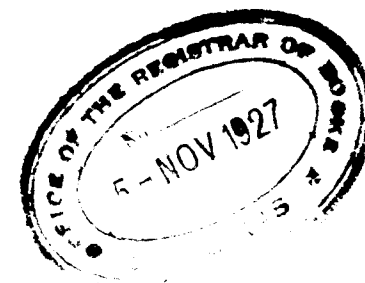


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THE MADRAS GEOGRAPHICAL ASSOCIATION

RULES.

1. The name of the Association shall be 'The Madras Geographical Association.'

Objects.

2. The objects of the Association shall be :—
 - (A) To promote geographical knowledge ;
 - (B) To secure for geography its proper place in the High School, the University and its constituent and affiliated colleges ;
 - (C) To help to improve the methods of teaching Geography ;
 - (D) To work for a School of Geography being started ;
 - (E) To promote studies about South India from various standpoints.
3. These objects shall be secured by :—
 - (A) Holding meetings and conferences, and publishing periodicals and occasional bulletins ;
 - (B) Organizing geographical exhibitions and excursions ;
 - (C) Helping in the preparation of geography books in the languages current in the Presidency ;
 - (D) Forming a central library of geographical literature; and collecting maps, charts, plans, models, slides and instruments ;
 - (E) Providing for circulation to members, of books, periodicals, and other collections ;
 - (F) And by such other ways as are deemed necessary to effectuate the objects of the Association.

Membership.

4. The membership of the Association shall be open to all those who are interested in the promotion of geographical knowledge or in the teaching of geography.
5. There shall be two classes of members, honorary and ordinary.
6. Honorary members are those who shall be so elected by the council by the majority thereof present at its meeting. They shall be exempt from liability to pay subscription, and shall have all the privileges of ordinary members, except voting.

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— THE JOURNAL OF —

The Madras Geographical Association.

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July 1927.

[No. 2.]

South Indian Cattle: Their Breeds And Distribution.

I wish to place before you this evening some notes which I have collected, regarding some of the important breeds of cattle in South India and their distribution. They are intended more to emphasise an aspect of the problem which, it seems to me, has not received adequate attention. The Madras Geographical Association, which is the first of its kind in India, and which is interested in the regional study of South Indian problems has to be congratulated on taking up the study of the cattle problem.

Two Species.

By the term cattle we usually mean domesticated bovine animals, principally of two species—*bos taurus* European cattle—and *bos indicus* the humped cattle of India and Africa. When and where man first turned his attention to the domestication of cattle, it is impossible to say. It may be as old as the tradition of *Iswara* (Siva) the Mountain Lord with the *trisula* (trident) and the sacred bull, which is his *vahanam*. Brahmini bulls are even now dedicated to *Iswara*, with the *trisula*, Siva's trident, branded on them, to indicate that they are set at large as village breeding bulls (Figure 1).

Effects of Domestication.

The most striking feature about the modern breeds of domestic animals is that they as a rule consist of strains which differ, in form, colour and disposition. This is because man has come into contact with and has now more or less influenced wild forms as a sportsman, as a stock-owner, as an agriculturist, and in many other ways

The stability of a species is thus disturbed so to say by domestication, and in addition to artificial selection, there has been in many cases an almost complete cessation of natural selection.

Effects of Environment.

Though in the reproduction of domestic animals the breeder is the chief factor of control, we must make due allowance to the part played by environment. In some cases the part played by the breeder is limited to selecting, from among the individuals not eliminated by the environment, those nearest to the type aimed at and thereafter deciding with which males the females ought to be mated. Hence environment continues to be of supreme importance. The more we study the wild animals, the more evident it becomes that in form, colour and behaviour, they are marvellously adapted to their surroundings. But there is a limit to the part played by environment and by the breeder.

Differences in the Characteristics of the two Species.

As regards form, we have evidence that domestication has from the first led to variation in the skin, limb, horns, etc.

The *hump* is the peculiar characteristic of the Indian type. This is absent in the European cattle (Figure 2). There are other distinctive characteristics, as we shall see from the pictures. In *form or general appearance*, Indian cattle are, as a rule, inclined to be leggy and rather thinly made up. They carry little flesh and are in this respect strikingly deficient in their thighs. Taken as a race, Indian cattle, represented by pure-bred specimens of different species, are what may be termed *whole-coloured* in contra-distinction to what may be termed *broken-coloured*. By whole colour is not meant that an animal is all of uniform colour, but that in the change of colour from one part to another part there is no distinct breach or dividing-line. The colour shades are merged into one another. The most common colour of Indian cattle is white or very light grey in the body, and the ends of the limbs are of various shades, which blend harmoniously. When broken or patchy colours appear, they with few exceptions indicate cross-breeding of more or less recent date. No doubt it is possible that a breed which has been formed by the crossing of two distinct

types a long time ago, may yet retain its broken colour as a permanent characteristic; but, in that case, it will be well-defined and pronounced, and this may be seen in such features as a white head, white legs and white patches over the body. The broken colour peculiar to the cross-bred cattle will be irregular and easily recognised by one, who is accustomed to observe carefully the freaks of nature in the matter of cattle reproduction. Perhaps the most interesting and remarkable peculiarity connected with Indian cattle is the fact that however white the hair, they mostly have *dark skins underneath*. It is probable that the dark skin has much to do with the ability of the Indian cattle to work in the Sun without suffering as light-skinned cattle do. It would, however, be assuming too much to take for granted that in colour only lay the advantage in the ability to stand the Sun. The known differences in the quality of surface *thickness and texture of the skin* have doubtless their influence, but the relative importance of each factor has not been precisely determined. Another peculiarity of Indian cattle is their *impatience in the presence of strangers*, while perfectly docile and amenable to subsequent treatment. The *horns* of the different breeds are exceedingly variable in shape and size and also in the directions they incline after leaving the frontal bone. In *voice* also, Indian cattle differ as much from the European races as in other particulars. In place of the ringing bellow of the English bull in which both lungs and throat play an important part, there is a coarse guttural grunt or half-cough thrown down to the earth. So much for the main characteristics distinguishing the two races.

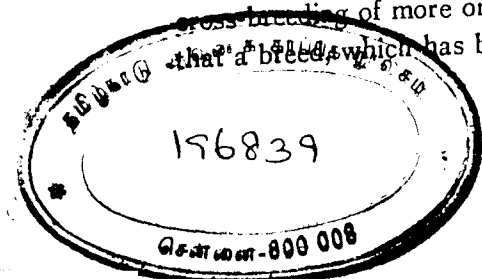
The voice, and the hump or the absence of the hump descend to the progeny.

The Indian Cattle.

Let me now place some general considerations, which will help us to study in somewhat greater detail the Indian race of cattle and their breeds and distribution which I have chosen as the subject for this evening.

Influence of Climate and Rainfall: Northern Indian Breeds.

