued extraction of the latter, attaining a stage where they extend throughout the greater part of the basin as far as the upper limit of the forests and rising toward the alpine clearing, in some places to over 1,500 m in altitude. For the most part it forms pure stands toward the lower limit. Toward the village and city homes where the trees have been wasted or degraded, it grows with birch trees. In the upper part, especially in the areas which are difficult to reach and in which exploitation was less profitable because of the lack of means to convey the material by shoots from the forest, it grows together with spruce, which in some series toward their upper limit forms pure stands. White fir, maple, and ash are scattered in almost all production units, while pine and locust come from plantings made in the last 20-30 years on the old waste deposits (waste materials taken out of the coal mine galleries) as well as in the areas adjacent to the mouths of the mine of the Vilcan-Aninoasa production unit.

Man-Made Modifications in the Production Units of the West Jiu

In Series I (Straja), the dominant trees are beech (88%) which ascends from the lowest part of the forest (600 m) to the alpine clearing (1,550 m), forming for the most part pure stands. The spruce is poorly represented, growing in a mixture with beech and more rarely in pure stands, as for example towards the start of Balcia Valley and below Straja Peak and in some wood lots found in beech forests, where spruce plantings have been made.

The upper limit of the forests is natural. In places it has descended in a natural manner as a result of the abusive grazing and the numerous forest injuries which took place in the past in the time of the bourgeois landowner regime.

In Series II (Lupeni), the upper limit of the forests is formed of pure beeches or beeches mixed with spruce. To the south of Barbateni, in the middle of the beech forest, there is a wood lot of spruce with scattered beech, which indicates to us a very old planting.

In Series III (Siglaul Mare), the beech ascends from the lower limit of the forests (700 m) as far as the alpine clearing (1,650 m), forming for the most part pure stands. The spruce is mixed in with the beech. It is the dominant element only in stands which were artificially created by plantings as a result of the rash cuttings effected during exploitation, particularly in Valea de Peste and Valea Balomirului (1,100-1,700 m height). In this series there is a true mosaic of trees, with different trees dominant: pure beech, which are most numerous; beech with spruce; spruce with beech in equal proportions; spruce with beech in which the spruce is dominant; and

pure spruce in several p[illegible] the upper limit of the forest.

Just as variegated is the mosaic of trees in the fourth series (Oslea), having the same explanation. The beech ascends as far as the alpine clearing (1,700 m), forming for the most part pure stands. The natural type of the forests here had formerly been the spruce-fir-beech type. At the time of the opening of the coal mines this type of wood suffered modifications, becoming the beech-spruce-fir type, with a predominance of the beech.

In Series V (Plesa), the situation is the same. The alpine clearing descends a great deal (as far as 1,450 m).

In general, the bottom of the West Jiu depression towards the west has suffered important man-made modifications.

The longitudinal phytogeographic profile of the West Jiu valley, from Paltina Peak to Cimpul lui Neag (profile No 1) (These profiles are drawn and effected on the map of the forests of Petrosani rayon (Figure 1).) shows us the following situation: the alpine clearing down to an altitude of 1,700 m; spruce with beech (the spruce dominant) to 1,200 m; beeches with spruce (the beech dominant) to 1,150 m; and spruce with beech (the spruce dominant) to 1,050 m; from which point the pure beeches begin and continue as far as Cimpul lui Neag.

The transverse phytogeographic profile of this depression, between the Butea Valley (Custura Peak) and the Nedeuta Valley (profile No 2), shows us the following situation: in the [illegible]

Valley, the alpine clearing to 1,4 0 m; pure spruce, in small quantities to 1,225 m; beech with spruce (the beech dominant) to 1,025 m; pure beech as far as Jiu (1,000 m); again beech with spruce (the beech dominant) in Jiu on the lower part of the Sedeuta, to 1,02 m; then pure beech to 1,500 m, at the upper limit of the forest.

