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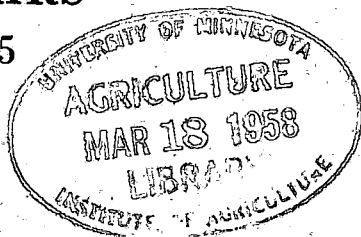
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**Agriculture
and Forestry:
Competition or
Coexistence?**

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FRANCE

IN a country like France, the development of which is very old, forest land only occupies a small part of the agricultural territory. Nevertheless, it must not be considered a mere relic of the past, inevitably doomed to diminish in importance and even probably to disappear altogether. On the contrary, it should be viewed as an instrument of production satisfying numerous needs which it alone has the power to satisfy.

Changes in the 'developed area' during the last century have been as follows:¹

(In thousands of ha.)²

	Total developed area	Land under cultivation		Meadows, grasslands, pasturage		Woods and forests	
		Area	%	Area	%	Area	%
1852	49,279	28,631	58	11,633	24	9,015	18
1862	50,279	29,392	58	11,570	23	9,317	19
1892	46,631	28,507	61	8,602	19	9,522	20
1912	46,689	26,720	57	10,083	22	9,886	21
1921	46,703	25,428	55	10,929	23	10,346	22
1938	45,270	22,740	50	11,775	26	10,755	24
1951	44,649	21,122	48	12,277	27	11,250	25

Thus, in the course of the last hundred years, wooded surfaces³ have gained more than 2 million ha., their percentage rising from 18 to 25 per cent. As grassland has also extended, it is solely at the expense of lands under cultivation that the advance of the forest has come about. Despite the imperfection of agricultural statistics, it would seem difficult to contest these conclusions. At any rate, the direction

¹ Taken from *Renseignements statistiques sur l'agriculture française* published by the Chambres d'Agriculture.

² 1 ha. = 2.47 acres.

³ Wooded surfaces are the only ones for which statistics can be prepared. To arrive at the total production of woods, isolated trees, trees planted in avenues, poplars planted along water-courses or around meadows, and, in particular, trees planted on slopes and in hedges, must be added. The latter are especially numerous in 'woodland' districts, where they literally form a 'sparsely sown forest'. 'Wooded surfaces', then, minimize the real rate of wood growth to an extent which is impossible to assess but which is certainly not negligible.

of the movement is recognized by everyone and it is probable that the near future will bring a continuation of the process. Since the end of the Second World War, a vigorous effort to intensify the work of re-forestation has been agreed upon and an instrument for its realization has been brought into play in the form of the Fonds Forestier National (National Forestry Fund). This has succeeded in reforesting over 50,000 ha. a year,¹ and it is hoped that in twenty years it will increase the forest area by a million ha.

It would seem that this movement of public opinion in favour of the tree can be explained by two sets of reasons. Firstly, an economic reason: the war brought about a greater demand for wood than the forests could produce and their impoverishment needs to be made up. Also, the need for wood, which at the beginning of the century seemed to be an outmoded raw material, is today continually increasing. Wood is the origin of paper and, under new forms, is increasingly utilized by industry. Every year, recourse is had to costly imports.²

To this economic reason must be added one which we might class as geographical: forests constitute an essential factor in the maintenance of the fertility of soils and even of their existence. It is no doubt true that the majority of French soils do not suffer from erosion. A temperate climate, gradients which are often moderate and prudent methods of cultivation account for this. Erosion has only made spectacular ravages in the mountainous regions and, during the second half of last century, foresters made a very considerable effort to arrest it. But besides the fact that this localized effort must be continued and intensified, the adoption at the present time of rougher methods of cultivation, and the search for higher immediate productivity, have brought the question to the fore again. Recent progress in soil investigation has shown that from 4 to 5 million ha. are at present affected by erosion, its intensity increasing progressively³ from NW. to SE. (from index 40 to index 150). The experience of other nations shows that it is essential to be extremely vigilant and to take action without delay.

To try to form an idea of what the future may bring, it may be use-

¹ From 1 January 1947 to 1 January 1954 425,000 ha. have been reforested or enriched.

² In 1953 these reached 49 thousand million francs (average exchange rate for 1953 £1 = 982.76 francs); it must be added that they included 22 thousand millions of 'materials for paper manufacture' and that exports, on the other hand, represented 45 thousand millions. The deficit is thus essentially due to purchases of paper pulp.

