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THE problem of justified appraisal of agricultural soils is of great importance for agriculture and land ownership, for this appraisal is concerned with agriculture as a production process and as a source of value and, consequently, should take into account the natural local factors, the soil included, as well as the economic, social, cultural, and psychological influences of man and society.

The problem of justified appraisal is a difficult and complicated one, but, nevertheless, it is highly attractive. It is pre-eminently the field of agricultural synthesis: it ascertains and weighs the inter-relationship of science, knowledge, experience, and observation of the individual facts and phenomena. Also, full justice is done to techniques, economics, and sociology, which are included in harmonious connexion. In this field of research, analysis is always followed by synthesis.

So, fundamentally, the appraisal process ranks higher than many a branch of agricultural science, where only some detached phenomena are analysed and studied without regard to the entirety of the farm and its relation to the social and economic environs.

Whereas, from the scientific side, in central Europe and in the United States of North America much attention has been paid to the appraisal process, it is remarkable that there lies an area between the Wadden Islands (north of the Netherlands) and the Riviera, where little, if any, interest is shown in farm appraisal. Typical is the remark of a French agriculturist: 'La valeur de la terre ne se calcule pas, elle se constate.'

I shall start with a description of the various theories of appraisal.

(a) In the first place mention may be made of the capital method, by which the soil, buildings, and stock are valued separately, regardless of the fact that the net return results from the conjunction of all capital elements.

The science of farm management, which, as early as last century, rightly distinguished between the return value and the exchange value—which, for instance, was set forth in the work by von der Goltz at the beginning of this century—strongly underwent the
influence of the purchase-price theory. The great advocate of this theory was Aereboe.

(b) The adherents of the purchase-price theory declared the theory of the return value to be a utopism, as, in their opinion, it was impossible to deduce values direct from returns, it being absurd to assume values which may develop independently of the prices determined by supply and demand.

According to the purchase-price theory it is not right to consider the return a primary, and the capital value of the land a secondary, factor. For the cultivated soil does not yield returns without more, but only when, capital and labour are applied, the returns then being in proportion to this application. So the outlay is a primary factor and the return should be placed on a secondary plane.

At present, however, the view is held that the admissible costs (intensity) depend on the possibilities of return in yield or in returns. So the costs should be based on the returns and, in consequence, are secondary.

The purchase-price theory involves the exclusion of return calculations in the appraisal of property, as the price determined by supply and demand is the only criterion.

The following disadvantages attach to a one-sided application of the purchase-price theory:

1. The formation of purchase price is often affected by circumstances which are isolated from the object under consideration. In this connexion may be mentioned the need for capital investment.

2. The purchase price is influenced by irrational factors, especially when there is a small supply and a heavy demand.

The influence of these unweightable factors can only be ascertained by calculating the return value, which cannot be done by means of the purchase-price theory.

The purchase-price theory tended to lead the appraisal procedure astray, as in practice this theory strengthened the influence of the intangible factors and of the general economic condition with its speculations and investments. Therefore this method brought in its train uncertainty and dangers for agriculture.

(c) Finally, according to the theory of the return value the soil is used by agriculture, because it yields a certain return and any soil appraisal should primarily be linked up with the size of this return, with the farm economic value of the object, and with its net rental value. The whole complex of ownership rights aims at only one
thing: return or income. 'Income is the alpha and the omega of economics', says Prof. Fisher in *The Theory of Interest*. And after rejecting with Böhm-Bawerk the costs method of valuation he defines value as follows:

'The value of the good itself is the discounted value of the value (however determined) of its future services. It is true, the crop depends on the soil that yields it. But the value of the crop does not depend on the value of the soil. On the contrary, the value of the soil depends on the expected value of its crop. Therefore, our valuations are always expectancies at the same time.'

The concept return value is important, because in determining it an adequate remuneration for the labour of the farmer and his family as well as for his working-capital is taken into account.

The individual or subjective return value based on the farming results of the holding to be appraised, and obtained through capitalization of the average annual rental value, reflects as such the abilities or disabilities of the farmer and for that reason is not a generally usable yardstick for value. But the average or objective return value does provide such a standard. As the determination of the objective return value is based on a number of analogous farms and ordinary farm management, the subjective influence of the abilities of the farmer is eliminated.