In Series VI (Bilugul-Ursasca) we find a mosaic of mixed trees. The alpine clearing descends a great deal, the forest being terminated by beech. The old spruce which are a half production cycle (over 25 years) are situated naturally, especially in the upper part of the forests, while the younger spruce, under 25 years, are coming into the majority as a result of the plantings.

In Series VII (Dealul Mare), the initial type of forest was beech-spruce-fir in which the conifers made up 30-40%. After the opening of the mines this type underwent profound modifications in the sense that the conifers almost completely disappeared, while their place was taken by the beech mixed with birch and willow. The beech ascends as far as the alpine clearing (1,600) forming pure stands. The spruce grows mixed with beech in the places where conifer plantings were made, and it is more abundant in the Mierlesasa Valley and the Serpilor Valley, 900-1,200 m in altitude. The forest clearings are scattered throughout this production unit. The limit of the alpine clearing is for the most part natural, descending because of fires, grazing, and abusive pasturing as far as the village homes, as for example near Uricani and Barbateni. The transverse phytogeographic profile No 3 shows us the following situation: the lowest alpine clearing (to an altitude

of 1,050 m.); from here down beech to 800 m., and to the north of Jiu to 750 m., representing the deforestation in the Uricani area.

In reference to Series VIII (Vulcan-Aninoasa), the last series of the West Jiu basin, the initial type of forest was beech-fir-spruce, but beginning with the opening of the mines (1860) of Lupeni and Aninoasa the % of conifers dropped constantly, their place being taken for the most part by beech which ascends up to the alpine clearing (1,400 m) being mixed here and there, as for example to the north of Lupeni, with conifers resulting from the plantings. To a large extent the beech have also destroyed them.

THE CONSERVATION OF THE LIMESTONE SLOPES AND DEGRADED TERRAINS OF PETROSANI RAYON BY PLANTING THEM WITH WILD LILAC

The struggle against soil erosion is one of the main objectives of the plan for the management of nature in our country, after the example of the Soviet Union.

Checking erosion cannot be realised except by the application of the Dokucaaev-Kosticev-Villiams complex.

An important link of this complex is the forestation of valleys, rivers, and unproductive places.

The great number of local natural factors which have an effect on the vegetation requires that the utilisation of the species should be very carefully determined. The over 2 million ha of degraded terrain in our country of different grades and shades, represents a mosaic which is awaiting a solution by the selection of species suited to the local conditions. Thus, for places with low or reduced moisture, xerophilous species

and species less exigent in relation to the nutritive substances of the soil must be used. Such species prepare favorable conditions for the development of more valuable species. Any action in this sense is a step forward toward the liquidation of erosion.

Studies made up to now by our silviculturalists have shown that the assurance of a forest vegetation in terrains with advanced erosion cannot be realized except by planting of the highest possible % of shrub species. Custo. has kept away from a series of shrubs which can grow on different types of degraded terrain, but observations made up to 1951 by Eugene Costin have shown that lilac has important protective qualities in eroded terrains. Therefore, up to last year this species was still used in such work even though to a small degree.

In reference to the fixing and improvement of degraded terrains of arid regions, it must be noted that lilac embodies a series of qualities which strongly indicate planting it on superficial soils and on hillsides.

Due to its density which comes from the sending out of suckers (as an example, 138 were found in one sq m) as well as the richness of its root system, the lilac covers a large mass of soil on which it settles and grows, thus giving the waters from the upper part of the slopes an opportunity to be absorbed and filtered into the soil.

The lilac is a less pretentious species in regard to stationary conditions. It is a xerophilous and thermophilous

plant, but can stand frosts of -25° to -30°. It is one of the species which starts to grow very early and finishes the vegetation period very late, a period of over 200 days. In all this time the lilac is spreading well over the soil.

By its abundant foliage it forms a large quantity of humus for the soil, thus improving the soil on eroded terrains. Having a great capacity for sending out suckers, it settles by growing on certain portions of terrain which represent extreme situations and on which vegetation in the initial phase of soil degradation could only be placed with difficulty. By the influence which it exerts over the surrounding area, due to the stretching of the suckers, it progressively improves the conditions of soil formation.

