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A lecture to be given to the Karoi Rotarians
on 10th November, 1972.

Mr. Chairman, (President), it is a very considerable honour and pleasure for me to have been asked to address you and your club here today. I am very grateful.

As is presumably expected, I intend to talk about tsetse flies, which as you know are my specialisation. It is also appropriate to talk about them here, since the Karoi area has been constantly in the fore front of the problem in Rhodesia ever since the area was first opened up for farming shortly after the war. I have made many visits here to try to allay the fears of anxious farmers and as you know there is still some danger, although we have come a long way to stabilising the problem in this region.

It may be of interest to you that I was personally involved in the destocking of the Urungwe Tribal Trust Land, (then Reserve) in 1952 and that I lived at Magunge, in the Tribal Trust Land, for some three and a half years whilst organising and supervising tsetse control measures, in the Urungwe district. I therefore know this area reasonably well.

But to get on with my prepared talk. This is entitled "Tsetse flies as a limiting factor to the full utilisation of the natural grazing in Rhodesia by domestic stock" and although of a general nature it contains some thoughts on land utilisation, which are of great concern to a number of

us in the Branch.

At the present time some 53 743 square kilometres, (20 750 square miles), of bush land and woodland are infested with tsetse flies, Glossina morsitans Westw. and to a lesser extent G.pallidipes Aust. and the grazing within this area, (or areas since the infestation is not continuous), is denied to domestic stock, because of the usually fatal disease which is transmitted by these insects, namely trypanosomiasis or nagana. Again, some 17 871 square kilometres, (6 900 square miles), of land lying along the fringes of the infested areas, which in most cases are settled by tribesmen, are affected by occasional incursions of tsetse flies or by the inevitable "carried fly" from the infested areas beyond, causing sporadic trypanosomiasis amongst the resident domestic stock, e.g. the cases which occur from time to time on those Karoi farms which adjoin the main Chirundu road. Furthermore there is that area of about 125 615 square kilometres, (48 500 square miles), lying approximately between the affected fringe region, (mentioned previously), and the 3 500' contour, which was originally infested by tsetse flies prior to the great rinderpest epizootic of 1896, and which, should control be removed, would be liable to relatively rapid reinfestation. Such is the problem as it exists in Rhodesia.

The efforts of the Branch of Tsetse and Trypanosomiasis Control, Department of Veterinary Services, the organisation

responsible for the control of tsetse flies and of the disease, trypanosomiasis, in Rhodesia, are currently directed to regaining the status quo held previously along the fly fronts, but which was lost in the period 1958-1960 when, because of well meaning, but very misinformed public opinion, game elimination, as a means of tsetse control, was terminated in favour of control by bush clearing and by the use of modern insecticides applied from aircraft as aerosols, or by ground spraying as residual deposits to the dry season resting and refuge sites of tsetse flies. Regrettably, these other methods proved quite inadequate in the face of fly belts which always have a potential for expansion and of fly fronts which are exceedingly long, the Zambezi fly front being 1 086 kilometres, (675 miles), in length. It was not within the capabilities of the organisation then to apply control measures at all the points of pressure with these methods, which, with the knowledge available at the time were only suitable for local application. It therefore became necessary in 1964 to reinstitute game elimination, albeit on a new and restricted basis, as the primary means of control along the fly fronts, supplemented where possible by the ground application of residual insecticides to the dry season resting and refuge sites of the tsetse. Briefly, the modifications to the game elimination technique involved the restriction of the species to be removed to the preferred hosts only, namely warthog, bushpig, kudu and bushbuck, as had been determined by the

identifications of many hundreds of tsetse blood meals from the Rhodesian fly-belts. Elephant and buffalo are also driven out or destroyed, chiefly as a fence protection measure, (the fly fronts are delimited for the most part by six foot high, nine strand, high-strain steel wire fences), but also because they are known to be utilised as food hosts to quite a large degree when present in an area. It is noteworthy that just prior to the decision to resort to game elimination again, the efficacy of this modified technique, now called selective game elimination, was proven in a limited operation in the Sebungwe Operations Area, Binga district, which has come to be known as the Nagupande Operation. These selective game elimination operations are limited to defined areas along the fly fronts, the total area of these together being 29 125 square kilometres, (11 245 square miles). Similarly, the control method involving the application of residual insecticides to the dry season resting and refuge sites of tsetse flies has been greatly refined over the past few years and today it is possible to effect rapid control and even complete eradication of tsetse over relatively large areas of infested country at comparatively low cost. For instance, during the dry season of 1968, the Branch carried out a spraying Operation over an area falling within the Gokwe, Gatooma Lomagundi districts, using a five per cent suspension of DDE wettable powder, in which the total area of fly infested bush land and woodland, covered during the operation exceeded 4 403

square kilometres, (1 700 square miles). The results of the operation were most gratifying, with the easterly and south easterly fly advance, which had been threatening the Lomagundi and Gatooma European farming areas and which had involved the Copper Queen and Chenjiri African Purchase Land areas and the Sanyati and Umfuli Tribal Trust Land areas, being completely arrested. The cost for this operation was \$34,800 or \$19 per square kilometre (.50 per square mile), approximately. Other very notable successes using this technique have been the complete control of the Chikwizo Tribal Trust Land (Mtoko district), and Inyanga North problem and the driving back of tsetse in the Sabi-Lundi region from the Gona-re-zhou game reserve to a depth of 30 km into Mocambique, from the international border. And coming nearer home spraying with residual insecticides has been used successfully, in conjunction with selective game elimination for some years to hold the tsetse at bay to the north of us, on a front extending from Nzoze gate in the west, to the headwaters of the Chitaki in the east. In this last spraying season (1st June to 8th October of this year), we extended our effort to include the lake shore from Dandawa's fishing village to Kariba township and taking in the Charara river basin. Early results in the lake shore region are encouraging as some of you here today may have noticed personally.