The sale-value is generally in excess of the return value, especially in the case of smaller holdings. The causes of this are the following:

(a) the unbounded competition among the great number of intending buyers of land;

(b) the small farmers have less regard to the remuneration of their capital and labour than to the opportunities offered by the farm for utilizing as well as possible the labour of the members of the family, and of redundant and less able-bodied labour;

(c) the attraction of the soil as safe investment which appears from the bidding of too high prices as compared with the rentals. So this provides an extra investment value;

(d) the imponderabilia, or intangible factors such as favourable situation, love of the soil and the parental farm, attractive farmhouse, home-uses, amenities, *valeur d'amateur*.

In addition to amenities the nearness to definite centres may also have a real economic basis, owing to greater purchasing-power of the same net return.

In the practical valuation of the purchase price, starting from the return value as resultant from the production process, it will be
necessary to ascertain in what measure special factors such as those mentioned above may be taken into account.

Too high valuations, however, lead to encumbrance with debts.

As early as in the time of free exchange a method of valuation was employed to calculate ordinary exchange values with the aid of capitalization. For this purpose the so-called natural capitalization rate was used, which was deducted from the real ratio of purchase price and rental.

This natural capitalization rate was subject to great fluctuations in time and space and was linked up with prosperity and purchasing power, the labour supply in the country, the situation and nature of the object. In favourable conditions a low capitalization rate is found, in unfavourable circumstances a high one.

Attaching to the natural rate of interest of free exchange, however, are all the subjective features which may present themselves in the formation of prices, viz.

1. Lack of money on the part of the seller.
2. The pecuniary resources of the purchaser.
3. The number of intending purchasers.
4. The need for housing on the part of the buyer, &c.

So the natural rate of interest reflects a variety of factors, which are in no way related to the return value or even conflict with it.

In view of the investment policy of the investors, as of the large lessors, who are sure to take into account the general rate of interest, especially in view of the impossibility of fixing the various rates of interest in the event of price control, it would not seem unreasonable to base the capitalization of the rental for calculating the return value on the general rate of interest or on the rate of mortgage interest.

A deviation from the general rate of interest would now be quite arbitrary. In this case proper allowance should be made for the special value elements we wish to recognize over and above the return value.

In Switzerland, a weighted mean of the rate of interest of the first and second mortgages on farms is taken as a capitalization rate, in the U.S.A., it is confined to the rate of interest of the first mortgage. The rate of capitalization is changed only when the change in the mortgage rate is relatively permanent. Because the investor may choose between investment in mortgage and in land there must be interplay between the two rates of interest. According to these views the rate of interest which is used in ascertaining the value should be the same as the rate payable by the farmer for the part of the purchase money he has to borrow.
As the acquisition of a house is a very attractive feature, the rate of capitalization need not exceed the mortgage interest. So the greater amount of risk run by the farmer with regard to investment in mortgage is compensated by the possession of a house.

In practice the return of land will sometimes be lower in consequence of an anticipated increase in value of land and in consequence of the influence of the intangible factors.

Logically, the return value theory leads us to consider the soil and soil productivity by the side of a judgement of the other factors which determine the net return and the rental value. In this connexion the place and the significance of soil science for appraisal should be determined.

A relationship between the types of soil and the rental and soil value considered over a large area cannot be expected to exist, because agriculture is not soil science, but a variegated production process in which an interplay of innumerable factors brings about the realization of the net return. The soil constitutes only one of these factors. To a certain extent agricultural technique, which has made great strides, liberates us from natural circumstances, especially in horticulture and in cattle farming.

Side by side with the soil may be mentioned as important natural factors the climate, the micro-climate, topography, and hydrology. Further, farm economics has shown that the net return and, in consequence, the rental and soil value are most strongly affected by the type of farming. With regard to the latter, reference should be made to the difference in net return per acre and the difference in soil value between horticulture on the one hand and pasture and arable farming on the other.

The fine restricted soils for horticulture have only a slight exchange and rental value when they are destined for carrying on extensive pasture farming, and no value at all when they are covered with native forests as was the case in olden times.

