Book Reviews.

The Measurement of Grassland Productivity.

(Proceedings of the University of Nottingham's Sixth Easter School in Agricultural Science, 1959).

Ed. J. D. IVINS.

Butterworths, London, 1959. 217 pp. 35s. Stg.

This publication is the fifth of a series of useful editions which bring together information on the latest research in particular fields of agricultural science. The Sixth Easter School was concerned with grassland productivity and the techniques available for its measurement.

The book is divided into five parts. 1. General Aspects ; II. Herbage Growth ; III. The Consumption of Herbage by Livestock ; IV. Animal Production from Grassland ; and V. Farm Scale Measurements. Nineteen authors contributed to the twenty chapters of the book, each comprising a paper read at the School. At the end of each part is a summary of discussions which arose from the papers read, and many important points are found therein.

The opening speaker, Dr. W. Davies, outlined the historical evolution of grassland research techniques. It is noteworthy that the use of the animal for measuring grassland productivity is essentially a recent development. Most evaluation has been by various cutting techniques, supported by chemical analyses to estimate the nutritive value of the various components of the sward. Information on persistence under grazing, palatability and selection by the grazing animal is not brought to light by these methods, but subsequent chapters explain why grassland workers have had to use this approach, even though the results are often not completely satisfactory. Such "artificial" measurements of productivity will continue to form the basis of much pasture research for many years.

Although all the information presented is based on results from temperate environments, some of the techniques can be related to subtropical and tropical conditions ; for example, the relation of ley pastures to crop productivity. Knowledge of the latest techniques used in the agronomic assessment of temperate pasture species will assist in the proper evaluation of tropical species.

It is in the nutritive values of herbage that important differences between tropical and temperate pastures are known to exist. Techniques recently developed for measuring the quantity and quality of feed consumed by free-grazing animals in temperate environments have limited value in the tropics. Workers in Queensland and East Africa have confirmed this for the faecal nitrogen and faecal crude fibre techniques. Feeding standards based on starch equivalents and total digestible nutrients are highly inaccurate when applied to tropical and subtropical species, and the serious limitations of these relationships even in temperate environments is noted in Chapter 16.

Although confined to research on temperate pastures, this well edited and very readable book should also be on the bookshelves of those engaged in tropical pasture research.

C. S. Edwards.

The Wild Species of Gossypium and their Evolutionary History.

J. H. SAUNDERS.

Oxford University Press, London, 1961. VIII + 62 pp. (illus.) Price in Australia 28s.

"The Evolution of Gossypium and the Differentiation of the Cultivated Cottons" by Hutchison, Silow and Stephens, has, since its publication in 1947, been the definitive work on the classification, differentiation and genetical relationships of the species of *Gossypium*, both wild and cultivated. In "The Application of Genetics to Cotton Improvement", published in 1959, the senior author elaborated further on the origin and development of the cultivated cottons and discussed prospects for future improvement. The monograph here reviewed supplements these two volumes by revising and expanding the section on the wild species in "The Evolution of Gossypium".

According to the dust cover, Saunders' book comprises a "set of botanical drawings of the wild species of *Gossypium* . . . . accompanied by notes on the sections into which the genus is divided cytogenetically, and on its world distribution and evolutionary history." As with the other two volumes mentioned above, the work was carried out under the auspices of the Empire Cotton Growing Corporation.

Part I contains the botanical drawings and notes on the genomes. Saunders' division of the genus *Gossypium* is made on a strictly cytogenetical basis, the lintless wild species being grouped into four genomes, B, C, D and E. Hutchinson *et al.* used a morphological and geographical basis for delineating the Sections, while recognizing that the genomes, for which the nomenclature had already been proposed by Beasley, could be regarded as representing the Sections if it were a fair assumption that morphological similarity in *Gossypium* indicated cytogenetic affinity. At that time, many of the wild species had not been grown in culture and the validity of this assumption had not been thoroughly tested, but Saunders has now confirmed cytologically the essential soundness of the morphological classification.

The two species *anomalum* and *triphyllum* of Hutchinson's Section Anomala comprise the Saunders B genome, whilst *areysianum* has been removed to the E genome ; *G. areysianum,* known to Hutchinson *et al.* only from Defler's original collection, is the only species which Saunders has reclassified into another Section. Hutchinson's *G. sturtii* and *G. robinsonii,* grouped together in the Section Sturtiana, now make the C genome together with *G. australe* von Mueller, which was erroneously transferred by Lewton in 1915 to the genus *Notoxylinon,* where it remained until Saunders re-examined it in 1961. The three American Sections Erioxyla, Klotzschiana and Thurberana (species *aridum, armourianum, harknesii* ; *klotzschianum* and its variety *davidsonii, raimondii ; thurberi, trilobum, gossypioides*) with the addition of the new species *G. lobatum* Gentry and the deletion of Hutchinson's *G. trilobum* of the Section Thurberana, make up the D genome. The Section Stocksiana, comprising *stocksii* and *somalense,* becomes the E genome by the addition of *areysianum,* transferred from the B genome, and, tentatively, the newly-described species *incanum* and *longicalyx.*

The notes on each genome cover the cytogenetical evidence for the genome classification, and briefly touch on the morphology, habitat, distribution, variability and possession of characteristics of commercial value of some of the species.