³ See the frequency map of erosion by water drawn up by Henin and Gabillot, of the Laboratoire des sols de Versailles, and published in the *Bulletin des Chambres d'Agriculture*, supplement to No. 26 of 15 April 1953.

ful to glance at the past quantitative relations between forestry and agriculture. Unfortunately we lack definite data and have to content ourselves with hypotheses.¹

The most original is that described by Gaston Roupel, the historian. For him 'the frontier of the forest would still be that whose foliage rustled in the presence of the first human labours'. The great clearances would date from the Neolithic Age, continuing to the close of the Bronze Age. They would have practically ended with the Iron Age and, in the course of the centuries known to history, the tree would have prevailed over crops. The Gallic and Germanic invasions, the Norman Conquest, the troubles of the fifteenth and sixteenth centuries and the wars of the seventeenth century would have favoured the advance of the forest which today is probably more extensive than at the beginning of historical times. It is true that forest clearances have not been absent from history, those, for instance, of the monastic Middle Ages and those of modern times, but, by and large, they have not been sufficient to compensate for the advances of the forest.

This theory has found more opponents than followers. Most thinkers consider that great importance should be allowed here to the demographic factor: a multiplication of the number of individuals forces them to undertake forest clearance for the production of the cereals and vegetables they need; a reduction in numbers, on the other hand, leads them to abandon fields which have become useless and these, given certain conditions, tend to reforestation naturally. Thus an author of considerable weight, Huffel, writes in his *Histoire des forêts françaises* that ancient Gaul, only a century before the Christian era, would have shown a degree of afforestation of 65 per cent. which persisted without any great change until the ninth century. From then onwards, the demographic increase would have caused clearings; the rate would have fallen to 24 per cent. in the fourteenth century and to 15 per cent. at the end of the eighteenth (the figure calculated by the Englishman, Young, based on Cassini's maps). Since that date the rural exodus has brought this rate back to its present level.

This brief historical account shows that the extent of forest lands is a changing thing and that it is essentially determined by man. It is the importance of the services he requires from the forest that regulates its size, and that importance depends both on the number of men

¹ They are very clearly set out by M. Messines, Inspector General of Waters and Forests, in the report presented to the Congrès National du Bois 1953-4 (Limoges, Clermont-Ferrand session, report, *Le reboisement en France*).

and on the nature of the needs which they consider can be satisfied by the tree. Such factors themselves depend in turn on demographic and technological changes.

I. *The traditional equilibrium*

At first sight, the forest appears as the enemy of agriculture, occupying lands which could be exploited. In actual fact, however, it renders agriculture immense services, the consideration of which has continually led agriculturists to preserve a part of the virgin forest or to create a forest plantation where none existed naturally. What services have they demanded from it for centuries?

The agriculturist sees in the forest a source of raw materials. It is there that he finds the fuel which enables him to prepare his food and warm himself during winter. It is there too that he finds the wherewithal to construct and repair his dwellings and his farm buildings, to manufacture or repair some of his simple equipment and tools. The importance of this kind of service is growing less but, even today, is far from trivial.

The agriculturist sees in the forest a source of fodder for his animals. The tree's power of growth, due to the depth of its roots, enables it to resist droughts; during the summer the forest continues to provide green leaves and grasses while in the fields everything is burnt up. The fact that until the end of the eighteenth century the forest was the principal pasture land, and in numerous regions has remained so until today, is well known. Where artificial grassland has been introduced and developed this function of the forest has eventually disappeared, but the tree still remains a valuable auxiliary of stock-rearing: the hedges and the clumps of trees provide economic tending of the animals and ensure their protection against undue wind, heat, sun-stroke, or rain. This is evident in certain mountainous regions, such as the Jura and the Alps, where the kind of growth known as *pré-bois* is found.

The agriculturist sees in the forest tree a possible fruit producer. The 'fruit-bearing forest', generally sparsely planted, can supply him with an important part of his food. The chestnut has proved a particularly valuable tree in this respect. The walnut tree has long constituted the principal source of oil for temperate zones and has discharged the same function as the olive in Mediterranean regions. From the point of view of nutriment, the acorn harvest has long supplied the droves of

pigs with food, if not for their fattening, at least for their 'getting into condition for Christmas'.