So we must not overrate the significance of the factor of soil for the holding and its value. We should put it at its true value, as befits a good appraiser. The overrating of the soil factor by practical experts may be due to its conspicuousness. Many other factors are less obvious and require a more difficult investigation of a combined nature.

1. Starting from the existing economic and social conjuncture the soil is a decisive factor when we want to change the purpose of the soil, that is when a new culture is introduced.
2. This is also the case in the determination of the productivity of the soil for individual valuation, in the estimation of the yields of the crops occurring in the cropping system.

3. Further, the knowledge of the soil is indispensable when comparisons are to be made between farms of which the value is known, e.g. type-farms, and the objects to be appraised. But in this case the internal and the external traffic positions also come into play. Essentially, the influence of soil differences on the dispersion of the soil value within a certain type of farm is concerned here.

4. Finally, in estimating the value of the separate parcels of an appraised farm not only the situation and the parcelling-out but also, and especially, the condition of the soil is of great importance.

I turn now to some of the more important appraisal systems in practice. After 1925, the Einheitsbewertung method of appraisal, or appraisal of the Einheitswert (value of units), was developed in Germany by the Government Financial Administration with a view to obtaining uniformity in the various standards employed in appraisal for fiscal purposes.

A long time ago Thaer introduced into Germany appraisal tables based on kinds of soil. But Stremme departed from the insufficient basis of the mechanical composition and passed on to the types of soil, which are also related to morphology. Stremme found a relationship between the type of soil and the size of the crop. But the wide variety of soil types, the absence of a uniform nomenclature, and the difficulty for practical appraisal of using these scientific designations forbade their use in appraisal tables.

Wolff, von Bülow, and Görz (Jahrbuch Preuß. Geol. Landesanstalt, 1933) suggested the classification of the types of soil according to their value in condition levels, Zustandsstufen (Alterungsstufen and Entwicklungsstufen). In the valuation of the objects two tables are used, one for grass land and one for arable land, both with ratios for the net returns.

In the arable-land table are indicated on the one hand the physical soil types grouped according to the principal geologic formations, and on the other hand seven condition levels (from Tsjernozon to sand and bog-ore profile).

The grass-land table is not based on vegetation, as in the case of older German tables, but directly on soil, water condition, and average annual temperature, and leaves geology out of account.
The soil figures of the tables refer to the differences in net returns in usual and proper farm management and on the assumption of an average climate, a level surface, and the economic conditions of central Saxony on medium-sized farms.

From a weighted average arable-land figure and a weighted average grass-land figure results a *Bodenklimazahl*, which is 100 for the most favourable farm in Saxony. By correcting deviating economic factors the *Betriebszahl* results, and by means of a table the *Einheitswert* or return value may be found. In this table the return values have been grouped in nineteen classes with a very great dispersion.

This detailed method of calculation is only applied for the standard farms. The value of the other holdings is deduced from these findings.

Apart from farm appraisal the soil scale was taken as the basis for the Government Soil Appraisal by Prof. Dr. Rothkegel, in which all soils were specified, the result being included in the land register.

For those who want to develop soil mapping in such a way that the results may be used for land classification and appraisal, it is important to know of this development in Germany so as to obviate errors and disappointments.

The weak points of this German method are the insufficient farm economic basis and the comparison with one top farm, which is often situated at a great distance from the farm to be appraised and which, therefore, will mostly show other natural and economic production conditions as well as a different system.

The Swiss method is not based on soil science, but on farm economics. It has been deduced from the average data of book-keeping over a thirty years' period, by determining the relation between the gross return and the return value for the various types of farming and sizes of farms. This coefficient of the return value is fairly constant for the allied holdings and varies from 1.47 to 5.66 for the various Swiss types of farms. In order to calculate the non-adjusted return value the estimated average normal gross return of a farm is multiplied by the coefficient just mentioned.

In this system the following points are taken into account:

(a) the average ability of the farm manager,
(b) a normal method of exploitation,
(c) average annual returns.