Climate plays an important part in the production of breeds of cattle. The contrast in climate is more marked in Northern than in



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Southern India. In the latter generally, it may be said that there is uniform warmth with dampness in the west and dryness in the east and interior; but, in Northern India, we find every variation from the dry climate of the west and north-west accompanied by marked differences of summer heat and winter cold to the permanently damp climate and heavy rainfall of Eastern Bengal. Equally pronounced is the variation in the rainfall of the other parts of India, the influence of which is strongly seen in the breeds of cattle. One may notice the wide difference between the diminutive cows and bullocks of Bengal, where a damp, hot atmosphere prevails, and the fine, strong, large, cattle in the dry parts of the Punjab. In the Punjab, the atmosphere, though hot, is dry, and the soil is far better adapted to the breeding of cattle than are the damp regions of Bengal. The Sindhi ox of the dry region (Figure 3) may be contrasted with that of Malabar with its heavy rainfall (Figures 4 and 5). We see, however, an opposite climatic effect in the case of buffaloes, as no climate seems too damp, nor rainfall too heavy for them. Thus at Mahim (Thana District) of the Bombay Presidency, the buffaloes are magnificent, but the other cattle are poor and miserable. So, too, is it in Eastern Bengal. In Behar, on the other hand, where it is drier, the plough cattle are again superior. Buffaloes are the principal cattle throughout the districts of heavy rainfall below the Western Ghats. As another illustration of the effect of climate, take the case of South Konkan, where the poor soil, the heavy rainfall, the scarcity of water after the monsoon is over, and the trying climate during the rains make the tract unsuitable for breeding purposes, and make it depend for its supply of cattle on the neighbouring Karnatic.

Influence of Soil.

The prevailing types of soil have also their effect on the well-being of cattle. We have vast alluvial plains composed of mud and sand, stretching across the northern portion of the country from West to East. We have again the black cotton soils, which occupy mainly the central and western portions of the Deccan Plateau. All these types are sometimes found in the same tract with consequent variations in the breeds of cattle produced.

Influence of Agricultural System.

Apart from climate and soil, the system of agriculture pursued has a bearing on the quality of the cattle in a tract. Here it is almost

entirely a question of food-supply. With the pressure of population, the grazing areas are continuously narrowed down and the result is reflected in the degenerate specimens existing in highly cultivated tracts. It is often said that the number of cattle in a tract affords a good index of the prosperity of the tract. In the more fertile tracts cultivation has displaced grazing, and cattle-breeding inevitably falls off in such places. On the other hand, the more backward tracts which contain much land unfit for cultivation, have hardly emerged from the pastoral stage, and produce large numbers of animals, although of poor average quality. Looked at from this point of view, a large herd of cattle is taken to imply the agricultural backwardness of a tract, and relative dearth of cattle as indication of fertility. And in support of this view such a high authority as Mr. Keatinge, a former Director of Agriculture, Bombay, says that Ahmednagar, perhaps the poorest district in the Bombay Presidency, contains the largest number of cattle, while Broach, which perhaps is the richest, has by far the smallest number, and purchases bullocks from outside. This is a matter for investigation.

Some Breeds of the Northern Deccan.

I have mentioned some of the Northern India types. Let me next take a few typical breeds of the Northern Deccan. Firstly, there are the Guzerat and the Kankreji breeds of cattle. The large-sized Guzerat cattle (Figures 6 and 7) is decidedly the finest of all the large cattle of North-Western India surpassed only by the Kistna valley cattle (Figure 9) from the banks of the Upper Kistna. The Kankreji breed (Figure 8) is one of the fastest, one of the best of the trotting breeds, and also one of the most handsome. The breed belongs to a well-cultivated flat region, lying in the north of Guzerat. Coming from rich soft land, the bullocks are tender-footed, which is a defect for trotting. As a remedy, the breed is frequently crossed with the Wadhiali, (Figure 10) which has hard and durable feet. They are good in the plough, having been so employed for generations. The breed is found in a region somewhat akin to that in which Kankreji breed is seen, and resembles Guzerat cattle more than any other in appearance. They are noted more as draught animals rather than as plough cattle; and, among the cattle of North-Western India they are famous for trotting and come next to

the Mysore. The *Gir* or *Junaghad* breed (Figure 12) from the neighbourhood of the Gir forest in Kathiawar is of a special type, quite different from the ordinary run of Indian cattle. Another breed is the Hurrianah breed, (Figure 13) which is a dual quality breed like the Punganurs of the Madras Presidency. The bullocks are good walkers and the cows good milkers.

Climate and Soil of South India.

Let us now turn to the main features of South India.

We find that on the West Coast, the rains of the South-West Monsoon are so heavy as to bring to the greater part of the two districts of Malabar and South Kanara more than double the rainfall, that reaches any other part of the Presidency. The average rainfall of these districts is over 100 inches, while the average of the other districts is only half that amount or less. Bellary and Anantapur are the driest districts in the Presidency, their rainfall ranging from 20 to 23 inches. The soils of the Presidency are for the most part loamy, gravelly or sandy, alternating with the alluvium of the great river-deltas. This alluvium varies according to the nature of the soils in the drainage basins of the rivers. Further, there are wide stretches of black cotton soil, which is an extremely retentive clay of great stiffness. This type of soil is found in parts of Kistna, Nellore, Cuddappah, Bellary, Kurnool, Anantapur, Madura, Ramnad and Tinnevely.

South Indian Breeds.

The cattle of the Madras Presidency have long been famous, those designated "Mysore" and "Ongole" (also called Nellore) being preeminent.

Irrigation has been most highly developed in the East Coast districts, where the Deltas of the Godavari, the Kistna, and the Cauveri are situated. Save in Coimbatore and parts of the adjoining districts, all cultivation is carried on in open fields over which the live-stock of villagers roam at large, as soon as the harvest is over. In those excepted areas and in parts of Nellore, Madura and Tinnevely, the greater part of the land is enclosed with live fences. In these tracts, fodder is grown. In Coimbatore particularly, special

fodder crops of cholam and kambu are grown, and the practice of sowing the land with grass (*kolla-kattai*) exists. Elsewhere, the ryots depend on wild pasture and on the grazing of arable fields for pasturing cattle. As in the rest of India, here, too, the number of cattle kept varies considerably and is usually greatest where a large proportion of the arable land is under irrigation, and is least in the dry open plain of the black cotton soil found in the Deccan Districts, where the ordinary tillage is very superficial and where by means of several ingenious, but simple implements, cattle labour is economised.

The tilling cattle vary greatly in quality. Generally, they are inferior in coastal districts, where there is a large proportion of land irrigated by the natural flow of water.

Cattle are bred everywhere as a part of the general business of the cultivator. But, cattle breeding as a special branch of agriculture is followed extensively only in the Mysore Province, and in parts of Kistna, Guntur and Coimbatore, which supply a large number of bullocks to the districts round about.

Mysore Breed.

Mysore from a very early period has been famous for a superior breed of cattle. The generally mild and salubrious climate of the plateau with extensive pasture over which cultivation has not made much inroads has been favourable to cattle-breeding on a large scale, and has attracted nomadic tribes from the North bringing with them their excellent breeds.

Almost everywhere two varieties of the same type of cattle may be found side by side in the same region. The first variety consists of cattle of small size and compact frame; and, these form the bulk of the agricultural stock and are the main source of the dairy supply. The second variety consists of large-sized cattle of the same breed and these are used as beasts of burden more than in agriculture. They are largely sold in cattle fairs and markets in the Mysore State and elsewhere.

Amrita Mahal Breed.