The agriculturist sees in the forest a source of monetary returns. This is particularly true of the land-owning agriculturist who possesses wooded plots. If their extent allows of regular exploitation by felling, an annual return accrues, which is added to the returns from fields and pasture lands, forming part of the aggregate and normal working revenue. If the wooded area is smaller the fellings are spaced out and can be relied upon to meet those unforeseen heavy expenses which always crop up some time or other in every human life. The tree may be said to serve the peasant as a savings bank. The agriculturist, whether landowner or not, can also obtain certain returns from the forest by undertaking the transport, on behalf of a tree-grower, of the product of his fellings; in certain regions, such haulage work considerably improves peasant finances, although the costs (the wear and tear of beasts and materials) are by no means negligible. Or again, a cultivator or simple employee working as a day-labourer finds opportunity in the forest for paid work. Whether he shares in the work of felling, or is taken on temporarily in a sawmill, the result is an increase in his resources. This aid which the forest supplies is particularly appreciated in regions where the length of winter causes agricultural unemployment.

The forest in relation to the local community. It is increasingly apparent that environment exercises a profound influence on the level of population. According to whether it is deprived of all conveniences or offers the material advantages of modern life so it repels or attracts inhabitants. Now, present-day comfort presupposes community equipment which is always costly—only those communities possessing the necessary resources can provide themselves with it. In rural communes, local taxation generally brings in only sparse returns, the State reserving for itself the yield of the more productive taxes. In practice, therefore, only those communes which own important forest areas can avail themselves of comfortable budgets contributed by the product of the fellings. They alone, generally speaking, prove capable of facing heavy expenses for equipment without having to overwhelm their inhabitants with heavy 'additional centimes'.

This is what M. Velay, Inspector of Waters and Forests, finds: 'In numerous regions of semi-mountain, we find that the hamlets which remain active are those which have at their disposal four fundamental riches: a road, electricity, water, the right to cut firewood. *The forest,*

*thanks to the extraordinary resources it procures for local finances, enables the upkeep of the road to be covered, and the expenses of conveying water and electricity to be faced.*¹

Thus, the forest is obviously an important agent in the financing of modern social equipment and an effective factor of consolidation of the rural population.

The forest in the national framework. Here again the forest, even if remote, is far from being a matter of indifference to the agriculturist. By its very presence it constitutes a factor in the good health of the soil, which it holds firm by the roots of its trees and enriches with humus from its leaves. Thanks to the forest, the earth remains on the sides of mountains and the output of water-courses is regularized. Thanks to the forest, the plains can be put under cultivation without risk; the crops will not perish, cattle and men will not be drowned as the result of devastating floods. Tens of millions of Chinese peasants die on their immense river plains which are periodically submerged; they pay with their lives for the absence of forests on the mountains where their mighty rivers rise.

Thus an equilibrium between forestry and agriculture has been established. The forest has not disappeared in favour of the cultivated field, either because man did not experience the need of extending his work of clearing, or because his strength did not allow him to do so. Demographic pressure has been the principal active factor; any increase in this pressure resulting in a receding of the forest, any slackening bringing about its extension. What fresh factors intervene today?

II. *Fresh factors*

The extent of forest land is influenced by many factors at the present time. For instance, man has recourse more and more to printing and in this way uses more and more wood. This probably constitutes one of the more active motives behind reforestation today. But apart from indirect considerations of this kind there seem to be four important factors which affect the equilibrium between field and forest.

1. *New techniques for working the soil.* Methods of working the soil have been fundamentally transformed by the appearance of the tractor which has placed fresh possibilities in the hands of man. He can obviously make use of such possibilities to extend the areas worked

¹ Congrès National du Bois, 1953-4—report, *Le Plan de reboisement français*.