The presence of the lilac in such degraded terrains gives us in addition a pleasing green appearance throughout the greater part of the year and its beautiful and fragrant flowers change the aspect of these desolate districts.

The lilac can be used not only in the settlement of degraded terrain on inclined ridges, but also in the formula for the forestation of degraded terrain in the steppe and forest-steppe districts as well.

The introduction of the lilac as a shrub in forest culture was first made in 1942 in the Banat, on the shore of the Danube, within the range of the Bersasca forest district, and in the spring of 1948 in the experimental forest area of the ICES

-Baraganu Station.

As compared to its multiple qualities, lilac requires only a very little work in its cultivation, while the production of the material for forestation can be obtained in many ways, as from seeds, cuttings, and suckers (Eugen Costin).

Of the Mediterranean elements which exist in Petrosani Rayon, the wild lilac is the most characteristic. It grows in limestone and sandstone, in out of the way places, and with suitable ecological conditions in many more points in Petrosani Rayon (Figure 2).

Thus numerous bushes exist on the limestone rocks which have a southern exposure, such as on Paroasa (Fata Paroasei) from where the inhabitants of Cimpul lui Neag have taken and carried several samples into their gardens.

In the area of Paroasa and separate from the Bilugul River is found Fruntea Dodoconilor, on which bushes of wild lilac are also found growing. It is also found on the sandstone and conglomerate rocks near Uricani at the place called "In Borzi." Farther to the west of Cimpul lui Neag, wild lilac also grows in Plesea, not far from the Buta Valley in a burnt forest.

To the south of the West Jiu it is found in the Balomir Valley at an altitude of 1,150 m, on limestone in terrain with an eastern exposure. Because of the high altitudes, wild lilac flowers very late. Remnants of the flowers have even been found during the month of July in 1952.

In the East Jiu basin, wild lilac grows on the limestone rocks of Pestera Bolii, above the entrance to the grotto as

well as above the massif in which this grotto is found. The exposure is to the south, southeast, and east. Numerous bushes are seen here and on the hill from the face of Bolii Hill on the other side of Banita Brook.

It also grows on limestones in the Taia Valley at heights of 700-800 m.

Since in these localities lilac vegetates under optimum conditions, forming dense and high bushes, this is an indication that it should be able to be cultivated on all rocky slopes and especially on the limestone rocks of Petrosani Rayon, an indication which in this case should be utilized.

Similarly, the wild lilac of Petrosani Rayon being greatly cultivated on the limestone rivers should also be able to form the basis for a perfume industry, in which the coal minerals should also be able to contribute their share in regard to the synthetic perfumes.

THE PROBLEM OF THE APPEARANCE OF FOREST MICE AND THE DAMAGE CAUSED BY THEM IN THE FOREST MASSIF OF PETROSANI RAYON

One problem of Petrosani Rayon is that of the forest mice (Mus sylvaticus L.) which are injurious for the forests and which could cause great damages.

Thus, because of the mild winter of 1951-1952, and because of the abundance of acorns, the forest mice multiplied greatly in the spring of 1952.

In the fall of 1951 sowings of acorns were made in many parts of the rayon with a view toward the reforestation of the

forests, as for example, in the Valea de Peste. These sowings suffered much from the forest mice.

In the spring of 1952 the forest mice ate the young plants from the spruce plantings and the young beech plantings which had been regenerated naturally.

From the plantings the mice have invaded the meadows and again caused damage, chewing the grass and boring into the ground down to the roots.

During the summer the forest mice were reduced in number because they were eaten by hawks which had multiplied the following year, attaining a sufficiently large number.

PHYTOGEOGRAPHIC CONCLUSIONS

1. The flora of Petrosani Rayon is a central European flora with arctic-alpine irradiations on the alpine peaks of the adjacent mountains and with some Mediterranean elements in sheltered spots with suitable ecological conditions.