There is one variety of Mysore cattle which is pre-eminently the most handsome, the best known, and the most largely represented. That is the Amrita Mahal breed (Figure 14). Its distinguishing features are the following :—The head is long and tapering towards the muzzle, which is generally black. The forehead bulges out beyond the line of the elongated nose. The horns are set well back on the crest of the frontal bone. They spring close together, then diverge and incline back towards each other in a straight line for fully half the length, when, with a gentle and graceful curve, they bend upwards and usually slightly inwards, towards the terminations, which are brown tipped. The eyes are quick, but neither large nor prominent; the ears are pink or slightly yellow shaded within, neat and sharp for the cattle of the size, and they taper rapidly from a good breadth to a sharp point. They project at about right angles from the cheek. The tail is nicely formed, and tapers down like a whip-lash to the black terminating tuft of hair. The hump and dewlap are both well-developed. The black line is straight from shoulder to the loins, where it drops. The hoofs are small, hard and well-formed. The ribs are well-rounded and deep, yet the belly is not too large to interfere with active work. The shoulders are remarkably neat and the bones of the leg are fine, fat, clean, and like those of a race-horse. The breed as a whole occupies among cattle the position for form, temper and endurance, strongly analogous to that of the thoroughbred horse among horses. These bullocks are on an average about 47 inches high. In disposition, these cattle are somewhat unruly and impatient of the presence of strangers. They are famous trotters and are largely used in the military transport.

Cauvery Basin Breed.

Of the other important varieties of Mysore cattle, the large white bullocks in the Cauvery Basin in the south-east (Figure 15) hold the most important place. Their superior weight and strength peculiarly suit them as carrier cattle. When compared to the other Mysore types, their foreheads are particularly long and prominent. On leaving the crown of the head, the horns at first go almost straight back, but finally turn up with a more abrupt bend than those of others. The ears are also large and pendulous, but the feet are a little soft owing to the character of the soil.

Punganur Breed.

The *Punganur* (Figure 16) is a small variety of the "Mysore." The horns curl forward more than in the pure Mysore. The legs are also shorter and the temper milder. This species is now almost extinct, having nearly died out along with the owners during a famine. Most of the Punganur cattle now extant are cross-bred "Mysore," which form a useful source of supply for working the shallow moat lifts of Chittoor and North Arcot districts. It is a great pity that the original breed should have been allowed practically to disappear. For, in addition to combining many of the good qualities found in breeds, still extant, the cows were what is so rare in Indian cattle, good milkers. The bullocks were excellent plough cattle as well as good trotters.

Nellore or Ongole Breed.

This is one of the most famous and widely known in India. (Figures 17 and 18). It is the great milking breed of the Madras Presidency. The finest specimens of this breed are to be seen in the villages lying between the Gundlakamma and Alluru rivers in the Ongole and Kandukur taluqs of the Guntur District. Like the Guzerat cattle, there are two varieties—large and small. The smaller cattle have short legs and are more compact and hardy. They are also the better milkers of the two. The animals of the large variety are leggy. The true colour of the breed is white with black points and frequently a slight shading of grey in the male. The horns of the male are short, and, for their length, stout and sharp-pointed. Those of the female are longer and are likewise sharp-pointed. Both are pretty straight and have a distinct inclination backwards, which begins at the root. The ears are of good size and decidedly drooping. They are docile, and are of mild temper and gentle disposition. The large variety is, in point of size, inferior to Guzerat or Nagar cattle (Figure 11), while being superior to Sindh breed. Though the bullocks are very much sought after, on account of their size, they are not good cattle on hard land, being soft and tender-footed. They are consequently not adapted to trotting. The breeding areas of the Nellore or Ongole type extend from Ongole westwards to Kurnool and northward to parts of Kistna District. It is from this tract that the great supply of draught cattle

to the Ceded districts is drawn. In the southern parts of Nellore District, where wet crops are grown, the cattle are very much inferior. The country where the best cattle are reared is the undulating highlands, interspersed with small hills covered with grass and is mostly composed of light red or dark alluvial soil. The breed probably is not so hardy as the Mysore or Alambadi; but for slow, heavy work, they are unsurpassed. Their huge size and great weight make them the best beefers in India and the sires are highly prized by foreign ranches.

The Alambadi Breed.

The *Alambadi* (Figure 19) is another useful variety of cattle, bred in the wild country near the Cauvery valley among the hills of Salem and Coimbatore. The males are good coach and cart bullocks, and are largely used in the extreme south of the Presidency for field work on the black cotton soils. This breed derives its name from its chief market—Mahadeswarabetta in the Kollegal taluq of the Coimbatore District, where two large cattle fairs are held in July and in October in which the cattle exhibited are mostly of this breed. It is called the Cauvery-breed from its hill home being on either side of the Cauvery. A more common name is Alambadi, after a village of that name on the banks of the Cauvery. The breeding area proper lies among the forests of east and south Kollegal and north Bhavani taluqs of the Coimbatore District and south Hosur and west and south-west Dharmapuri taluqs of the Salem District, as well as the adjoining territory of Mysore. The forests afford abundant pasture, and wide and unrestricted roaming ground. In the regular breeding tract, all male calves are sold when young, and these are taken by dealers to recognised rearing tracts, chiefly in north Salem, west Chittoor and the adjoining Mysore territory. Ryots of South Coimbatore also visit the Gettisamudram fair in Bhavani as well as the breeding villages in the hills and buy large numbers of calves for rearing. West coast dealers visit the fairs of Dharmapuri and take away calves to the west coast for rearing. As a necessary result of all this, in the breeding tracts, male stock are seldom seen, most of the agricultural and draught work being done with cows.

Kangayam Breed.

The *Kangayam* (Figures 20 and 21) is raised in the main portion of the Coimbatore District. They are good milkers and good draught cattle too. As in the other tracts, so also here, there are two varieties, a large and a small one. This well-known breed is not the common cattle of Kangayam, but one specially raised by breeders, the largest among them being the Pattagar of Palaiyakottai. The area in which the Kangayams are bred consists of the whole of the Dharapuram Taluq and the adjoining parts of Palladam, Erode, Karur, Palni and Dindigal Taluqs. The Kangayam division of Dharapuram taluq is the centre of the breeding area.

It is unnecessary to mention in a brief survey other local breeds which are useful and suited to the localities where they are raised, such as the "Gumsurs" in Ganjam, the "Dupads" and the "Kumbam valley cattle" in Kurnool and "Pulikulam" in Madura.

In this connection, a few words about crosses between two distinct breeds may be appropriate. It is a well recognised rule that the sire, in virtue of his greater potency, should be of the more improved breed. And breeders are aware that in farm stock it is the male that gives the external form, the female more the vital and internal organs, although it often happens that a calf has a very strong likeness to its mother. Regarding the improvement of cattle by using better sires, Dr. Voelcker is not in favour of trying to improve Indian Cattle by crossing them with English bulls, as the main object of the Indian farmer is to produce cattle better suited to *work* and not as in England to produce either meat or milk. There is a good deal to be said in favour of Dr. Voelcker's view and the opinion which really counts is that although the crosses between English bull and Indian cow give better milk-yielding cows than the indigenous varieties, the bullocks are not able to stand the strain of heavy farm work in the hot sun. So the more advantageous method apparently is to select the sire from the better kinds of the indigenous breeds. In the Agricultural Research Institute, Pusa, a successful attempt has been made in this manner to produce a better type of Kangayam bullock, useful not only for trotting but for heavy transport work, by crossing a Kangayam cow with an Ongole sire (Figures 22, 23 and 24).

Rearing Tracts.