and, in fact, he generally finds that he does not manage to use his tractor to the full over the areas which he is exploiting. He finds there is free time for himself and his equipment. Sometimes he devotes such time to working on his neighbours' land, or he can try to extend his cultivation to lands which have hitherto remained unworked. This extension of the cultivated land does not take on imposing proportions; it remains accidental and sporadic, and is only carried out on poor land. Moreover, it is rarely undertaken to the detriment of the forest, the mechanical clearing of which presupposes equipment quite different from the simple tractor. It is generally done at the expense of moorland, scrub or wasteland, that is, at the expense of the more deteriorated types of forest. It is pasture land rather than timber-producing land that is encroached upon. But where the new techniques can be used to best advantage is in the direction of reafforestation. They make it possible to give the soil a thorough preparation for planting by clearing away undergrowth and working the soil throughout or in strips. Man's capacity for reafforestation is thus multiplied. Not only can he plant more land but he can do so in better conditions, thus increasing the chances that the plantations will strike root. The quality of the work is substantially improved while its cost is considerably reduced. That man is going to be ready and willing to use new possibilities for the production of fresh plantations is exemplified by a group of agriculturists who have recently purchased a good deal of equipment to cultivate their land and have left no stone unturned to find additional work so that their machinery may be used to the full and its amortisation facilitated. The group found that the timber yards of the Fonds Forestier National could offer them very valuable supplementary work while they were able to profit from the advice of the local Forestry service.¹ So far as working the soil is concerned, the new techniques seem to have to be used more for forestry than for agriculture.

2. *The recognized importance of humus* constitutes another factor which can hardly be over-estimated. A particularly competent technician, M. Kuhnhotz-Lordat, recently wrote² that 'forest land has two essential roles to play today: to protect the soil and to create organic matter'. Insisting on the second point, he affirmed: 'The exaggerations of the mineral theory, presented as a panacea during the

¹ Durieux, Engineer of Waters and Forests, Congrès National du Bois 1953-4; report, *Les Problèmes d'application des techniques modernes de reboisement à la propriété privée.*

² L'équilibre agro-sylvo-pastoral, *Terres de France*, 1954, No. 5.

Second Empire, are now obvious. We hope, with all those who have the preservation of the lands of France at heart, that the abuses promulgated by Liebig will be clearly recognized.' He regards the forest as a particularly valuable source of organic matter. Discussing the subject, he writes,

What plants, productive of dead or living organic matter, are or will be utilized? That depends on regional resources. It should be pointed out that close associations have been solidly established, among others, between the agriculturists of the Roussillon 'huerta' (i.e. cultivated land) and the straw producers of the Lauragais; between the vine-growers of the littoral and the owners of the Phragmite marshes (common phragmites or marsh reeds). The rights of users over the litter and deadwood of the forests have no other reason than the transfer of the organic matter of the forest to the field.

He instances those countries which practise a variety of cropping on the humus left after forest felling: 'It is in these very countries that the technique of agricultural nomadism reaches its culmination. The forest is then incorporated in the rotation as a phase for the recuperation of the organic matter. And it is required to produce dead leaf and brushwood which decomposes easily.' But, as he continues, 'plenty of space and conditions of temperature and humidity favourable to rapid growth are necessary'. In actual fact, one of the present authors personally knows two instances of such a rotation in Brazil, in the State of São Paulo. If such a practice had for long seemed not to be practical in France, the fires which in 1940 and 1950 destroyed almost one-half of the forest massif in the Landes called for a reassessment of the problem in the direction of ensuring the presence of zones of cultivation which would serve as fire-barriers. On these zones, which would necessarily be small enough to ensure an intensive agricultural production, it is proposed to bring back the forest into the cycle of cultivation.¹

3. *Fodder intensification can be a factor in the new equilibrium* between pastoral agriculture and forest. So long as such agriculture is carried out in an intensive manner, very large areas in the form of pasture lands and grazing are necessary. In mountain territory they may easily become immense and they are generally established on slopes, i.e. on ground the declivity of which exposes them to erosion. This would call for afforestation were it not economically impossible, for

¹ Cf. Sargos, *Les Landes de Gascogne et la culture des Pins Maritimes* (from the author at Aureilhan par Mimizan (Landes)).

the reason that it would very considerably reduce the number of grazing animals and, consequently, the cultivator's returns.

Everything changes immediately we pass to intensive methods where the same number of animals can be maintained on much smaller areas and land can be released for afforestation. Intensification of this kind would seem to be both demanded by present-day economic conditions (the smaller areas facilitate enclosure and reduce herding expenses) and made possible by contemporary techniques (the working of the soil made easier by tractor, the transport of fertilizers made possible by improved networks of roads and highways and, in the mountains, by the multiplication of cable transporters).