2. In relation to the physical geographic conditions of the depression, the vegetation is arranged in stages by altitude as follows. In the lowest parts along the rivers and particularly in the meadow of the 2 Jiu rivers, forests which are composed of white elements (alders, willows, and German tamarisks) are strung out along the rivers. Beech and coniferous forests extend over the ridges. On the alpine peaks, the alpine meadows are used as pastures. These latter need to be improved and even reseeded, since sharp and unnourishing grasses, such as Nardus, predominate in them.

3. The forests of Petroşani Rayon have been subject to a strong man-made influence, particularly at the time when the coal mines opened (1878-1880), and today the situation has changed a great deal as compared to the natural situation. Around the human settlements, the forest is wasted and devastated. The alpine clearing descends to a very low height, completely abnormally, as, for example, at Uricani, to 1,050 m. The beech are dominant and very often they and not the conifers terminate the forest toward the alpine clearing. Throughout the beech forests spruce appear, either in pure stands or mixed, often even in the lower part of the beech forest. These anomalies are especially observed in the West Jiu basin, while in the East Jiu basin the staging is much more natural.

4. The main cause of these anomalies is the extraction of coniferous wood, used as pit props, which has had the immediate consequence of reducing the number of spruce and making the beech predominant and has even had the result of a partial or total disappearance of the spruce in corresponding places such as the upper limit of the forests where today the forest is terminated by beech. Everything for the need of the coniferous wood, needed for the mines, has been appraised, and there have been effected afforestations with spruce, even in the beech zone. This was done to replace these elements with the conifers required for the needs of mining. Thus today the forests appear as mosaics variegated with stands of beech, interspersed with spruce stands regardless of altitude, even down to the lower part of the beech forest.

5. A secondary cause of these anomalies has been the elimination of the alpine pastures through abusive pasturing,

cutting, or burning of the forests toward their upper limits by the shepherds. This, together with the main cause (the extraction of the conifers in the upper part), has caused the limit of the alpine clearing to descend far below its normal altitude and even down to 1,050 m as is the case near Uricani.

6. Among the Mediterranean elements which exist in the forests of Petrosani Rayon is the wild lilac (Syringa vulgaris L.) which grows especially on the limestone slopes. Planting lilac on such slopes should create more utility for it than for any other forest element.

7. In recent years, the favorable spread of forest mice (Mus sylvaticus L.) has truly brought about a mass appearance of these mice. Because of them great damages have been caused to both the young trees and the young plants.

PROPOSALS AND RECOMMENDATIONS

The work which is required to replenish the forests of Petrosani Rayon must be in connection with and subordinate to the economic functions of Petrosani Rayon, that is, the mining industry connected with the important coal beds of this rayon.

It is necessary therefore that these forests, which today are for the most part of beech, should become coniferous by means of the energetic and sustained action of replanting coniferous trees.

The regeneration of the forests into conifers for the purpose of satisfying the requirements of the exploitation of the coal basin will have to be made by the application of measures recommended by forest technology, that is, by the

application of quick cuttings and planting a minimum of 70% spruce and pine, species which are the most sought in mining.

After the expiration of a production cycle (50 years), we will be able to create stands of conifers mixed with deciduous trees which will cover in good part and in a constant way the ever increasing needs of the coal mines. Through this replacement of elements we will be able to obtain the requirements which today are needed for the increasing extraction of coal. Thus more needed pit props will be obtained.

This task of reforesting, outlined in our Five-Year Plan, is being realized by the Petrosani and Lupeni forest districts which have developed nurseries of the existing spruce and which today are operating at full capacity.

For stopping erosion and fixing the soil on the limestone rocks, we recommend the planting of wild lilac which grows spontaneously on such rocks.