Through the application of correctives (adjustment of the return value) the definite return value is derived from the non-adjusted return value.
Allowance is made for:

1. Letting one or more rooms of the farm house (capitalization at from 6 to 8 per cent.).
2. Finer rounding off.
3. Exceptional conditions with regard to the configuration of the fields, the premises, and buildings, attended with lower cost of labour.
4. New buildings in excess of the average; an increase in proportion to the saving in the cost of maintenance.

Deductions are made in respect of:

1. Considerable repair expenses to be incurred in the near future.
2. Prospective charges.
3. Exceptional conditions with regard to the configuration of the grounds, premises, and buildings, attended with higher cost of labour.
4. Buildings providing insufficient accommodation; the costs of enlargement are deducted from the non-adjusted return value.
5. Inefficient parcelling-out.

The application of the system is facilitated by the use of lists of standards for the volume of the yields and the prices (averages over a longer period).

It would appear to me that the Swiss method of appraisal is the best thought-out and the best founded, but for the present its application will be impossible in many countries, because it sets high requirements for our farm economic knowledge over a stretch of years.

In the American method, there was at first a controversy between the advocates of the method of the return value and the adherents of the sale value.

Before the war the method of sale prices was defended by G. C. Haas and Karl Brandt.

The fundamental question of the methodology was first discussed in the Joint Committee on Rural Credits, which endeavoured to devise a system of appraisal which would be generally recognized and accepted. The upshot of these discussions was that the committee recommended the employment of two methods, one stressing the net return and the other based on value comparisons.

In continuation of the work of this committee the American Society of Farm Managers and Rural Appraisers accepted a series of cardinal principles placing emphasis on return capitalization.
Farm Appraisal

P. L. Gaddis, who was at one time head of the Appraisal Section of the Farm Credit Administration, developed a system which was a compromise between the method of the return value and that of the sale value.

Gaddis is no upholder of the direct return capitalization, but recognizes its value as an approach to the value per acre and as a means of control. The good points of the two methods are utilized and the disadvantages are avoided as far as possible. In the Gaddis method of appraisal analysis, comparison and capitalization are applied in succession.

Though, naturally, in methodology there will always be differences in details, it is a matter of general agreement in the United States that a combination of the two extreme methods will provide a plausible solution. It is also considered essential to vary the method, as neither yields satisfactory results for all areas and for all farm types.

Where there is much leasehold land, where the values are high and the value factors not affecting the return are negligible, in these areas the return value predominates and purchase prices serve to determine the amenities and to check the reliability of the appraisal of the return value. Where the opposite is the case, the sale value is stressed and the return figures are used for checking the results. In both cases an accurate description of the soil and the buildings is considered necessary. This physical inventory should be followed by an economic appraisal.

For an accurate administration of data an appraisal map is used, which is filled up when the farm is visited. In addition a detailed form has to be completed.

In America the exclusively intuitive appraisal method with its 'horseback and windshield' appraisals is no longer in favour. However, insurance companies' credit administrations and members of the American Society of Farm Managers and Rural Appraisers apply a system which is better founded both from a soil-science and an economic point of view.

Finally, there is the method of comparative statistics. It is a rule in differentiated intensive agriculture that, given equal local factors, a great variability tends to occur in the type of farm. The old, distinct farming systems, largely connected with soil, climate, and situation, have then disappeared in consequence of the economic and social process of development. The yields have become more and more individual, with a great dispersion round the mean.

Now the type of farm is one of the most important factors affecting the net return. In these circumstances the determination of the farm
type can only take place on a comparative statistical basis by forming
groups of similar farms of about equal sizes, for which a number
of standards of judgement are calculated in respect of costs and
returns.

After analysing the type of farm in this way and obtaining data
covering a few years’ period it is possible to determine the rental
value and the return value. In these conditions not the soil type but
the farm type is a primary standard of classification. Thereupon the
differences in local factors is an important factor in the determination
of the dispersion of the value within the group. This distinction of
various types of farms yields an equal number of comparison farms
or type farms, with which the appraiser may compare his separate
appraisal objects.

In this method it is essential to work in small homogeneous
areas of which the soil types are known and to have a fair number
of book-keeping records at one’s disposal.

This system, which is based on type farms, has been advocated
by me in the Netherlands since 1941 and is now in course of develop­
ment.