The rearing tracts are as important as breeding tracts, and in almost all parts of the Presidency there are considerable movements of stock from the breeding to the rearing tracts. The young stock are either reared for sale, as, for instance, in Vizagapatam, or for the ryots' own use, as in the Ceded Districts. Yearling male stock are brought by the dealers from the Godaveri, Kistna and Guntur districts and are sold either in the villages or in the markets throughout the littoral of Vizagapatam. The whole of the black cotton area of the Ceded Districts may be regarded as a rearing tract. Young bulls up to two years old are regularly imported every year by Nellore dealers and these are brought and reared by the black soil ryots for their own use. In the west Bellary district, Mysore-bred calves are brought in large numbers and are reared by the ryots. Punganur and north Salem with the adjacent Mysore country form a large cattle rearing tract. Young stock are purchased either from the Mysore state or from the dealers in young stock, who buy in the fairs to which the Alambadi forest-bred calves are brought. This area supplies the moht and cart bullocks of Chittoor, North Arcot, South Arcot, south Chingleput as well as further south. The whole of the Coimbatore district may be regarded as a rearing tract. To a smaller extent, south Trichinopoly and north Madura are engaged in rearing. South Malabar is also a cattle rearing tract, but the class of stock reared are not of the best quality. Consequently Malabar draws on Coimbatore for its supply. Throughout the dry months of the year, October to May, *i.e.*, after the rains and before the commencement of the next cultivation season, a constant stream of young cattle pours into Malabar. Malabar dealers also buy in the big fairs in Dharmapuri taluq and take the calves from there to the West Coast. These young stock are bought by the ryots of the southern taluqs of Malabar and also by the ryots of Cochin and Travancore States and sold at the Trichur fair, held annually in December.

The Cattle Dealers.

This brief sketch of South Indian Cattle and their breeding and rearing areas will be incomplete without a word or two of the part played by the cattle dealers who form an important link between the

rearing areas and the tracts where the cattle are required for agricultural and draught purposes and fill a very necessary place in the agricultural economy of the country. Mr. H. C. Sampson, a former Deputy Director of Agriculture, has recorded very valuable information on this subject.

The following extract from Mr. Sampson's Report dealing with the cattle trade in the southern districts will be found interesting:—
“The Annual fairs of Tiruvannamalai, South Arcot, Trichinopoly, Madura and Tinnevely are mainly for full-grown cattle. Mysore and Salems are the chief attraction. A considerable number of Kangayams are also taken to Kazhugumalai, in the Tinnevely district. The Janappa Chettis who deal in Mysore or Alambadi cattle usually make four or five trips in the season, and while away on one trip, their relations and agents are collecting animals for the next. The trading commences in December at the Tiruvannamalai fair in North Arcot, held at the time of the Karthikai festival, and unsold animals are taken from here to Samayapuram near Trichinopoly for the Ekadasi festival held in the end of December or early in January. The second trip commences at the karthikai festival at Mailam in South Arcot at the end of January, and cattle, unsold here, are taken to the Kazhugumalai fair in Tinnevely. The third trip commences at the fair held at Malaiyanur in South Arcot in February or early in March, and unsold animals are taken to the Masi Makham festival at Kumbakonam or the Masi Makham festival at Tiruchendur. The fourth trip commences at the Panguni Uttaram festivals either at Mailam in South Arcot, or Palni in Madura district, and unsold animals from these two are taken to the Chithrai festival at Madura, while the remnants of this and other trips drift down to the several fairs in Tinnevely, *viz.*, Kazhugumalai Panguni Uttaram festival, Sivalaperi Chithrai festival, and finally the Sankaranayanar Koil Audi Tapasu festival. The last trip commences and ends with the Audi Kritthigai festival at Mailam in July. Besides attending these fairs, the Janappa Chettis have also to attend the annual fairs of north Salem and north-west Coimbatore, *viz.*, Mahadeswaramalai, Gettisamudram, Adamanakotta, Nattapatti, Macheri, and Nanjaval, where they principally deal in forest-bred calves, which they buy and take to the rearing tracts for sale. “The annual fairs of the Coimbatore district, *e.g.*, Avanashi, Karuvalur, and Tiruppur

are the selling markets for the trading tracts of the district, to which the ryots from other parts come to buy."

Other fairs are also held in May and June, and again in November and December, and a summer fair in August, the times of the fairs being in harmony with the seasonal rhythm of the region.

A. SWAMINATHA IYER, B.A.,
Retired Deputy Collector.

A Meeting of the Association.

Was held on 26—2—1927 at the Y. M. C. A. Auditorium, when Mr. A. Swaminatha Iyer, retired Deputy Collector and Editor 'Rural India,' read a paper on "**South Indian Cattle: their Breeds and Distribution.**" The Hon. Mr. A. Ranganadha Mudaliar, B.A., M.L.C., Minister for Development occupied the chair.

After a brief introductory speech by the Chairman, Mr. Swaminatha Iyer read the paper printed above, and a discussion followed.

Mr. Woodford, Dy. Director of Livestock, Salem :—I may be able to tell you about the official attitude in regard to the crossing of Indian cattle with English sires. It is not to be assumed that the cross will improve the male generation although the many calves born have got good milking strain. The idea of crossing is, therefore, purely for milking purposes in such cities as Madras or in municipalities, where the object is entirely to improve milking, and I think it is getting to be the accepted attitude in regard to this question.

Mr. M. Subramaniam.—Regarding the Indian humped bull, the breed is at least five thousand years old, as evidenced by archaeological finds of North India.

As regards the return to wild nature from domestication, there are found examples in the horses taken to Argentine by the Spaniards. Those horses were taken to the Pampas and such as escaped from man's control refuse to be tamed and are to this day fully free.

It is often mentioned that the number of cattle indicates the prosperity of the village. My own impression is that the quality of

the cattle affords the best index of that. You can gauge from the quality of the cattle the ability of the husbandman, and what care he takes of his cattle is reflected in his cultivation. In fact, these are the only handy power in the countryside for transport and for tillage. The cattle is the mainstay of Indian life.

The grasslands are *par excellence* the breeding places for cattle. These lands are thus of great service and that is why all tillage tracts here depend so very much on Mysore pastures. The difficulties with regard to the cattle in deltas, where cultivation has been carried to the very verge of arability, are not only the question of fodder but also that of cattle getting satisfaction for the physiological needs of exercising their limbs in free play and movement. The latter fact presents the greatest difficulty of all. For, the lack of natural fodder is made good by straw and oil-cakes and husks. The main difficulty is, therefore, in getting their physiological needs satisfied. But much may be done in this direction, as well, by co-operative effort.

It appears that the Sindhi breed makes very good milkers, and it is very easy too to get them down to Madras, and have them crossed. They cost very little compared with the good milkers here. The cost of transport (by ship) is also very little. That is one of the ways by which an improvement in the milk supply for the City of Madras can be effected. Most of us are aware of the failure of the Hygienic Milk Supply Co., started here. The difficulty, it appears, arose from very little care having been taken in the selection of the cows that were purchased. Provided there is a proper selection, there must be little difficulty in getting a good breed of milkers in this city.

As regards the fairs where cattle are offered for sale, about the time of Pongal we have got the fair of Subbaroya Shashti, 30 miles north of Bangalore, which is about the biggest cattle fair in South India. It is well worth visiting.

The Cattle Exhibitions have not been all to the good. One evil that has resulted from them is this. Some 15 years ago, there was an Exhibition organised at Ongole by the enthusiasts for the Improvement of Cattle. The result was that the good sires were all

bought at tempting prices by brokers for ranches in Argentine, Brazil and Batavia ; systematically this has been going on ; and our cattle have been degenerating year by year.

The question of improvement has to be tackled from two stand-points, from that of milk supply and of tillage. Stock breeding is becoming rarer and rarer. The Viceroy says that 60 Crores of Rupees are being wasted to-day in poor breeding. That is as much as the Army Charges. Various remedies are suggested. But very few can stand the test of being good business propositions. One such, for instance, is that exports be stopped.