In the course of 1952 both spruce nurseries and young plantings of spruce and the beech seedings have suffered much from invasions of the forest mice. A sustained campaign will be necessary for the destruction of these harmful rodents. This can be done by the use of carbon disulfide, by seeds poisoned with strychnine placed at their holes, and by contaminating the mice with the typhus bacillus.

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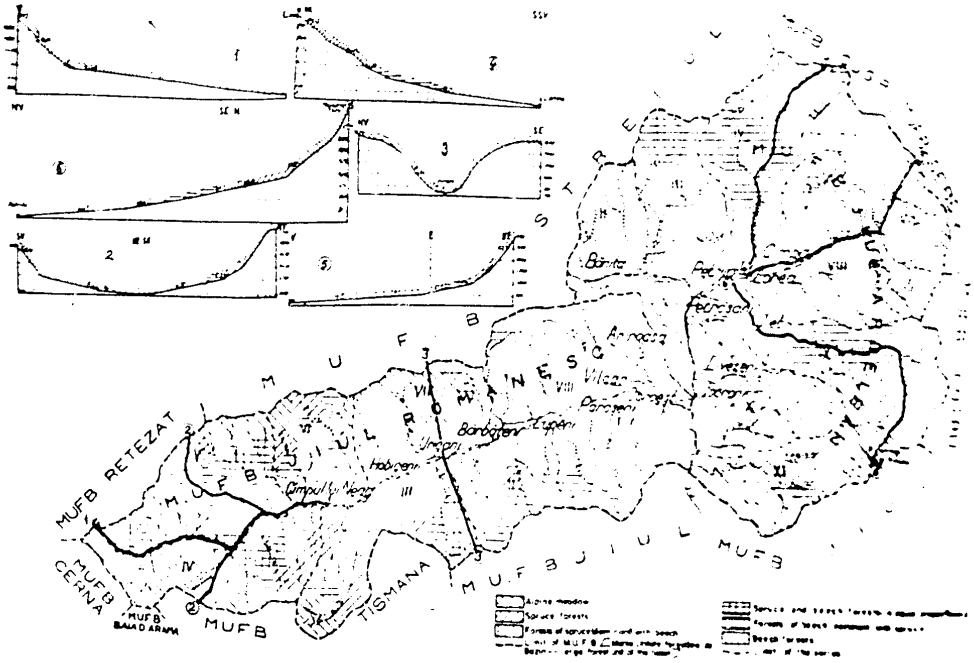

FIGURE 1 (CAPTION ON FOLLOWING PAGE

Figure 1. The Forests of Petrosani Rayon

The Large Forest Unit of the East Jiu Basin

I, Straja series; II, Lupeni series; III, Siglaul Mare series; IV, Oslea series; V, Plesa series; VI, Valea Ursasca series; VII, Dealul Mare series; VIII, Vulcan-Aninoasa series.

The Large Forest Unit of the West Jiu Basin

I, Inter-Jiu series; II, Jigoreasa series; III, Jupineasa-Rosia series; IV, Valea Popii series; V, Ausel series; VI, Rascoala series; VII, Voevod series; VIII, Cimpia series; IX, Jiet series; X, Maleia-Izvor series; XI, Polatistea series.

1, longitudinal profile of the East Jiu from the source to Cimpul Lui Neag; 2, longitudinal profile of the Nedeuta valley from source to the confluence with the West Jiu, and of the Butii valley from its confluence with the West Jiu to the source; 3, transverse north-south profile of Uricani; 4, longitudinal profile of the Taia Valley from the source to the issue; 5, longitudinal profile of the East Jiu from Lonea toward the source and then of the Voevod tributary as far as its source; 6, longitudinal profile of the Jiet from Petrila to the issue (Virful Mindra).

Figura 2 Distribution of the lilac (*Syringa vulgaris* L.) in Petroşani Rayon.

1. Frunţea Dodoconilor, 2. Parosaia, 3 Valea Bilegu-, 4 Valea Balomir, 5 Poiana Baii; 6 Valea Tau.