The botanical drawings (by the author) are particularly clear and the descriptions concise but complete.

Part II contains a brief account of the world distribution and evolutionary history of the genus *Gossypium.* It is suggested that the ancestral stock from which the genus arose was itself polyploid, that the ancestral allopolyploid with 13 chromosomes underwent evolutionary change leading to the differentiation of the five genomes in Central Africa, and that the present inter-continental distribution of the genomes may be accounted for by Wegener's theory of continental drift. No mention is made of opposing theories such as migration through an Antarctic sub-continent or via alternative land bridges. Saunders considers it probable that man was responsible for an A genome diploid cotton reaching the New World, where it hybridized with a wild D to produce the allotetraploid ancestor of the modern New World cottons, although he does not entirely discount the possibility of an ancient natural overlap in habitat between A and D genome species.

The book concludes with a botanical drawing and description of *G. herbaceum* race *africanum,* a primitive diploid with linted seeds, belonging to the A genome and considered to be the closest modern relative to the original forebear of the diploid cottons.

As would be expected from the Oxford University Press, the production of this slim volume is of high standard. It is printed on heavy art paper and the clear line illustrations are excellently reproduced. One wonders, however, whether anything is gained by stating the scale of each part of an illustration in the drawing itself and again in the legend. The author, in the brief narrative sections, has not a particularly felicitous style and is occasionally clumsy in expression or even ambiguous—e.g., the first sentence on page 18 where it is stated that " The D genome . . . . comprises eight species and the variety of another "—*davidsonii* is, of course, the variety of one of the eight species in question. The not-infrequent adverbial usage of the phrase " due to " might also be queried.

Printers' errors are few ; there is occasional inconsistency in the use of italics for plant parts in the botanical descriptions, as on page 33 where " stems " in line 2 should read " *stems* " and " Seeds " in line 16 should read " *Seeds* ". In the References on page 60, line 24, " *Bot.*" should read " *bot.*"

None of these criticisms is of any substance and the book will be welcomed by all geneticists and plant breeders working with cotton, and indeed by tropical agriculturalists and botanists generally.

A. W. Charles.

The Economic Development of Uganda.

International Bank for Reconstruction and Development. The Johns Hopkins Press, Maryland. 1962 xviii + 475 pp. (paper) $4.00 U.S.

It is difficult to resist the temptation to draw an analogy between the recommendations made by this International Bank for Reconstruction and Development's mission to Uganda, and those which a similar mission might submit for this Territory. However, the following review is presented with a bias for Territory readers and as such may raise a number of questions which should be carefully considered by all engaged in policy decisions affecting this Territory.

The IBRD mission to Uganda was charged with the task of drawing up a development programme, based on "practical recommendations" for the five year period, 1961/62-1965/66. However, the recommendations of the mission rest firmly on basic economic principles. The main limiting factor to economic development, which is of course capital, has been located, and the mission has proceeded to show how available resources of this factor can be used to obtain the greatest return to the economy as a whole.

Agriculture has been accepted as the mechanism by which further economic development of Uganda can be initiated. The report is liberally spread with statements showing this; "the developmental potential lies largely in agriculture"; "in spite of everything possible in manufacturing and mining, the main opportunity for economic growth in Uganda in the next five years is in agriculture"; "in our view that, in present circumstances, investment in agriculture will bring greater returns, in terms of expanded output and incomes, than comparable investment in almost any other sector of the economy".

The economy of Uganda has reached the stage of development where the mission considered that governmental control of agricultural development should decrease. Normal market forces should now operate more fully in allocating resources. The two main exports, coffee and cotton, are examined in this context and present marketing difficulties for coffee are seen as extending beyond the last year of the plan 1965-66. For this reason greater emphasis on cotton is advocated.

Low productivity of labour is also suggested as an important factor preventing increased agricultural production in Uganda. Detailed studies are needed to verify this fact and the mission states that these should be undertaken immediately. Increased productivity of labour rests upon widespread changes in the methods of production in agriculture. Therefore, extension services must be more fully developed and more appropriate methods must be adopted.

Capital infusion is also essential, and this can be carried out by better credit facilities and wider use of subsidies to farmers. Land tenure must also change but the mission takes a very realistic approach to this problem. Short run changes in the present system should be "modest and largely based on modifying rather than altering the fundamental structure of the land system". However, in the long run land must become a negotiable factor of production with its value determined by productive capacity.