The Chairman has now part control over the Revenues of the Presidency, but I am afraid that when he applies himself to the practical problems, he will probably find the finances all too poor. I am sure that in the course of his office, he will be able to remedy some of the standing grievances and make things really better.

*Mr. Woodford :—*The lecturer takes you over an enormous number of breeds of cattle. He has talked to you of the breeds of a continent and about those of the sub-continent of South India, but of these, people in our position can only choose two or three. Therefore, two or three have been picked out and taken for experimenting on. The Madras Government have naturally chosen first of all, the Ongole, and secondly, the Kangyam types, out of the South Indian types to work on. In addition, they have imported the Sindhi breed primarily for milk and secondarily for draught purposes and then are also making experiments with imported European breeds. Madras is about the best example of an Indian city where some success has been attained by the importation. I think there are more cross-breeds and better cross-bred cows in Madras, privately owned, than in any other city of India.

To come back to the Ongole type, Government ran a cattle farm at Chintaladevi in the Nellore District with the object of breeding the Ongole breed, with the double purpose of producing draught cattle and milking cows. The female supplied large quantity of milk, while, it was found, the male could not supply the power for cultivation.

When a Corporation or Government or a private person sets out to improve the cattle, time alone could ensure the result. We can breed from one plant a thousand seeds in a few years. When we come to cattle, each generation takes four years. From this, some selection has to be made and another four years pass, and possibly some improvement could be made only after those four years. Improvements do not come quickly ; possibly ten generations must pass before any noticeable improvement can be seen. That means 40 years and the oldest cow is only 10 years.

We can teach the Pattagar of Kangayam nothing in the way of breeding draught cattle, for he is a professional man, and his knowledge is being handed down to him from father to son, and he can give many points to us.

The result is one of the finest breeds of cattle, the Kangayam breed. With a view to having bulls at the care of Government to place them wherever they please, a breeding station was started three years ago. We are scarcely on the way of seeing any improvement, as it takes at least four years for one generation. The first generation is most expensive ; but the progeny is less expensive. It is our policy to pick out the cow of one breed and cross it on the western bulls. We are following as fast as we can the example of Cochin in this respect, and we are crossing Sindhi cattle. We shall have in the course of years several hundreds of them.

The concern mentioned in Madras, the Hygienic Milk Supply Co., which was owned by some of the richest men of the City, went into liquidation. The cow did give certain Madras measures of milk per day and she kept that up for nine months. The sire was of Sindhi breed and there was that line which we so much admire. This is almost equal to the cross-breed in regard to milk. Where the objection is got over, we find the Sindhi is decidedly good. We have sent half a dozen to the west coast. As we bring them, there is a great demand.

I have already mentioned the cross-breed cattle which is the other branch of the breed. It is not claimed that this cross-breed is going in any way to improve the draught cattle. I consider the draught cattle cannot be improved. But the milk-yielding power of the cows is enormous. I know a cow gave twelve thousand pints of milk in eleven months—nearly twenty measures a day, and she gave that for

four years and is still alive. I mention this as an example of what cross-breeding of this high-milking breed can do. But with regard to the animals for traffic, it is not recommended. We are working, therefore, on the Ongole and Kangayam and the Sinddhi and the cross-breed of these in cities and municipalities.

Mr. Sivasankaran.—Will the English cross-breed last for more than one generation or two? Because, I was told by some one experienced in the Mysore cattle that even the milking quality deteriorates after the second generation. So even from that point of view crossing is not recommended.

Mr. Woodford.—That takes one into a very big problem. The point is this:—The first cross is an enormous success. We get the milking quality and the constitution is original. When it comes to breeding the second generation the difficulty arises. For, you are going either to use the imported bull again or you are going to use the country bull and get a quarter imported and three-fourths inland calf. The first experiment, it is the usual experience, is enormously successful. The greater majority lose the constitution of the mother. The constitution of the original Indian mother is lost. Therefore a three-fourths breed animal is liable to disease, and is in bad condition. On the other hand, if you use the country breed on the half-bred cow you are more or less passing to it milking strain, and you will find only a quarter of this milking power. We in the agricultural department have solved that problem by using the half bred on the half-bred cow, whereby we get a half-bred second generation. With the half bred second generation we use a half-bred second generation, and we get a half-bred third generation. We have thus got up to the half-bred fifth generation. There is some deterioration, no doubt, but not very great. The third half-bred generation is 50 per cent above the original, but that deterioration will go, and it is the object of our attempts to see how far it goes. Probably it may go on to the tenth generation before we can definitely say that there is deterioration. But I cannot give you definite information on that. I should like to say this,—if deterioration is general, it is very slow.

The Hon'ble Mr. A. Ranganatha Mudaliar then spoke as follows :—

“Gentlemen, I think I have really discharged my duty as Chairman by calling on the representative of the Livestock Department to address you this evening. You have heard what steps the Government is taking in the matter of improving the cattle of this Province. I do not know how many of you are aware of the fact that Government carried out a survey of cattle in this province in the year 1912. The Report of the Survey contains a lot of useful information, and it is in fact as a result of the survey that the department of livestock has been formed by Government. Just now I think we have a number of places where experiments are being carried on in improving cattle both for draught and milking purposes. Such farms are to be found in Chintaladevi, Hosur and other places. But the farm at Hosur is the best, and from that we have every reason to expect the best results. We are carrying on experiments purely to improve the milking quality of the breed; and I think there is also an object of getting what is called dual-purpose animals, *i.e.*, animals that would be good for draught purposes and would have good milking capacity. It is, however, too early to say how far we can have successful results in the direction. Some surveys have also been made of the Ongole breeding tracts and of buffaloes of the Ceded Districts. Where these surveys are completed, we can have some more important information in regard to the methods of feeding, rearing, etc., of this breed. Just at present there is a scheme which we are considering by which it would be possible for Government to lend bulls to individuals, Municipalities, District Boards and Corporations, so that they may be placed in different principal centres. That is a scheme I have got under consideration and I think it would be very easy to have some bulls for this purpose soon.

Closely associated with this is the question of supply of fodder. That is again a serious problem. Perhaps, some new process might be tried by which ryots might preserve fodder so that they may be helped to have their own bulls and to breed their own bulls. Of course, in these days of fodder scarcity, we have to turn our first attention to these unfortunate animals which are the first to suffer in time of scarcity and drought. That means our calculations will be affected. But the Government are throwing open reserve forests for free grazing. There is no doubt this would be freely extended by Government. It is all in the stage of experiment;

and we cannot have many years to wait in which the experiments can be carried out, and it would be for us to watch the results.

I am sure we are very much indebted for the excellent lecture and also to the other speakers in the discussion, and I thank you for the honour done to me in asking me to preside this evening; for, surely, I have heard very instructive things this evening."

With a vote of thanks to the Lecturer, the Chairman and the speakers, the meeting came to a close.

APPENDIX A.

List of Illustrations.