Brief mention must also be made at this juncture of the important role which the various trypanosomicidal drugs

have played during the difficult times experienced since 1961. Suffice it is to say that without the excellent drugs and the veterinary organisation which has been responsible for their administration, it is certain that many of the cattle in those areas which were overrun by tsetse flies after 1960 would have died. In many cases, cattle have been protected in the face of heavy trypanosome risk by the judicious use of prophylaxis or by regular curative therapy, whilst anti-tsetse operations necessary to combat the particular problem were being mounted. It is of interest that the number of cattle at risk and therefore subject to regular inspection for the reporting year ended 30th September, 1971, exceeded 493 500 head. It must be emphasised, however, that the utilisation of drugs can only be regarded, at the most, as palliative, the only certain solution being elimination of the vector, for though it is true that cattle and other domestic stock can be maintained reasonably satisfactorily in tsetse-infested country, as has been done on the Branch's two field research stations, the problems involved are many. In particular, there is the drug therapist's nightmare, namely drug resistance. Drug resistance has occurred a number of times in Rhodesia and now, today, we are left with but one drug in our prophylactic drug armoury and even this one has given us cause for concern, in several areas, in recent months.

It has been suggested from time to time over the years, and in various ways, often in all seriousness, that the existing

approach to the problem is wrong and that more attention should be paid to the phenomenon of natural tolerance which is exhibited by the majority of game animals to trypanosome infections, in order to provide a satisfactory solution to the problem, i.e. if interpreted correctly, that game animals should be utilised instead of cattle within the tsetse infested areas of Rhodesia, either by farming those species which show a potential for domestication, or by ranching the existing spectrum of game animals occurring within any particular area. These ideas are interesting but fail to provide a solution for the interface between the fly infested country and the country stocked with cattle and other domestic stock. To implement them would involve either a withdrawal of all control, with a return to the situation which prevailed prior to 1896, with domestic stock on the highveld and game animals occupying the middle and low veld areas, (albeit the latter on a utilisation basis), or else Government would be obliged to continue, ad infinitum, to maintain an area of control as a barrier along the existing fronts, with that country lying within the fly belts being turned over to game farmers or ranchers, either European or African. Both ideas are unacceptable, the first because it would invite disaster to a large portion of our national herd and the second because it would perpetuate the existing problem. The first idea need not be discussed further, and in the case of the

second, it would be quite wrong to go on holding a line year after year, always at great cost when, with intelligent planning, but with very little extra effort and expenditure, the "carpet could be gradually rolled up" over a period of years. Recent successes with the application of residual insecticides to the resting and refuge sites of tsetse flies would suggest that such an approach is feasible, and, as time proceeds, will become increasingly more so because, as each spraying season passes so does our efficiency and "know how" improve. It must be emphasised, however, that it would be wrong to make a start on this gigantic undertaking before the existing fly fronts have been stabilised and the detailed planning for the task in question completed on a long term basis, including, in particular, the adoption of a rational land use policy for the land to be reclaimed.

It is not the function of the Branch of Tsetse and Trypanosomiasis Control, Department of Veterinary Services, to decide on land use policies. It may well be that the game farming and ranching protagonists are right and that the land in question would be utilized to best advantage by an economy based on game. Generally speaking such land falls within Vincent and Thomas's (1960) agro-ecological land categories IV, V and XX. Regions IV and V are particularly suitable for beef production and XX is defined as "Unsuitable for any form of agricultural utilisation : Suitable only for nature reserves".

It would thus appear that this land is mostly of a marginal nature. However, the crux of the whole matter is that the greater part of the infested country falls within the Tribal Trust Land category with the balance being made up of African Purchase Land, game reserves, wild life land and forest areas, and therefore the final utilisation for the most part will almost certainly involve cattle. This might appear to be a pessimistic outlook but without radical change on the part of the tribesman this can be the only end result. To emphasise this point further the only factor preventing the immediate settlement of those areas which have already been developed for settlement by the Ministry of Internal Affairs within tsetse infested country, (all part of the overall reclamation plan), is that potential settlers are not permitted to take cattle into these areas with them and therefore they invariably decline to take up the offers of land when these are made.

Finally it is considered appropriate in this context and as a word of warning to quote Dr. Cockbill, until recently head of the Branch of Tsetse and Trypanosomiasis Control, who wrote in Rhodesia Science News in November 1968 as follows :

"Effective methods of tsetse control are available and are being used with success in Rhodesia. Research is directed towards refining them, to make them more selective and thus more economical. Even now, it can be claimed that the ultimate control of the fly is a matter of logistics - to get enough skilled personnel with

enough material into the correct place at the correct time. But if the elimination of the fly in Rhodesia can be contemplated, its consequences must be seriously and conscientiously considered. What social changes will take place if hundreds of square miles of territory, now denied to man and his cattle are made available for settlement and cattle owning tribesmen? Are these areas of wooded savannas and wide vleis, the home of our varied game species and abundant bird life, where only an occasional village is seen, where roads are few and poor and only the venturesome go - are these to be transformed into vast tracts of treeless, grassless, eroded desert, overstocked and overgrazed by people who demand more and yet more land for their exaciated stock?

At the present time tsetse control operations are organised to halt the advances which have taken place since 1960 into settled agricultural areas. When that has been achieved and the tsetse front has been stabilized, demands will be made to make uninhabited areas free of tsetse flies. It must be made a condition of occupancy of these areas that holdings of stock shall not exceed the carrying capacity of the land and that the stock be treated as a crop. Unless a rational form of land use is introduced to these new areas it would be better to assign the land to the tsetse fly forever."