The developments in the field of soil science with regard to soil
productivity are important for appraisal. The results of these
developments, however, may generally serve only as guidance for
the appraiser, who will have to make an accurate productivity
appraisal as part of the physical inventory, which should comprise
not only the soil but also the improvements, the farm buildings,
and the farm house.

A difficult and decisive step is the transition from the physical
inventory to an economic appraisal. In this connexion it is also
difficult to determine the share of the net return of the productive
contributions of soil and buildings or, as counterpart, the determina­
tion of the farmer’s remuneration.

In conclusion:

1. It is essential to arrive gradually at a better foundation and
   co-ordination of appraisal. Agricultural economics and soil
   science will have to contribute towards this goal in concerted
   action with a view to providing the appraisers with data in a
   convenient form.

2. It is also desirable to give courses in appraisal and to grant a
diploma (which is already done in the U.S.A.)

3. In order to obtain fixed points of support or measuring rods
   for appraisal the system of type farms will have to be introduced.
An appraisal form is indispensable for adequate analysis, synthesis, uniformity, documentation, comparisons, and farm classification.

W. G. Murray

I have enjoyed this paper very much, and I would like to ask a question on the German system. Dr. Boerendonk's statement reads that the weak points of this German method are the insufficiency of the economic basis, and the comparison with one top farm, often situated at a great distance from the farm to be appraised. I had the same feeling about the German method until I visited Germany about three weeks ago. A group of Germans took me to a farm, an area north of Frankfurt, where they put on a demonstration for me. I obtained from them the impression that the top farm is only used as a reference, and that they had other farms in addition in every locality which they appraised in detail and used as reference farms. I gathered that they at least had this particular weakness in mind and were trying to correct it. I may be wrong in that; if so, I hope one of our German members will correct me. The other question I would like to ask is: to what extent does Dr. Boerendonk expect the differences in management to average out for your type farms; that is, if the records from an individual farm show unusually high or low management returns because of the manager's high or low ability, would that influence unjustifiably your key farm?

M. J. Boerendonk

I know I have been very short in this exposition: it is only a summary, of course, of the German method, so I only mentioned the name comparison farms (*Vergleichsbetriebe* in German). I know from recent literature that there are many of these comparative farms in Germany. But, nevertheless, there is one, and there stays one, top farm; as you know, that one is in central Germany (Saxony), and all tables, with their ratios of net returns, are based on this farm. The whole procedure of appraisal of the individual comparison farms in the different districts of Germany is a process of deduction from just one top farm, with all the weak points in it, in my opinion at least. I mean that if you want to have comparison farms, you have to take them not individually but as a group of ten or twenty in a certain agricultural region, all with one type of farming, so that these farms are analogous and may be compared.

So if you have 20 or 30 of these types in Holland then you have 20 or 30 of these groups of comparison farms, and when you take
the average of each group you have one abstract standard farm for each type. And at the same time you have also averaged the abilities or disabilities of the farm manager.

That is my answer also to the second question.

S. Sinclair

During the discussions here Professor Skovgaard raised the question of the division of farm production into primary and secondary phases. He intimated that crop production is of a primary nature, while livestock can logically be considered secondary farm production. Bearing this in mind and considering the varied nature of the sources of farm returns, does Dr. Boerendonk consider that total net farm returns should be considered when arriving at the value of farm lands?

M. J. Boerendonk

This question must be answered even for the Swiss method, I suppose, in this way: that one has to define a system of farming, and not the cropping system. In doing so you must take normal livestock production, not an over-intensification of livestock production by means of purchased feed as in the case of some rural areas of Holland. In studying the group of comparison farms, over-intensification, i.e. high costs, must be eliminated, otherwise you would come to too high a value for the land itself. Professor Murray in his book on Farm Appraisal has also indicated, as I remember well, that it is fair, in the case of intensive dairy farms, to make allowance for the management of the farmer and the significance of the buildings, whereas the soil itself is a minor item in comparison. When the group of comparison farms is homogeneous in every respect except for intensification (costs) then you get the trouble to apply a correction for this latter.