- Figure 1. An Indian Breeding bull.
 " 2. An English shorthorn bull.
 " 3. A Sindhi bull.
 " 4. West Coast (Malabar) cow.
 " 5. Malabar cow.
 " 6. Guzerat bull.
 " 7. Guzerat bullock.
 " 8. Kankreji bullock.
 " 9. Kistna Valley bullock.
 " 10. Wadhiali cow.
 " 11. Nagar bullock.
 " 12. Gir cow.
 " 13. Hurrianah bullock.
 " 14. Amrita Mahal bullock.
 " 15. Mysore (Cauvery Valley) bullock.
 " 16. Punganur bullock.
 " 17. Ongole (Nellorie) bull.
 " 18. Ongole (Nellorie) cow and calf.
 " 19. Alambadi bullock.
 " 20. Kangayam bullock.
 " 21. Kangayam cow.
 " 22. Cross-bred, from Pusa.
 " 23. Cross-bred from Pusa.
 " 24. Kangayam bullock half bred. The cross is with Ongole.

Regional Surveys.

IV. The Middle School.

In our last article, it will be remembered, we treated the work of the regional survey as it might be commenced in the Primary or Elementary School. In this article it is proposed to carry on the work into the Middle School, in the classes, called Standards 6, 7 and 8 in some Schools, and in others Forms 1, 2 and 3. It must be clearly understood, however, that the collection of pictures, photos, etc., of the district, goes on in all these classes, and really never ceases until the Sixth Form work is finished. The School Collection will never be complete unless this is done systematically, and marks may be given to boys and girls who bring these pictures to the School to add to the Collection. In the course of a few years then, a fairly complete collection will be in the possession of the School for reference and teaching aids.

In the First Form the time has come for definite Nature Study in the district. The pupils of this Form will specialise in making a survey of the insects of the neighbourhood. A beginning can be made by collecting butterflies and moths common in the district, and by "common" we mean such as can be seen almost any time in the year. Madras just now is full of these lovely creatures, brilliantly coloured and fragile, swarming wherever thick foliage gives them opportunity to do so. It would be ideal if the boys could draw and copy in colours these creatures, and then set them free again. A glass-fronted box would assist them to do this, and would at the same time avoid the necessity of killing these beautiful creatures of God's making. But perhaps this may be a counsel of perfection where boys are concerned. Having classified the butterflies and moths of the neighbourhood, the boys may then make a collection of the other insects and make a classification of these also, in categories such as beetles, wasps, ants and so on. A simple natural history, and perhaps the aid of a teacher, who has taken Natural Sciences as his degree subjects, will enable the boys to make a fairly satisfactory classification of their collections. Some arrangement will have to be made at this stage for housing the collections made, and it seems that here is the real function of a School Museum, to

take the place of the heterogenous mass of odds and ends one usually sees dignified by that title. As we said in a previous article on this subject, the school must have a museum curator, and he will be one of the boys in the upper part of the school. His work will be (under the supervision, of course, of the teacher) to arrange the collections made by the boys, so that they can be easily referred to, when occasion demands.

When these collections have been made and classified (and there is no reason why the boys of other forms should not assist *if they wish*, and not otherwise) the way is now open for further observation of the insect world around. There is always an interrelation evident between the insect, the bird, and the plant life of a district, and this interrelation the boys must be led to notice. We use the word "led" advisedly, for though the boys, by their own attempts, may not have the necessary powers to grasp the connections between these three forms of life and may therefore need the help of the teacher, they most certainly ought not to be told anything beyond what is strictly necessary. The more they discover by their own efforts the greater will be the benefit of this type of work. They will then probably discover, for instance, how certain forms of plant life attract certain insects, either for food or for egg-laying, and then how the consequent caterpillars and grubs attract in their turn certain types of birds. This interrelation is perhaps the most important part of the work to be done, and it should not be shirked.

The final effort of this Form will be to supply information to the teacher so that he can plot on a class map the ponds, rivers, and open waters, such as tanks, in the immediate district, and later to make a list of the living creatures to be found in each type of open water and compare these lists to find any principle governing the life and the situation or other factors governing the open water.

The Second Form is concerned with the botanical aspect of the survey, and it will commence its work by careful observation of the trees of the neighbourhood. The question to be ever in their minds is the one dealing with the most common types; "What is the type of tree, or what are the types of trees, mostly met with round here?" asks the teacher, and the boys spend their leisure time observing the trees of the district. The teacher can do a good piece of work here

by beginning a co-operative map in which all the boys contribute information as to the woods, marshes, (wet lands) ponds, maidans and uncultivated patches of ground in the neighbourhood. The map when finished is generally an eye-opener as to the amount of land that is being wasted for want of cultivation. Now to return to the study of the trees, and having discovered which are the most prevalent types of trees in the neighbourhood, the boys are then set the following problems. What kind of shrub or small bush grows best under each kind of tree? What plants flourish under each type of tree, and what is the condition of the ground on which these plants grow? After a time the boys will then be able to differentiate the various types of woodland found in the district and will know something of the characteristics of each type. All these investigations and observations are of course of the most elementary type and nothing in advanced Nature Study can be attempted; nor ought it to be, at this stage.

As the work goes on, the boys will have made plant-lists of each part of the district and these lists will be marked opposite each kind of plant with observations like "very abundant," "common" or "rare", and when the lists are fairly complete, the localities where the various plants are very abundant can be marked in some distinctive manner on a large scale map. On this large-scale map are also marked the crops growing in each area, and also the map will show the grasslands (pasturage) and the areas of natural vegetation in the district. If this marking of crops is done for a number of years and done fairly conscientiously, the method of rotating crops in the neighbourhood will become evident, and with a little assistance from the teacher the boys will find the reasons underlying that particular rotation, a very important fact dependent on soil, climate and other factors.

An interesting exercise for this Form to carry out is to imagine from the above data what the district looked like before man cultivated it, and then to make an imaginative map of the district as it then was. This co-ordinates all the previous work of the Form and clinches the facts.

Finally the class will make a list of the wild plant foods, which are good to eat, and at the same time make a list of dangerous

berries, flowers and trees. The former list will be useful to any boy camping, say as a Boy Scout, and the latter list is invaluable to every boy, who loves to walk abroad for his pleasure, and perhaps eat of the berries and leaves he finds about him.

We said we would deal with the entire Middle School, but our space is exhausted and there is yet the important subject of the Third Form work on Climate and Weather to be dealt with. So, we will continue our description of the survey in the next number of the Journal, commencing with the work of the Third Form.

—G. Davies-Watkins, B.Sc., F.R.G.S., F.R. Econ S.

Rural Geography.

III. Other Natural Controls on Rural Life.

The effects of climatic and seasonal control of rural activities were discussed in the previous paper; and, before we proceed to trace the work of Man in rural areas as an agent of his environment, let us indicate in brief the effects of the other chief physical controls, such as location and surroundings, structure and soils, flora and fauna.

It is possible that in a particular rural locality there may be facilities enough for the people there to take to any work from hunting and fishing at one end of the scale to industries and trade at the other end. Fishing in the neighbouring river or tank, hunting for small game, cutting wood, or gathering forest produce in the neighbouring woods, grazing sheep or cattle in the dry uplands of the vicinity or in the uncultivated and *poramboke* lands of the village, cultivation of dry, wet and garden crops, planting of topes and orchards, working in quarries for limestone or building material, working on wood and metals, spinning and weaving—*traces* of several of these occupations can be seen in various villages taken together of a local grouping in a single tract. But the true measure of the natural facilities afforded for this or that occupation to prevail over the rest is a *quantitative one*. In what proportion do the inhabitants of a village take to the various occupations obtaining therein? *What do the bulk of them work at?* On the answer to this query, quite

apart from man's skill in getting over natural obstacles, depends the impress of the environment on human activities of the locality, and these in turn mirror the features of that environment.