Intensive exploitation of grassland would thus allow of an adequate life in the case of small estates. Examining the region of the High Plateaux of the Corrèze, M. Roche, Inspector General of Agriculture, considers¹ 'that the typical farm of such regions could comprise a total area of about 40 ha., of which 20 would be in woodland and 20 under cultivation, including grass. Normally cultivated, it could maintain a weight in living animals of 500 kg. per ha.—for instance, a score of horned cattle to which a round ten of pigs could be added. Such a farm with its 20 ha. of forest in production is economically workable.' He thinks that 'this theory is confirmed by facts and we can already begin to see in many regions, classed as pastoral, a departure from the classic system of summering in mountain pastures, the cattle being kept the whole year through on land near the farm'. M. Roche thinks that under these conditions 'the forest should normally encroach deeply upon the great pasture tracts, without any inconvenience for animal production. But it is still necessary in many cases to improve the access by vehicles to these border areas which are both pasture and forest.' He concludes: 'Thus the search for agro-sylvo-pastoral equilibrium with its different aspects varying with the locality implies at the outset the carrying out of a simultaneous effort of afforestation and of the application of modern cultivation techniques, more especially those which concern the production of grass.'²

Thus, fodder intensification, by reducing the amount of land

¹ Vide, *La Recherche d'un équilibre agro-sylvo-pastoral dans la Métropole*, Congrès National du Bois, 1953-4.

² The solution, ingenious as it is, meets certain obstacles: the tree cannot live above a certain altitude and the intensification of meadows at high altitudes raises difficulties of transport.

needed for stock-rearing puts fresh areas at the disposal of re-forestation. The new equilibrium will be characterized by a higher proportion of forest.

4. *The desire for demographic deconcentration.* It may be recalled briefly that the nineteenth century and the beginning of the twentieth saw a strong centralization of population with people tending to agglomerate at certain points. Such points were those favoured by richness of soil or subsoil or by geographical situation which made commercial relations easy. As a counterpart there was depopulation of other regions. Experience has shown that such inequality in the redistribution of the population offers more inconveniences than advantages, and for twenty years now efforts have been made in various directions to counteract it.

This situation has a bearing on the forestry problem. For a long time now some foresters have been principally preoccupied by the technical aspect of reforestation and by the idea that, since the cultivator and especially the stock-raiser are born enemies of the forest, it was prudent to make their points of contact with it as few as possible. Thus there came to be mass reforestations, where the tree was supreme and whence men had been driven away. Present-day forestry teaching in France runs counter to such a policy and affirms that men should continue to live among the trees, for their mutual good.

Thus M. de Vaissière, Reporter General of the National Forestry Congress, wrote in 1953:

Just as it would be prejudicial, when the pressure of rural population requires an extension of crop cultivation, to devote too much space to forest, for such a policy would be in danger either of ending in failure by the destruction of the plantations, or of ending in a mass rural exodus, so it would be illogical, and this has been seen in the past, to expect that all the young hands should leave the farms in order to reforest the abandoned fields, for the return to the land is a slogan, and a forest without an active population to protect and exploit it, is dead riches.¹

At the same Congress, M. Messines, Inspector General of Waters and Forests, defended the same thesis:²

A case like that of Mont Ventoux, where an integral reforestation, crowned with success, has brought about the total disappearance of pastoral life and the abandonment of the villages, should not be renewed. Reforestation can fill the empty spaces of a region which is in process of depopulating itself, but it must

¹ *Rapport général au Congrès.*

² *Rapport sur le reboisement en France.*

not encourage the departure of the last inhabitants. There again, an equilibrium should be observed. The forest should be inhabited; it should be intersected by clearings of cultivated land. It should be watched for and defended against fire. It is in the great quasi-desert masses that fires start and are not fought.

And lastly M. Roche affirmed on the same occasion: 'The forest should facilitate the spread of human population and not destroy it.'¹

This preoccupation with the organizing of a populated forest involves primarily a regular and methodical exploitation of the fellings, thus ensuring regular work for the men, as opposed to the 'cutting of trees off at the roots' which only gives rise to temporary work. It further presupposes cultivated clearings, i.e. a certain sacrifice of the wooded area.