M. Rolfes

I think all Germans would endorse the remarks made here on the German system. There is, of course, a certain weakness in a system based on one yard-stick situated in a particular area, and it is still more of an objection when this one reference farm in central Saxony has extreme climatic conditions which make its adaptation to the varying climates in Germany particularly difficult. In practice, as Professor Murray has suggested, we can no longer refer to this farm, because it is on the other side of the Iron Curtain, and, as we are
now carrying on the work of soil appraisal as a basis for taxation in various western lands of Germany, we just take a reference farm of the particular land as our absolute yard-stick, and no longer refer to this farm in Saxony.

J. Gilchrist, West of Scotland Agricultural College, Glasgow, Scotland

I have two short questions. First, is the forecasting of future price movements purely fortuitous, and second—though it does not arise on the paper itself—could Dr. Boerendonk tell us in general terms what is the trend of land values in the Netherlands at present?

M. J. Boerendonk

In the Swiss method of appraisal a moving average of farm product prices over a period of thirty years is taken for calculating the gross return. So it is only the past that is considered. I mean that a period going back so far into the past is unreal for the Netherlands, where the agricultural policy of the Government tends to support the product prices to make farming a profitable enterprise. Great fluctuations of prices of agricultural products are not to be expected in our conditions.

Professor Murray indicated in his book on Farm Appraisal that the giving of equal weight to each of the previous years is likely to result in prices which are not at all reasonable to use in appraisal. And he discussed another type of moving average, a weighted one, supported by the fact that in forecasting prices the present price is more important than the price ten years ago or even one year ago. For instance, the most recent year is given a weight of ten, the preceding year a weight of nine, and so on, with the last and most distant year of a period of ten years having a weight of one.

As for the second question relative to the trend of land values in the Netherlands at present, I can answer that there is no trend at all, since there was a fixation of prices in 1940 and this fixation is still in force. As for the rent, there is no fixation but a control exercised individually by a provincial organ, the Grondkamer. For this control many intuitive appraisals are made and norms are used.

G. Medici

It should be borne in mind that in the matter of methods of estimation we have not yet reached a sufficient clarity, because unfortunately everyone is trying to find a method which is the right method, as though there were a unique approach, or a unique
method which would resolve all the innumerable questions which confront a person who has to express a judgement on estimation. I listened with great interest to the paper of our colleague, Dr. Boerendonk, because, in view of the fact that he represents the Dutch Ministry of Agriculture, and in particular that department of it which deals with estimation, he has been faced with a series of particular problems of estimation, while in practical life we have to resolve innumerable problems of estimation in which the estimates required have to be satisfactory for a range of different purposes. There was a time when we were confronted with more uniformity, where differences between different parts were extremely slight, whether in the nature of the soil or in the type of cultivations which were practised in those regions. And at the same time many of these estimates were calculated exclusively, or almost exclusively, for purposes of taxation or cadastre. But this is a particular type of estimation which requires, and can be given, an appropriate method. Clearly, however, we now have many other reasons for which we are expected to provide estimations. Inasmuch as land, whether it is bare land or whether it is richly equipped with factories, with plantations, with canals, with irrigation, land or capitale fondiario as we call it in Italian, is a good: like all other goods, it therefore has a price which is based on market transactions. The method, therefore, has to have reference to the purpose which the estimate is designed to serve. For example, if we have to estimate a selling value, then obviously what we have to determine is the price which that particular piece of land would fetch in the market at that particular time if it were brought forward for sale. This problem is totally different from that which faces the fiscal assessors of various countries, whose problem is to determine the value of an individual piece of land for the purpose of taxation, whether it is an income tax or a property tax. There are many other things which I should like to say on Dr. Boerendonk’s paper, but there is no time. I would maintain, however, that in the field of estimation the older Italian students have made important contributions which are not well-enough known, because unfortunately the Italian language is not sufficiently widely known and foreign students find the difficulties of studying Italian texts sometimes insurmountable.

M. J. Boerendonk

As Professor Medici spoke in Italian and the English translation was not complete, I could not follow everything he said. I have understood, however (and I have learned from the Italian
publications shown upstairs), that the science of appraisal is much in favour in the Italian Universities. Professor Medici, Professor Proni, and others have made important studies, and the fine book of Professor Medici on 'Estimo' has drawn the attention of many of us so much that French and English colleagues have determined to translate it into their languages.