Location is often thought to be a matter of secondary importance. But it is a mistake. The location of a place is not merely a static fact—one of topography only—but it is of the highest dynamic value, leading to far-reaching consequences on the life and economy of its inhabitants.

Maritime or aquatic location.—All along the sea-coast and in the neighbourhood of the backwaters there have sprung up hundreds of fishing villages, *kuppams* or mere hamlets, (like Parthasarathy Kuppam in Triplicane and Kasimode in Royapuram) whose inhabitants live by gathering the harvest of the sea in their primitive fashion. The salinity and the sandy nature of the soil here, which are unsuited for agriculture, are, however, specially favourable for the growth of the cocoanut and the casuarina. Looking along the Madras coast from the sea, or travelling along the Buckingham Canal, one sees for miles and miles north and south of the city nothing else but groves of these two kinds of trees. In favoured spots, where the salinity is not very high and where a good supply of water is available, cultivation of a sort is carried on towards the interior, as in Tiruvamiyur and Minjur; but, it is not the fishermen themselves that take to it. The facilities for transport control the expansion of such villages. For example, Ennore and Pulicat owe what little importance they have to their location on the backwaters and by the lagoon.

Hilly location.—A hilly or upland location, whether forested on account of heavy rainfall or bare owing to prevailing dry conditions results generally in a sparse population, as the means of subsistence there is precarious. The habitations are few and far between, while villages are little more than hamlets, whose inhabitants eke out a miserable living by hunting or tending sheep and goats. Cutting stones and working in quarries, and cutting wood, working in timber and collecting forest produce from the neighbouring jungle for disposal in towns are other useful occupations in such areas.

Location on natural routes.—Villages situated on highways and frequented routes, howsoever they may have originated at first, develop in course of time, as a result of the facilities of communication, into towns. For example, Villupuram, which is now a municipal town, was nothing more than a small village a few decades ago. Its growth, due at first to crossing of roads, has been accelerated by the railway junction. In such nodal villages, trade forms an important occupation, and there is much traffic in the needs of wayfarers.

Location near a water-source.—The bulk of the more important villages in South India are clustered in the plains, and grow wet crops, owing to their location in areas of good water-supply either from rivers, tanks and springs, or by rainfall. Those in less rainy areas but still having dependable water-supply such as those in parts of Mysore or the Ceded Districts grow more largely the dry crops. Both these kinds of villages form the bulk of South Indian villages and are essentially agricultural in pursuits and outlook.

Slope and Drainage.—Next to location is the influence of *Slope and Drainage*. Slope control, however, ultimately resolves itself into moisture control. And, as pointed out above, villages in upland regions are few and sparsely populated, having insufficient facilities for the retention of water, while low-lying valleys and river-plains are studded with rich and populous villages.

Soil.—Soil is a chief factor in determining the occupation, size and character of a village. The adverse effects of a saline sandy soil on agriculture, and its usefulness for the growth of the cocoanut and the casuarina have been pointed out. Other kinds of poor soil—rock, laterite, etc.—have similar effects on agriculture. But, where soil is being constantly renewed in large quantities as in alluvial plains, agriculture flourishes best. Large villages spring up in great numbers, for example, in Deltas.

Natural flora and fauna.—These did indeed influence the original choice of site of villages as well as their early growth and development. But in modern times it is very difficult to trace their direct effects on rural settlements. For, Man has cleared the forest and has hunted down or driven out the wild animals for his own

safety. Cultivated plants and domestic animals have taken their place almost wholly.

These remarks are intended merely to point out how the physical factors bear on rural life and activities. In the next articles, we shall touch upon how man has shaped his own environment for his ends, in South Indian Villages.

N. SUBRAHMANYAM, M.A., L.T.

News and Notes.

This number of the Journal is a Cattle Number. To do bare justice to the famous varieties of South Indian Cattle, it would require many more articles of the kind. Some of these breeds are alas, disappearing. The Punganur Cow, that wet nurse of many a child, had solved, almost successfully, the well-high impossible economic problem of costing *little*, eating *little* but yielding *much* milk; her bullocks were also very useful at the plough and in the cart. She was cheap to buy and cheap to keep; yet so little has been the care taken, that she has almost disappeared within the last twenty years.

* * *

Miss Birdseye, B. Sc., is to repeat this year, at Chittoor once more, her last year's successful experiment at Chittoor of a Summer School of Geography for Women Teachers in Missionary Schools. Her insistence on practical work and her enthusiastic handling of the subject will doubtless leave a healthy impress on the teachers gathered there.

* * *

While so much is done by private agency under Missionary auspices, for the promotion of the teaching of Geography, it is not out of place to suggest to the Government which is looked up to

give the lead in these matters, and ought to do so, that it, too, should do its bit for the Teachers of Geography, by organising Refresher Courses in them. There is great need for such a course; for, *Modern Geography* is a new subject to most of those who now handle the subject of Geography in Schools, and the teachers; it is that require *first* to be taught.

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This extract from the speech of Dr. C. V. Raman, F.R.S., at Kumbakonam (July 22, 1927. *The Hindu*, July 25th, p. 16) will surely, be read with delight :—

"What was wanted was the cultivation of live interests in the subjects they were called upon to learn. Any subject was bound to become interesting and informing if the students but approached it with the required appetite for knowledge. In his schooldays the lecturer had a step-motherly affection for Geography, but when he went to California and observed the beauties of nature there, when he wondered at the Majestic Alps and the mighty Caucasus, he thought to himself why he had not read Geography with the keenest interest so that he might enjoy and appreciate the natural scenery more thoroughly in all their aspects, harnessing personal experience to the knowledge gained in the school. They could not properly appraise and appreciate the live side of any subject if there was no knowledge about it beforehand."

Reviews.

1. *The World*.—By L. Dudley Stamp, D. Sc., Longmans, Green and Co., 1927—pp. 648, with 10 coloured Maps and 414 diagrams and illustrations : price Rs. 3-0-0.

This book is the full text of which the advance copy was noticed in the last number. It is written for Schools and Colleges in India by a writer with the first hand experience of the Indian Student whose notorious love of working for the Examination-hall has not escaped his thought and care. The result is a good working textbook written from the standpoint of 'Modern Geography,' a subject that in its modernity is somewhat new to Indian teachers. The diagrams are abundant and have been *especially* prepared for the

book, and they are its outstanding merit. Both the sketchmaps and the coloured Maps lead the pupil along helpfully, making the book almost self-contained. And for the matter in the book or the size of it, the price is remarkably cheap.

2. *A Junior Reader in Economic Geography*.—By V. C. Spary, B. Sc., University of London Press (Agents, Longmans, Green and Co.,) pp. 172 with 76 maps, illustrations and diagrams : price 2 sh.

This book is admirably adapted to excite in its reader a geographical outlook starting him from the common things around him. The preface explains clearly the standpoint : "The aim of this book is to show junior pupils the relation between physical conditions and the production of those goods which satisfy man's elemental needs ; to show how man's increasing knowledge re-acts on his welfare ; and to suggest some of the complexities of organisation which accompany the distribution of commodities in the modern world. It is thought that this elementary introduction will form a good basis for a serious study of Geography in its economic aspect." The pages of the text make good the claim of the writer. Although the book is written primarily from the standpoint of an English citizen and draws for illustrations from the British Isles, yet such is the generality of the treatment and 'the world outlook' of it, that the Indian student may study it with profit and gain through it an insight into the geographical basis of Economics. Altogether, it is an excellent little book.

Geographical Exercise Books.