The remaining sectors of the economy are discussed but the place of secondary industry in an underdeveloped economy is seen in its correct perspective. Successful development depends upon a prosperous agriculture and "as purchasing power grows so will the demand for manufactured goods, to the point where local production of additional commodities may become viable".

Previous so-called "development plans" do not escape scrutiny. It is suggested that agriculture in the past has been largely overlooked while social development has tended to be favoured. The advantages of the latter type of development are acknowledged but future investment should be more carefully examined. The "development plans" of previous years are described as lists of expenditure determined in most cases by the personal interests of Governors, the bargaining strength of the various government departments and what happened in other years. The mission states that "it is probably fair to say that in none of the development plans has there been the weight of effort on agricultural development that, in the opinion of the mission, it deserves in Uganda"; "the Government of

Uganda has not been equipped to undertake effective forward planning for the economy as a whole".

At the end of reading this excellent report, one is moved to wonder just how many of this mission's recommendations have been made previously by public servants and private individuals in Uganda but are now gathering dust in files. Perhaps some can now say "I told you so" but the reward is small and uninviting.

G. R. Spinks.

Economic Bulletin for Africa.

Vol. 1. No. 1.

United Nations Economic Commission for Africa. Addis Ababa, Ethiopia—January, 1961. pp. 104, 5s. Stg.

This Bulletin maintains the high standard of previous publications by the various Economic Commissions covering the world. It is the first of the series on Africa and although issued some time ago it should be brought to the notice of all interested in world economic events. Its issue is particularly timely in that the rapidly changing political, social and economic conditions in the continent have focussed world attention on Africa.

The publication is divided into two sections covering the current economic trends throughout Africa and three special articles surveying financial conditions, development programmes and policies in selected countries, and economic developments in the Republic of the Congo (Leopoldville), 1957-59.

The first section of current economic trends within the continent follows similar lines to those in other Economic Commissions' publications by giving a brief but comprehensive survey of world economic conditions. These are related to the events within Africa. Trends in African trade are surveyed showing the importance of the Franc Zone and the European Economic Community and the Sterling Area. Although the volume of African exports rose between 1958 and 1959, no increase in income occurred as world prices for major exports fell. The high propensity for African countries to import is expected to continue as economic development progresses.

The principal exports are dealt with individually. The success of the African countries in penetrating world markets with low quality tea and coffee has been a major achievement over the past decade. But world marketing problems are envisaged for all the agricultural exports.

Of the minerals, gold and copper are the most important. Despite the fact that the world price in U.S. dollars of gold has not changed since 1934, investment in mining has continued. Considerable confidence is also shown for copper, as investments are being maintained even though world price fluctuations have been most pronounced. The marketing of diamonds is controlled by a world wide cartel so price is stabilized.

The three special articles are the most interesting. The first covers financial conditions throughout the continent. Most space is given to examining the effects on countries within the Franc Zone and the Sterling Area when granted independence. The greater trading freedom within the Sterling Area means that financial institutions do not need as much modification as those within the more centralized Franc Zone.

The second article deals with development programmes and policies within selected African countries. The two main techniques in economic planning, the programming and project approaches, are briefly described. In none of the countries are these techniques employed as the so-called development plans are usually capital expenditure programmes. As such they do not cover projections, objectives or targets for the private sector of the economies. However, the wider approach to economic planning is now being considered as the economy of several countries is reaching the stage where this is possible and also essential.

The last article covering economic developments in the Republic of the Congo (Leopoldville) 1957-59 provides excellent background to conditions prior to independence. It is shown that the transfer to independence did not occur in a period of economic expansion and prosperity.

G. R. Spinks.

Port Moresby: V. P. Bloink, Government Printer.—8983/3.63.

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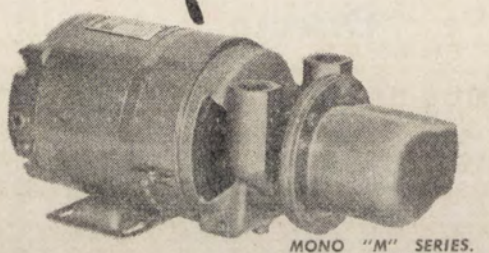

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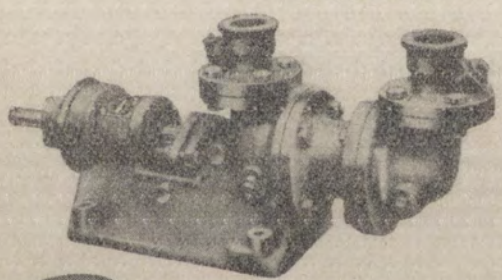

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