Conclusion

The fact that the question of agro-sylvo-pastoral equilibrium should have been debated at the last National Forestry Congress shows how much it is preoccupying thinking men. It is the more topical too in that it concerns very closely the territories of the Union Française. The same Congress discussed reports on the search for agro-sylvo-pastoral equilibrium in North Africa and in French West Africa.²

But even in the Metropolis, where the problem is less acute, men's minds are everywhere aroused. M. Velay instanced the following facts to the Forestry Congress:

In the Champagne district which is chalky, the Committee which has just been set up for the development of the district is contemplating the planting of screens of forest, in order to ensure the maintenance of areas which can be cultivated. Without such screens, the wind would tend to destroy not only the crops, aggravating the inadequacy of their water intake on land already naturally dry, but also the soil itself, the fine elements of which it carries away with considerable force. Similarly, in Burgundy, the vine-growers endeavour to rewood the upper part of the vine plantations, to protect the vines against the frosts.³

In much the same way, an experiment of the greatest interest has just been carried out in the upper basin of the Agout, a sub-tributary of the Garonne, which rises about 1,100 m.⁴ in the Espinouse massif.⁵ The estate of Grandsagnes, 363 ha., which was on the point of being

¹ *Op. cit.*

² Reports of M. Challot and M. Bellouar.

³ Rapport, *Le Plan de reboisement français.*

⁴ 1 metre = 3.28 ft.

⁵ J. Prax, Le rétablissement de l'équilibre agro-sylvo-pastoral et la mise en valeur forestière du bassin supérieur de l'Agout. *Annales de l'École Nationale des Eaux et Forêts et de la Station de Recherches et Expériences*, 1951, pp. 469-519.

abandoned, has been acquired by the State which is in process of creating there a pilot farm and a *sylvetum* which will enable the behaviour of the principal species of tree capable of being used in the region to be studied. It was necessary as a preliminary to decide on the use of each piece of land. The following table shows the profound transformations which have been made:

Land Use

	1939	Present aim
	per cent.	per cent.
Sylva*	28.05	63.7
Extensive Ager*	25.10	..
Extensive Saltus*	28.10	..
Saltus under mowing	18.75	8.3
Intensive Ager	13.7
Saltus (with pasture)	14.3

* *Sylva* indicates everything which supplies wood, *Saltus* any pasture land, and *Ager* the various cultivated crops.

Thus a doubling of the wooded area is envisaged, but also an intensification of cultivation and of the production of grass. The number of cattle reared will thus be maintained and even increased. Such at least is the expected result.

These calculations rest essentially on the concept of the so-called 'natural vocation of soils', a concept which responsible authorities use with considerable caution. For instance, at the First National Congress of Rural Life in the Mountains, which was held at Paris in March 1952, M. de Vaissière was able to report:¹

The place to be reserved for the forest must only be determined after a profound study not only of the actual conditions of the area, but of the evolution to be envisaged, notably from the demographic point of view, once the desired equilibrium has been attained. I have deliberately refrained from using the expression 'lands with a forestry vocation', for I consider it difficult to assign to a particular plot of land a definite and unchangeable destiny, from the very fact that agriculture is linked with silviculture, and that neither should remain within a narrow framework, but should be adapted to the evolution of techniques and markets. The development of a piece of land by reforestation can be made necessary not only by technical reasons, such as the necessity of restoring a deteriorated soil, but for economic or financial reasons, with a view to creating new wealth or satisfying certain needs and to maintain the population, which amounts to a social aspect of the question.

On the other hand, one of the highest forestry authorities in France,

¹ Rapport sur *Le Role du reboisement et de l'équipement des forêts dans l'économie montagnarde*.

M. Ph. Guinier, understands the word 'vocation' in a more precise sense:¹

There is in the mountains a fundamental notion, that of the 'vocation' of different parcels of land. By the very fact of the condition of local climate and soil, and also by the fact of its situation and relief, each parcel of land of a mountain region has a more or less marked aptitude for a given economic use, agricultural, pastoral or forest. Ecological research and floristic investigation enable this vocation to be exactly determined. Despite the disturbances resulting from human action, the botanist can, by study of the vegetation, determine whether man has done well or ill in bending nature to his service. It is possible to establish a rational development of the territory of a commune, and to make a logical and economically advantageous distribution of agriculture, of pasture land and of forest. In the mountain, as in the house, it is essential that each thing should be in its place.

This writer then insists on the static aspect of the idea of 'vocation' because he gives it a basis which is primarily botanical. The former insists on its dynamic aspect, because he brings into play economic factors and those which are, properly speaking, human. The two conceptions are perhaps complementary rather than opposed to each other, and can furnish a useful directive when it is required to determine in a given region the point of equilibrium between agriculture and forest.

¹ Botanique et économie rurale en montagne. *Bulletin de la Société Botanique Française*, 1950, tome 97.