The teaching of Modern Geography lays the emphasis on Practical Work, on 'learning by doing'—which includes, besides field work and excursions, 'practical work' in its narrower sense—work done in the class room or at home. This serves to explain and elucidate geographical facts and principles as well as facilitate their memorisation. It generally consists of the preparation and drawing of plans, maps, charts and diagrams. Of these, map-work is by far the most important, since maps are, as it were, the Shorthand of Geography.

But the ordinary maps in Atlases are highly complex, very many features being crowded together ; and however valuable they may

be as books of reference, they are worse than useless as educational text-books. The representation of each geographical feature in a separate map helps easy understanding; and, when such simplified maps are prepared by the pupils themselves from given data, and suggestive questions and problems are attempted to be solved from them, the result of such work is of high educational value.

The Exercise Books of this kind till now available for use in Schools in India have been those prepared for English or American boys and girls, and it is a sign of the changed outlook regarding the teaching of Geography in this country that there are forthcoming books planned from the Indian or South Indian point of view, and in the mother-tongue. We are, therefore, very happy to welcome the Mapping and other Exercise Books noticed below.

3. *Macmillan's Mapping Exercise Books*.—Macmillan and Co.

Book One, 32 pp. Price 4 as.
Book Two, 32 pp. Price 4 as.
Book Three, 64 pp. Price 7 as.

These Mapping Exercise Books have been planned for use in the Middle School forms in accordance with the syllabus issued by the Madras Educational Department. They contain outline maps of continents and countries on one side of the sheet, the other side being left blank for writing notes and exercises.

4. *Excelsior Geographical Exercise Books*.—With suggestive questions by G. P. William, B.A., L.T. published by E. M. Gopalakrishna Kone, Pudumandapam, Madura, 1927.

Book One for	V Class.	22 sheets.	Price 5 annas.
Book Two for	I Form.	22 sheets.	Price 5 annas.
Book Three for	II Form.	30 sheets.	Price 6 annas.
Book Four for	III Form.	30 sheets.	Price 7 annas.

These Exercise Books have been prepared in accordance with the requirements of the Madras Educational Department. The syllabus of the class is printed in the opening page of the book. A useful feature of the series is the insertion under each outline map of

a few typical suggestive questions, well chosen and carefully arranged, calculated to cultivate in the pupils a real geographical sense. Another merit of it is that these questions are in the mother-tongue, making them eminently suitable for use in the lower forms. These books may usefully be issued in other South Indian languages also.

5. *Boys' Own Outline Atlas of the Indian Empire*.—By Hiralal L. Kaji, M.A., B. Sc., I.E.S. Published by The Guzerat Oriental Book Depot, Ahmedabad. Pp. 48, 1927.

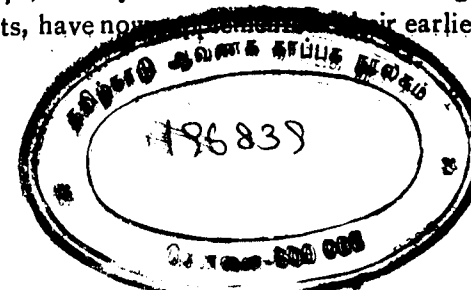
This Outline Atlas is suited for schools and colleges in India. It contains twenty outline maps of India, in each of which various geographical features have been marked arranged in a logical sequence; such as, contour lines, rivers, isotherms, isohyets, rail ways, sea-routes, areas of density of population, political divisions, locations of chief towns, etc., "Directions" as to what to do in these Outline Maps, and a series of stimulating and suggestive questions and problems with reference to each of these maps are interleaved between them so as to come in on the opposite page. This "Boys' Own Atlas" can be used with great advantage in those classes where Indian Geography is studied in detail.

The maps are printed on good drawing paper, and the get-up is neat.

6. *Longmans Geographical Exercise Books For India*.—By L. Dudley Stamp, B.A., D. Sc. (London), F.R.G.S., and Elsa C. Stamp, B.A., (London). Published by Longmans, Green and Co. 1927.

Part I—Map Reading Exercises	32 pp.	Price 12 annas.
Part II—Climatic Exercises	32 pp.	Price 12 annas.
Part III—Graphical and Regional Exercises.	32 pp.	Price 12 annas.

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Geographical Exercise Books, which are suitable for use in the High School and the College. They are printed attractively on glazed paper, one side of which is ruled in squares; and maps and diagrams are drawn or are required to be drawn on this side.

Part I is devoted to Map reading. It contains lessons, maps, diagrams, scale, area, representation of height by means of block-diagrams and contours, sections, and enlargement of maps, and closes with the reading of Ordinance Survey Maps.

Part II treats of the Climate of India. It contains maps, graphs and exercises on Temperature, Pressure, Winds, and Rainfall, and closes with an explanation of Cyclones and Anti-cyclones.

Part III attempts to show how other facts, besides Physical and Climatic, can be represented by means of maps and diagrams. The topics of Indian Geography chosen for illustration and exercises are Population, Vegetation and Cultivation, Irrigation, Railways, and Trade; and it closes with a brief explanation of three of the most common Map Projections.

Books and Journals received.

The influence of the Geography of India on its History by Shamsul Ghani Khan, Ajmer.

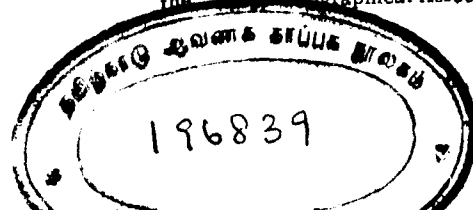
The Educational Review. Vol. XXXIII, No. 6. June 1927.

Rural India. Vol. II, No. 1. July 1927.

The Quarterly Journal of the Andhra Historical Research Society. Vol. II, Part 1. July 1927.

Geography (formerly the Geographical Teacher). No. 78, Vol. XIV, Part II. Summer 1927.

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7. A person shall become an ordinary member upon the proposal by a member, the seconding by another member and approval by the council by the majority thereof present at its meeting. He shall pay an annual subscription of rupees ~~two~~ payable in one instalment or in two equal half-yearly instalments at his option.

8. Those who pay an amount of hundred rupees in two years become LIFE MEMBERS, and they shall be exempt from payment of any further subscriptions.

Officers.

9. There shall be the following officers for the Association:—
Patrons, Vice-Patrons, President, one or more Vice-Presidents, Secretary and Treasurer.

Management.

10. The management of the Association shall vest in a Working Council, which shall consist of the president, the vice-presidents, the secretary and the treasurer as ex-officio members, and four others elected by the general body, one at least of whom shall be from amongst the mofussil members.

11. The Quorum for a meeting of the Working Council shall be three.

The Powers and Duties of the Working Council.

12. The duties of the Working Council shall be:—

- (A) To receive and approve all applications for membership;
- (B) To arrange for the annual and other meetings of the Association;
- (C) To provide for the custody and utilisation of funds and other property of the Association;
- (D) To appoint committees and assign duties to them;
- (E) To act in all respects on behalf of and exercise the powers of the general body, except when actually sitting.

13. The Working Council shall have the powers, subject to the veto of the general body, to issue, modify or rescind the regulation of the work and activities of the Association.

Miscellaneous.

14. The official year of the Association shall be the year ending on 31st December, and shall be divided into two halves.

15. The Annual Meeting of the Association shall be held in December, when the officers for the coming year shall be elected.

16. All life membership subscriptions, and one-third of all ordinary subscriptions shall be added to the capital fund of the Association.

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